

# 天文年鑑 2019

臺北市立天文科學教育館編

# 2019 年 天文年鑑

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## 編輯說明（代序）

- 一、本書依據國際主要研究機構發佈預報之年度重要天象事件、太陽系星體升沒時間位置、常用天文常數與星表等資料選輯編印；俾便提供各界參考，以為本館推廣天文之社會教育目標。
- 二、本書編輯含有曆象表：我國傳統民俗及生活中習用之二十四節氣、月相、農曆日期、地球與月球的軌道位置以及各行星的位置、動態等資訊；唯本館並非曆法或時間發布的權責機關，本資料僅供參考。天象表及每月行星動態概述。太陽表、月球表與行星表：列有各該星體升沒時間及座標方位與亮度等數據。太陽黑子測繪為本館持續超過半世紀的工作，年報資料附列於太陽表後供作參考。日月食表、流星雨表、年度回歸彗星表及掩星表：參考國際主要研究機構發布資訊，彙整預報臺灣地區可見情形。天文常數、主要亮星表、星座表及星雲星團等天體位置表、小型望遠鏡功能簡介、國內外重要天文機構網站等各類簡要數據資訊；詳細完整資訊請參閱各相關專著。書中紅字敘述表示該天象屬相對重要，或臺灣地區可見的精彩天象。
- 三、本書資料來源主要參考：
  - 1 美國海軍天文臺及英國拉塞福實驗室太空科學與技術部聯合出版的 The Astronomical Almanac 及其計算軟體 Multiyear Interactive Computer Almanac（MICA）1800-2050；
  - 2 日本海上保安廳出版「天體位置表」；
  - 3 美國航太總署日月食網站 <http://sunearth.gsfc.nasa.gov/eclipse/eclipse.html>；
  - 4 國際彗星季刊（International Comet Quarterly）<http://cfa-www.harvard.edu/icq/icq.html>；
  - 5 國際流星組織（International Meteor Organization）<http://www.imo.net/>；
  - 6 國際掩星組織（International Occultation Timing Association, IOTA）提供掩星計算軟體 Occult Predictions Programs by D. Herald 等。
- 四、本書內容謬誤脫漏之處，祈請各界賢達不吝斧正指教。

## 西元 2019 年曆象表

農曆歲次己亥年【豬】年；平年 365 日

東經 120 度平均太陽時

## ※ 二十四節氣：

| 節氣 | 太陽黃經度 | 月  | 日 | 時  | 分  | 中氣 | 太陽黃經度 | 月  | 日  | 時  | 分  |
|----|-------|----|---|----|----|----|-------|----|----|----|----|
| 小寒 | 285   | 1  | 5 | 23 | 39 | 大寒 | 300   | 1  | 20 | 17 | 00 |
| 立春 | 315   | 2  | 4 | 11 | 14 | 雨水 | 330   | 2  | 19 | 07 | 04 |
| 驚蟄 | 345   | 3  | 6 | 05 | 10 | 春分 | 0     | 3  | 21 | 05 | 58 |
| 清明 | 15    | 4  | 5 | 09 | 51 | 穀雨 | 30    | 4  | 20 | 16 | 55 |
| 立夏 | 45    | 5  | 6 | 03 | 03 | 小滿 | 60    | 5  | 21 | 15 | 39 |
| 芒種 | 75    | 6  | 6 | 07 | 06 | 夏至 | 90    | 6  | 21 | 23 | 54 |
| 小暑 | 105   | 7  | 7 | 17 | 21 | 大暑 | 120   | 7  | 23 | 10 | 50 |
| 立秋 | 135   | 8  | 8 | 03 | 13 | 處暑 | 150   | 8  | 23 | 18 | 02 |
| 白露 | 165   | 9  | 8 | 06 | 17 | 秋分 | 180   | 9  | 23 | 15 | 50 |
| 寒露 | 195   | 10 | 8 | 22 | 06 | 霜降 | 210   | 10 | 24 | 01 | 20 |
| 立冬 | 225   | 11 | 8 | 01 | 24 | 小雪 | 240   | 11 | 22 | 22 | 59 |
| 大雪 | 255   | 12 | 7 | 18 | 18 | 冬至 | 270   | 12 | 22 | 12 | 19 |

## ※ 月相：

| 朔  |    |    |    | 上弦 |    |    |    | 望  |    |    |    | 下弦 |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 月  | 日  | 時  | 分  | 月  | 日  | 時  | 分  | 月  | 日  | 時  | 分  | 月  | 日  | 時  | 分  |
| 1  | 6  | 9  | 28 | 1  | 14 | 14 | 46 | 1  | 21 | 13 | 16 | 1  | 28 | 5  | 10 |
| 2  | 5  | 5  | 4  | 2  | 13 | 6  | 26 | 2  | 19 | 23 | 54 | 2  | 26 | 19 | 28 |
| 3  | 7  | 0  | 4  | 3  | 14 | 18 | 27 | 3  | 21 | 9  | 43 | 3  | 28 | 12 | 10 |
| 4  | 5  | 16 | 50 | 4  | 13 | 3  | 6  | 4  | 19 | 19 | 12 | 4  | 27 | 6  | 18 |
| 5  | 5  | 6  | 45 | 5  | 12 | 9  | 12 | 5  | 19 | 5  | 11 | 5  | 27 | 0  | 34 |
| 6  | 3  | 18 | 2  | 6  | 10 | 13 | 59 | 6  | 17 | 16 | 31 | 6  | 25 | 17 | 46 |
| 7  | 3  | 3  | 16 | 7  | 9  | 18 | 55 | 7  | 17 | 5  | 38 | 7  | 25 | 9  | 18 |
| 8  | 1  | 11 | 12 | 8  | 8  | 1  | 31 | 8  | 15 | 20 | 29 | 8  | 23 | 22 | 56 |
| 8  | 30 | 18 | 37 | 9  | 6  | 11 | 10 | 9  | 14 | 12 | 33 | 9  | 22 | 10 | 41 |
| 9  | 29 | 2  | 26 | 10 | 6  | 0  | 47 | 10 | 14 | 5  | 8  | 10 | 21 | 20 | 39 |
| 10 | 28 | 11 | 38 | 11 | 4  | 18 | 23 | 11 | 12 | 21 | 34 | 11 | 20 | 5  | 11 |
| 11 | 26 | 23 | 6  | 12 | 4  | 14 | 58 | 12 | 12 | 13 | 12 | 12 | 19 | 12 | 57 |
| 12 | 26 | 13 | 13 |    |    |    |    |    |    |    |    |    |    |    |    |

## ※ 地球軌道位置：(地心赤道座標)

| 近日點 |   |    |    |             | 遠日點 |   |   |    |             |
|-----|---|----|----|-------------|-----|---|---|----|-------------|
| 月   | 日 | 時  | 分  | 距離 (AU)     | 月   | 日 | 時 | 分  | 距離 (AU)     |
| 1   | 3 | 13 | 20 | 0.983301386 | 7   | 5 | 6 | 11 | 1.016754005 |

## ※ 月球軌道位置：(地心赤道座標)

| 近地點 |    |    |    |           | 遠地點 |    |    |    |           |
|-----|----|----|----|-----------|-----|----|----|----|-----------|
| 月   | 日  | 時  | 分  | 距離 (公里)   | 月   | 日  | 時  | 分  | 距離 (公里)   |
| 1   | 22 | 4  | 0  | 357451.05 | 1   | 9  | 12 | 29 | 406068.96 |
| 2   | 19 | 17 | 3  | 356872.49 | 2   | 5  | 17 | 29 | 406519.31 |
| 3   | 20 | 3  | 48 | 359475.79 | 3   | 4  | 19 | 26 | 406349.08 |
| 4   | 17 | 6  | 5  | 364277.39 | 4   | 1  | 8  | 14 | 405521.12 |
| 5   | 14 | 5  | 53 | 369046.51 | 4   | 29 | 2  | 20 | 404514.41 |
| 6   | 8  | 7  | 15 | 368544.75 | 5   | 26 | 21 | 27 | 404066.21 |
| 7   | 5  | 13 | 0  | 363799.43 | 6   | 23 | 15 | 50 | 404481.14 |
| 8   | 2  | 15 | 11 | 359495.00 | 7   | 21 | 7  | 59 | 405424.75 |
| 8   | 30 | 23 | 53 | 357285.06 | 8   | 17 | 18 | 49 | 406202.04 |
| 9   | 28 | 10 | 24 | 357908.64 | 9   | 13 | 21 | 32 | 406340.40 |
| 10  | 26 | 18 | 39 | 361400.15 | 10  | 11 | 2  | 29 | 405851.86 |
| 11  | 23 | 15 | 41 | 366774.50 | 11  | 7  | 16 | 36 | 404995.82 |
| 12  | 19 | 4  | 25 | 370289.86 | 12  | 5  | 12 | 8  | 404373.74 |

## ※ 行星軌道位置：(日心黃道座標)

|    | 降交點 |    | 遠日點 |    | 軌道最南點 |    | 昇交點 |    | 近日點 |    | 軌道最北點 |    |
|----|-----|----|-----|----|-------|----|-----|----|-----|----|-------|----|
|    | 月   | 日  | 月   | 日  | 月     | 日  | 月   | 日  | 月   | 日  | 月     | 日  |
| 水星 | 1   | 2  | 1   | 12 | 2     | 1  | 2   | 20 | 2   | 25 | 3     | 7  |
|    | 3   | 31 | 4   | 10 | 4     | 30 | 5   | 19 | 5   | 24 | 6     | 3  |
|    | 6   | 27 | 7   | 7  | 7     | 27 | 8   | 15 | 8   | 20 | 8     | 30 |
|    | 9   | 23 | 10  | 3  | 10    | 23 | 11  | 11 | 11  | 16 | 11    | 26 |
|    | 12  | 20 | 12  | 30 |       |    |     |    |     |    |       |    |
| 金星 |     |    |     |    |       |    |     |    |     |    | 1     | 17 |
|    | 3   | 14 | 4   | 18 | 5     | 10 | 7   | 5  | 8   | 8  | 8     | 30 |
| 火星 | 10  | 25 | 11  | 29 | 12    | 21 |     |    |     |    |       |    |
|    | 8   | 26 |     |    |       |    | 1   | 15 |     |    | 7     | 19 |

註：木星、土星、天王星、海王星均無通過上述各點。

## ※日食、月食等食象：

| 日期     | 全球食象 | 臺灣地區觀測情形 |
|--------|------|----------|
| 1月6日   | 日偏食  | 中部以北可見   |
| 1月21日  | 月全食  | 不可見      |
| 7月3日   | 日全食  | 不可見      |
| 7月17日  | 月偏食  | 可見月沒帶食   |
| 12月26日 | 日環食  | 可見偏食     |

## ※ 行星動態：( 地心赤道座標 )

內側行星：

|    | 上合 |    | 東大距 |    |      | 留  |   | 下合 |    | 留  |    | 西大距 |    |      |
|----|----|----|-----|----|------|----|---|----|----|----|----|-----|----|------|
|    | 月  | 日  | 月   | 日  | 日距角° | 月  | 日 | 月  | 日  | 月  | 日  | 月   | 日  | 日距角° |
| 水星 | 1  | 30 | 2   | 27 | 18.1 | 3  | 5 | 3  | 15 | 3  | 27 | 4   | 12 | 27.7 |
|    | 5  | 21 | 6   | 24 | 19.0 | 7  | 7 | 7  | 21 | 8  | 1  | 8   | 10 | 19.0 |
|    | 9  | 4  | 10  | 20 | 24.6 | 11 | 1 | 11 | 11 | 11 | 20 | 11  | 28 | 20.1 |
| 金星 | 8  | 14 |     |    |      |    |   |    |    |    |    | 1   | 6  | 47.0 |

外側行星、冥王星、穀神星與較大小行星：

|     | 合  |    | 留 |    | 衝  |    | 留  |    |
|-----|----|----|---|----|----|----|----|----|
|     | 月  | 日  | 月 | 日  | 月  | 日  | 月  | 日  |
| 火星  | 9  | 2  |   |    |    |    |    |    |
| 木星  | 12 | 28 | 4 | 11 | 6  | 10 | 8  | 12 |
| 土星  | 1  | 2  | 4 | 30 | 7  | 10 | 9  | 18 |
| 天王星 | 4  | 23 | 8 | 12 | 10 | 28 | 1  | 7  |
| 海王星 | 3  | 7  | 6 | 22 | 9  | 10 | 11 | 28 |
| 冥王星 | 1  | 11 | 4 | 25 | 7  | 14 | 10 | 2  |
| 穀神星 |    |    | 4 | 8  | 5  | 29 | 7  | 19 |
| 智神星 | 12 | 3  | 3 | 4  | 4  | 10 | 6  | 3  |
| 婚神星 | 8  | 23 |   |    |    |    |    |    |
| 灶神星 | 3  | 8  | 9 | 25 | 11 | 12 |    |    |

## ※行星晨昏出現情形：

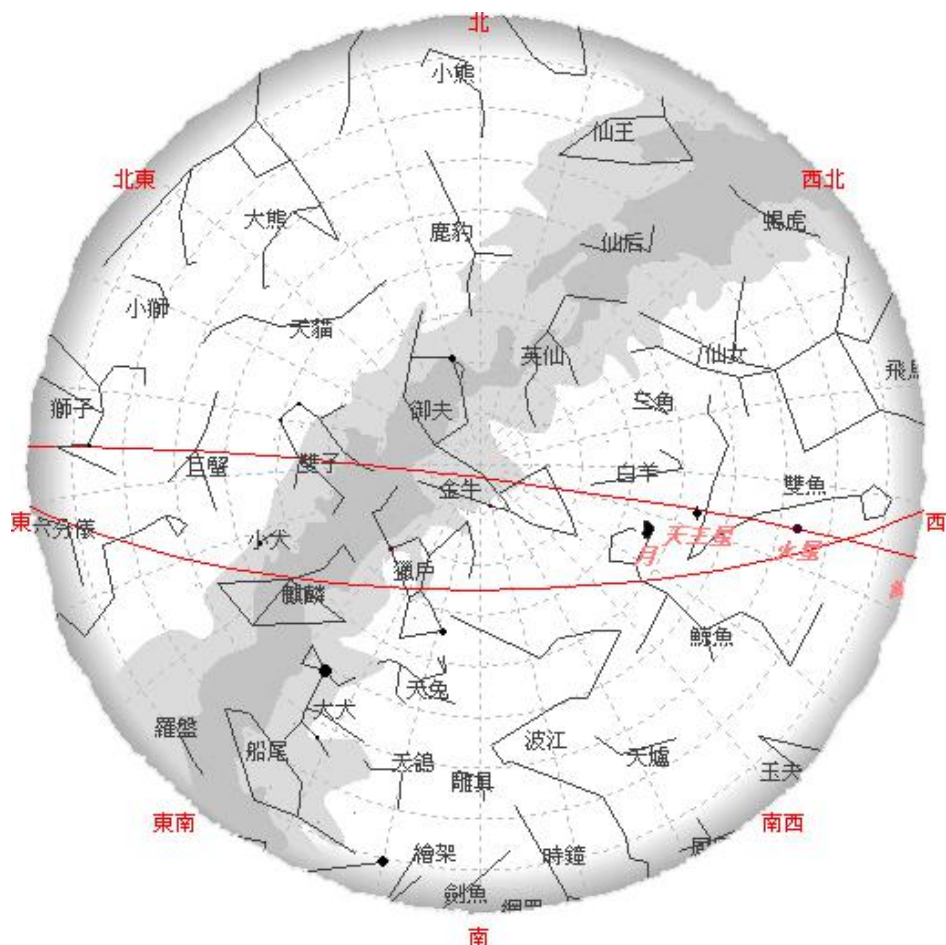
| 行星  | 晨昏出現情形                   |   |       |          |
|-----|--------------------------|---|-------|----------|
|     | (因地形地物與天候因素，實際可見日期可能有誤差) |   |       |          |
| 水星  | 01 月初                    |   |       | ( 清晨可見 ) |
|     | 02 月底                    | ~ | 03 月初 | ( 黃昏可見 ) |
|     | 04 月初                    | ~ | 04 月中 | ( 清晨可見 ) |
|     | 06 月中                    | ~ | 06 月底 | ( 黃昏可見 ) |
|     | 08 月初                    | ~ | 09 月中 | ( 清晨可見 ) |
|     | 10 月中                    | ~ | 11 月底 | ( 黃昏可見 ) |
|     | 12 月底                    |   |       | ( 清晨可見 ) |
| 金星  | 01 月初                    | ~ | 05 月底 | ( 清晨可見 ) |
|     | 10 月底                    | ~ | 12 月底 | ( 黃昏可見 ) |
| 火星  | 01 月初                    | ~ | 08 月初 | ( 黃昏可見 ) |
|     | 11 月初                    | ~ | 12 月底 | ( 清晨可見 ) |
| 木星  | 01 月初                    | ~ | 05 月底 | ( 清晨可見 ) |
|     | 06 月                     |   |       | ( 全夜可見 ) |
|     | 07 月初                    | ~ | 12 月底 | ( 黃昏可見 ) |
| 土星  | 02 月初                    | ~ | 06 月底 | ( 清晨可見 ) |
|     | 07 月                     |   |       | ( 全夜可見 ) |
|     | 08 月初                    | ~ | 12 月底 | ( 黃昏可見 ) |
| 天王星 | 01 月初                    | ~ | 03 月初 | ( 黃昏可見 ) |
|     | 05 月中                    | ~ | 09 月底 | ( 清晨可見 ) |
|     | 10 月初                    | ~ | 11 月初 | ( 全夜可見 ) |
|     | 11 月中                    | ~ | 12 月底 | ( 黃昏可見 ) |
| 海王星 | 01 月初                    | ~ | 02 月初 | ( 黃昏可見 ) |
|     | 04 月初                    | ~ | 08 月中 | ( 清晨可見 ) |
|     | 08 月底                    | ~ | 09 月底 | ( 全夜可見 ) |
|     | 10 月初                    | ~ | 12 月底 | ( 黃昏可見 ) |

## 2019 年 一 月 天 象

| 日期 | 儒略日<br>(20.0 時) | 月齡   | 星期 | 時間                       | 天象記要   |
|----|-----------------|------|----|--------------------------|--|
| 1  | 2458485         | 25.2 | 二  |                          |  |
| 2  | 2458486         | 26.2 | 三  | 1h21m<br>5h48m<br>13h50m | 穀神星合月，穀神星在月球北 1.65 度。<br>金星合月，金星在月球南 1.28 度。<br>土星合。                       |
| 3  | 2458487         | 27.2 | 四  | 13h20m<br>15h35m         | 地球過近日點，日地距離 0.983301386AU。<br>木星合月，木星在月球南 3.13 度。                          |
| 4  | 2458488         | 28.2 | 五  |                          | 象限儀座流星雨極大期 (ZHR~110)。  |
| 5  | 2458489         | 29.2 | 六  | 1h40m<br>23h39m          | 水星合月，水星在月球南 2.77 度。<br>小寒。   |
| 6  | 2458490         | 0.4  | 日  | 2h42m<br>9h28m<br>12h54m | 土星合月，土星在月球南 0.87 度。<br>朔，日偏食 (臺灣中部以北可見偏食)。<br>金星西大距 (日距角 47 度，視亮度 -4.6 等)。 |
| 7  | 2458491         | 1.4  | 一  |                          | 天王星留。  |
| 8  | 2458492         | 2.4  | 二  |                          |  |
| 9  | 2458493         | 3.4  | 三  | 5h13m<br>12h29m          | 灶神星合月，灶神星在月球南 1.96 度。<br>月球過遠地點，月地距離 406068.958 公里。                        |
| 10 | 2458494         | 4.4  | 四  |                          |  |
| 11 | 2458495         | 5.4  | 五  | 19h38m                   | 冥王星合。  |
| 12 | 2458496         | 6.4  | 六  |                          |  |
| 13 | 2458497         | 7.4  | 日  | 19h                      | 土星合水星，土星在水星北 1.72 度。   |
| 14 | 2458498         | 8.4  | 一  | 14h46m                   | 上弦。  |
| 15 | 2458499         | 9.4  | 二  |                          |  |
| 16 | 2458500         | 10.4 | 三  |                          |  |
| 17 | 2458501         | 11.4 | 四  |                          |  |
| 18 | 2458502         | 12.4 | 五  | 2h47m                    | 畢宿五合月，畢宿五在月球南 1.63 度。  |
| 19 | 2458503         | 13.4 | 六  | 0h                       | 冥王星合水星，冥王星在水星北 1.54 度。   |
| 20 | 2458504         | 14.4 | 日  | 17h0m                    | 大寒。  |
| 21 | 2458505         | 15.4 | 一  | 13h16m                   | 望，月全食 (臺灣不可見)。   |
| 22 | 2458506         | 16.4 | 二  | 4h0m<br>14h              | 月球過近地點，月地距離 357451.047 公里。<br>木星合金星，木星在金星南 2.43 度。                         |
| 23 | 2458507         | 17.4 | 三  | 10h6m                    | 軒轅十四合月，軒轅十四在月球南 2.54 度。  |
| 24 | 2458508         | 18.4 | 四  |                          |  |
| 25 | 2458509         | 19.4 | 五  |                          |  |
| 26 | 2458510         | 20.4 | 六  |                          |  |
| 27 | 2458511         | 21.4 | 日  |                          |  |
| 28 | 2458512         | 22.4 | 一  | 5h10m                    | 下弦。  |
| 29 | 2458513         | 23.4 | 二  |                          |  |
| 30 | 2458514         | 24.4 | 三  | 1h47m<br>10h52m          | 穀神星合月，穀神星在月球北 1.99 度。<br>水星上合日。  |
| 31 | 2458515         | 25.4 | 四  | 7h53m                    | 木星合月，木星在月球南 2.76 度。  |



## 一月星座圖



2019 年 1 月 15 日 21:00 的天空

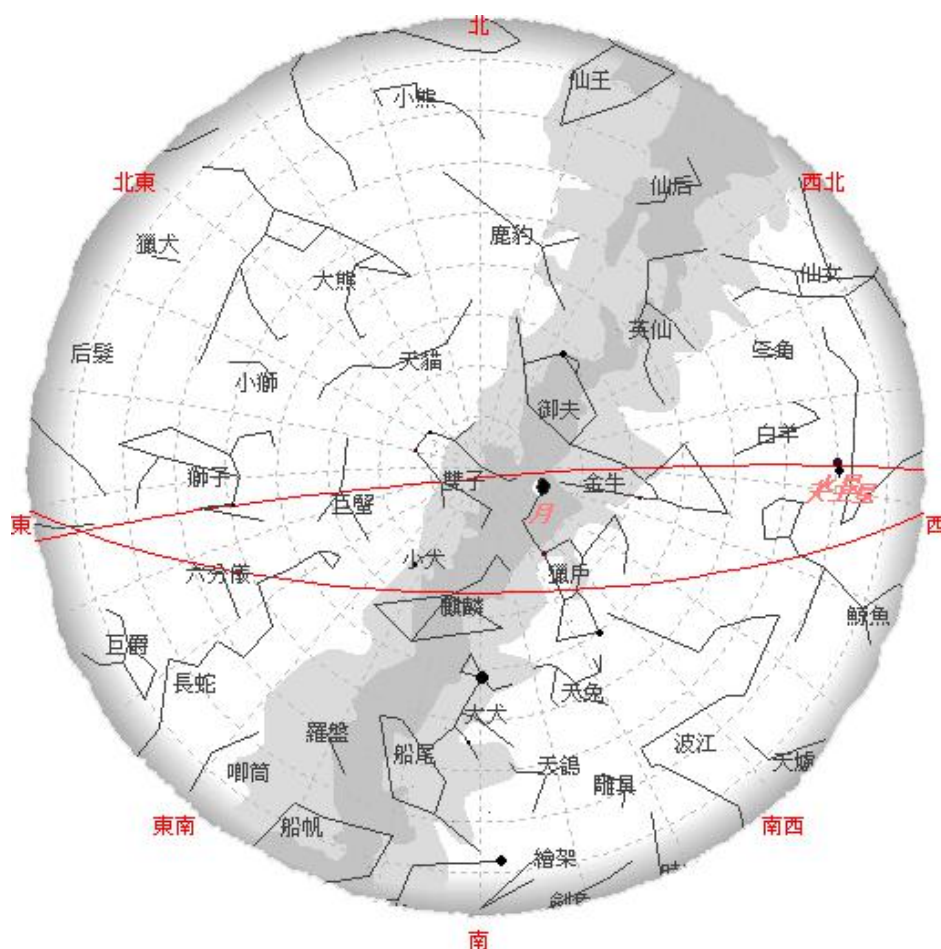
## 2019 年 1 月行星動態：

- 水 星： 由蛇夫座經人馬座到摩羯座，順行。上旬日出前見於東南方，15 日 11:24 過中天。視亮度-0.4~-1.5 等，視直徑約 5.2"~4.8"。
- 金 星： 天秤座經天蠍座到蛇夫座，順行。日出前見於東方，15 日 08:44 過中天。視亮度-4.6~-4.3 等，視直徑約 26.3"~19.4"。
- 火 星： 在雙魚座，順行。日沒後見於西南方，15 日 23:01 沒。視亮度約 0.5~0.9 等，視直徑約 7.4"~6.2"。
- 木 星： 在蛇夫座，順行。近太陽不易見。15 日 03:45 升。視亮度約-1.8 等，視直徑約 31.8"~33.68"。
- 土 星： 在人馬座，順行。近太陽不易見。15 日 11:13 升。視亮度約 0.5 等，視直徑約 15.1"。
- 天王星： 在雙魚座，逆行，7 日留，順行。日沒後見於東南方。15 日 00:28 沒。視亮度約 5.8 等，視直徑約 3.6"。
- 海王星： 在寶瓶座，順行。日沒後見於西南方，15 日 21:09 沒。視亮度約 7.9 等，視直徑約 2.2"。

## 2019 年 二 月 天 象

| 日期 | 儒略日<br>(20.0 時) | 月齡   | 星期 | 時間                                       | 天象記要   |
|----|-----------------|------|----|--|--|
| 1  | 2458516         | 26.4 | 五  | 1h35m                                    | 金星合月，金星在月球南 0.09 度。  |
| 2  | 2458517         | 27.4 | 六  | 15h5m                                    | 土星合月，土星在月球南 0.62 度。  |
| 3  | 2458518         | 28.4 | 日  | 4h26m                                    | 冥王星合月，冥王星在月球南 0.63 度。  |
| 4  | 2458519         | 29.4 | 一  | 11h14m                                   | 立春。  |
| 5  | 2458520         | 0.6  | 二  | 5h4m<br>15h2m<br>17h29m                  | 朔。<br>水星合月，水星在月球北 0.19 度。<br>月球過遠地點，月地距離 406519.310 公里。  |
| 6  | 2458521         | 1.6  | 三  | 15h47m                                   | 灶神星合月，灶神星在月球南 1.14 度。  |
| 7  | 2458522         | 2.6  | 四  |  |  |
| 8  | 2458523         | 3.6  | 五  |  | 半人馬座 $\alpha$ 流星雨極大期 ( ZHR~6 ) 。   |
| 9  | 2458524         | 4.6  | 六  |  |  |
| 10 | 2458525         | 5.6  | 日  |  |  |
| 11 | 2458526         | 6.6  | 一  |  |  |
| 12 | 2458527         | 7.6  | 二  |  |  |
| 13 | 2458528         | 8.6  | 三  | 6h26m                                    | 上弦。  |
| 14 | 2458529         | 9.6  | 四  | 4h<br>11h58m                             | 天王星合火星，天王星在火星南 1.05 度。<br>畢宿五合月，畢宿五在月球南 1.7 度。   |
| 15 | 2458530         | 10.6 | 五  |  |  |
| 16 | 2458531         | 11.6 | 六  |  |  |
| 17 | 2458532         | 12.6 | 日  |  |  |
| 18 | 2458533         | 13.6 | 一  | 22h                                      | 土星合金星，土星在金星南 1.09 度。   |
| 19 | 2458534         | 14.6 | 二  | 7h4m<br>17h3m<br>19h<br>21h32m<br>23h54m | 雨水。<br>月球過近地點，月地距離 356872.491 公里。<br>海王星合水星，海王星在水星南 0.77 度。<br>軒轅十四合月，軒轅十四在月球南 2.52 度。<br>望，今年最大滿月，視直徑 33.3' 。 |
| 20 | 2458535         | 15.6 | 三  |  |  |
| 21 | 2458536         | 16.6 | 四  |  |  |
| 22 | 2458537         | 17.6 | 五  |  |  |
| 23 | 2458538         | 18.6 | 六  | 17h                                      | 冥王星合金星，冥王星在金星南 1.41 度。   |
| 24 | 2458539         | 19.6 | 日  |  |  |
| 25 | 2458540         | 20.6 | 一  |  |  |
| 26 | 2458541         | 21.6 | 二  | 19h28m<br>23h9m                          | 下弦。<br>穀神星合月，穀神星在月球北 2.47 度。   |
| 27 | 2458542         | 22.6 | 三  | 9h25m<br>22h16m                          | 水星東大距 ( 日距角 18.1 度，視亮度 -0.5 等 ) 。<br>木星合月，木星在月球南 2.32 度。   |
| 28 | 2458543         | 23.6 | 四  |  |  |

## 二月星座圖



2019 年 2 月 15 日 21:00 的天空

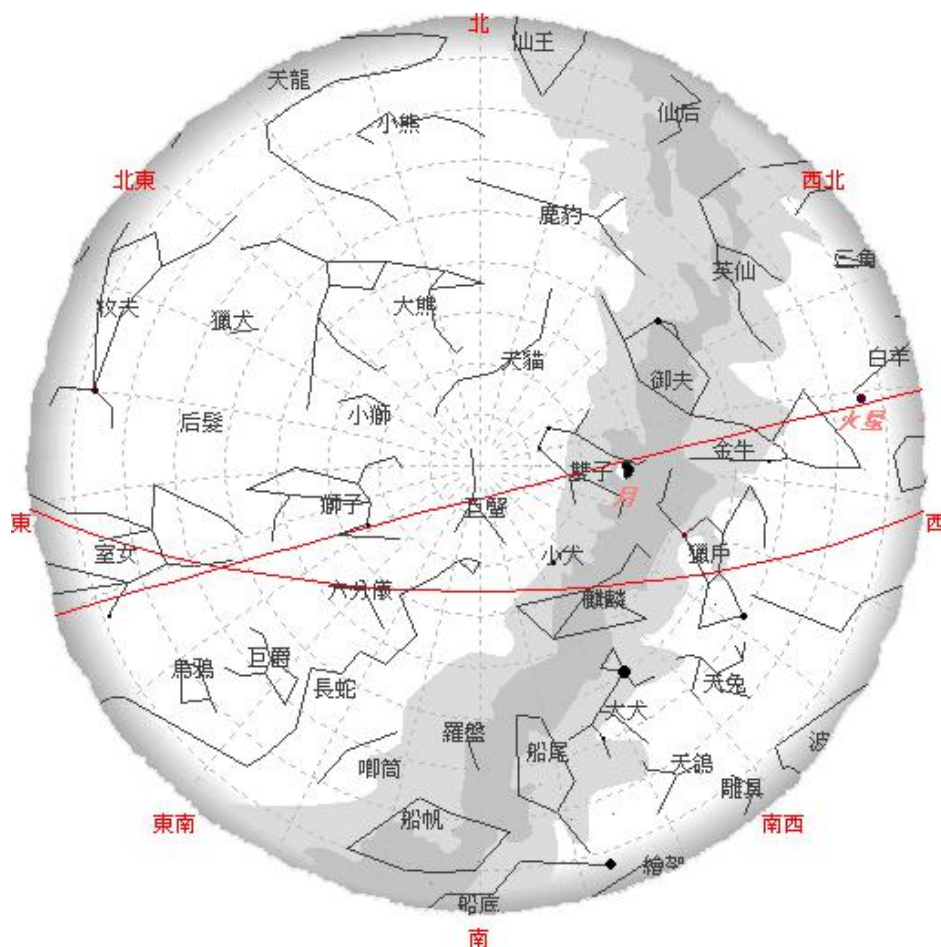
## 2019 年 2 月行星動態：

- 水 星：由摩羯座經寶瓶座到雙魚座，順行。下旬日沒後見於西南方，15 日 12:56 過中天。27 日東大距。視亮度-1.5~-0.4 等，視直徑約 4.8"~7.5"。
- 金 星：由蛇夫座到人馬座，順行。日出前見於東方，15 日 09:10 過中天。視亮度-4.3~-4.1 等，視直徑約 19.4"~15.7"。
- 火 星：由雙魚座到白羊座，順行。日沒後見於西南方，15 日 23:32 沒。視亮度約 0.9~1.2 等，視直徑約 6.1"~5.3"。
- 木 星：在蛇夫座，順行。日出前見於南方。15 日 02:14 升。視亮度約-1.9 等，視直徑約 33.7"~36.1"。
- 土 星：在人馬座，順行。日出前見於東南方。15 日 04:07 升。視亮度約 0.6 等，視直徑約 15.4"。
- 天王星：由雙魚座到白羊座，順行。日沒後見於南方。15 日 22:25 沒。視亮度約 5.8 等，視直徑約 3.5"。
- 海王星：在寶瓶座，順行。日沒後見於西南方，15 日 19:11 沒。視亮度約 8.0 等，視直徑約 2.2"。

## 2019 年 三 月 天 象

| 日期 | 儒略日<br>(20.0 時) | 月齡   | 星期 | 時間                    | 天象記要  |
|----|-----------------|------|----|-----------------------|---|
| 1  | 2458544         | 24.6 | 五  |                       |   |
| 2  | 2458545         | 25.6 | 六  | 2h28m<br>11h59m       | 土星合月，土星在月球南 0.31 度。<br>冥王星合月，冥王星在月球南 0.52 度。  |
| 3  | 2458546         | 26.6 | 日  | 5h27m                 | 金星合月，金星在月球北 1.2 度。                            |
| 4  | 2458547         | 27.6 | 一  | 19h26m                | 月球過遠地點，月地距離 406349.084 公里。<br>智神星留。           |
| 5  | 2458548         | 28.6 | 二  |                       | 木星留。<br>水星留。                                  |
| 6  | 2458549         | 29.6 | 三  | 5h10m                 | 驚蟄。   |
| 7  | 2458550         | 0.8  | 四  | 0h4m<br>1h51m<br>9h0m | 朔。<br>灶神星合月，灶神星在月球南 0.54 度。<br>海王星合。          |
| 8  | 2458551         | 1.8  | 五  | 6h12m                 | 灶神星合。   |
| 9  | 2458552         | 2.8  | 六  |                       |   |
| 10 | 2458553         | 3.8  | 日  | 12h11m                | 天王星合月，天王星在月球北 4.9 度。                          |
| 11 | 2458554         | 4.8  | 一  |                       |   |
| 12 | 2458555         | 5.8  | 二  |                       |   |
| 13 | 2458556         | 6.8  | 三  | 18h42m                | 畢宿五合月，畢宿五在月球南 1.9 度。                          |
| 14 | 2458557         | 7.8  | 四  | 18h27m                | 上弦。   |
| 15 | 2458558         | 8.8  | 五  | 9h47m                 | 水星下合日。<br>矩尺座 $\gamma$ 流星雨極大期 (ZHR $\sim$ 6)。 |
| 16 | 2458559         | 9.8  | 六  |                       |   |
| 17 | 2458560         | 10.8 | 日  |                       |   |
| 18 | 2458561         | 11.8 | 一  |                       |   |
| 19 | 2458562         | 12.8 | 二  | 8h24m                 | 軒轅十四合月，軒轅十四在月球南 2.57 度。                       |
| 20 | 2458563         | 13.8 | 三  | 3h48m                 | 月球過近地點，月地距離 359475.786 公里。                    |
| 21 | 2458564         | 14.8 | 四  | 5h58m<br>9h43m        | 春分。<br>望。                                     |
| 22 | 2458565         | 15.8 | 五  | 15h                   | 海王星合水星，海王星在水星南 3.4 度。                         |
| 23 | 2458566         | 16.8 | 六  |                       |   |
| 24 | 2458567         | 17.8 | 日  |                       |   |
| 25 | 2458568         | 18.8 | 一  |                       |   |
| 26 | 2458569         | 19.8 | 二  | 15h41m                | 穀神星合月，穀神星在月球北 2.8 度。                          |
| 27 | 2458570         | 20.8 | 三  | 10h27m                | 木星合月，木星在月球南 1.9 度。<br>水星留。                    |
| 28 | 2458571         | 21.8 | 四  | 12h10m                | 下弦。   |
| 29 | 2458572         | 22.8 | 五  | 12h59m<br>19h42m      | 土星合月，土星在月球北 0.05 度。<br>冥王星合月，冥王星在月球南 0.31 度。  |
| 30 | 2458573         | 23.8 | 六  |                       |   |
| 31 | 2458574         | 24.8 | 日  |                       |   |

## 三月星座圖



2019 年 3 月 15 日 21:00 的天空

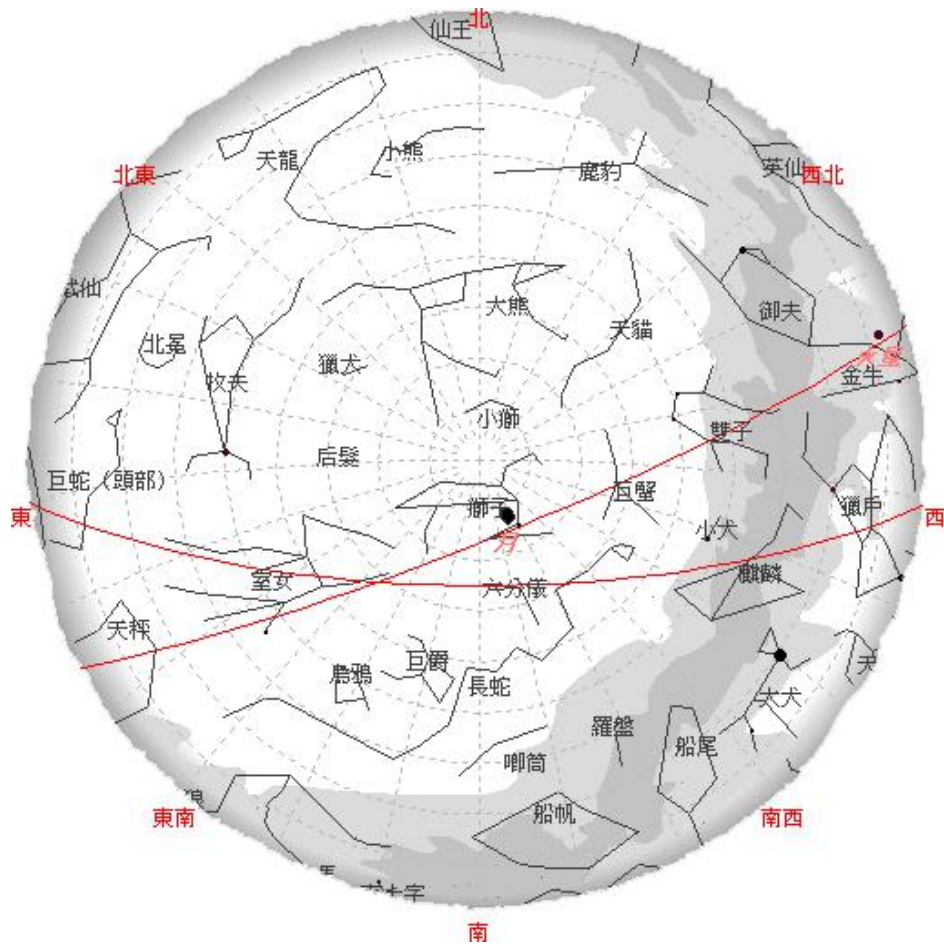
## 2019 年 3 月行星動態：

- 水 星：由雙魚座到寶瓶座，順行，5 日留，逆行。27 日留，順行。下旬日出前見於東南方，15 日 11:57 過中天。視亮度-0.2~0.9 等，視直徑約 7.7''~9.5''。
- 金 星：由人馬座經摩羯座到寶瓶座，順行。日出前見於東方，15 日 09:38 過中天。視亮度-4.1~-3.9 等，視直徑約 15.6''~13.2''。
- 火 星：由白羊座到金牛座，順行。日沒後見於西南方，15 日 22:08 沒。視亮度約 1.2~1.4 等，視直徑約 5.3''~4.7''。
- 木 星：在蛇夫座，順行。日出前見於南方。15 日 00:39 升。視亮度約-2.1 等，視直徑約 36.2''~39.7''。
- 土 星：在人馬座，順行。日出前見於東南方。15 日 02:27 升。視亮度約 0.5 等，視直徑約 16.0''。
- 天王星：在白羊座，順行。日沒後見於南方。15 日 20:40 沒。視亮度約 5.9 等，視直徑約 3.4''。
- 海王星：在寶瓶座，順行。4 日合，近太陽不易見，15 日 05:46 升。視亮度約 8.0 等，視直徑約 2.2''。

## 2019 年 四 月 天 象

| 日期 | 儒略日<br>(20.0 時) | 月齡   | 星期 | 時間                     | 天象記要   |
|----|-----------------|------|----|------------------------|--|
| 1  | 2458575         | 25.8 | 一  | 8h14m                  | 月球過遠地點，月地距離 405521.121 公里。   |
| 2  | 2458576         | 26.8 | 二  | 12h17m                 | 金星合月，金星在月球北 2.68 度。  |
| 3  | 2458577         | 27.8 | 三  | 3h<br>7h1m             | 海王星合水星，海王星在水星南 0.38 度。<br>水星合月，水星在月球北 3.62 度。                              |
| 4  | 2458578         | 28.8 | 四  | 11h34m                 | 灶神星合月，灶神星在月球南 0.2 度。   |
| 5  | 2458579         | 0.1  | 五  | 9h51m<br>16h50m        | 清明。<br>朔。  |
| 6  | 2458580         | 1.1  | 六  | 20h59m                 | 天王星合月，天王星在月球北 4.77 度。  |
| 7  | 2458581         | 2.1  | 日  |                        |  |
| 8  | 2458582         | 3.1  | 一  |                        | 穀神星留。  |
| 9  | 2458583         | 4.1  | 二  | 14h40m                 | 火星合月，火星在月球北 4.72 度。  |
| 10 | 2458584         | 5.1  | 三  | 0h12m<br>12h           | 畢宿五合月，畢宿五在月球南 2.14 度。<br>海王星合金星，海王星在金星北 0.31 度。                            |
| 11 | 2458585         | 6.1  | 四  |                        |  |
| 12 | 2458586         | 7.1  | 五  | 3h42m                  | 水星西大距（日距角 27.7 度，視亮度 0.2 等）。   |
| 13 | 2458587         | 8.1  | 六  | 3h6m                   | 上弦。  |
| 14 | 2458588         | 9.1  | 日  |                        |  |
| 15 | 2458589         | 10.1 | 一  | 16h47m                 | 軒轅十四合月，軒轅十四在月球南 2.75 度。  |
| 16 | 2458590         | 11.1 | 二  |                        |  |
| 17 | 2458591         | 12.1 | 三  | 6h5m                   | 月球過近地點，月地距離 364277.386 公里。   |
| 18 | 2458592         | 13.1 | 四  |                        |  |
| 19 | 2458593         | 14.1 | 五  | 19h12m                 | 望。   |
| 20 | 2458594         | 15.1 | 六  | 16h55m                 | 穀雨。  |
| 21 | 2458595         | 16.1 | 日  |                        |  |
| 22 | 2458596         | 17.1 | 一  |                        |  |
| 23 | 2458597         | 18.1 | 二  | 1h2m<br>7h7m<br>19h35m | 穀神星合月，穀神星在月球北 2.5 度。<br>天王星合。<br>木星合月，木星在月球南 1.64 度。<br>天琴座流星雨極大期（ZHR~18）。 |
| 24 | 2458598         | 19.1 | 三  |                        | 船尾座π流星雨極大期（ZHR~Var.）。  |
| 25 | 2458599         | 20.1 | 四  | 22h27m                 | 土星合月，土星在月球北 0.37 度。<br>冥王星留。   |
| 26 | 2458600         | 21.1 | 五  | 3h49m<br>8h            | 冥王星合月，冥王星在月球南 0.07 度。<br>冥王星合火星，冥王星在火星北 1.42 度。                            |
| 27 | 2458601         | 22.1 | 六  | 6h18m                  | 下弦。  |
| 28 | 2458602         | 23.1 | 日  |                        |  |
| 29 | 2458603         | 24.1 | 一  | 2h20m                  | 月球過遠地點，月地距離 404514.411 公里。   |
| 30 | 2458604         | 25.1 | 二  |                        | 土星留。   |

## 四月星座圖



2019 年 4 月 15 日 21:00 的天空

## 2019 年 4 月行星動態：

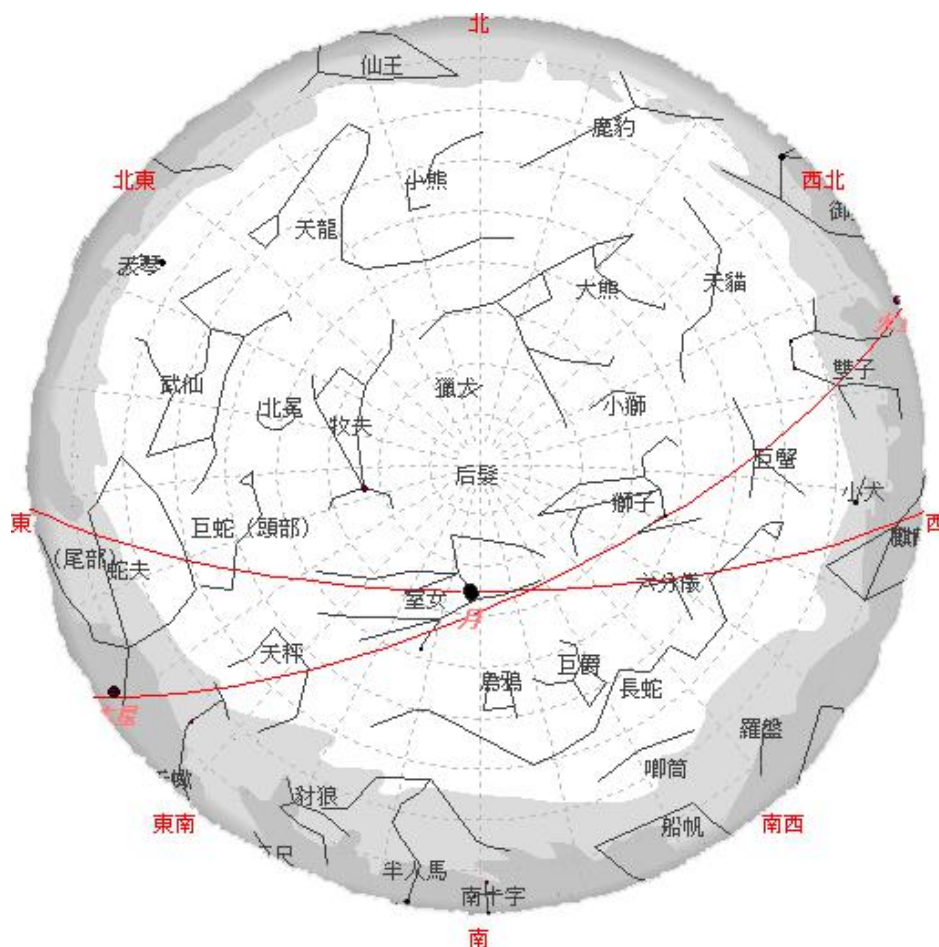
- 水 星： 由寶瓶座經鯨魚座到雙魚座，順行。12 日西大距。上旬日出前見於東南方，15 日過中天 10:17。視亮度 0.8~-0.3 等，視直徑約 9.3"~6.0"。
- 金 星： 由寶瓶座到雙魚座，順行。日出前見於東方，15 日 09:59 過中天。視亮度-3.9~-3.8 等，視直徑約 13.1"~11.6"。
- 火 星： 在金牛座，順行。日沒後見於西南方，15 日 21:42 沒。視亮度約 1.4~1.6 等，視直徑約 4.7"~4.2"。
- 木 星： 在蛇夫座，順行，11 日留，逆行。日出前見於南方。15 日 22:38 升。視亮度約-2.3 等，視直徑約 39.9"~43.4"。
- 土 星： 在人馬座，順行，30 日留，逆行。日出前見於南方。15 日 00:31 升。視亮度約 0.5 等，視直徑約 16.7"。
- 天王星： 在白羊座，順行。23 日合，近太陽不易見。15 日 18:46 沒。視亮度約 5.9 等，視直徑約 3.4"。
- 海王星： 在寶瓶座，順行。日出前見於東南方，15 日 03:47 升。視亮度約 7.9 等，視直徑約 2.2"。

## 2019 年 五 月 天 象

| 日期 | 儒略日<br>(20.0 時) | 月齡   | 星期 | 時間                       | 天象記要   |
|----|-----------------|------|----|--------------------------|--|
| 1  | 2458605         | 26.1 | 三  |                          |  |
| 2  | 2458606         | 27.1 | 四  | 19h39m<br>20h57m         | 金星合月，金星在月球北 3.62 度。<br>灶神星合月，灶神星在月球南 0.19 度。   |
| 3  | 2458607         | 28.1 | 五  | 14h25m                   | 水星合月，水星在月球北 2.91 度。                            |
| 4  | 2458608         | 29.1 | 六  | 7h12m                    | 天王星合月，天王星在月球北 4.73 度。                          |
| 5  | 2458609         | 0.5  | 日  | 6h45m                    | 朔。   |
| 6  | 2458610         | 1.5  | 一  | 3h3m                     | 立夏。<br>寶瓶座 $\eta$ 流星雨極大期 (ZHR50)。              |
| 7  | 2458611         | 2.5  | 二  | 6h20m                    | 畢宿五合月，畢宿五在月球南 2.29 度。                          |
| 8  | 2458612         | 3.5  | 三  | 7h35m<br>16h             | 火星合月，火星在月球北 3.23 度。<br>天王星合水星，天王星在水星北 1.38 度。  |
| 9  | 2458613         | 4.5  | 四  |                          | 天琴座 $\eta$ 流星雨極大期 (ZHR~3)。                     |
| 10 | 2458614         | 5.5  | 五  |                          |  |
| 11 | 2458615         | 6.5  | 六  |                          |  |
| 12 | 2458616         | 7.5  | 日  | 9h12m<br>22h44m          | 上弦。<br>軒轅十四合月，軒轅十四在月球南 2.99 度。                 |
| 13 | 2458617         | 8.5  | 一  | 5h                       | 天王星合水星，天王星在水星北 2.4 度。                          |
| 14 | 2458618         | 9.5  | 二  | 5h53m                    | 月球過近地點，月地距離 369046.514 公里。                     |
| 15 | 2458619         | 10.5 | 三  |                          |  |
| 16 | 2458620         | 11.5 | 四  |                          |  |
| 17 | 2458621         | 12.5 | 五  |                          |  |
| 18 | 2458622         | 13.5 | 六  | 16h                      | 天王星合金星，天王星在金星北 1.15 度。                         |
| 19 | 2458623         | 14.5 | 日  | 5h11m                    | 望。   |
| 20 | 2458624         | 15.5 | 一  | 2h18m                    | 穀神星合月，穀神星在月球北 1.18 度。                          |
| 21 | 2458625         | 16.5 | 二  | 0h54m<br>15h39m<br>21h7m | 木星合月，木星在月球南 1.69 度。<br>小滿。<br>水星上合日。           |
| 22 | 2458626         | 17.5 | 三  |                          |  |
| 23 | 2458627         | 18.5 | 四  | 6h14m<br>11h56m          | 土星合月，土星在月球北 0.52 度。<br>冥王星合月，冥王星在月球北 0.07 度。   |
| 24 | 2458628         | 19.5 | 五  |                          |  |
| 25 | 2458629         | 20.5 | 六  |                          |  |
| 26 | 2458630         | 21.5 | 日  | 21h27m                   | 月球過遠地點，月地距離 404066.212 公里。                     |
| 27 | 2458631         | 22.5 | 一  | 0h34m                    | 下弦。  |
| 28 | 2458632         | 23.5 | 二  |                          |  |
| 29 | 2458633         | 24.5 | 三  | 6h36m                    | 穀神星衝 (視亮度 7.0 等)。                              |
| 30 | 2458634         | 25.5 | 四  |                          |  |
| 31 | 2458635         | 26.5 | 五  | 5h34m<br>18h24m          | 灶神星合月，灶神星在月球南 0.56 度。<br>天王星合月，天王星在月球北 4.79 度。 |



## 五月星座圖



2019 年 5 月 15 日 21:00 的天空

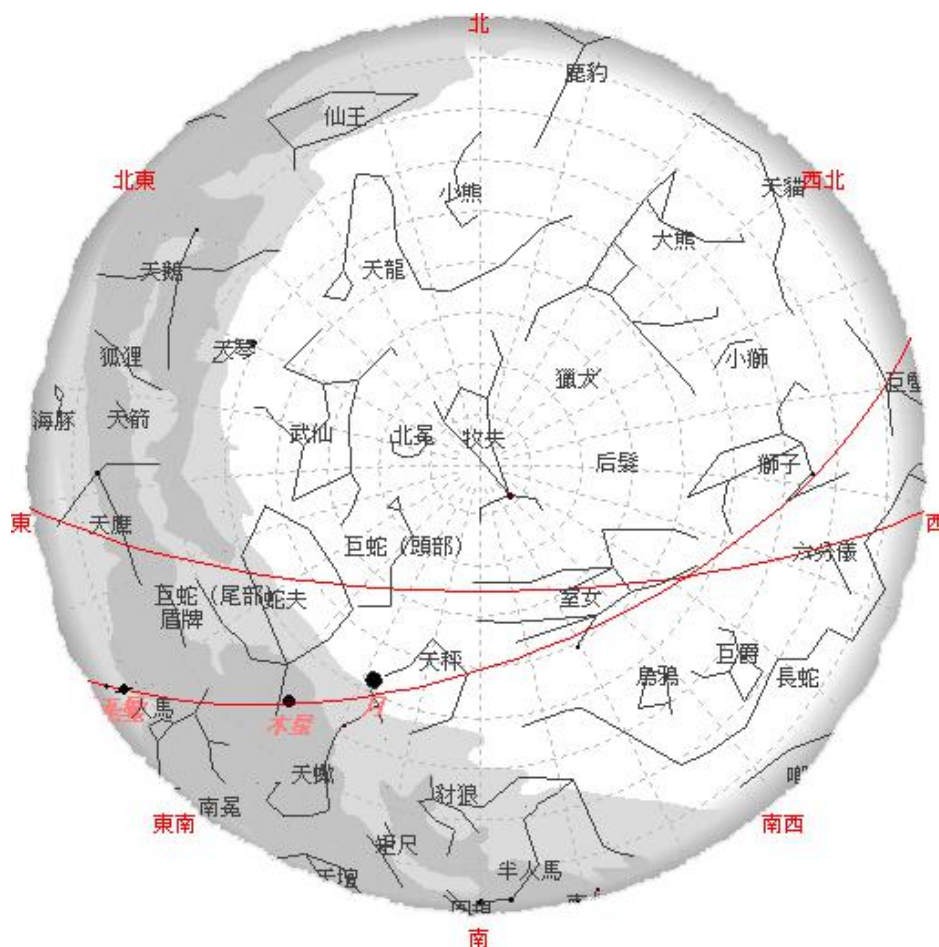
## 2019 年 5 月行星動態：

- 水 星：由雙魚座經白羊座到金牛座，順行。近太陽不易見，15 日 11:20 過中天。視亮度-0.4~-1.2 等，視直徑約 5.9''~5.4''。
- 金 星：由雙魚座到白羊座，順行。日出前見於東方，15 日 10:16 過中天。視亮度-3.8 等，視直徑約 11.6''~10.5''。
- 火 星：由金牛座到雙子座，順行。日沒後見於西南方，15 日 21:13 沒。視亮度約 1.6~1.7 等，視直徑約 4.2''~3.9''。
- 木 星：在蛇夫座，逆行。日出前見於西南方。15 日 20:23 升。視亮度約-2.5 等，視直徑約 43.5''~45.8''。
- 土 星：在人馬座，逆行。日出前見於西南方。15 日 22:29 升。視亮度約 0.4 等，視直徑約 17.6''。
- 天王星：在白羊座，順行。日出前見於東南方。15 日 04:06 升。視亮度約 5.9 等，視直徑約 3.4''。
- 海王星：在寶瓶座，順行。日出前見於東南方，15 日 01:52 升。視亮度約 7.9 等，視直徑約 2.3''。

## 2019 年 六 月 天 象

| 日期 | 儒略日<br>(20.0 時) | 月齡   | 星期 | 時間               | 天象記要   |
|----|-----------------|------|----|------------------|--|
| 1  | 2458636         | 27.5 | 六  |                  |  |
| 2  | 2458637         | 28.5 | 日  | 2h14m            | 金星合月，金星在月球北 3.24 度。                            |
| 3  | 2458638         | 0.1  | 一  | 14h12m<br>18h2m  | 畢宿五合月，畢宿五在月球南 2.32 度。<br>朔。<br>智神星留。           |
| 4  | 2458639         | 1.1  | 二  | 23h41m           | 水星合月，水星在月球北 3.66 度。                            |
| 5  | 2458640         | 2.1  | 三  | 23h5m            | 火星合月，火星在月球北 1.58 度。                            |
| 6  | 2458641         | 3.1  | 四  | 7h6m             | 芒種。  |
| 7  | 2458642         | 4.1  | 五  |                  |  |
| 8  | 2458643         | 5.1  | 六  | 7h15m            | 月球過近地點，月地距離 368544.749 公里。                     |
| 9  | 2458644         | 6.1  | 日  | 4h1m             | 軒轅十四合月，軒轅十四在月球南 3.17 度。                        |
| 10 | 2458645         | 7.1  | 一  | 13h59m<br>23h28m | 上弦。<br>木星衝 ( 視亮度 -2.6 等 ) 。                    |
| 11 | 2458646         | 8.1  | 二  |                  |  |
| 12 | 2458647         | 9.1  | 三  |                  |  |
| 13 | 2458648         | 10.1 | 四  |                  |  |
| 14 | 2458649         | 11.1 | 五  |                  |  |
| 15 | 2458650         | 12.1 | 六  | 23h15m           | 穀神星合月，穀神星在月球南 0.94 度。                          |
| 16 | 2458651         | 13.1 | 日  |                  |  |
| 17 | 2458652         | 14.1 | 一  | 2h50m<br>16h31m  | 木星合月，木星在月球南 1.99 度。<br>望。                      |
| 18 | 2458653         | 15.1 | 二  | 5h<br>23h        | 畢宿五合金星，畢宿五在金星南 4.8 度。<br>火星合水星，火星在水星南 0.24 度。  |
| 19 | 2458654         | 16.1 | 三  | 11h46m<br>19h15m | 土星合月，土星在月球北 0.44 度。<br>冥王星合月，冥王星在月球北 0.07 度。   |
| 20 | 2458655         | 17.1 | 四  |                  |  |
| 21 | 2458656         | 18.1 | 五  | 23h54m           | 夏至。  |
| 22 | 2458657         | 19.1 | 六  |                  | 海王星留。  |
| 23 | 2458658         | 20.1 | 日  | 15h50m           | 月球過遠地點，月地距離 404481.144 公里。                     |
| 24 | 2458659         | 21.1 | 一  | 7h16m            | 水星東大距 ( 日距角 25.2 度，視亮度 0.4 等 ) 。               |
| 25 | 2458660         | 22.1 | 二  | 17h46m           | 下弦。  |
| 26 | 2458661         | 23.1 | 三  |                  |  |
| 27 | 2458662         | 24.1 | 四  |                  | 6 月牧夫座流星雨極大期 ( ZHR~Var. ) 。                    |
| 28 | 2458663         | 25.1 | 五  | 5h31m<br>12h25m  | 天王星合月，天王星在月球北 4.84 度。<br>灶神星合月，灶神星在月球南 1.33 度。 |
| 29 | 2458664         | 26.1 | 六  |                  |  |
| 30 | 2458665         | 27.1 | 日  | 23h34m           | 畢宿五合月，畢宿五在月球南 2.29 度。                          |

## 六月星座圖



2019 年 6 月 15 日 21:00 的天空

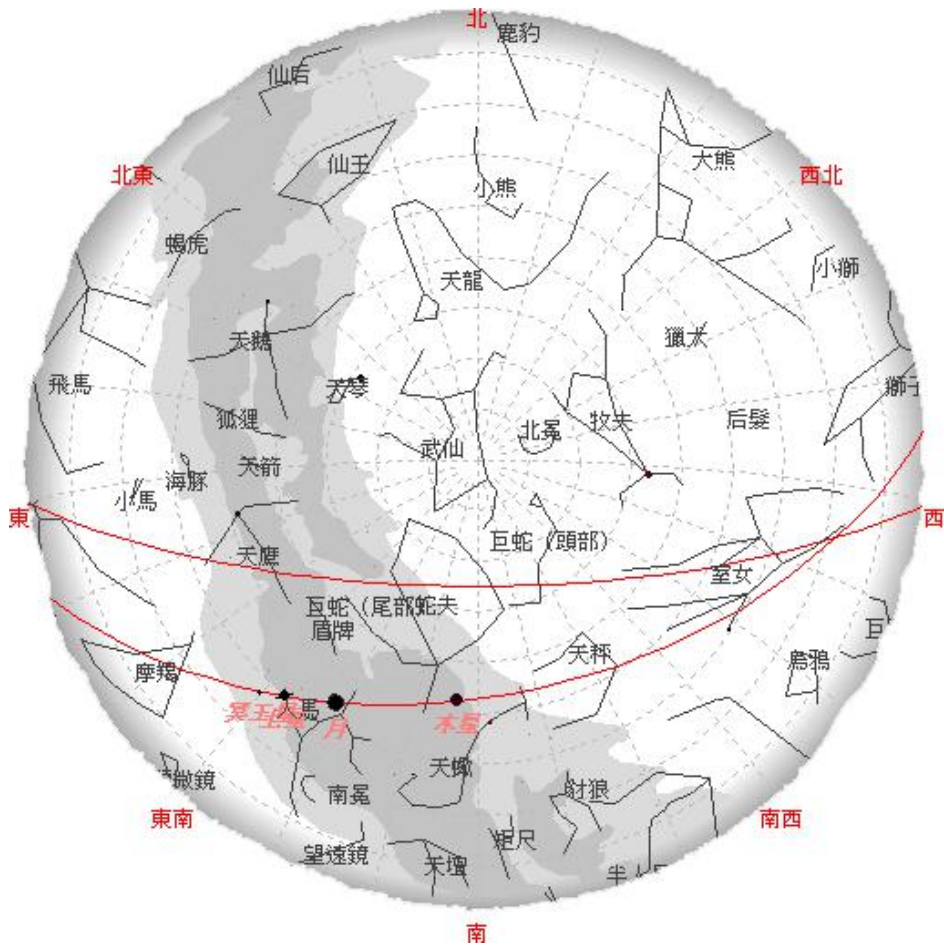
## 2019 年 6 月行星動態：

- 水 星：由金牛座經雙子座到巨蟹座，順行。下旬日沒後見於西南方，15 日 13:36 過中天。視亮度-1.~ -0.9 等，視直徑約 5.5"~9.2"。
- 金 星：由白羊座到金牛座，順行。近太陽不易見，15 日 10:44 過中天。視亮度-3.8 等，視直徑約 10.5"~9.9"。
- 火 星：由雙子座到巨蟹座，順行。日沒後見於西南方，15 日 20:34 沒。視亮度約 1.8 等，視直徑約 3.9"~3.7"。
- 木 星：在蛇夫座，逆行。10 日衝，近全夜可見。15 日 18:14 升。視亮度約-2.5 等，視直徑約 45.8"~45.5"。
- 土 星：在人馬座，逆行。近全夜可見。15 日 20:22 升。視亮度約 0.2 等，視直徑約 18.2"。
- 天王星：在白羊座，順行。日出前見於東南方。15 日 02:09 升。視亮度約 5.9 等，視直徑約 3.4"。
- 海王星：在寶瓶座，順行，22 日留，逆行。日出前見於東南方，15 日 23:47 升。視亮度約 7.9 等，視直徑約 2.3"。

## 2019 年 七 月 天 象

| 日期 | 儒略日<br>(20.0 時) | 月齡   | 星期 | 時間              | 天象記要   |
|----|-----------------|------|----|-----------------|--|
| 1  | 2458666         | 28.1 | 一  |                 |  |
| 2  | 2458667         | 29.1 | 二  | 5h45m           | 金星合月，金星在月球北 1.64 度。                                      |
| 3  | 2458668         | 0.7  | 三  | 3h16m           | 朔，日全食（臺灣不可見）。  |
| 4  | 2458669         | 1.7  | 四  | 13h39m          | 火星合月，火星在月球南 0.09 度。                                      |
| 5  | 2458670         | 2.7  | 五  | 6h11m<br>13h0m  | 地球過遠日點，日地距離 1.016754005AU。<br>月球過近地點，月地距離 363799.433 公里。 |
| 6  | 2458671         | 3.7  | 六  | 10h42m          | 軒轅十四合月，軒轅十四在月球南 3.24 度。                                  |
| 7  | 2458672         | 4.7  | 日  | 17h21m<br>22h   | 小暑。<br>火星合水星，火星在水星北 3.84 度。<br>水星留。                      |
| 8  | 2458673         | 5.7  | 一  |                 |  |
| 9  | 2458674         | 6.7  | 二  | 18h55m          | 上弦。  |
| 10 | 2458675         | 7.7  | 三  | 1h7m            | 土星衝（視亮度 0.1 等）。  |
| 11 | 2458676         | 8.7  | 四  |                 |  |
| 12 | 2458677         | 9.7  | 五  | 23h3m           | 穀神星合月，穀神星在月球南 2.96 度。                                    |
| 13 | 2458678         | 10.7 | 六  |                 |  |
| 14 | 2458679         | 11.7 | 日  | 3h43m<br>22h51m | 木星合月，木星在月球南 2.34 度。<br>冥王星衝（視亮度 14.2 等）。                 |
| 15 | 2458680         | 12.7 | 一  |                 |  |
| 16 | 2458681         | 13.7 | 二  | 15h15m          | 土星合月，土星在月球北 0.22 度。                                      |
| 17 | 2458682         | 14.7 | 三  | 1h17m<br>5h38m  | 冥王星合月，冥王星在月球南 0.04 度。<br>望，月偏食（臺灣可見月沒帶食）。                |
| 18 | 2458683         | 15.7 | 四  |                 |  |
| 19 | 2458684         | 16.7 | 五  |                 | 穀神星留。  |
| 20 | 2458685         | 17.7 | 六  |                 |  |
| 21 | 2458686         | 18.7 | 日  | 7h59m<br>20h34m | 月球過遠地點，月地距離 405424.747 公里。<br>水星下合日。                     |
| 22 | 2458687         | 19.7 | 一  |                 |  |
| 23 | 2458688         | 20.7 | 二  | 10h50m          | 大暑。  |
| 24 | 2458689         | 21.7 | 三  |                 |  |
| 25 | 2458690         | 22.7 | 四  | 9h18m<br>15h13m | 下弦。<br>天王星合月，天王星在月球北 4.8 度。                              |
| 26 | 2458691         | 23.7 | 五  | 15h52m          | 灶神星合月，灶神星在月球南 2.47 度。                                    |
| 27 | 2458692         | 24.7 | 六  |                 |  |
| 28 | 2458693         | 25.7 | 日  | 9h16m           | 畢宿五合月，畢宿五在月球南 2.3 度。<br>南魚座流星雨極大期（ZHR~5）。                |
| 29 | 2458694         | 26.7 | 一  |                 |  |
| 30 | 2458695         | 27.7 | 二  |                 | 寶瓶座δ南流星雨極大期（ZHR~25）。<br>摩羯座α流星雨極大期（ZHR~5）。               |
| 31 | 2458696         | 28.7 | 三  | 10h18m          | 水星合月，水星在月球南 4.52 度。                                      |

## 七月星座圖



2019 年 7 月 15 日 21:00 的天空

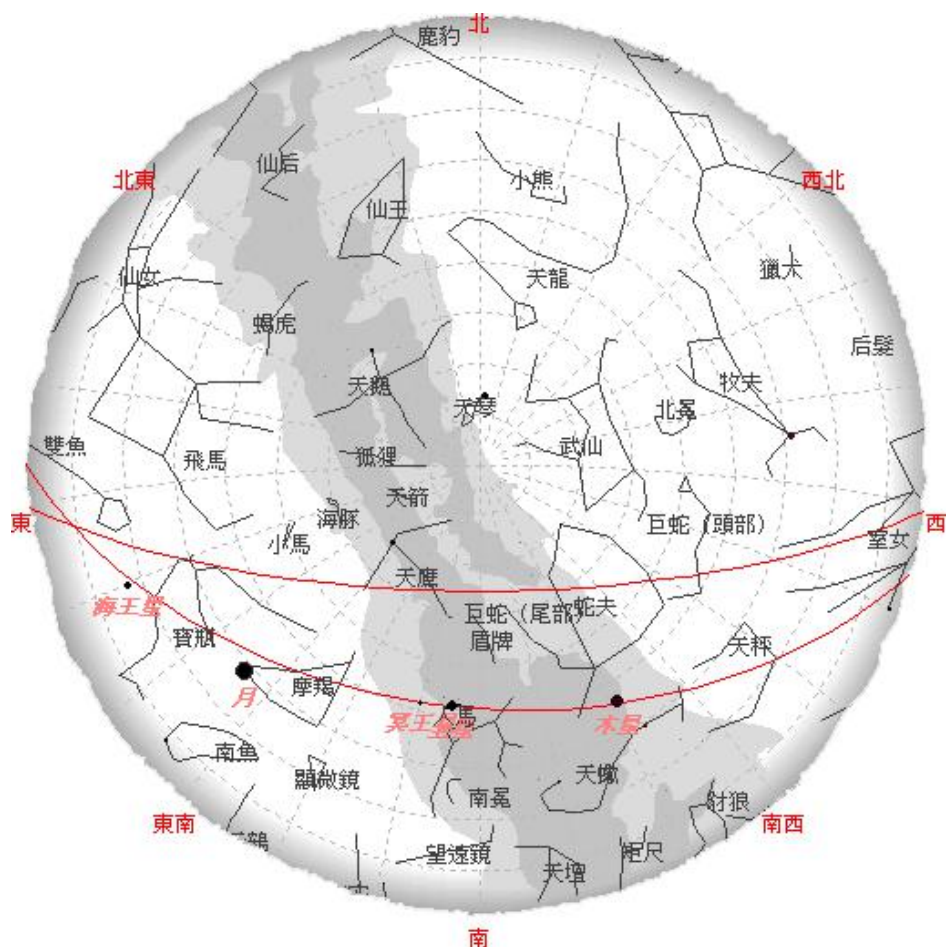
### 2019 年 7 月行星動態：

- 水 星：由巨蟹座到雙子座，順行，7日留，逆行。近太陽不易見。15日 12:38 過中天。視亮度-1.0~2.3 等，視直徑約 9.4"~10.0"。
- 金 星：由金牛座經雙子座到巨蟹座，順行。近太陽不易見，15日 11:25 過中天。視亮度-3.9 等，視直徑約 9.9"~9.7"。
- 火 星：由巨蟹座到獅子座，順行。日沒後見於西南方，15日 19:47 沒。視亮度約 1.8 等，視直徑約 3.7"~3.5"。
- 木 星：在蛇夫座，逆行。日沒後見於東南方。15日 02:41 沒。視亮度約-2.5 等，視直徑約 45.5"~42.8"。
- 土 星：在人馬座，逆行。10日衝，近全夜可見。15日 04:56 沒。視亮度約 0.1 等，視直徑約 18.4"。
- 天王星：在白羊座，順行。日出前見於東南方。15日 00:14 升。視亮度約 5.8 等，視直徑約 3.5"。
- 海王星：在寶瓶座，逆行。日出前見於南方，15日 21:49 升。視亮度約 7.8 等，視直徑約 2.3"。

## 2019 年 八 月 天 象

| 日期 | 儒略日<br>(20.0 時) | 月齡   | 星期 | 時間                         | 天象記要   |
|----|-----------------|------|----|----------------------------|--|
| 1  | 2458697         | 0.4  | 四  | 4h36m<br>11h12m            | 金星合月，金星在月球南 0.59 度。<br>朔。<br>水星留。  |
| 2  | 2458698         | 1.4  | 五  | 3h55m<br>15h11m<br>19h41m  | 火星合月，火星在月球南 1.68 度。<br>月球過近地點，月地距離 359494.995 公里。<br>軒轅十四合月，軒轅十四在月球南 3.21 度。 |
| 3  | 2458699         | 2.4  | 六  |                            |  |
| 4  | 2458700         | 3.4  | 日  |                            |  |
| 5  | 2458701         | 4.4  | 一  |                            |  |
| 6  | 2458702         | 5.4  | 二  |                            |  |
| 7  | 2458703         | 6.4  | 三  |                            |  |
| 8  | 2458704         | 7.4  | 四  | 1h31m<br>3h13m             | 上弦。<br>立秋。   |
| 9  | 2458705         | 8.4  | 五  | 6h33m                      | 穀神星合月，穀神星在月球南 4.23 度。  |
| 10 | 2458706         | 9.4  | 六  | 6h53m<br>7h8m              | 木星合月，木星在月球南 2.47 度。<br>水星西大距（日距角 19 度，視亮度-0.1 等）。                            |
| 11 | 2458707         | 10.4 | 日  |                            |  |
| 12 | 2458708         | 11.4 | 一  | 17h53m                     | 土星合月，土星在月球北 0.04 度。<br>天王星留。<br>木星留。   |
| 13 | 2458709         | 12.4 | 二  | 6h14m                      | 冥王星合月，冥王星在月球南 0.12 度。<br>英仙座流星雨極大期（ZHR~110）。                                 |
| 14 | 2458710         | 13.4 | 三  | 14h7m                      | 金星上合日。   |
| 15 | 2458711         | 14.4 | 四  | 20h29m                     | 望。   |
| 16 | 2458712         | 15.4 | 五  |                            |  |
| 17 | 2458713         | 16.4 | 六  | 18h49m                     | 月球過遠地點，月地距離 406202.035 公里。   |
| 18 | 2458714         | 17.4 | 日  | 7h                         | 軒轅十四合火星，軒轅十四在火星南 0.7 度。<br>天鵝座κ流星雨極大期（ZHR~3）。                                |
| 19 | 2458715         | 18.4 | 一  |                            |  |
| 20 | 2458716         | 19.4 | 二  |                            |  |
| 21 | 2458717         | 20.4 | 三  | 12h                        | 軒轅十四合金星，軒轅十四在金星南 0.96 度。   |
| 22 | 2458718         | 21.4 | 四  |                            |  |
| 23 | 2458719         | 22.4 | 五  | 5h43m<br>18h2m<br>22h56m   | 婚神星合。<br>處暑。<br>下弦。  |
| 24 | 2458720         | 23.4 | 六  | 17h54m<br>21h              | 畢宿五合月，畢宿五在月球南 2.43 度。<br>火星合金星，火星在金星南 0.31 度。                                |
| 25 | 2458721         | 24.4 | 日  |                            |  |
| 26 | 2458722         | 25.4 | 一  |                            |  |
| 27 | 2458723         | 26.4 | 二  |                            |  |
| 28 | 2458724         | 27.4 | 三  |                            |  |
| 29 | 2458725         | 28.4 | 四  |                            |  |
| 30 | 2458726         | 0.1  | 五  | 18h22m<br>18h37m<br>23h53m | 火星合月，火星在月亮南 3.06 度。<br>朔。<br>月球過近地點，月地距離 357285.055 公里。                      |
| 31 | 2458727         | 1.1  | 六  | 0h18m                      | 金星合月，金星在月球南 2.94 度。  |

## 八月星座圖



2019 年 8 月 15 日 21:00 的天空

## 2019 年 8 月行星動態：

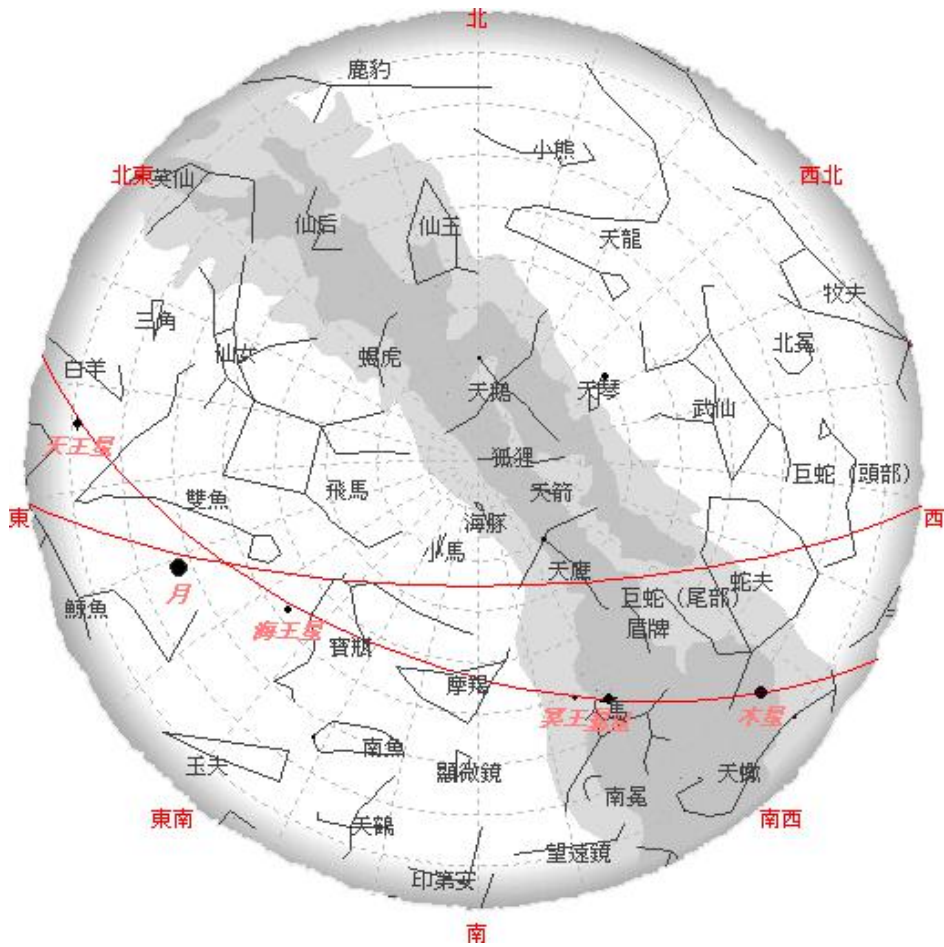
- 水 星：由雙子座經巨蟹座到獅子座，逆行，1 日留，順行。10 日西大距。上旬日出前見於東南方，15 日 10:47 過中天。視亮度 2.0~-1.7 等，視直徑約 9.7"~5.0"。
- 金 星：由巨蟹座到獅子座，順行。近太陽不易見，15 日 12:01 過中天。視亮度 -3.9 等，視直徑約 9.7"。
- 火 星：在獅子座，順行。日沒後見於西南方，15 日 18:51 沒。視亮度約 1.8 等，視直徑約 3.5"。
- 木 星：在蛇夫座，逆行，12 日留，順行。日沒後見於南方。15 日 00:35 沒。視亮度約 -2.3 等，視直徑約 42.7"~39.1"。
- 土 星：在蛇夫座，逆行。日沒後見於東南方，15 日 02:45 沒。視亮度約 0.2 等，視直徑約 18.0"。
- 天王星：在白羊座，順行，12 日留，逆行。日出前見於南方。15 日 22:09 升。視亮度約 5.8 等，視直徑約 3.6"。
- 海王星：在寶瓶座，逆行。日出前見於西南方，15 日 19:45 升。視亮度約 7.8 等，視直徑約 2.4"。

## 2019 年 九 月 天 象

| 日期 | 儒略日<br>(20.0 時) | 月齡   | 星期 | 時間                    | 天象記要  |
|----|-----------------|------|----|-----------------------|---|
| 1  | 2458728         | 2.1  | 日  |                       | 御夫座 $\alpha$ 流星雨極大期 (ZHR~6)。                        |
| 2  | 2458729         | 3.1  | 一  | 18h42m                | 火星合。  |
| 3  | 2458730         | 4.1  | 二  | 19h                   | 火星合水星，火星在水星南 0.7 度。                                 |
| 4  | 2458731         | 5.1  | 三  | 9h40m                 | 水星上合日。  |
| 5  | 2458732         | 6.1  | 四  | 22h21m                | 穀神星合月，穀神星在月球南 4.72 度。                               |
| 6  | 2458733         | 7.1  | 五  | 11h10m<br>14h52m      | 上弦。<br>木星合月，木星在月球南 2.3 度。                           |
| 7  | 2458734         | 8.1  | 六  |                       |   |
| 8  | 2458735         | 9.1  | 日  | 6h17m<br>21h42m       | 白露。<br>土星合月，土星在月球北 0.04 度。                          |
| 9  | 2458736         | 10.1 | 一  | 11h5m                 | 冥王星合月，冥王星在月球南 0.08 度。                               |
| 10 | 2458737         | 11.1 | 二  | 15h24m                | 海王星衝 (視亮度 7.8 等)。<br>9 月英仙座流星雨極大期 (ZHR~5)。          |
| 11 | 2458738         | 12.1 | 三  |                       |   |
| 12 | 2458739         | 13.1 | 四  |                       |   |
| 13 | 2458740         | 14.1 | 五  | 21h32m                | 月球過遠地點，月地距離 406340.400 公里。                          |
| 14 | 2458741         | 15.1 | 六  | 6h<br>12h33m          | 金星合水星，金星在水星北 0.34 度。<br>望，今年最小滿月，視直徑 29.2'。         |
| 15 | 2458742         | 16.1 | 日  |                       |   |
| 16 | 2458743         | 17.1 | 一  |                       |   |
| 17 | 2458744         | 18.1 | 二  |                       |   |
| 18 | 2458745         | 19.1 | 三  |                       | 土星留。  |
| 19 | 2458746         | 20.1 | 四  |                       |   |
| 20 | 2458747         | 21.1 | 五  |                       |   |
| 21 | 2458748         | 22.1 | 六  | 0h45m                 | 畢宿五合月，畢宿五在月球南 2.66 度。                               |
| 22 | 2458749         | 23.1 | 日  | 10h41m                | 下弦。   |
| 23 | 2458750         | 24.1 | 一  | 15h50m                | 秋分。   |
| 24 | 2458751         | 25.1 | 二  |                       |   |
| 25 | 2458752         | 26.1 | 三  | 10h52m                | 望。<br>灶神星留。   |
| 26 | 2458753         | 27.1 | 四  | 16h54m                | 軒轅十四合月，軒轅十四在月球南 3.28 度。                             |
| 27 | 2458754         | 28.1 | 五  |                       |   |
| 28 | 2458755         | 29.1 | 六  | 9h19m<br>10h24m       | 火星合月，火星在月球南 4.06 度。<br>月球過近地點，月地距離 357908.643 公里。   |
| 29 | 2458756         | 0.7  | 日  | 2h26m<br>7h<br>20h46m | 朔。<br>角宿一合水星，角宿一在水星南 1.42 度。<br>金星合月，金星在月球南 4.37 度。 |
| 30 | 2458757         | 1.7  | 一  |                       |   |



## 九月星座圖



2019 年 9 月 15 日 21:00 的天空

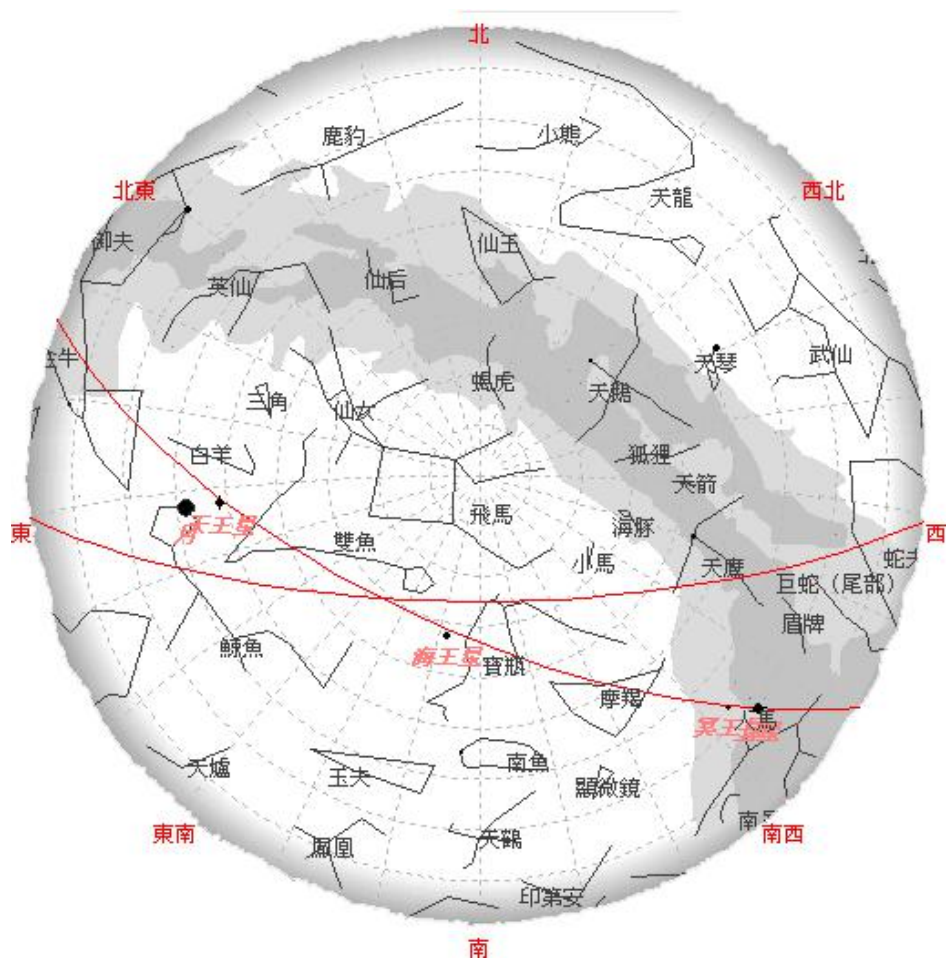
## 2019 年 9 月行星動態：

- 水 星：由獅子座到室女座，順行。近太陽不易見，15 日 12:25 過中天。視亮度-1.8~-0.2 等，視直徑約 5.0''~5.2''。
- 金 星：由獅子座到室女座，順行。近太陽不易見，15 日 12:23 過中天。視亮度-3.9 等，視直徑約 9.7''~10.0''。
- 火 星：由獅子座到室女座，順行。近太陽不易見，15 日 17:48 沒。視亮度約 1.8 等，視直徑約 3.5''。
- 木 星：在蛇夫座，順行。日沒後見於西南方。15 日 22:36 沒。視亮度約-2.1 等，視直徑約 39.0''~35.9''。
- 土 星：在人馬座，逆行，18 日留，順行。日沒後見於西南方，15 日 00:39 沒。視亮度約 0.4 等，視直徑約 17.2''。
- 天王星：在白羊座，逆行。日出前見於西南方。15 日 20:06 升。視亮度約 5.7 等，視直徑約 3.7''。
- 海王星：在寶瓶座，逆行。10 日衝，近全夜可見，15 日 17:41 升。視亮度約 7.8 等，視直徑約 2.4''。

## 2019 年 十 月 天 象

| 日期 | 儒略日<br>(20.0 時) | 月齡   | 星期 | 時間                       | 天象記要  |
|----|-----------------|------|----|--------------------------|---|
| 1  | 2458758         | 2.7  | 二  |                          |   |
| 2  | 2458759         | 3.7  | 三  |                          | 冥王星留。   |
| 3  | 2458760         | 4.7  | 四  | 9h<br>20h51m             | 角宿一合金星，角宿一在金星南 3.13 度。<br>穀神星合月，穀神星在月球南 4.62 度。     |
| 4  | 2458761         | 5.7  | 五  | 4h23m                    | 木星合月，木星在月球南 1.87 度。                                 |
| 5  | 2458762         | 6.7  | 六  |                          |   |
| 6  | 2458763         | 7.7  | 日  | 0h47m<br>4h36m<br>17h13m | 上弦。<br>土星合月，土星在月球北 0.26 度。<br>冥王星合月，冥王星在月球北 0.11 度。 |
| 7  | 2458764         | 8.7  | 一  |                          |   |
| 8  | 2458765         | 9.7  | 二  | 22h6m                    | 寒露。   |
| 9  | 2458766         | 10.7 | 三  |                          | 天龍座流星雨極大期 (ZH~10)。                                  |
| 10 | 2458767         | 11.7 | 四  |                          | 金牛座南流星雨極大期 (ZHR~5)。                                 |
| 11 | 2458768         | 12.7 | 五  | 2h29m                    | 月球過遠地點，月地距離 405851.861 公里。<br>御夫座δ流星雨極大期 (ZHR~2)。   |
| 12 | 2458769         | 13.7 | 六  |                          |   |
| 13 | 2458770         | 14.7 | 日  |                          |   |
| 14 | 2458771         | 15.7 | 一  | 5h8m                     | 望。  |
| 15 | 2458772         | 16.7 | 二  |                          |   |
| 16 | 2458773         | 17.7 | 三  |                          |   |
| 17 | 2458774         | 18.7 | 四  |                          |   |
| 18 | 2458775         | 19.7 | 五  | 6h22m                    | 畢宿五合月，畢宿五在月球南 2.9 度。                                |
| 19 | 2458776         | 20.7 | 六  |                          | 雙子座ε流星雨極大期 (ZHR~3)。                                 |
| 20 | 2458777         | 21.7 | 日  | 12h2m                    | 水星東大距 (日距角 24.6 度，視亮度-0.1 等)。                       |
| 21 | 2458778         | 22.7 | 一  | 20h39m                   | 下弦。   |
| 22 | 2458779         | 23.7 | 二  |                          | 獵戶座流星雨極大期 (ZHR~20)。                                 |
| 23 | 2458780         | 24.7 | 三  |                          |   |
| 24 | 2458781         | 25.7 | 四  | 1h20m<br>1h37m           | 霜降。<br>軒轅十四合月，軒轅十四在月球南 3.49 度。                      |
| 25 | 2458782         | 26.7 | 五  | 0h45m                    | 望。<br>小獅座流星雨極大期 (ZHR~2)。                            |
| 26 | 2458783         | 27.7 | 六  | 18h39m                   | 月球過近地點，月地距離 361400.151 公里。                          |
| 27 | 2458784         | 28.7 | 日  | 0h52m                    | 火星合月，火星在月球南 4.53 度。                                 |
| 28 | 2458785         | 0.4  | 一  | 11h38m<br>16h15m         | 朔。<br>天王星衝 (視亮度 5.7 等)。                             |
| 29 | 2458786         | 1.4  | 二  | 21h32m                   | 金星合月，金星在月球南 3.91 度。                                 |
| 30 | 2458787         | 2.4  | 三  | 16h                      | 金星合水星，金星在水星北 2.72 度。                                |
| 31 | 2458788         | 3.4  | 四  | 22h22m<br>23h58m         | 木星合月，木星在月球南 1.31 度。<br>穀神星合月，穀神星在月球南 4.2 度。         |

## 十月星座圖



2019 年 10 月 15 日 21:00 的天空

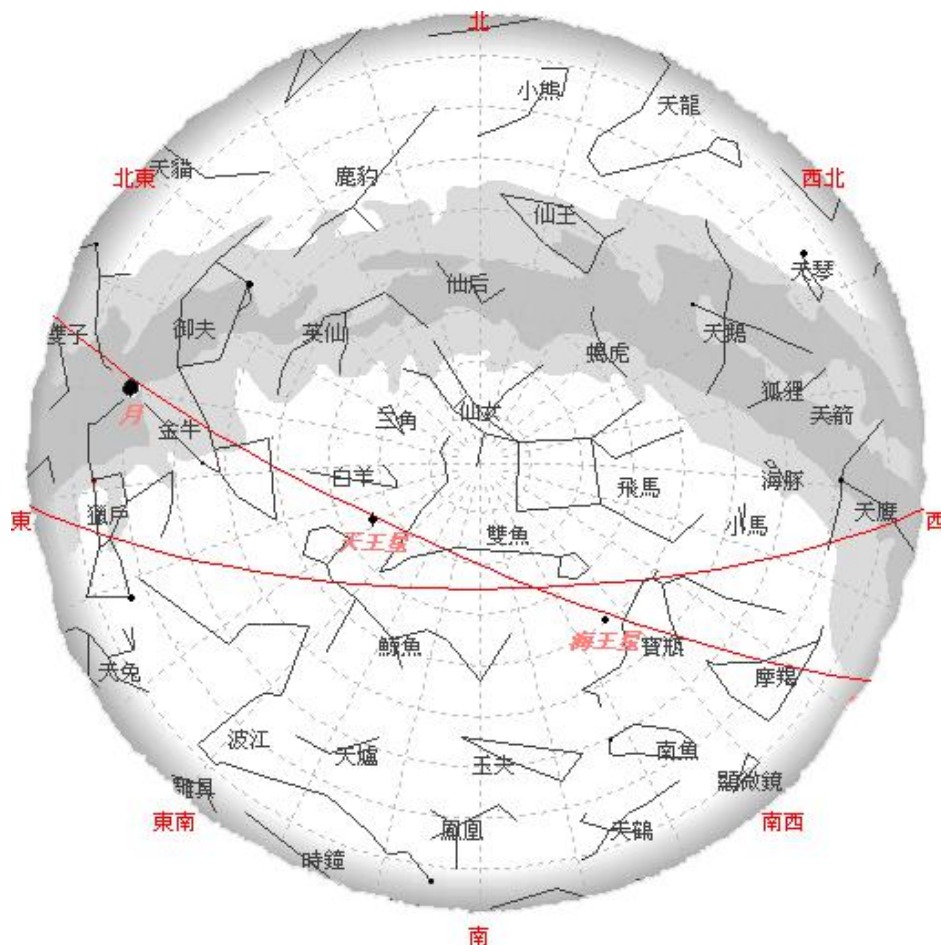
## 2019 年 10 月行星動態：

- 水 星： 由室女座到天秤座，順行。20 日東大距。中旬日沒後見於西南方，15 日 13:09 過中天。視亮度-0.2~0.4 等，視直徑約 5.3''~8.4''。
- 金 星： 由室女座到天秤座，順行。近太陽不易見，15 日 12:43 過中天。視亮度-3.9 等，視直徑約 10.0''~10.6''。
- 火 星： 在室女座，順行。近太陽不易見，15 日 04:49 升。視亮度約 1.8 等，視直徑約 3.6''。
- 木 星： 在蛇夫座，順行。日沒後見於西南方。15 日 20:54 沒。視亮度約-2.0 等，視直徑約 35.8''~33.5''。
- 土 星： 在人馬座，順行。日沒後見於南方，15 日 22:40 沒。視亮度約 0.5 等，視直徑約 16.4''。
- 天王星： 在白羊座，逆行。28 日衝，近全夜可見。15 日 18:05 升。視亮度約 5.7 等，視直徑約 3.7''。
- 海王星： 在寶瓶座，逆行。日沒後見於東南方，15 日 03:24 沒。視亮度約 7.8 等，視直徑約 2.3''。

## 2019 年 十 一 月 天 象

| 日期 | 儒略日<br>(20.0 時) | 月齡   | 星期 | 時間               | 天象記要   |
|----|-----------------|------|----|------------------|--|
| 1  | 2458789         | 4.4  | 五  |                  | 水星留。   |
| 2  | 2458790         | 5.4  | 六  | 15h21m           | 土星合月，土星在月球北 0.59 度。  |
| 3  | 2458791         | 6.4  | 日  | 1h33m            | 冥王星合月，冥王星在月球北 0.36 度。  |
| 4  | 2458792         | 7.4  | 一  | 18h23m           | 上弦。  |
| 5  | 2458793         | 8.4  | 二  |                  |  |
| 6  | 2458794         | 9.4  | 三  |                  |  |
| 7  | 2458795         | 10.4 | 四  | 16h36m           | 月球過遠地點，月地距離 404995.818 公里。                                   |
| 8  | 2458796         | 11.4 | 五  | 1h24m<br>23h     | 立冬。<br>角宿一合火星，角宿一在火星南 3.06 度。                                |
| 9  | 2458797         | 12.4 | 六  | 19h              | 心宿二合金星，心宿二在金星南 3.95 度。                                       |
| 10 | 2458798         | 13.4 | 日  |                  |  |
| 11 | 2458799         | 14.4 | 一  | 23h22m           | 水星下合日。   |
| 12 | 2458800         | 15.4 | 二  | 16h56m<br>21h34m | 灶神星衝（視亮度 6.5 等）。<br>望。                                       |
| 13 | 2458801         | 16.4 | 三  |                  | 金牛座北流星雨極大期（ZHR~5）。   |
| 14 | 2458802         | 17.4 | 四  | 12h23m<br>23h56m | 畢宿五合月，畢宿五在月球南 3.03 度。<br>月球過遠地點，月地距離 404266.962 公里。          |
| 15 | 2458803         | 18.4 | 五  |                  |  |
| 16 | 2458804         | 19.4 | 六  |                  |  |
| 17 | 2458805         | 20.4 | 日  |                  |  |
| 18 | 2458806         | 21.4 | 一  |                  | 獅子座流星雨極大期（ZHR~15）。   |
| 19 | 2458807         | 22.4 | 二  |                  |  |
| 20 | 2458808         | 23.4 | 三  | 5h11m<br>7h51m   | 下弦。<br>軒轅十四合月，軒轅十四在月球南 3.71 度。<br>水星留。                       |
| 21 | 2458809         | 24.4 | 四  |                  |  |
| 22 | 2458810         | 25.4 | 五  | 22h59m           | 小雪。<br>麒麟座 $\alpha$ 流星雨極大期（ZHR~Var.）。                        |
| 23 | 2458811         | 26.4 | 六  | 13h39m<br>15h41m | 望。<br>月球過近地點，月地距離 366774.497 公里。                             |
| 24 | 2458812         | 27.4 | 日  | 17h2m<br>22h     | 火星合月，火星在月球南 4.34 度。<br>木星合金星，木星在金星北 1.41 度。                  |
| 25 | 2458813         | 28.4 | 一  | 10h50m           | 水星合月，水星在月球南 1.91 度。  |
| 26 | 2458814         | 29.4 | 二  | 23h6m            | 朔。   |
| 27 | 2458815         | 0.9  | 三  |                  |  |
| 28 | 2458816         | 1.9  | 四  | 18h29m<br>18h49m | 水星西大距（日距角 20.1 度，視亮度-0.6 等）。<br>木星合月，木星在月球南 0.73 度。<br>海王星留。 |
| 29 | 2458817         | 2.9  | 五  | 2h49m<br>5h33m   | 金星合月，金星在月球南 1.87 度。<br>穀神星合月，穀神星在月球南 3.67 度。                 |
| 30 | 2458818         | 3.9  | 六  | 5h3m<br>11h47m   | 土星合月，土星在月球北 0.93 度。<br>冥王星合月，冥王星在月球北 0.55 度。                 |

# 十一月星座圖



2019 年 11 月 15 日 21:00 的天空

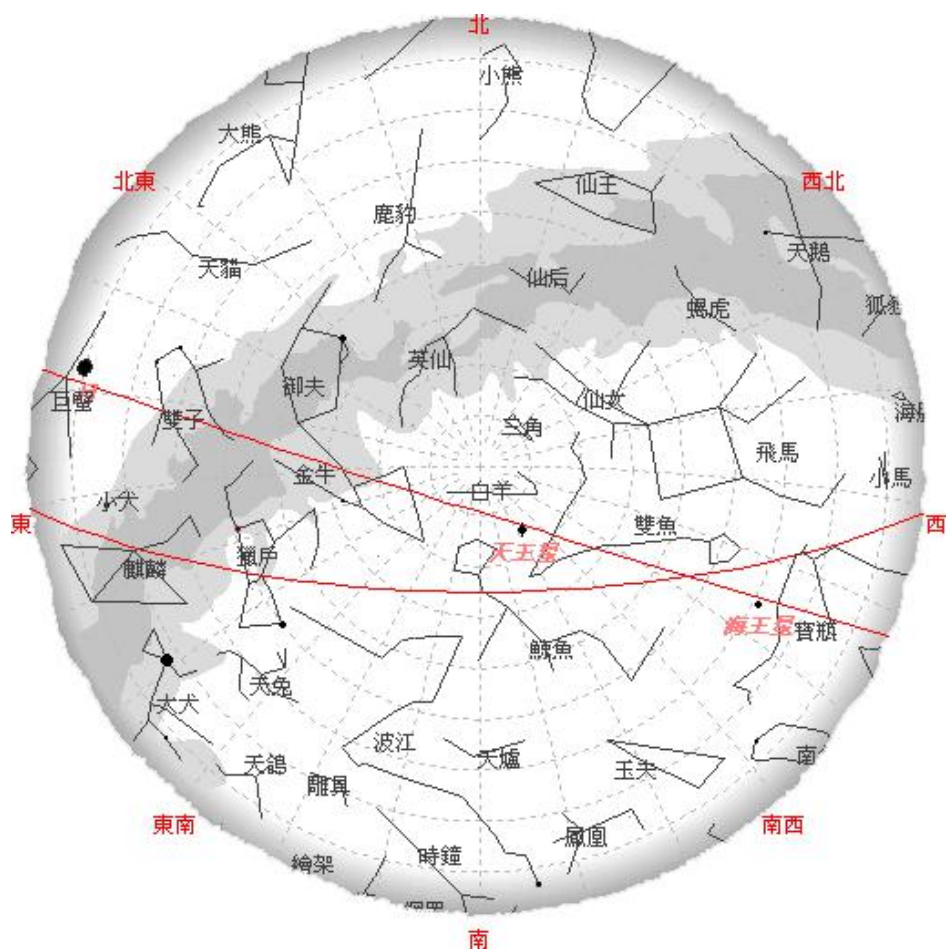
## 2019 年 11 月行星動態：

- 水 星： 在天秤座，順行，1 日留，逆行。20 日留，順行。28 日西大距。下旬日出後見於東南方，15 日 11:08 過中天。視亮度 0.5~-0.6 等，視直徑約 8.6"~6.5"。
- 金 星： 由天秤座經天蠍座經蛇夫座到人馬座，順行。日出後見於東南方，15 日 13:19 過中天。視亮度-3.9 等，視直徑約 10.7"~11.6"。
- 火 星： 在室女座，順行。近太陽不易見，15 日 04:17 升。視亮度約 1.8 等，視直徑約 3.7"~3.9"。
- 木 星： 由蛇夫座到人馬座，順行。日沒後見於西南方。15 日 19:17 沒。視亮度約-1.9 等，視直徑約 33.4"~32.1"。
- 土 星： 在人馬座，順行。日沒後見於西南方，15 日 20:47 沒。視亮度約 0.6 等，視直徑約 15.7"。
- 天王星： 在白羊座，逆行。近全夜可見。15 日 04:53 沒。視亮度約 5.7 等，視直徑約 3.7"。
- 海王星： 在寶瓶座，逆行，28 日留，順行。日沒後見於東南方，15 日 01:20 沒。視亮度約 7.9 等，視直徑約 2.3"。

## 2019 年 十 二 月 天 象

| 日期 | 儒略日<br>(20.0 時) | 月齡   | 星期 | 時間                         | 天象記要  |
|----|-----------------|------|----|----------------------------|---|
| 1  | 2458819         | 4.9  | 日  |                            |   |
| 2  | 2458820         | 5.9  | 一  |                            | 鳳凰座流星雨極大期 (ZHR~Var.)。   |
| 3  | 2458821         | 6.9  | 二  |                            |   |
| 4  | 2458822         | 7.9  | 三  | 14h58m                     | 上弦。   |
| 5  | 2458823         | 8.9  | 四  | 12h8m                      | 月球過遠地點，月地距離 404373.737 公里。  |
| 6  | 2458824         | 9.9  | 五  |                            |   |
| 7  | 2458825         | 10.9 | 六  | 18h18m<br>23h              | 大雪。<br>海王星合火星，海王星在火星南 0.04 度。<br>船尾/船帆座流星雨極大期 (ZHR~10)。             |
| 8  | 2458826         | 11.9 | 日  |                            |   |
| 9  | 2458827         | 12.9 | 一  | 20h10m                     | 灶神星合月，灶神星在月球南 4.06 度。<br>麒麟座流星雨極大期 (ZHR~2)。                         |
| 10 | 2458828         | 13.9 | 二  |                            |   |
| 11 | 2458829         | 14.9 | 三  | 13h<br>20h10m              | 土星合金星，土星在金星北 1.81 度。<br>畢宿五合月，畢宿五在月球南 3.03 度。                       |
| 12 | 2458830         | 15.9 | 四  | 13h12m<br>20h25m           | 望。<br>月球過遠地點，月地距離 405112.930 公里。<br>長蛇座 $\sigma$ 流星雨極大期 (ZHR~3)。    |
| 13 | 2458831         | 16.9 | 五  | 20h                        | 冥王星合金星，冥王星在金星北 1.14 度。  |
| 14 | 2458832         | 17.9 | 六  |                            | 雙子座流星雨極大期 (ZHR~140)。  |
| 15 | 2458833         | 18.9 | 日  |                            |   |
| 16 | 2458834         | 19.9 | 一  |                            | 后髮座流星雨極大期 (ZHR~3)。  |
| 17 | 2458835         | 20.9 | 二  | 13h8m                      | 軒轅十四合月，軒轅十四在月球南 3.84 度。   |
| 18 | 2458836         | 21.9 | 三  |                            |   |
| 19 | 2458837         | 22.9 | 四  | 4h25m<br>12h57m            | 月球過近地點，月地距離 370289.859 公里。<br>下弦。                                   |
| 20 | 2458838         | 23.9 | 五  | 15h58m                     | 婚神星合月，婚神星在月球南 4.5 度。<br>12 月小獅座流星雨極大期 (ZHR~5)。                      |
| 21 | 2458839         | 24.9 | 六  |                            |   |
| 22 | 2458840         | 25.9 | 日  | 12h19m                     | 冬至。   |
| 23 | 2458841         | 26.9 | 一  | 1h49m<br>9h49m             | 望。<br>火星合月，火星在月球南 3.53 度。<br>小熊座流星雨極大期 (ZHR~10)。                    |
| 24 | 2458842         | 27.9 | 二  | 22h                        | 木星合金星，木星在金星北 1.41 度。  |
| 25 | 2458843         | 28.9 | 三  | 19h8m                      | 水星合月，水星在月球南 1.94 度。   |
| 26 | 2458844         | 0.3  | 四  | 13h13m<br>15h30m           | 朔，日環食 (臺灣可見偏食)。<br>木星合月，木星在月球南 0.18 度。                              |
| 27 | 2458845         | 1.3  | 五  | 11h44m<br>19h47m<br>22h31m | 穀神星合月，穀神星在月球南 3.2 度。<br>土星合月，土星在月球北 1.2 度。<br>冥王星合月，冥王星在月球北 0.62 度。 |
| 28 | 2458846         | 2.3  | 六  | 2h26m                      | 木星合。  |
| 29 | 2458847         | 3.3  | 日  | 9h31m                      | 金星合月，金星在月球北 1.0 度。  |
| 30 | 2458848         | 4.3  | 一  |                            |   |
| 31 | 2458849         | 5.3  | 二  |                            |   |

## 十二月星座圖



2019 年 12 月 15 日 21:00 的天空

## 2019 年 12 月行星動態：

- 水 星：由天秤室經天蠍座經蛇夫座到人馬座，順行。上旬日出前見於東南方，15 日 10:47 過中天。視亮度-0.6~-0.9 等，視直徑約 6.3"~4.7"。
- 金 星：由人馬座到摩羯座，順行。日出後見於東南方，15 日 14:03 過中天。視亮度-3.9 等，視直徑約 11.6"~13.0"。
- 火 星：由室女座到天秤座，順行。日出後見於東南方，15 日 04:17 升。視亮度約 1.7~1.6 等，視直徑約 3.9"~4.3"。
- 木 星：在人馬座，順行。近太陽不易見。15 日 17:48 沒。視亮度約-1.8 等，視直徑約 32.0"~31.8"。
- 土 星：在人馬座，順行。日沒後見於西南方。15 日 19:02 沒。視亮度約 0.6 等，視直徑約 15.2"。
- 天王星：由白羊座，逆行。日落後見於東南方，15 日 02:50 沒。視亮度約 5.7 等，視直徑約 3.7"。
- 海王星：在寶瓶座，順行。日沒後見於東南方，15 日 23:18 沒。視亮度約 7.9 等，視直徑約 2.3"。

# 太陽表

地球除了繞本身自轉軸自轉外，也以橢圓形軌道繞著太陽公轉。從生活的經驗中可以知道每日太陽的大略位置，作為日常作息的依據。在天文觀測與計算裡，則必須知道太陽確切的位置，所以本太陽表列出每日世界時 0 時的恆星時，太陽的視黃經、赤經與赤緯座標、日地距離、視差、視半徑，及太陽球面中心點的經度( $L_0$ )、緯度( $B_0$ )、自轉軸偏角( $P$ )等數值。並列出三種曙光始、暮光終的時刻，日出、日沒與中天的時間與位置。

## 一、恆星時

恆星時的定義是春分點的時角，更簡單的說法可定義為天球子午線的赤經座標。由於地球自轉，春分點每 23 小時又 56.1 分通過子午線一次，也可以說天球轉了一圈，稱為一恆星日。天文學就用天球子午線的赤經值為恆星時，一恆星日也分割為 24 個恆星小時。

與太陽日比較，恆星日比太陽日短了約 3.9 分鐘的時間，所以在每天相同的太陽時來測定恆星時，都會比前一天增加約 3.9 分。又因為恆星時是以天球子午線的赤經值為標準，所以在地球上經度不同的地點，其恆星時的數值也不相同。表中列出的是在世界時 0 時的格林威治平恆星時 (G. M. S. T.)。各個不同地點的地方平恆星時 (L. M. S. T.) 可由下式計算得知：

$$L. M. S. T. = G. M. S. T. \pm \text{當地經度} + (\text{當地時間} \pm \text{時區修正值}) \times 1.002738$$

若所得結果大於 24 或為負數，都應加或減 24，將之修正為介於 0 與 24 之間的正數。例如，臺北市立天文科學教育館(東經 121° 31' 5.0")的地方平恆星時為：

$$L. M. S. T. = G. M. S. T. + 8\text{h } 06\text{m } 04.3\text{s} + (\text{現在時刻} - 8\text{h}) \times 1.002738$$

## 二、視黃經、赤經、赤緯

以地球中心為觀測原點，忽略大氣折射等效應，即為地心「視」座標。

太陽在天球上的位置分別以黃經，赤經和赤緯表示。

黃道是地球繞太陽公轉的軌道平面與天球相接觸的大圓。也可以說是由地球上所見太陽在天球上運行的軌跡。天球赤道是地球赤道在天球上的投影，也是一個大圓。黃道與赤道在天球上有兩個交點，每年 3 月 22 日前後，太陽由天球南方通過赤道進入天球北方時，經過的交點稱為春分點；每年 9 月 22 日前後，太陽由天球北方通過赤道進入天球南方時，經過的交點稱為秋分點。春分點則被選為黃道座標與赤道座標的原點。在黃道座標中，黃道面是基準平面，緯度定為 0°；依前述說明，太陽始終在黃道面上，所以只須標示太陽的黃經座標，就能確知其在黃道上的位置。

赤道與黃道的夾角約為 23.5 度，所以太陽會在天球赤道南北 23.5 度的範圍中移動。因此在天球赤道座標中，須同時標示太陽的赤經與赤緯座標。太陽在每年 6 月 21 日前後到達赤道的最北方，此時稱為夏至；每年 12 月 23 日前後到達赤道的最南方，稱為冬至。黃經由春分點開始，沿黃道面向東等分為 360°，太陽每天在黃道上約移動一度；赤經在

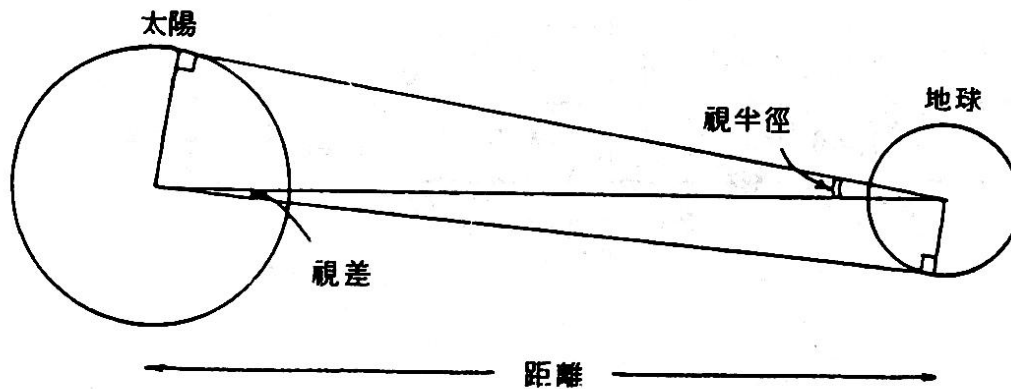


赤道面上等分為 24 時，每時相當於  $15^\circ$ ；赤緯以赤道面為  $0^\circ$ ，南北各分為  $90^\circ$ ，北方為正，南方為負。一般在繪製星圖時以赤道為準，所以黃道的位置就被畫為彎曲的弧線。

### 三、距離、視差、視半徑

由於地球繞日公轉的軌道為離心率 0.0167 的橢圓，所以地球與太陽的實際距離會有  $\pm 1.7\%$  的變化產生。太陽到地球的平均距離為 1.4960 億公里，為了使用上的方便，天文學家定義此一長度為一天文單位(astronomical unit, AU)，作為太陽系中天體間距離測量的標準單位。表中即使用天文單位表示地球與太陽間的距離。

視差是在不同的地點測量同一物體方位時的差異。由地球中心與赤道表面上沿地平方向測量太陽中心點在天球上的位置時的差值，稱為赤道地平視差，以弧秒為單位。當距離為一天文單位時，赤道地平視差為  $8''.8$ 。而視半徑是由地心測量所得的太陽半徑值，當距離為一天文單位時，太陽視半徑為  $15' 59''.6$ 。參考下圖。



#### 四、太陽自轉軸偏角(P)、太陽球面中心點的緯度(B<sub>0</sub>)、和經度(L<sub>0</sub>)

標示太陽表面某一點的位置時，必須使用以太陽自轉軸的偏角與盤面經緯度所定義出來的座標。

P = 太陽自轉軸的北點方位角；由於太陽的赤道與黃道間的夾角約為  $7^{\circ}.2$ ，而黃道與地球赤道間有  $23^{\circ}.5$  的夾角，同時太陽赤道、地球赤道與黃道法線的指向不同，使得地球上觀測到的太陽自轉軸偏角在一年中有  $\pm 26^{\circ}.5$  的變化。

B<sub>0</sub> = 太陽圓盤面中心點的緯度；在一年中有  $\pm 7^{\circ}.2$  的變化。

L<sub>0</sub> = 太陽圓盤面中心點的經度；也稱為中央子午線經度，每天的改變值為  $13^{\circ}.2$ ，應用時須根據觀測時間參照補正表加以修正。表一列出一天中 L<sub>0</sub> 的補正量。

地球公轉一週的時間與一年相當，所以 P 與 B<sub>0</sub> 的值在每年相同的日子有相近的值，若不要求精確度高的觀測，可以參考表二迅速得出 P 與 B<sub>0</sub> 概略的數值。

表一：L<sub>0</sub> 補正量，單位為度 (°)。

| 東經 120°<br>平太陽時 | 0 分   | 10 分  | 20 分  | 30 分  | 40 分  | 50 分  |
|-----------------|-------|-------|-------|-------|-------|-------|
| 06 時            | +1.10 | +1.01 | +0.92 | +0.83 | +0.73 | +0.64 |
| 07 時            | +0.55 | +0.46 | +0.37 | +0.28 | +0.18 | +0.09 |
| 08 時            | +0.00 | -0.09 | -0.18 | -0.28 | -0.37 | -0.46 |
| 09 時            | -0.55 | -0.64 | -0.73 | -0.83 | -0.92 | -1.01 |
| 10 時            | -1.10 | -1.19 | -1.28 | -1.38 | -1.47 | -1.56 |
| 11 時            | -1.65 | -1.74 | -1.83 | -1.93 | -2.02 | -2.11 |
| 12 時            | -2.20 | -2.29 | -2.38 | -2.48 | -2.57 | -2.66 |
| 13 時            | -2.75 | -2.84 | -2.93 | -3.03 | -3.12 | -3.21 |
| 14 時            | -3.30 | -3.39 | -3.48 | -3.58 | -3.67 | -3.76 |
| 15 時            | -3.85 | -3.94 | -4.03 | -4.13 | -4.22 | -4.31 |
| 16 時            | -4.40 | -4.49 | -4.58 | -4.68 | -4.77 | -4.86 |

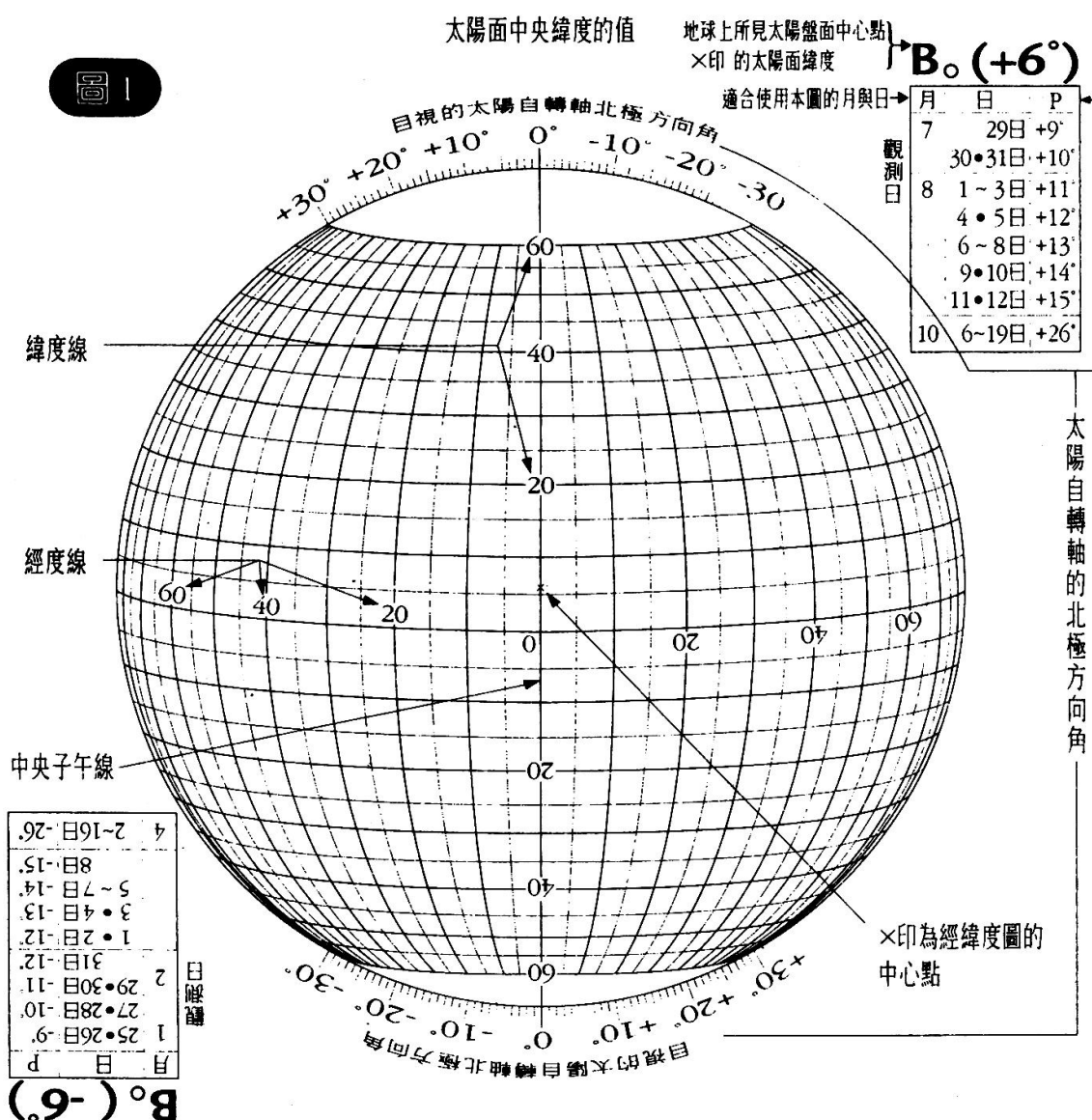
表二：B<sub>0</sub>、P 簡易值，單位為度 (°)。

| 月     | 日      | B <sub>0</sub> | P   | 月      | 日      | B <sub>0</sub> | P   | 月      | 日      | B <sub>0</sub> | P  | 月      | 日      | B <sub>0</sub> | P     |       |        |       |        |        |        |        |       |     |     |     |      |     |        |       |        |     |
|-------|--------|----------------|-----|--------|--------|----------------|-----|--------|--------|----------------|----|--------|--------|----------------|-------|-------|--------|-------|--------|--------|--------|--------|-------|-----|-----|-----|------|-----|--------|-------|--------|-----|
| 1     | 1, 2   | -3             | +2  | 3      | 23~31  | -7             | -26 | 6      | 30     | +3             | -3 | 9      | 18~24  | +7             | +25   |       |        |       |        |        |        |        |       |     |     |     |      |     |        |       |        |     |
|       | 3, 4   | -3             | +1  |        | 4      | 1              | -7  |        | -26    | 7              | 1  |        | +3     | -3             | 10    | 25~30 | +7     | +26   |        |        |        |        |       |     |     |     |      |     |        |       |        |     |
|       | 5~7    | -4             | 0   | 2~16   |        | -6             | -26 | 2~4    | +3     |                | -2 | 6~19   | +6     | +26            |       |       |        |       |        |        |        |        |       |     |     |     |      |     |        |       |        |     |
|       | 8      | -4             | -1  | 17~22  |        | -5             | -26 | 5, 6   | +3     |                | -1 |        | 20~26  | +5             |       | +26   |        |       |        |        |        |        |       |     |     |     |      |     |        |       |        |     |
|       | 9, 10  | -4             | -2  | 23~27  |        | -5             | -25 | 7, 8   | +4     |                | -0 | 27~30  |        | +5             |       | +25   |        |       |        |        |        |        |       |     |     |     |      |     |        |       |        |     |
|       | 11, 12 | -4             | -3  | 28, 29 |        | -4             | -25 | 9, 10  | +4     |                | +1 |        | 31     | +4             |       | +25   |        |       |        |        |        |        |       |     |     |     |      |     |        |       |        |     |
|       | 13, 14 | -4             | -4  | 30     |        | -4             | -24 | 11, 12 | +4     |                | +2 | 11     |        | 1~2            |       | +4    | +25    |       |        |        |        |        |       |     |     |     |      |     |        |       |        |     |
|       | 15     | -5             | -4  | 5      |        | 1~5            | -4  | -24    | 13~15  |                | +4 |        | +3     | 3~7            |       | +4    | +24    |       |        |        |        |        |       |     |     |     |      |     |        |       |        |     |
|       | 16, 17 | -5             | -5  |        |        | 6, 7           | -4  | -23    | 16     |                | +4 |        | +4     |                |       | 8, 9  | +4     | +23   |        |        |        |        |       |     |     |     |      |     |        |       |        |     |
|       | 18, 19 | -5             | -6  |        |        | 8~13           | -3  | -22    | 17     |                | +5 |        | +4     |                |       |       | 10, 11 | +3    | +23    |        |        |        |       |     |     |     |      |     |        |       |        |     |
|       | 20, 21 | -5             | -7  |        |        | 14~16          | -3  | -21    | 18, 19 |                | +5 |        | +5     |                |       |       |        | 12~15 | +3     | +22    |        |        |       |     |     |     |      |     |        |       |        |     |
|       | 22, 23 | -5             | -8  |        |        | 17             | -2  | -21    | 20~22  |                | +5 |        | +6     |                |       |       |        |       | 16, 17 | +3     | +21    |        |       |     |     |     |      |     |        |       |        |     |
|       | 24     | -5             | -9  |        |        | 18~20          | -2  | -20    | 23, 24 |                | +5 |        | +7     |                |       |       |        |       |        | 18~22  | +2     | +20    |       |     |     |     |      |     |        |       |        |     |
|       | 25, 26 | -6             | -9  |        |        | 21~23          | -2  | -19    | 25, 26 |                | +5 |        | +8     |                |       |       |        |       |        |        | 23~25  | +2     | +19   |     |     |     |      |     |        |       |        |     |
|       | 27, 28 | -6             | -10 |        |        | 24             | -2  | -18    | 27, 28 |                | +5 |        | +9     |                |       |       |        |       |        |        |        | 26, 27 | +1    | +18 |     |     |      |     |        |       |        |     |
|       | 29, 30 | -6             | -11 |        |        | 25, 26         | -1  | -18    | 29     |                | +6 |        | +9     |                |       |       |        |       |        |        |        |        | 28~30 | +1  | +17 |     |      |     |        |       |        |     |
|       | 31     | -6             | -12 |        |        | 27~29          | -1  | -17    | 30, 31 |                | +6 |        | +10    |                |       |       |        |       |        |        |        |        |       | 12  | 1~3 | +1  | +16  |     |        |       |        |     |
|       | 2      | 1, 2           | -6  |        |        | -12            | 30  | -1     | -16    |                | 8  |        | 1~3    |                |       |       |        |       |        |        |        |        |       |     | +6  | +11 | 4, 5 | 0   | +15    |       |        |     |
|       |        | 3, 4           | -6  |        | -13    | 6              | 1   | -1     | -16    | 4, 5           |    |        | +6     |                | +12   |       |        |       |        |        |        |        |       |     | 6~8 | 0   |      | +14 |        |       |        |     |
| 5~7   |        | -6             | -14 |        | 2      |                | -1  | -15    | 6~8    | +6             |    |        | +13    |                | 9, 10 |       |        |       |        |        |        |        |       |     |     | 0   |      | +13 |        |       |        |     |
| 8     |        | -6             | -15 |        | 3, 4   |                | 0   | -15    | 9, 10  | +6             |    |        | +14    |                |       |       |        |       |        |        |        |        |       |     |     | 11  |      | 0   | +12    |       |        |     |
| 9     |        | -7             | -15 |        | 5, 6   |                | 0   | -14    | 11, 12 | +6             |    |        | +15    |                |       |       |        |       |        |        |        |        |       |     |     |     |      | 12  | -1     | +12   |        |     |
| 10~12 |        | -7             | -16 |        | 7~9    |                | 0   | -13    | 13     | +7             |    |        | +15    |                |       |       |        |       |        |        |        |        |       |     |     |     |      |     | 13, 14 | -1    | +11    |     |
| 13~15 |        | -7             | -17 |        | 10     |                | 0   | -12    | 14~16  | +7             |    |        | +16    |                |       |       |        |       |        |        |        |        |       |     |     |     |      |     |        | 15~17 | -1     | +10 |
| 16~18 |        | -7             | -18 |        | 11     |                | +1  | -12    | 17~19  | +7             |    |        | +17    |                |       |       |        |       |        |        |        |        |       |     |     |     |      |     |        |       | 18, 19 | -1  |
| 19~21 |        | -7             | -19 | 12, 13 | +1     |                | -11 | 20~23  | +7     | +18            |    | 20, 21 | -2     | +8             |       |       |        |       |        |        |        |        |       |     |     |     |      |     |        |       |        |     |
| 22~25 |        | -7             | -20 | 14~16  | +1     |                | -10 | 24~26  | +7     | +19            |    |        | 22, 23 | -2             |       | +7    |        |       |        |        |        |        |       |     |     |     |      |     |        |       |        |     |
| 26~28 |        | -7             | -21 | 17, 18 | +1     |                | -9  | 27~30  | +7     | +20            |    |        |        | 24, 25         |       | -2    | +6     |       |        |        |        |        |       |     |     |     |      |     |        |       |        |     |
| 3     |        | 1              | -7  | -21    | 19, 20 |                | +2  | -8     | 31     | +7             |    |        |        |                |       | +21   | 9      | 1, 2  |        |        |        |        |       |     |     |     |      |     |        |       |        | +7  |
|       |        | 2~5            | -7  | -22    | 21~23  |                | +2  | -7     | 9      | 3~7            |    |        |        |                |       | +7    |        | +22   | 26, 27 |        |        |        |       |     |     |     |      |     |        |       |        | -2  |
|       |        | 6~9            | -7  | -23    | 24, 25 |                | +2  | -6     |        | 8~11           |    |        |        |                |       | +7    |        | +23   |        | 28, 29 |        |        |       |     |     |     |      |     |        |       |        | -3  |
|       |        | 10~15          | -7  | -24    | 26, 27 |                | +2  | -5     |        | 12~17          |    |        |        |                |       | +7    |        | +24   |        |        | 30, 31 |        |       |     |     |     |      |     |        |       |        | -3  |
|       |        | 16~22          | -7  | -25    | 28, 29 |                | +3  | -4     |        | ---            |    |        |        |                |       | ---   |        | ---   |        |        |        | ---    |       |     |     |     |      |     |        |       |        | --- |
| ---   |        | ---            | --- | ---    | ---    |                | --- | ---    |        | ---            |    |        |        |                |       | ---   | ---    | ---   |        |        |        |        | ---   |     |     |     |      |     |        |       |        |     |

太陽面經緯度圖：測量太陽表面的位置，可以使用太陽面經緯度圖，全套太陽面經緯度圖共有 8 張，使用時依照速見表中的 B。值選用適當的圖面，參考下面的圖例來使用。

## 太陽面經緯度圖

共 8 枚



## 五、日出、日沒、中天、曙暮光

一般認為當太陽的上端邊緣位在地平線時，就是日出（日沒）的時刻。由於太陽實際上是個具有一定大小的發光盤面以及大氣層對陽光的偏折作用（稱為濛氣差），因此在計算時考慮太陽視半徑 $16'$ 與平均濛氣差 $34'$ 的影響，以太陽盤面中心在地平線下 $50'$ 的位置作為日出或日沒的標準。不過由於大氣折射率會因溫度、濕度等天氣的因素而發生變化，所以測量所得的日出或日落時刻總會與預報的時間有些許出入。而一年之中，無論是日出或日落，太陽的視高度都是 $0^\circ$ ，所以表中只標示時間與方位。

天體經過子午線時稱為中天，同時這也是在一天當中該天體位置最高的時刻。因為子午線是指向正南北的方向，所以要表示中天的太陽位置，只須標示高度即可，因此表中只列出中天的時間與仰角高度，並以 s 與 n 表示太陽偏南或偏北。臺北位於北回歸線以北，所以太陽中天時均在南方。

自古以來人類就以 6 等星在天頂能否被見到來定義暮光終與曙光始的時刻。在日落後的微光稱為暮光，當 6 等星在天頂被見到時，表示暮光已完全消逝，天空完全黑暗。出現在日出前的光線稱為曙光，而當日出前 6 等星在天頂消逝不見時，即表示天空中已有陽光滲漏開始變亮了，此一時間即定義為曙光始的時刻。

以目前的定義來說，當太陽在地平線下  $18^\circ$  為天文曙光始與天文暮光終。而為了其他的需要，還另外定義當太陽在地平線下  $12^\circ$  時，為航海曙光始與航海暮光終的時刻；當太陽在地平線下  $6^\circ$  的時刻，則作為民用曙光始與民用暮光終的時刻。因為曙光與暮光都是擴散在大氣中的光線，難以明確的指出最初的方位，所以表中只列出時刻。

## 太陽位置與日面座標

— 月

本表採用世界時 0 時

| 日期 | GMST |    |       | 視黃經<br>° | 視赤經 |       | 視赤緯 |       | 距離<br>(AU) | 視差<br>" | 視半徑 |       | P<br>° | B <sub>0</sub><br>° | L <sub>0</sub><br>° |
|----|------|----|-------|----------|-----|-------|-----|-------|------------|---------|-----|-------|--------|---------------------|---------------------|
|    | h    | m  | s     |          | h   | m     | °   | '     |            |         | '   | "     |        |                     |                     |
| 1  | 6    | 41 | 26.52 | 280.3    | 18  | 44.63 | -23 | 2.42  | 0.9833     | 8.94    | 16  | 15.93 | 2.20   | -2.97               | 208.41              |
| 2  | 6    | 45 | 23.08 | 281.3    | 18  | 49.05 | -22 | 57.48 | 0.9833     | 8.94    | 16  | 15.94 | 1.72   | -3.09               | 195.24              |
| 3  | 6    | 49 | 19.64 | 282.3    | 18  | 53.46 | -22 | 52.09 | 0.9833     | 8.94    | 16  | 15.94 | 1.23   | -3.21               | 182.07              |
| 4  | 6    | 53 | 16.19 | 283.3    | 18  | 57.87 | -22 | 46.24 | 0.9833     | 8.94    | 16  | 15.94 | 0.75   | -3.32               | 168.90              |
| 5  | 6    | 57 | 12.75 | 284.3    | 19  | 2.26  | -22 | 39.94 | 0.9833     | 8.94    | 16  | 15.94 | 0.27   | -3.43               | 155.73              |
| 6  | 7    | 1  | 9.30  | 285.4    | 19  | 6.66  | -22 | 33.18 | 0.9833     | 8.94    | 16  | 15.93 | -0.22  | -3.55               | 142.56              |
| 7  | 7    | 5  | 5.86  | 286.4    | 19  | 11.04 | -22 | 25.99 | 0.9833     | 8.94    | 16  | 15.91 | -0.70  | -3.66               | 129.39              |
| 8  | 7    | 9  | 2.41  | 287.4    | 19  | 15.42 | -22 | 18.35 | 0.9833     | 8.94    | 16  | 15.90 | -1.18  | -3.77               | 116.22              |
| 9  | 7    | 12 | 58.97 | 288.4    | 19  | 19.78 | -22 | 10.27 | 0.9834     | 8.94    | 16  | 15.88 | -1.66  | -3.88               | 103.05              |
| 10 | 7    | 16 | 55.52 | 289.4    | 19  | 24.14 | -22 | 1.76  | 0.9834     | 8.94    | 16  | 15.85 | -2.14  | -3.99               | 89.88               |
| 11 | 7    | 20 | 52.08 | 290.5    | 19  | 28.49 | -21 | 52.82 | 0.9834     | 8.94    | 16  | 15.82 | -2.62  | -4.09               | 76.72               |
| 12 | 7    | 24 | 48.63 | 291.5    | 19  | 32.83 | -21 | 43.45 | 0.9834     | 8.94    | 16  | 15.79 | -3.10  | -4.20               | 63.55               |
| 13 | 7    | 28 | 45.19 | 292.5    | 19  | 37.16 | -21 | 33.66 | 0.9835     | 8.94    | 16  | 15.75 | -3.57  | -4.30               | 50.38               |
| 14 | 7    | 32 | 41.74 | 293.5    | 19  | 41.48 | -21 | 23.45 | 0.9835     | 8.94    | 16  | 15.71 | -4.05  | -4.41               | 37.21               |
| 15 | 7    | 36 | 38.30 | 294.5    | 19  | 45.78 | -21 | 12.83 | 0.9836     | 8.94    | 16  | 15.66 | -4.52  | -4.51               | 24.04               |
| 16 | 7    | 40 | 34.86 | 295.5    | 19  | 50.08 | -21 | 1.80  | 0.9836     | 8.94    | 16  | 15.61 | -4.98  | -4.61               | 10.88               |
| 17 | 7    | 44 | 31.41 | 296.6    | 19  | 54.36 | -20 | 50.37 | 0.9837     | 8.94    | 16  | 15.55 | -5.45  | -4.71               | 357.71              |
| 18 | 7    | 48 | 27.97 | 297.6    | 19  | 58.63 | -20 | 38.54 | 0.9837     | 8.94    | 16  | 15.49 | -5.91  | -4.81               | 344.54              |
| 19 | 7    | 52 | 24.52 | 298.6    | 20  | 2.89  | -20 | 26.33 | 0.9838     | 8.94    | 16  | 15.42 | -6.37  | -4.90               | 331.37              |
| 20 | 7    | 56 | 21.08 | 299.6    | 20  | 7.14  | -20 | 13.73 | 0.9839     | 8.94    | 16  | 15.35 | -6.83  | -5.00               | 318.21              |
| 21 | 8    | 0  | 17.63 | 300.6    | 20  | 11.38 | -20 | 0.75  | 0.9840     | 8.94    | 16  | 15.26 | -7.28  | -5.09               | 305.04              |
| 22 | 8    | 4  | 14.19 | 301.7    | 20  | 15.60 | -19 | 47.39 | 0.9841     | 8.94    | 16  | 15.18 | -7.73  | -5.18               | 291.87              |
| 23 | 8    | 8  | 10.74 | 302.7    | 20  | 19.81 | -19 | 33.67 | 0.9842     | 8.94    | 16  | 15.08 | -8.18  | -5.27               | 278.71              |
| 24 | 8    | 12 | 7.30  | 303.7    | 20  | 24.01 | -19 | 19.58 | 0.9843     | 8.93    | 16  | 14.98 | -8.62  | -5.36               | 265.54              |
| 25 | 8    | 16 | 3.85  | 304.7    | 20  | 28.19 | -19 | 5.14  | 0.9844     | 8.93    | 16  | 14.87 | -9.06  | -5.44               | 252.37              |
| 26 | 8    | 19 | 60.41 | 305.7    | 20  | 32.36 | -18 | 50.35 | 0.9845     | 8.93    | 16  | 14.76 | -9.50  | -5.53               | 239.21              |
| 27 | 8    | 23 | 56.96 | 306.7    | 20  | 36.52 | -18 | 35.21 | 0.9846     | 8.93    | 16  | 14.64 | -9.93  | -5.61               | 226.04              |
| 28 | 8    | 27 | 53.52 | 307.8    | 20  | 40.67 | -18 | 19.74 | 0.9847     | 8.93    | 16  | 14.52 | -10.36 | -5.69               | 212.87              |
| 29 | 8    | 31 | 50.08 | 308.8    | 20  | 44.80 | -18 | 3.93  | 0.9849     | 8.93    | 16  | 14.40 | -10.78 | -5.77               | 199.71              |
| 30 | 8    | 35 | 46.63 | 309.8    | 20  | 48.92 | -17 | 47.80 | 0.9850     | 8.93    | 16  | 14.26 | -11.20 | -5.85               | 186.54              |
| 31 | 8    | 39 | 43.19 | 310.8    | 20  | 53.03 | -17 | 31.35 | 0.9851     | 8.93    | 16  | 14.13 | -11.62 | -5.92               | 173.37              |

## 臺北市 日出、日沒、曙光始、暮光終 時間表

— 月

東經：121°31' 5" ，北緯：25°5' 44"

本表採用東經 120°平太陽時

| 日<br>期 | 天 文<br>曙光始<br>h m | 航 海<br>曙光始<br>h m | 民 用<br>曙光始<br>h m | 日 出<br>時間 方位<br>h m ° | 中 天<br>時間 仰角<br>h m ° | 日 沒<br>時間 方位<br>h m ° | 民 用<br>暮光終<br>h m | 航 海<br>暮光終<br>h m | 天 文<br>暮光終<br>h m |
|--------|-------------------|-------------------|-------------------|-----------------------|-----------------------|-----------------------|-------------------|-------------------|-------------------|
| 1      | 05:18             | 05:46             | 06:14             | 06:39 115             | 11:57 42S             | 17:16 245             | 17:40             | 18:09             | 18:37             |
| 2      | 05:18             | 05:46             | 06:14             | 06:39 115             | 11:58 42S             | 17:16 245             | 17:41             | 18:10             | 18:38             |
| 3      | 05:18             | 05:46             | 06:15             | 06:39 115             | 11:58 42S             | 17:17 245             | 17:42             | 18:10             | 18:38             |
| 4      | 05:18             | 05:46             | 06:15             | 06:40 115             | 11:59 42S             | 17:18 245             | 17:42             | 18:11             | 18:39             |
| 5      | 05:19             | 05:47             | 06:15             | 06:40 115             | 11:59 42S             | 17:18 245             | 17:43             | 18:11             | 18:39             |
| 6      | 05:19             | 05:47             | 06:15             | 06:40 115             | 11:59 42S             | 17:19 245             | 17:44             | 18:12             | 18:40             |
| 7      | 05:19             | 05:47             | 06:16             | 06:40 114             | 12:00 43S             | 17:20 246             | 17:44             | 18:13             | 18:41             |
| 8      | 05:20             | 05:47             | 06:16             | 06:41 114             | 12:00 43S             | 17:20 246             | 17:45             | 18:13             | 18:41             |
| 9      | 05:20             | 05:48             | 06:16             | 06:41 114             | 12:01 43S             | 17:21 246             | 17:46             | 18:14             | 18:42             |
| 10     | 05:20             | 05:48             | 06:16             | 06:41 114             | 12:01 43S             | 17:22 246             | 17:47             | 18:15             | 18:43             |
| 11     | 05:20             | 05:48             | 06:16             | 06:41 114             | 12:02 43S             | 17:23 246             | 17:47             | 18:15             | 18:43             |
| 12     | 05:20             | 05:48             | 06:16             | 06:41 114             | 12:02 43S             | 17:23 246             | 17:48             | 18:16             | 18:44             |
| 13     | 05:20             | 05:48             | 06:16             | 06:41 114             | 12:02 43S             | 17:24 247             | 17:49             | 18:17             | 18:45             |
| 14     | 05:20             | 05:48             | 06:16             | 06:41 113             | 12:03 44S             | 17:25 247             | 17:49             | 18:17             | 18:45             |
| 15     | 05:21             | 05:48             | 06:16             | 06:41 113             | 12:03 44S             | 17:25 247             | 17:50             | 18:18             | 18:46             |
| 16     | 05:21             | 05:48             | 06:16             | 06:41 113             | 12:03 44S             | 17:26 247             | 17:51             | 18:19             | 18:46             |
| 17     | 05:21             | 05:48             | 06:16             | 06:41 113             | 12:04 44S             | 17:27 247             | 17:52             | 18:20             | 18:47             |
| 18     | 05:21             | 05:48             | 06:16             | 06:41 112             | 12:04 44S             | 17:28 248             | 17:52             | 18:20             | 18:48             |
| 19     | 05:21             | 05:48             | 06:16             | 06:41 112             | 12:04 45S             | 17:29 248             | 17:53             | 18:21             | 18:48             |
| 20     | 05:21             | 05:48             | 06:16             | 06:40 112             | 12:05 45S             | 17:29 248             | 17:54             | 18:22             | 18:49             |
| 21     | 05:21             | 05:48             | 06:16             | 06:40 112             | 12:05 45S             | 17:30 248             | 17:54             | 18:22             | 18:50             |
| 22     | 05:20             | 05:48             | 06:16             | 06:40 112             | 12:05 45S             | 17:31 249             | 17:55             | 18:23             | 18:50             |
| 23     | 05:20             | 05:48             | 06:16             | 06:40 111             | 12:06 45S             | 17:32 249             | 17:56             | 18:24             | 18:51             |
| 24     | 05:20             | 05:48             | 06:15             | 06:40 111             | 12:06 46S             | 17:32 249             | 17:56             | 18:24             | 18:52             |
| 25     | 05:20             | 05:47             | 06:15             | 06:39 111             | 12:06 46S             | 17:33 249             | 17:57             | 18:25             | 18:52             |
| 26     | 05:20             | 05:47             | 06:15             | 06:39 110             | 12:06 46S             | 17:34 250             | 17:58             | 18:26             | 18:53             |
| 27     | 05:20             | 05:47             | 06:15             | 06:39 110             | 12:07 46S             | 17:34 250             | 17:59             | 18:26             | 18:54             |
| 28     | 05:20             | 05:47             | 06:14             | 06:38 110             | 12:07 47S             | 17:35 250             | 17:59             | 18:27             | 18:54             |
| 29     | 05:19             | 05:47             | 06:14             | 06:38 110             | 12:07 47S             | 17:36 251             | 18:00             | 18:28             | 18:55             |
| 30     | 05:19             | 05:46             | 06:14             | 06:38 109             | 12:07 47S             | 17:37 251             | 18:01             | 18:28             | 18:55             |
| 31     | 05:19             | 05:46             | 06:13             | 06:37 109             | 12:07 47S             | 17:37 251             | 18:01             | 18:29             | 18:56             |

## 太陽位置與日面座標

二 月

本表採用世界時 0 時

| 日期 | GMST |    |       | 視黃經   | 視赤經 |       | 視赤緯 |       | 距離<br>( AU ) | 視差<br>" | 視半徑 |       | P<br>° | B <sub>0</sub><br>° | L <sub>0</sub><br>° |
|----|------|----|-------|-------|-----|-------|-----|-------|--------------|---------|-----|-------|--------|---------------------|---------------------|
|    | h    | m  | s     | °     | h   | m     | °   | '     |              |         | '   | "     |        |                     |                     |
| 1  | 8    | 43 | 39.74 | 311.8 | 20  | 57.12 | -17 | 14.59 | 0.9853       | 8.93    | 16  | 13.99 | -12.03 | -5.99               | 160.21              |
| 2  | 8    | 47 | 36.30 | 312.8 | 21  | 1.20  | -16 | 57.52 | 0.9854       | 8.92    | 16  | 13.85 | -12.44 | -6.07               | 147.04              |
| 3  | 8    | 51 | 32.85 | 313.8 | 21  | 5.26  | -16 | 40.15 | 0.9856       | 8.92    | 16  | 13.70 | -12.84 | -6.13               | 133.88              |
| 4  | 8    | 55 | 29.41 | 314.9 | 21  | 9.32  | -16 | 22.49 | 0.9857       | 8.92    | 16  | 13.55 | -13.24 | -6.20               | 120.71              |
| 5  | 8    | 59 | 25.96 | 315.9 | 21  | 13.35 | -16 | 4.55  | 0.9859       | 8.92    | 16  | 13.40 | -13.63 | -6.27               | 107.54              |
| 6  | 9    | 3  | 22.52 | 316.9 | 21  | 17.38 | -15 | 46.33 | 0.9860       | 8.92    | 16  | 13.25 | -14.02 | -6.33               | 94.38               |
| 7  | 9    | 7  | 19.07 | 317.9 | 21  | 21.39 | -15 | 27.84 | 0.9862       | 8.92    | 16  | 13.09 | -14.40 | -6.39               | 81.21               |
| 8  | 9    | 11 | 15.63 | 318.9 | 21  | 25.39 | -15 | 9.09  | 0.9863       | 8.92    | 16  | 12.93 | -14.78 | -6.45               | 68.05               |
| 9  | 9    | 15 | 12.18 | 319.9 | 21  | 29.38 | -14 | 50.08 | 0.9865       | 8.91    | 16  | 12.77 | -15.15 | -6.51               | 54.88               |
| 10 | 9    | 19 | 8.74  | 320.9 | 21  | 33.35 | -14 | 30.82 | 0.9867       | 8.91    | 16  | 12.60 | -15.52 | -6.57               | 41.71               |
| 11 | 9    | 23 | 5.29  | 322.0 | 21  | 37.30 | -14 | 11.32 | 0.9868       | 8.91    | 16  | 12.43 | -15.88 | -6.62               | 28.55               |
| 12 | 9    | 27 | 1.85  | 323.0 | 21  | 41.25 | -13 | 51.59 | 0.9870       | 8.91    | 16  | 12.26 | -16.24 | -6.67               | 15.38               |
| 13 | 9    | 30 | 58.41 | 324.0 | 21  | 45.18 | -13 | 31.63 | 0.9872       | 8.91    | 16  | 12.08 | -16.59 | -6.72               | 2.21                |
| 14 | 9    | 34 | 54.96 | 325.0 | 21  | 49.10 | -13 | 11.44 | 0.9874       | 8.91    | 16  | 11.90 | -16.93 | -6.77               | 349.04              |
| 15 | 9    | 38 | 51.52 | 326.0 | 21  | 53.01 | -12 | 51.04 | 0.9876       | 8.90    | 16  | 11.72 | -17.27 | -6.81               | 335.88              |
| 16 | 9    | 42 | 48.07 | 327.0 | 21  | 56.90 | -12 | 30.44 | 0.9878       | 8.90    | 16  | 11.53 | -17.61 | -6.86               | 322.71              |
| 17 | 9    | 46 | 44.63 | 328.0 | 22  | 0.78  | -12 | 9.63  | 0.9880       | 8.90    | 16  | 11.33 | -17.94 | -6.90               | 309.54              |
| 18 | 9    | 50 | 41.18 | 329.0 | 22  | 4.65  | -11 | 48.64 | 0.9882       | 8.90    | 16  | 11.14 | -18.26 | -6.93               | 296.37              |
| 19 | 9    | 54 | 37.74 | 330.0 | 22  | 8.51  | -11 | 27.46 | 0.9884       | 8.90    | 16  | 10.93 | -18.58 | -6.97               | 283.20              |
| 20 | 9    | 58 | 34.29 | 331.0 | 22  | 12.36 | -11 | 6.10  | 0.9886       | 8.90    | 16  | 10.73 | -18.89 | -7.01               | 270.03              |
| 21 | 10   | 2  | 30.85 | 332.1 | 22  | 16.20 | -10 | 44.56 | 0.9888       | 8.89    | 16  | 10.51 | -19.20 | -7.04               | 256.86              |
| 22 | 10   | 6  | 27.40 | 333.1 | 22  | 20.02 | -10 | 22.86 | 0.9890       | 8.89    | 16  | 10.30 | -19.50 | -7.07               | 243.69              |
| 23 | 10   | 10 | 23.96 | 334.1 | 22  | 23.84 | -10 | 1.00  | 0.9892       | 8.89    | 16  | 10.08 | -19.79 | -7.09               | 230.52              |
| 24 | 10   | 14 | 20.51 | 335.1 | 22  | 27.64 | -9  | 38.98 | 0.9895       | 8.89    | 16  | 9.85  | -20.08 | -7.12               | 217.35              |
| 25 | 10   | 18 | 17.07 | 336.1 | 22  | 31.44 | -9  | 16.82 | 0.9897       | 8.89    | 16  | 9.62  | -20.36 | -7.14               | 204.18              |
| 26 | 10   | 22 | 13.63 | 337.1 | 22  | 35.22 | -8  | 54.52 | 0.9899       | 8.88    | 16  | 9.39  | -20.64 | -7.16               | 191.01              |
| 27 | 10   | 26 | 10.18 | 338.1 | 22  | 39.00 | -8  | 32.08 | 0.9902       | 8.88    | 16  | 9.15  | -20.90 | -7.18               | 177.84              |
| 28 | 10   | 30 | 6.74  | 339.1 | 22  | 42.77 | -8  | 9.52  | 0.9904       | 8.88    | 16  | 8.92  | -21.17 | -7.20               | 164.67              |



## 臺北市 日出、日沒、曙光始、暮光終 時間表

二 月

東經：121°31' 5" · 北緯：25°5' 44"

本表採用東經 120°平太陽時

| 日<br>期 | 天 文<br>曙光始<br>h m | 航 海<br>曙光始<br>h m | 民 用<br>曙光始<br>h m | 日 出<br>時 間 方 位<br>h m ° | 中 天<br>時 間 仰 角<br>h m ° | 日 沒<br>時 間 方 位<br>h m ° | 民 用<br>暮光終<br>h m | 航 海<br>暮光終<br>h m | 天 文<br>暮光終<br>h m |
|--------|-------------------|-------------------|-------------------|-------------------------|-------------------------|-------------------------|-------------------|-------------------|-------------------|
| 1      | 05:18             | 05:46             | 06:13             | 06:37 109               | 12:07 48S               | 17:38 251               | 18:02             | 18:29             | 18:57             |
| 2      | 05:18             | 05:45             | 06:13             | 06:36 108               | 12:08 48S               | 17:39 252               | 18:03             | 18:30             | 18:57             |
| 3      | 05:18             | 05:45             | 06:12             | 06:36 108               | 12:08 48S               | 17:40 252               | 18:03             | 18:31             | 18:58             |
| 4      | 05:17             | 05:44             | 06:12             | 06:36 108               | 12:08 49S               | 17:40 252               | 18:04             | 18:31             | 18:58             |
| 5      | 05:17             | 05:44             | 06:11             | 06:35 107               | 12:08 49S               | 17:41 253               | 18:05             | 18:32             | 18:59             |
| 6      | 05:17             | 05:44             | 06:11             | 06:34 107               | 12:08 49S               | 17:42 253               | 18:05             | 18:33             | 19:00             |
| 7      | 05:16             | 05:43             | 06:10             | 06:34 107               | 12:08 50S               | 17:42 253               | 18:06             | 18:33             | 19:00             |
| 8      | 05:16             | 05:43             | 06:10             | 06:33 106               | 12:08 50S               | 17:43 254               | 18:07             | 18:34             | 19:01             |
| 9      | 05:15             | 05:42             | 06:09             | 06:33 106               | 12:08 50S               | 17:44 254               | 18:07             | 18:34             | 19:01             |
| 10     | 05:15             | 05:42             | 06:09             | 06:32 106               | 12:08 50S               | 17:44 254               | 18:08             | 18:35             | 19:02             |
| 11     | 05:14             | 05:41             | 06:08             | 06:32 105               | 12:08 51S               | 17:45 255               | 18:09             | 18:36             | 19:02             |
| 12     | 05:14             | 05:40             | 06:07             | 06:31 105               | 12:08 51S               | 17:46 255               | 18:09             | 18:36             | 19:03             |
| 13     | 05:13             | 05:40             | 06:07             | 06:30 105               | 12:08 51S               | 17:46 256               | 18:10             | 18:37             | 19:04             |
| 14     | 05:12             | 05:39             | 06:06             | 06:30 104               | 12:08 52S               | 17:47 256               | 18:10             | 18:37             | 19:04             |
| 15     | 05:12             | 05:39             | 06:05             | 06:29 104               | 12:08 52S               | 17:48 256               | 18:11             | 18:38             | 19:05             |
| 16     | 05:11             | 05:38             | 06:05             | 06:28 103               | 12:08 52S               | 17:48 257               | 18:12             | 18:38             | 19:05             |
| 17     | 05:11             | 05:37             | 06:04             | 06:27 103               | 12:08 53S               | 17:49 257               | 18:12             | 18:39             | 19:06             |
| 18     | 05:10             | 05:37             | 06:03             | 06:27 103               | 12:08 53S               | 17:49 257               | 18:13             | 18:40             | 19:06             |
| 19     | 05:09             | 05:36             | 06:03             | 06:26 102               | 12:08 54S               | 17:50 258               | 18:13             | 18:40             | 19:07             |
| 20     | 05:08             | 05:35             | 06:02             | 06:25 102               | 12:08 54S               | 17:51 258               | 18:14             | 18:41             | 19:07             |
| 21     | 05:08             | 05:34             | 06:01             | 06:24 102               | 12:08 54S               | 17:51 259               | 18:14             | 18:41             | 19:08             |
| 22     | 05:07             | 05:34             | 06:00             | 06:23 101               | 12:07 55S               | 17:52 259               | 18:15             | 18:42             | 19:08             |
| 23     | 05:06             | 05:33             | 06:00             | 06:23 101               | 12:07 55S               | 17:52 259               | 18:15             | 18:42             | 19:09             |
| 24     | 05:05             | 05:32             | 05:59             | 06:22 100               | 12:07 55S               | 17:53 260               | 18:16             | 18:43             | 19:09             |
| 25     | 05:05             | 05:31             | 05:58             | 06:21 100               | 12:07 56S               | 17:53 260               | 18:17             | 18:43             | 19:10             |
| 26     | 05:04             | 05:30             | 05:57             | 06:20 99                | 12:07 56S               | 17:54 261               | 18:17             | 18:44             | 19:10             |
| 27     | 05:03             | 05:30             | 05:56             | 06:19 99                | 12:07 56S               | 17:55 261               | 18:18             | 18:44             | 19:11             |
| 28     | 05:02             | 05:29             | 05:55             | 06:18 99                | 12:07 57S               | 17:55 262               | 18:18             | 18:45             | 19:11             |

## 太陽位置與日面座標

## 三 月

本表採用世界時 0 時

| 日期 | GMST |    |       | 視黃經   | 視赤經 |       | 視赤緯 | 距離<br>(AU) | 視差<br>" | 視半徑  |    | P<br>° | B <sub>0</sub><br>° | L <sub>0</sub><br>° |        |
|----|------|----|-------|-------|-----|-------|-----|------------|---------|------|----|--------|---------------------|---------------------|--------|
|    | h    | m  | s     | °     | h   | m     | °   |            |         | '    | '  |        |                     |                     | "      |
| 1  | 10   | 34 | 3.29  | 340.1 | 22  | 46.53 | -7  | 46.83      | 0.9907  | 8.88 | 16 | 8.68   | -21.43              | -7.21               | 151.50 |
| 2  | 10   | 37 | 59.85 | 341.1 | 22  | 50.28 | -7  | 24.03      | 0.9909  | 8.87 | 16 | 8.43   | -21.68              | -7.23               | 138.32 |
| 3  | 10   | 41 | 56.40 | 342.1 | 22  | 54.02 | -7  | 1.12       | 0.9912  | 8.87 | 16 | 8.19   | -21.92              | -7.24               | 125.15 |
| 4  | 10   | 45 | 52.96 | 343.1 | 22  | 57.75 | -6  | 38.12      | 0.9914  | 8.87 | 16 | 7.95   | -22.16              | -7.24               | 111.98 |
| 5  | 10   | 49 | 49.51 | 344.1 | 23  | 1.48  | -6  | 15.02      | 0.9917  | 8.87 | 16 | 7.70   | -22.39              | -7.25               | 98.80  |
| 6  | 10   | 53 | 46.07 | 345.1 | 23  | 5.20  | -5  | 51.83      | 0.9919  | 8.87 | 16 | 7.45   | -22.62              | -7.25               | 85.63  |
| 7  | 10   | 57 | 42.62 | 346.1 | 23  | 8.91  | -5  | 28.56      | 0.9922  | 8.86 | 16 | 7.20   | -22.84              | -7.25               | 72.46  |
| 8  | 11   | 1  | 39.18 | 347.1 | 23  | 12.62 | -5  | 5.22       | 0.9924  | 8.86 | 16 | 6.95   | -23.05              | -7.25               | 59.28  |
| 9  | 11   | 5  | 35.73 | 348.1 | 23  | 16.32 | -4  | 41.81      | 0.9927  | 8.86 | 16 | 6.70   | -23.26              | -7.25               | 46.11  |
| 10 | 11   | 9  | 32.29 | 349.1 | 23  | 20.01 | -4  | 18.34      | 0.9929  | 8.86 | 16 | 6.45   | -23.46              | -7.24               | 32.93  |
| 11 | 11   | 13 | 28.85 | 350.1 | 23  | 23.70 | -3  | 54.81      | 0.9932  | 8.85 | 16 | 6.20   | -23.65              | -7.23               | 19.75  |
| 12 | 11   | 17 | 25.40 | 351.1 | 23  | 27.38 | -3  | 31.24      | 0.9935  | 8.85 | 16 | 5.95   | -23.83              | -7.22               | 6.57   |
| 13 | 11   | 21 | 21.96 | 352.1 | 23  | 31.06 | -3  | 7.63       | 0.9937  | 8.85 | 16 | 5.69   | -24.01              | -7.21               | 353.40 |
| 14 | 11   | 25 | 18.51 | 353.1 | 23  | 34.73 | -2  | 43.99      | 0.9940  | 8.85 | 16 | 5.44   | -24.19              | -7.20               | 340.22 |
| 15 | 11   | 29 | 15.07 | 354.1 | 23  | 38.39 | -2  | 20.31      | 0.9942  | 8.84 | 16 | 5.18   | -24.35              | -7.18               | 327.04 |
| 16 | 11   | 33 | 11.62 | 355.1 | 23  | 42.06 | -1  | 56.62      | 0.9945  | 8.84 | 16 | 4.92   | -24.51              | -7.16               | 313.86 |
| 17 | 11   | 37 | 8.18  | 356.1 | 23  | 45.72 | -1  | 32.91      | 0.9948  | 8.84 | 16 | 4.66   | -24.67              | -7.14               | 300.68 |
| 18 | 11   | 41 | 4.73  | 357.1 | 23  | 49.37 | -1  | 9.19       | 0.9951  | 8.84 | 16 | 4.40   | -24.81              | -7.12               | 287.50 |
| 19 | 11   | 45 | 1.29  | 358.1 | 23  | 53.02 | 0   | 45.47      | 0.9953  | 8.84 | 16 | 4.14   | -24.95              | -7.09               | 274.31 |
| 20 | 11   | 48 | 57.84 | 359.1 | 23  | 56.67 | 0   | 21.76      | 0.9956  | 8.83 | 16 | 3.87   | -25.08              | -7.06               | 261.13 |
| 21 | 11   | 52 | 54.40 | 0.1   | 0   | 0.32  | +0  | 1.95       | 0.9959  | 8.83 | 16 | 3.60   | -25.21              | -7.03               | 247.95 |
| 22 | 11   | 56 | 50.95 | 1.1   | 0   | 3.96  | +0  | 25.64      | 0.9962  | 8.83 | 16 | 3.33   | -25.33              | -7.00               | 234.76 |
| 23 | 12   | 0  | 47.51 | 2.1   | 0   | 7.60  | +0  | 49.32      | 0.9964  | 8.83 | 16 | 3.05   | -25.44              | -6.97               | 221.58 |
| 24 | 12   | 4  | 44.07 | 3.1   | 0   | 11.24 | +1  | 12.96      | 0.9967  | 8.82 | 16 | 2.78   | -25.54              | -6.93               | 208.39 |
| 25 | 12   | 8  | 40.62 | 4.1   | 0   | 14.88 | +1  | 36.58      | 0.9970  | 8.82 | 16 | 2.50   | -25.64              | -6.89               | 195.20 |
| 26 | 12   | 12 | 37.18 | 5.0   | 0   | 18.52 | +2  | 0.16       | 0.9973  | 8.82 | 16 | 2.22   | -25.73              | -6.85               | 182.02 |
| 27 | 12   | 16 | 33.73 | 6.0   | 0   | 22.16 | +2  | 23.70      | 0.9976  | 8.82 | 16 | 1.94   | -25.81              | -6.81               | 168.83 |
| 28 | 12   | 20 | 30.29 | 7.0   | 0   | 25.80 | +2  | 47.19      | 0.9979  | 8.81 | 16 | 1.66   | -25.89              | -6.77               | 155.64 |
| 29 | 12   | 24 | 26.84 | 8.0   | 0   | 29.44 | +3  | 10.63      | 0.9982  | 8.81 | 16 | 1.37   | -25.96              | -6.72               | 142.45 |
| 30 | 12   | 28 | 23.40 | 9.0   | 0   | 33.09 | +3  | 34.00      | 0.9985  | 8.81 | 16 | 1.09   | -26.02              | -6.67               | 129.26 |
| 31 | 12   | 32 | 19.95 | 10.0  | 0   | 36.73 | +3  | 57.32      | 0.9988  | 8.80 | 16 | 0.81   | -26.08              | -6.62               | 116.07 |

## 臺北市 日出、日沒、曙光始、暮光終 時間表

三 月

東經：121°31' 5" · 北緯：25°5' 44"

本表採用東經 120°平太陽時

| 日<br>期 | 天 文<br>曙光始<br>h m | 航 海<br>曙光始<br>h m | 民 用<br>曙光始<br>h m | 日 出<br>時 間 方 位<br>h m ° | 中 天<br>時 間 仰 角<br>h m ° | 日 沒<br>時 間 方 位<br>h m ° | 民 用<br>暮光終<br>h m | 航 海<br>暮光終<br>h m | 天 文<br>暮光終<br>h m |
|--------|-------------------|-------------------|-------------------|-------------------------|-------------------------|-------------------------|-------------------|-------------------|-------------------|
| 1      | 05:01             | 05:28             | 05:54             | 06:17 98                | 12:06 57S               | 17:56 262               | 18:19             | 18:45             | 19:12             |
| 2      | 05:00             | 05:27             | 05:54             | 06:16 98                | 12:06 58S               | 17:56 262               | 18:19             | 18:46             | 19:12             |
| 3      | 05:00             | 05:26             | 05:53             | 06:16 97                | 12:06 58S               | 17:57 263               | 18:20             | 18:46             | 19:13             |
| 4      | 04:59             | 05:25             | 05:52             | 06:15 97                | 12:06 58S               | 17:57 263               | 18:20             | 18:47             | 19:13             |
| 5      | 04:58             | 05:24             | 05:51             | 06:14 97                | 12:06 59S               | 17:58 264               | 18:21             | 18:47             | 19:14             |
| 6      | 04:57             | 05:23             | 05:50             | 06:13 96                | 12:05 59S               | 17:58 264               | 18:21             | 18:48             | 19:14             |
| 7      | 04:56             | 05:22             | 05:49             | 06:12 96                | 12:05 60S               | 17:59 265               | 18:22             | 18:48             | 19:15             |
| 8      | 04:55             | 05:21             | 05:48             | 06:11 95                | 12:05 60S               | 17:59 265               | 18:22             | 18:49             | 19:15             |
| 9      | 04:54             | 05:20             | 05:47             | 06:10 95                | 12:05 60S               | 18:00 265               | 18:23             | 18:49             | 19:16             |
| 10     | 04:53             | 05:20             | 05:46             | 06:09 94                | 12:04 61S               | 18:00 266               | 18:23             | 18:50             | 19:16             |
| 11     | 04:52             | 05:19             | 05:45             | 06:08 94                | 12:04 61S               | 18:01 266               | 18:24             | 18:50             | 19:17             |
| 12     | 04:51             | 05:18             | 05:44             | 06:07 94                | 12:04 61S               | 18:01 267               | 18:24             | 18:51             | 19:17             |
| 13     | 04:50             | 05:17             | 05:43             | 06:06 93                | 12:04 62S               | 18:02 267               | 18:24             | 18:51             | 19:18             |
| 14     | 04:49             | 05:16             | 05:42             | 06:05 93                | 12:03 62S               | 18:02 268               | 18:25             | 18:51             | 19:18             |
| 15     | 04:48             | 05:15             | 05:41             | 06:04 92                | 12:03 63S               | 18:03 268               | 18:25             | 18:52             | 19:18             |
| 16     | 04:47             | 05:14             | 05:40             | 06:03 92                | 12:03 63S               | 18:03 268               | 18:26             | 18:52             | 19:19             |
| 17     | 04:46             | 05:12             | 05:39             | 06:02 91                | 12:02 63S               | 18:03 269               | 18:26             | 18:53             | 19:19             |
| 18     | 04:45             | 05:11             | 05:38             | 06:01 91                | 12:02 64S               | 18:04 269               | 18:27             | 18:53             | 19:20             |
| 19     | 04:44             | 05:10             | 05:37             | 06:00 90                | 12:02 64S               | 18:04 270               | 18:27             | 18:54             | 19:20             |
| 20     | 04:43             | 05:09             | 05:36             | 05:59 90                | 12:02 65S               | 18:05 270               | 18:28             | 18:54             | 19:21             |
| 21     | 04:42             | 05:08             | 05:35             | 05:58 90                | 12:01 65S               | 18:05 271               | 18:28             | 18:55             | 19:21             |
| 22     | 04:41             | 05:07             | 05:34             | 05:57 89                | 12:01 65S               | 18:06 271               | 18:29             | 18:55             | 19:22             |
| 23     | 04:39             | 05:06             | 05:33             | 05:56 89                | 12:01 66S               | 18:06 271               | 18:29             | 18:56             | 19:22             |
| 24     | 04:38             | 05:05             | 05:32             | 05:55 88                | 12:00 66S               | 18:07 272               | 18:29             | 18:56             | 19:23             |
| 25     | 04:37             | 05:04             | 05:31             | 05:54 88                | 12:00 67S               | 18:07 272               | 18:30             | 18:57             | 19:23             |
| 26     | 04:36             | 05:03             | 05:30             | 05:52 87                | 12:00 67S               | 18:07 273               | 18:30             | 18:57             | 19:24             |
| 27     | 04:35             | 05:02             | 05:29             | 05:51 87                | 11:59 67S               | 18:08 273               | 18:31             | 18:57             | 19:24             |
| 28     | 04:34             | 05:01             | 05:28             | 05:50 87                | 11:59 68S               | 18:08 274               | 18:31             | 18:58             | 19:25             |
| 29     | 04:33             | 05:00             | 05:26             | 05:49 86                | 11:59 68S               | 18:09 274               | 18:32             | 18:58             | 19:25             |
| 30     | 04:32             | 04:59             | 05:25             | 05:48 86                | 11:59 69S               | 18:09 275               | 18:32             | 18:59             | 19:26             |
| 31     | 04:31             | 04:58             | 05:24             | 05:47 85                | 11:58 69S               | 18:10 275               | 18:33             | 18:59             | 19:26             |

# 太陽位置與日面座標

## 四 月

本表採用世界時 0 時

| 日期 | GMST |    |       | 視黃經  |         | 視赤經 |       | 視赤緯    |      | 距離<br>(AU) | 視差<br>" | 視半徑    |       | P<br>° | B <sub>0</sub><br>° | L <sub>0</sub><br>° |
|----|------|----|-------|------|---------|-----|-------|--------|------|------------|---------|--------|-------|--------|---------------------|---------------------|
|    | h    | M  | s     | °    | '       | °   | '     | °      | '    |            |         | "      | "     |        |                     |                     |
| 1  | 12   | 36 | 16.51 | 11.0 | 0 40.37 | +4  | 20.56 | 0.9991 | 8.80 | 16         | 0.53    | -26.13 | -6.57 | 102.88 |                     |                     |
| 2  | 12   | 40 | 13.06 | 12.0 | 0 44.02 | +4  | 43.72 | 0.9993 | 8.80 | 16         | 0.25    | -26.17 | -6.52 | 89.69  |                     |                     |
| 3  | 12   | 44 | 9.62  | 13.0 | 0 47.67 | +5  | 6.80  | 0.9996 | 8.80 | 15         | 59.97   | -26.20 | -6.46 | 76.49  |                     |                     |
| 4  | 12   | 48 | 6.17  | 13.9 | 0 51.32 | +5  | 29.78 | 0.9999 | 8.79 | 15         | 59.69   | -26.23 | -6.40 | 63.30  |                     |                     |
| 5  | 12   | 52 | 2.73  | 14.9 | 0 54.97 | +5  | 52.68 | 1.0002 | 8.79 | 15         | 59.42   | -26.25 | -6.34 | 50.11  |                     |                     |
| 6  | 12   | 55 | 59.28 | 15.9 | 0 58.63 | +6  | 15.47 | 1.0005 | 8.79 | 15         | 59.14   | -26.26 | -6.28 | 36.91  |                     |                     |
| 7  | 12   | 59 | 55.84 | 16.9 | 1 2.29  | +6  | 38.15 | 1.0008 | 8.79 | 15         | 58.87   | -26.26 | -6.22 | 23.72  |                     |                     |
| 8  | 13   | 3  | 52.40 | 17.9 | 1 5.95  | +7  | 0.72  | 1.0011 | 8.78 | 15         | 58.59   | -26.26 | -6.15 | 10.52  |                     |                     |
| 9  | 13   | 7  | 48.95 | 18.9 | 1 9.62  | +7  | 23.17 | 1.0014 | 8.78 | 15         | 58.32   | -26.25 | -6.09 | 357.32 |                     |                     |
| 10 | 13   | 11 | 45.51 | 19.8 | 1 13.29 | +7  | 45.49 | 1.0016 | 8.78 | 15         | 58.06   | -26.24 | -6.02 | 344.12 |                     |                     |
| 11 | 13   | 15 | 42.06 | 20.8 | 1 16.96 | +8  | 7.69  | 1.0019 | 8.78 | 15         | 57.79   | -26.21 | -5.95 | 330.92 |                     |                     |
| 12 | 13   | 19 | 38.62 | 21.8 | 1 20.64 | +8  | 29.74 | 1.0022 | 8.77 | 15         | 57.52   | -26.18 | -5.88 | 317.72 |                     |                     |
| 13 | 13   | 23 | 35.17 | 22.8 | 1 24.33 | +8  | 51.65 | 1.0025 | 8.77 | 15         | 57.26   | -26.14 | -5.80 | 304.52 |                     |                     |
| 14 | 13   | 27 | 31.73 | 23.8 | 1 28.02 | +9  | 13.41 | 1.0027 | 8.77 | 15         | 56.99   | -26.09 | -5.73 | 291.32 |                     |                     |
| 15 | 13   | 31 | 28.28 | 24.7 | 1 31.71 | +9  | 35.02 | 1.0030 | 8.77 | 15         | 56.73   | -26.04 | -5.65 | 278.12 |                     |                     |
| 16 | 13   | 35 | 24.84 | 25.7 | 1 35.41 | +9  | 56.46 | 1.0033 | 8.77 | 15         | 56.47   | -25.98 | -5.57 | 264.91 |                     |                     |
| 17 | 13   | 39 | 21.39 | 26.7 | 1 39.11 | +10 | 17.74 | 1.0036 | 8.76 | 15         | 56.20   | -25.91 | -5.49 | 251.71 |                     |                     |
| 18 | 13   | 43 | 17.95 | 27.7 | 1 42.82 | +10 | 38.85 | 1.0039 | 8.76 | 15         | 55.94   | -25.84 | -5.41 | 238.50 |                     |                     |
| 19 | 13   | 47 | 14.50 | 28.7 | 1 46.54 | +10 | 59.77 | 1.0041 | 8.76 | 15         | 55.68   | -25.75 | -5.33 | 225.30 |                     |                     |
| 20 | 13   | 51 | 11.06 | 29.6 | 1 50.27 | +11 | 20.52 | 1.0044 | 8.76 | 15         | 55.42   | -25.66 | -5.24 | 212.09 |                     |                     |
| 21 | 13   | 55 | 7.62  | 30.6 | 1 54.00 | +11 | 41.08 | 1.0047 | 8.75 | 15         | 55.15   | -25.56 | -5.16 | 198.88 |                     |                     |
| 22 | 13   | 59 | 4.17  | 31.6 | 1 57.74 | +12 | 1.45  | 1.0050 | 8.75 | 15         | 54.89   | -25.46 | -5.07 | 185.67 |                     |                     |
| 23 | 14   | 2  | 60.73 | 32.6 | 2 1.48  | +12 | 21.62 | 1.0052 | 8.75 | 15         | 54.63   | -25.35 | -4.98 | 172.46 |                     |                     |
| 24 | 14   | 6  | 57.28 | 33.5 | 2 5.24  | +12 | 41.59 | 1.0055 | 8.75 | 15         | 54.37   | -25.23 | -4.89 | 159.25 |                     |                     |
| 25 | 14   | 10 | 53.84 | 34.5 | 2 9.00  | +13 | 1.35  | 1.0058 | 8.74 | 15         | 54.11   | -25.10 | -4.80 | 146.04 |                     |                     |
| 26 | 14   | 14 | 50.39 | 35.5 | 2 12.77 | +13 | 20.90 | 1.0061 | 8.74 | 15         | 53.85   | -24.97 | -4.70 | 132.83 |                     |                     |
| 27 | 14   | 18 | 46.95 | 36.5 | 2 16.55 | +13 | 40.23 | 1.0063 | 8.74 | 15         | 53.59   | -24.82 | -4.61 | 119.62 |                     |                     |
| 28 | 14   | 22 | 43.50 | 37.4 | 2 20.33 | +13 | 59.34 | 1.0066 | 8.74 | 15         | 53.33   | -24.68 | -4.51 | 106.40 |                     |                     |
| 29 | 14   | 26 | 40.06 | 38.4 | 2 24.13 | +14 | 18.22 | 1.0069 | 8.73 | 15         | 53.08   | -24.52 | -4.42 | 93.19  |                     |                     |
| 30 | 14   | 30 | 36.61 | 39.4 | 2 27.93 | +14 | 36.86 | 1.0071 | 8.73 | 15         | 52.83   | -24.36 | -4.32 | 79.97  |                     |                     |

## 臺北市 日出、日沒、曙光始、暮光終 時間表

四 月

東經：121°31' 5" ，北緯：25°5' 44"

本表採用東經 120°平太陽時

| 日<br>期 | 天 文<br>曙光始<br>h m | 航 海<br>曙光始<br>h m | 民 用<br>曙光始<br>h m | 日 出<br>時間 方位<br>h m ° | 中 天<br>時間 仰角<br>h m ° | 日 沒<br>時間 方位<br>h m ° | 民 用<br>暮光終<br>h m | 航 海<br>暮光終<br>h m | 天 文<br>暮光終<br>h m |
|--------|-------------------|-------------------|-------------------|-----------------------|-----------------------|-----------------------|-------------------|-------------------|-------------------|
| 1      | 04:29             | 04:57             | 05:23             | 05:46 85              | 11:58 69S             | 18:10 275             | 18:33             | 19:00             | 19:27             |
| 2      | 04:28             | 04:55             | 05:22             | 05:45 84              | 11:58 70S             | 18:10 276             | 18:33             | 19:00             | 19:28             |
| 3      | 04:27             | 04:54             | 05:21             | 05:44 84              | 11:57 70S             | 18:11 276             | 18:34             | 19:01             | 19:28             |
| 4      | 04:26             | 04:53             | 05:20             | 05:43 84              | 11:57 70S             | 18:11 277             | 18:34             | 19:01             | 19:29             |
| 5      | 04:25             | 04:52             | 05:19             | 05:42 83              | 11:57 71S             | 18:12 277             | 18:35             | 19:02             | 19:29             |
| 6      | 04:24             | 04:51             | 05:18             | 05:41 83              | 11:57 71S             | 18:12 277             | 18:35             | 19:02             | 19:30             |
| 7      | 04:23             | 04:50             | 05:17             | 05:40 82              | 11:56 72S             | 18:13 278             | 18:36             | 19:03             | 19:30             |
| 8      | 04:22             | 04:49             | 05:16             | 05:39 82              | 11:56 72S             | 18:13 278             | 18:36             | 19:03             | 19:31             |
| 9      | 04:20             | 04:48             | 05:15             | 05:38 81              | 11:56 72S             | 18:14 279             | 18:37             | 19:04             | 19:31             |
| 10     | 04:19             | 04:47             | 05:14             | 05:37 81              | 11:55 73S             | 18:14 279             | 18:37             | 19:04             | 19:32             |
| 11     | 04:18             | 04:46             | 05:13             | 05:36 81              | 11:55 73S             | 18:14 280             | 18:38             | 19:05             | 19:33             |
| 12     | 04:17             | 04:45             | 05:12             | 05:35 80              | 11:55 73S             | 18:15 280             | 18:38             | 19:05             | 19:33             |
| 13     | 04:16             | 04:44             | 05:11             | 05:34 80              | 11:55 74S             | 18:15 280             | 18:39             | 19:06             | 19:34             |
| 14     | 04:15             | 04:43             | 05:10             | 05:33 79              | 11:54 74S             | 18:16 281             | 18:39             | 19:07             | 19:34             |
| 15     | 04:14             | 04:42             | 05:09             | 05:32 79              | 11:54 75S             | 18:16 281             | 18:40             | 19:07             | 19:35             |
| 16     | 04:13             | 04:41             | 05:08             | 05:31 79              | 11:54 75S             | 18:17 282             | 18:40             | 19:08             | 19:36             |
| 17     | 04:12             | 04:40             | 05:07             | 05:31 78              | 11:54 75S             | 18:17 282             | 18:41             | 19:08             | 19:36             |
| 18     | 04:10             | 04:39             | 05:06             | 05:30 78              | 11:53 76S             | 18:18 282             | 18:41             | 19:09             | 19:37             |
| 19     | 04:09             | 04:38             | 05:05             | 05:29 77              | 11:53 76S             | 18:18 283             | 18:42             | 19:09             | 19:38             |
| 20     | 04:08             | 04:37             | 05:04             | 05:28 77              | 11:53 76S             | 18:18 283             | 18:42             | 19:10             | 19:38             |
| 21     | 04:07             | 04:36             | 05:03             | 05:27 77              | 11:53 77S             | 18:19 283             | 18:43             | 19:10             | 19:39             |
| 22     | 04:06             | 04:35             | 05:02             | 05:26 76              | 11:53 77S             | 18:19 284             | 18:43             | 19:11             | 19:39             |
| 23     | 04:05             | 04:34             | 05:02             | 05:25 76              | 11:52 77S             | 18:20 284             | 18:44             | 19:12             | 19:40             |
| 24     | 04:04             | 04:33             | 05:01             | 05:24 76              | 11:52 78S             | 18:20 285             | 18:44             | 19:12             | 19:41             |
| 25     | 04:03             | 04:32             | 05:00             | 05:23 75              | 11:52 78S             | 18:21 285             | 18:45             | 19:13             | 19:41             |
| 26     | 04:02             | 04:31             | 04:59             | 05:23 75              | 11:52 78S             | 18:21 285             | 18:45             | 19:13             | 19:42             |
| 27     | 04:01             | 04:30             | 04:58             | 05:22 75              | 11:52 79S             | 18:22 286             | 18:46             | 19:14             | 19:43             |
| 28     | 04:00             | 04:29             | 04:57             | 05:21 74              | 11:51 79S             | 18:22 286             | 18:46             | 19:14             | 19:44             |
| 29     | 03:59             | 04:28             | 04:56             | 05:20 74              | 11:51 79S             | 18:23 286             | 18:47             | 19:15             | 19:44             |
| 30     | 03:58             | 04:27             | 04:56             | 05:19 73              | 11:51 80S             | 18:23 287             | 18:47             | 19:16             | 19:45             |

# 太陽位置與日面座標

## 五 月

本表採用世界時 0 時

| 日期 | GMST |    |       | 視黃經  | 視赤經 |       | 視赤緯       | 距離<br>(AU) | 視差   |    | 視半徑   |        | P     | B <sub>0</sub> | L <sub>0</sub> |
|----|------|----|-------|------|-----|-------|-----------|------------|------|----|-------|--------|-------|----------------|----------------|
|    | h    | m  | s     | °    | h   | m     | ° ' "     |            | "    | '  | "     | °      | °     | °              |                |
| 1  | 14   | 34 | 33.17 | 40.3 | 2   | 31.75 | +14 55.26 | 1.0074     | 8.73 | 15 | 52.58 | -24.18 | -4.22 | 66.76          |                |
| 2  | 14   | 38 | 29.72 | 41.3 | 2   | 35.57 | +15 13.42 | 1.0076     | 8.73 | 15 | 52.34 | -24.01 | -4.12 | 53.54          |                |
| 3  | 14   | 42 | 26.28 | 42.3 | 2   | 39.40 | +15 31.33 | 1.0079     | 8.72 | 15 | 52.10 | -23.82 | -4.02 | 40.33          |                |
| 4  | 14   | 46 | 22.84 | 43.3 | 2   | 43.24 | +15 48.98 | 1.0082     | 8.72 | 15 | 51.86 | -23.63 | -3.92 | 27.11          |                |
| 5  | 14   | 50 | 19.39 | 44.2 | 2   | 47.09 | +16 6.37  | 1.0084     | 8.72 | 15 | 51.63 | -23.43 | -3.81 | 13.89          |                |
| 6  | 14   | 54 | 15.95 | 45.2 | 2   | 50.95 | +16 23.49 | 1.0086     | 8.72 | 15 | 51.39 | -23.22 | -3.71 | 0.67           |                |
| 7  | 14   | 58 | 12.50 | 46.2 | 2   | 54.82 | +16 40.34 | 1.0089     | 8.72 | 15 | 51.17 | -23.01 | -3.60 | 347.45         |                |
| 8  | 15   | 2  | 9.06  | 47.1 | 2   | 58.70 | +16 56.91 | 1.0091     | 8.71 | 15 | 50.95 | -22.79 | -3.49 | 334.23         |                |
| 9  | 15   | 6  | 5.61  | 48.1 | 3   | 2.59  | +17 13.20 | 1.0094     | 8.71 | 15 | 50.73 | -22.56 | -3.39 | 321.01         |                |
| 10 | 15   | 10 | 2.17  | 49.1 | 3   | 6.48  | +17 29.20 | 1.0096     | 8.71 | 15 | 50.51 | -22.33 | -3.28 | 307.79         |                |
| 11 | 15   | 13 | 58.72 | 50.0 | 3   | 10.39 | +17 44.90 | 1.0098     | 8.71 | 15 | 50.30 | -22.08 | -3.17 | 294.57         |                |
| 12 | 15   | 17 | 55.28 | 51.0 | 3   | 14.30 | +18 0.31  | 1.0100     | 8.71 | 15 | 50.09 | -21.84 | -3.06 | 281.35         |                |
| 13 | 15   | 21 | 51.83 | 52.0 | 3   | 18.23 | +18 15.41 | 1.0103     | 8.70 | 15 | 49.88 | -21.58 | -2.95 | 268.12         |                |
| 14 | 15   | 25 | 48.39 | 52.9 | 3   | 22.16 | +18 30.20 | 1.0105     | 8.70 | 15 | 49.68 | -21.32 | -2.84 | 254.90         |                |
| 15 | 15   | 29 | 44.94 | 53.9 | 3   | 26.10 | +18 44.68 | 1.0107     | 8.70 | 15 | 49.48 | -21.05 | -2.72 | 241.67         |                |
| 16 | 15   | 33 | 41.50 | 54.9 | 3   | 30.06 | +18 58.84 | 1.0109     | 8.70 | 15 | 49.28 | -20.78 | -2.61 | 228.45         |                |
| 17 | 15   | 37 | 38.05 | 55.8 | 3   | 34.02 | +19 12.68 | 1.0111     | 8.70 | 15 | 49.08 | -20.49 | -2.50 | 215.22         |                |
| 18 | 15   | 41 | 34.61 | 56.8 | 3   | 37.99 | +19 26.19 | 1.0113     | 8.70 | 15 | 48.89 | -20.21 | -2.38 | 201.99         |                |
| 19 | 15   | 45 | 31.17 | 57.8 | 3   | 41.97 | +19 39.37 | 1.0115     | 8.69 | 15 | 48.69 | -19.91 | -2.27 | 188.76         |                |
| 20 | 15   | 49 | 27.72 | 58.7 | 3   | 45.96 | +19 52.22 | 1.0117     | 8.69 | 15 | 48.50 | -19.61 | -2.15 | 175.54         |                |
| 21 | 15   | 53 | 24.28 | 59.7 | 3   | 49.95 | +20 4.73  | 1.0119     | 8.69 | 15 | 48.31 | -19.31 | -2.03 | 162.31         |                |
| 22 | 15   | 57 | 20.83 | 60.6 | 3   | 53.96 | +20 16.89 | 1.0121     | 8.69 | 15 | 48.13 | -18.99 | -1.92 | 149.08         |                |
| 23 | 16   | 1  | 17.39 | 61.6 | 3   | 57.98 | +20 28.71 | 1.0123     | 8.69 | 15 | 47.94 | -18.67 | -1.80 | 135.85         |                |
| 24 | 16   | 5  | 13.94 | 62.6 | 4   | 2.00  | +20 40.18 | 1.0125     | 8.69 | 15 | 47.76 | -18.35 | -1.68 | 122.62         |                |
| 25 | 16   | 9  | 10.50 | 63.5 | 4   | 6.03  | +20 51.29 | 1.0127     | 8.68 | 15 | 47.58 | -18.02 | -1.56 | 109.39         |                |
| 26 | 16   | 13 | 7.05  | 64.5 | 4   | 10.08 | +21 2.05  | 1.0129     | 8.68 | 15 | 47.40 | -17.68 | -1.45 | 96.16          |                |
| 27 | 16   | 17 | 3.61  | 65.4 | 4   | 14.13 | +21 12.44 | 1.0131     | 8.68 | 15 | 47.23 | -17.34 | -1.33 | 82.93          |                |
| 28 | 16   | 20 | 60.16 | 66.4 | 4   | 18.19 | +21 22.47 | 1.0133     | 8.68 | 15 | 47.06 | -16.99 | -1.21 | 69.70          |                |
| 29 | 16   | 24 | 56.72 | 67.4 | 4   | 22.25 | +21 32.13 | 1.0134     | 8.68 | 15 | 46.90 | -16.64 | -1.09 | 56.46          |                |
| 30 | 16   | 28 | 53.27 | 68.3 | 4   | 26.33 | +21 41.42 | 1.0136     | 8.68 | 15 | 46.74 | -16.28 | -0.97 | 43.23          |                |
| 31 | 16   | 32 | 49.83 | 69.3 | 4   | 30.41 | +21 50.33 | 1.0138     | 8.67 | 15 | 46.58 | -15.92 | -0.85 | 30.00          |                |

## 臺北市 日出、日沒、曙光始、暮光終 時間表

五 月

東經：121°31' 5" ，北緯：25°5' 44"

本表採用東經 120°平太陽時

| 日<br>期 | 天 文<br>曙光始<br>h m | 航 海<br>曙光始<br>h m | 民 用<br>曙光始<br>h m | 日 出<br>時間 方位<br>h m ° | 中 天<br>時間 仰角<br>h m ° | 日 沒<br>時間 方位<br>h m ° | 民 用<br>暮光終<br>h m | 航 海<br>暮光終<br>h m | 天 文<br>暮光終<br>h m |
|--------|-------------------|-------------------|-------------------|-----------------------|-----------------------|-----------------------|-------------------|-------------------|-------------------|
| 1      | 03:57             | 04:26             | 04:55             | 05:19 73              | 11:51 80S             | 18:24 287             | 18:48             | 19:16             | 19:46             |
| 2      | 03:56             | 04:25             | 04:54             | 05:18 73              | 11:51 80S             | 18:24 287             | 18:48             | 19:17             | 19:46             |
| 3      | 03:55             | 04:25             | 04:53             | 05:17 72              | 11:51 80S             | 18:25 288             | 18:49             | 19:18             | 19:47             |
| 4      | 03:54             | 04:24             | 04:52             | 05:17 72              | 11:51 81S             | 18:25 288             | 18:50             | 19:18             | 19:48             |
| 5      | 03:53             | 04:23             | 04:52             | 05:16 72              | 11:51 81S             | 18:26 288             | 18:50             | 19:19             | 19:48             |
| 6      | 03:53             | 04:22             | 04:51             | 05:15 71              | 11:51 81S             | 18:26 289             | 18:51             | 19:19             | 19:49             |
| 7      | 03:52             | 04:21             | 04:50             | 05:15 71              | 11:51 82S             | 18:27 289             | 18:51             | 19:20             | 19:50             |
| 8      | 03:51             | 04:21             | 04:50             | 05:14 71              | 11:50 82S             | 18:27 289             | 18:52             | 19:21             | 19:51             |
| 9      | 03:50             | 04:20             | 04:49             | 05:13 71              | 11:50 82S             | 18:28 290             | 18:52             | 19:21             | 19:51             |
| 10     | 03:49             | 04:19             | 04:48             | 05:13 70              | 11:50 82S             | 18:28 290             | 18:53             | 19:22             | 19:52             |
| 11     | 03:48             | 04:18             | 04:48             | 05:12 70              | 11:50 83S             | 18:29 290             | 18:53             | 19:23             | 19:53             |
| 12     | 03:48             | 04:18             | 04:47             | 05:11 70              | 11:50 83S             | 18:29 290             | 18:54             | 19:23             | 19:54             |
| 13     | 03:47             | 04:17             | 04:46             | 05:11 69              | 11:50 83S             | 18:30 291             | 18:55             | 19:24             | 19:54             |
| 14     | 03:46             | 04:16             | 04:46             | 05:10 69              | 11:50 83S             | 18:30 291             | 18:55             | 19:25             | 19:55             |
| 15     | 03:45             | 04:16             | 04:45             | 05:10 69              | 11:50 84S             | 18:31 291             | 18:56             | 19:25             | 19:56             |
| 16     | 03:45             | 04:15             | 04:45             | 05:09 69              | 11:50 84S             | 18:31 292             | 18:56             | 19:26             | 19:56             |
| 17     | 03:44             | 04:15             | 04:44             | 05:09 68              | 11:50 84S             | 18:32 292             | 18:57             | 19:26             | 19:57             |
| 18     | 03:43             | 04:14             | 04:44             | 05:08 68              | 11:50 84S             | 18:33 292             | 18:57             | 19:27             | 19:58             |
| 19     | 03:43             | 04:13             | 04:43             | 05:08 68              | 11:50 85S             | 18:33 292             | 18:58             | 19:28             | 19:59             |
| 20     | 03:42             | 04:13             | 04:43             | 05:08 68              | 11:50 85S             | 18:34 293             | 18:59             | 19:28             | 19:59             |
| 21     | 03:41             | 04:12             | 04:42             | 05:07 67              | 11:50 85S             | 18:34 293             | 18:59             | 19:29             | 20:00             |
| 22     | 03:41             | 04:12             | 04:42             | 05:07 67              | 11:51 85S             | 18:35 293             | 19:00             | 19:30             | 20:01             |
| 23     | 03:40             | 04:11             | 04:41             | 05:06 67              | 11:51 85S             | 18:35 293             | 19:00             | 19:30             | 20:01             |
| 24     | 03:40             | 04:11             | 04:41             | 05:06 67              | 11:51 86S             | 18:36 293             | 19:01             | 19:31             | 20:02             |
| 25     | 03:39             | 04:11             | 04:41             | 05:06 66              | 11:51 86S             | 18:36 294             | 19:01             | 19:31             | 20:03             |
| 26     | 03:39             | 04:10             | 04:40             | 05:05 66              | 11:51 86S             | 18:37 294             | 19:02             | 19:32             | 20:03             |
| 27     | 03:38             | 04:10             | 04:40             | 05:05 66              | 11:51 86S             | 18:37 294             | 19:02             | 19:33             | 20:04             |
| 28     | 03:38             | 04:09             | 04:40             | 05:05 66              | 11:51 86S             | 18:38 294             | 19:03             | 19:33             | 20:05             |
| 29     | 03:37             | 04:09             | 04:39             | 05:05 66              | 11:51 86S             | 18:38 294             | 19:03             | 19:34             | 20:05             |
| 30     | 03:37             | 04:09             | 04:39             | 05:04 66              | 11:51 87S             | 18:38 295             | 19:04             | 19:34             | 20:06             |
| 31     | 03:37             | 04:08             | 04:39             | 05:04 65              | 11:52 87S             | 18:39 295             | 19:04             | 19:35             | 20:07             |

# 太陽位置與日面座標

## 六 月

本表採用世界時 0 時

| 日期 | GMST |    |       | 視黃經  |         | 視赤經       |        | 視赤緯  |          | 距離<br>(AU) | 視差<br>" | 視半徑    |   | P<br>° | B <sub>0</sub><br>° | L <sub>0</sub><br>° |
|----|------|----|-------|------|---------|-----------|--------|------|----------|------------|---------|--------|---|--------|---------------------|---------------------|
|    | h    | m  | s     | °    | '       | h         | m      | °    | '        |            |         | '      | " |        |                     |                     |
| 1  | 16   | 36 | 46.39 | 70.2 | 4 34.50 | +21 58.86 | 1.0139 | 8.67 | 15 46.43 | -15.55     | -0.73   | 16.77  |   |        |                     |                     |
| 2  | 16   | 40 | 42.94 | 71.2 | 4 38.59 | +22 7.01  | 1.0141 | 8.67 | 15 46.28 | -15.18     | -0.61   | 3.53   |   |        |                     |                     |
| 3  | 16   | 44 | 39.50 | 72.2 | 4 42.70 | +22 14.78 | 1.0142 | 8.67 | 15 46.14 | -14.80     | -0.49   | 350.30 |   |        |                     |                     |
| 4  | 16   | 48 | 36.05 | 73.1 | 4 46.81 | +22 22.16 | 1.0144 | 8.67 | 15 46.00 | -14.42     | -0.36   | 337.07 |   |        |                     |                     |
| 5  | 16   | 52 | 32.61 | 74.1 | 4 50.92 | +22 29.14 | 1.0145 | 8.67 | 15 45.87 | -14.03     | -0.24   | 323.83 |   |        |                     |                     |
| 6  | 16   | 56 | 29.16 | 75.0 | 4 55.04 | +22 35.73 | 1.0147 | 8.67 | 15 45.75 | -13.64     | -0.12   | 310.60 |   |        |                     |                     |
| 7  | 17   | 0  | 25.72 | 76.0 | 4 59.17 | +22 41.93 | 1.0148 | 8.67 | 15 45.63 | -13.24     | 0.00    | 297.36 |   |        |                     |                     |
| 8  | 17   | 4  | 22.27 | 77.0 | 5 3.30  | +22 47.72 | 1.0149 | 8.66 | 15 45.51 | -12.84     | 0.12    | 284.13 |   |        |                     |                     |
| 9  | 17   | 8  | 18.83 | 77.9 | 5 7.43  | +22 53.12 | 1.0150 | 8.66 | 15 45.40 | -12.44     | 0.24    | 270.89 |   |        |                     |                     |
| 10 | 17   | 12 | 15.38 | 78.9 | 5 11.57 | +22 58.11 | 1.0152 | 8.66 | 15 45.29 | -12.03     | 0.36    | 257.66 |   |        |                     |                     |
| 11 | 17   | 16 | 11.94 | 79.8 | 5 15.71 | +23 2.70  | 1.0153 | 8.66 | 15 45.19 | -11.62     | 0.48    | 244.42 |   |        |                     |                     |
| 12 | 17   | 20 | 8.49  | 80.8 | 5 19.86 | +23 6.87  | 1.0154 | 8.66 | 15 45.09 | -11.20     | 0.60    | 231.18 |   |        |                     |                     |
| 13 | 17   | 24 | 5.05  | 81.7 | 5 24.00 | +23 10.65 | 1.0155 | 8.66 | 15 45.00 | -10.78     | 0.72    | 217.95 |   |        |                     |                     |
| 14 | 17   | 28 | 1.61  | 82.7 | 5 28.15 | +23 14.01 | 1.0156 | 8.66 | 15 44.91 | -10.36     | 0.84    | 204.71 |   |        |                     |                     |
| 15 | 17   | 31 | 58.16 | 83.6 | 5 32.31 | +23 16.96 | 1.0157 | 8.66 | 15 44.82 | -9.94      | 0.96    | 191.47 |   |        |                     |                     |
| 16 | 17   | 35 | 54.72 | 84.6 | 5 36.46 | +23 19.50 | 1.0158 | 8.66 | 15 44.73 | -9.51      | 1.08    | 178.24 |   |        |                     |                     |
| 17 | 17   | 39 | 51.27 | 85.6 | 5 40.62 | +23 21.63 | 1.0158 | 8.66 | 15 44.65 | -9.08      | 1.20    | 165.00 |   |        |                     |                     |
| 18 | 17   | 43 | 47.83 | 86.5 | 5 44.78 | +23 23.34 | 1.0159 | 8.66 | 15 44.57 | -8.65      | 1.32    | 151.76 |   |        |                     |                     |
| 19 | 17   | 47 | 44.38 | 87.5 | 5 48.93 | +23 24.65 | 1.0160 | 8.66 | 15 44.49 | -8.21      | 1.44    | 138.53 |   |        |                     |                     |
| 20 | 17   | 51 | 40.94 | 88.4 | 5 53.09 | +23 25.54 | 1.0161 | 8.65 | 15 44.42 | -7.77      | 1.55    | 125.29 |   |        |                     |                     |
| 21 | 17   | 55 | 37.49 | 89.4 | 5 57.25 | +23 26.02 | 1.0162 | 8.65 | 15 44.35 | -7.33      | 1.67    | 112.05 |   |        |                     |                     |
| 22 | 17   | 59 | 34.05 | 90.3 | 6 1.41  | +23 26.08 | 1.0162 | 8.65 | 15 44.28 | -6.89      | 1.79    | 98.81  |   |        |                     |                     |
| 23 | 18   | 3  | 30.60 | 91.3 | 6 5.57  | +23 25.74 | 1.0163 | 8.65 | 15 44.22 | -6.45      | 1.90    | 85.58  |   |        |                     |                     |
| 24 | 18   | 7  | 27.16 | 92.2 | 6 9.73  | +23 24.98 | 1.0164 | 8.65 | 15 44.16 | -6.00      | 2.02    | 72.34  |   |        |                     |                     |
| 25 | 18   | 11 | 23.71 | 93.2 | 6 13.88 | +23 23.81 | 1.0164 | 8.65 | 15 44.11 | -5.55      | 2.14    | 59.10  |   |        |                     |                     |
| 26 | 18   | 15 | 20.27 | 94.1 | 6 18.04 | +23 22.22 | 1.0165 | 8.65 | 15 44.06 | -5.10      | 2.25    | 45.87  |   |        |                     |                     |
| 27 | 18   | 19 | 16.83 | 95.1 | 6 22.19 | +23 20.23 | 1.0165 | 8.65 | 15 44.01 | -4.65      | 2.36    | 32.63  |   |        |                     |                     |
| 28 | 18   | 23 | 13.38 | 96.0 | 6 26.34 | +23 17.82 | 1.0166 | 8.65 | 15 43.97 | -4.20      | 2.48    | 19.39  |   |        |                     |                     |
| 29 | 18   | 27 | 9.94  | 97.0 | 6 30.49 | +23 15.01 | 1.0166 | 8.65 | 15 43.93 | -3.75      | 2.59    | 6.16   |   |        |                     |                     |
| 30 | 18   | 31 | 6.49  | 98.0 | 6 34.64 | +23 11.79 | 1.0167 | 8.65 | 15 43.90 | -3.30      | 2.70    | 352.92 |   |        |                     |                     |



## 臺北市 日出、日沒、曙光始、暮光終 時間表

六 月

東經：121°31' 5" ，北緯：25°5' 44"

本表採用東經 120°平太陽時

| 日<br>期 | 天 文<br>曙光始<br>h m | 航 海<br>曙光始<br>h m | 民 用<br>曙光始<br>h m | 日 出<br>時 間 方 位<br>h m ° | 中 天<br>時 間 仰 角<br>h m ° | 日 沒<br>時 間 方 位<br>h m ° | 民 用<br>暮光終<br>h m | 航 海<br>暮光終<br>h m | 天 文<br>暮光終<br>h m |
|--------|-------------------|-------------------|-------------------|-------------------------|-------------------------|-------------------------|-------------------|-------------------|-------------------|
| 1      | 03:36             | 04:08             | 04:39             | 05:04 65                | 11:52 87S               | 18:39 295               | 19:05             | 19:35             | 20:07             |
| 2      | 03:36             | 04:08             | 04:38             | 05:04 65                | 11:52 87S               | 18:40 295               | 19:05             | 19:36             | 20:08             |
| 3      | 03:36             | 04:08             | 04:38             | 05:04 65                | 11:52 87S               | 18:40 295               | 19:06             | 19:36             | 20:08             |
| 4      | 03:36             | 04:08             | 04:38             | 05:04 65                | 11:52 87S               | 18:41 295               | 19:06             | 19:37             | 20:09             |
| 5      | 03:35             | 04:07             | 04:38             | 05:04 65                | 11:52 87S               | 18:41 295               | 19:07             | 19:37             | 20:10             |
| 6      | 03:35             | 04:07             | 04:38             | 05:04 64                | 11:52 88S               | 18:42 296               | 19:07             | 19:38             | 20:10             |
| 7      | 03:35             | 04:07             | 04:38             | 05:03 64                | 11:53 88S               | 18:42 296               | 19:08             | 19:38             | 20:11             |
| 8      | 03:35             | 04:07             | 04:38             | 05:03 64                | 11:53 88S               | 18:42 296               | 19:08             | 19:39             | 20:11             |
| 9      | 03:35             | 04:07             | 04:38             | 05:03 64                | 11:53 88S               | 18:43 296               | 19:09             | 19:39             | 20:12             |
| 10     | 03:35             | 04:07             | 04:38             | 05:03 64                | 11:53 88S               | 18:43 296               | 19:09             | 19:40             | 20:12             |
| 11     | 03:34             | 04:07             | 04:38             | 05:03 64                | 11:53 88S               | 18:44 296               | 19:09             | 19:40             | 20:13             |
| 12     | 03:34             | 04:07             | 04:38             | 05:03 64                | 11:54 88S               | 18:44 296               | 19:10             | 19:41             | 20:13             |
| 13     | 03:34             | 04:07             | 04:38             | 05:04 64                | 11:54 88S               | 18:44 296               | 19:10             | 19:41             | 20:13             |
| 14     | 03:34             | 04:07             | 04:38             | 05:04 64                | 11:54 88S               | 18:45 296               | 19:10             | 19:41             | 20:14             |
| 15     | 03:34             | 04:07             | 04:38             | 05:04 64                | 11:54 88S               | 18:45 296               | 19:11             | 19:42             | 20:14             |
| 16     | 03:35             | 04:07             | 04:38             | 05:04 64                | 11:54 88S               | 18:45 296               | 19:11             | 19:42             | 20:15             |
| 17     | 03:35             | 04:07             | 04:38             | 05:04 64                | 11:55 88S               | 18:46 296               | 19:11             | 19:42             | 20:15             |
| 18     | 03:35             | 04:07             | 04:38             | 05:04 64                | 11:55 88S               | 18:46 296               | 19:12             | 19:43             | 20:15             |
| 19     | 03:35             | 04:07             | 04:38             | 05:04 64                | 11:55 88S               | 18:46 296               | 19:12             | 19:43             | 20:15             |
| 20     | 03:35             | 04:08             | 04:39             | 05:04 64                | 11:55 88S               | 18:46 296               | 19:12             | 19:43             | 20:16             |
| 21     | 03:35             | 04:08             | 04:39             | 05:05 64                | 11:56 88S               | 18:47 296               | 19:12             | 19:43             | 20:16             |
| 22     | 03:35             | 04:08             | 04:39             | 05:05 64                | 11:56 88S               | 18:47 296               | 19:13             | 19:44             | 20:16             |
| 23     | 03:36             | 04:08             | 04:39             | 05:05 64                | 11:56 88S               | 18:47 296               | 19:13             | 19:44             | 20:16             |
| 24     | 03:36             | 04:08             | 04:39             | 05:05 64                | 11:56 88S               | 18:47 296               | 19:13             | 19:44             | 20:16             |
| 25     | 03:36             | 04:09             | 04:40             | 05:06 64                | 11:56 88S               | 18:47 296               | 19:13             | 19:44             | 20:17             |
| 26     | 03:36             | 04:09             | 04:40             | 05:06 64                | 11:57 88S               | 18:47 296               | 19:13             | 19:44             | 20:17             |
| 27     | 03:37             | 04:09             | 04:40             | 05:06 64                | 11:57 88S               | 18:48 296               | 19:13             | 19:44             | 20:17             |
| 28     | 03:37             | 04:10             | 04:41             | 05:06 64                | 11:57 88S               | 18:48 296               | 19:13             | 19:44             | 20:17             |
| 29     | 03:38             | 04:10             | 04:41             | 05:07 64                | 11:57 88S               | 18:48 296               | 19:14             | 19:44             | 20:17             |
| 30     | 03:38             | 04:10             | 04:41             | 05:07 64                | 11:57 88S               | 18:48 296               | 19:14             | 19:45             | 20:17             |

# 太陽位置與日面座標

## 七 月

本表採用世界時 0 時

| 日期 | GMST |    |       | 視黃經   |   | 視赤經 |       | 視赤緯 |       | 距離<br>( AU ) | 視差<br>" ' " | 視半徑 |       | P<br>° | B <sub>0</sub><br>° | L <sub>0</sub><br>° |
|----|------|----|-------|-------|---|-----|-------|-----|-------|--------------|-------------|-----|-------|--------|---------------------|---------------------|
|    | h    | m  | s     | °     | ' | h   | m     | °   | '     |              |             | '   | "     |        |                     |                     |
| 1  | 18   | 35 | 3.05  | 98.9  |   | 6   | 38.78 | +23 | 8.16  | 1.0167       | 8.65        | 15  | 43.88 | -2.85  | 2.81                | 339.68              |
| 2  | 18   | 38 | 59.60 | 99.9  |   | 6   | 42.92 | +23 | 4.13  | 1.0167       | 8.65        | 15  | 43.86 | -2.39  | 2.93                | 326.45              |
| 3  | 18   | 42 | 56.16 | 100.8 |   | 6   | 47.05 | +22 | 59.69 | 1.0167       | 8.65        | 15  | 43.84 | -1.94  | 3.04                | 313.21              |
| 4  | 18   | 46 | 52.71 | 101.8 |   | 6   | 51.18 | +22 | 54.85 | 1.0167       | 8.65        | 15  | 43.83 | -1.49  | 3.14                | 299.98              |
| 5  | 18   | 50 | 49.27 | 102.7 |   | 6   | 55.30 | +22 | 49.62 | 1.0167       | 8.65        | 15  | 43.83 | -1.03  | 3.25                | 286.74              |
| 6  | 18   | 54 | 45.82 | 103.7 |   | 6   | 59.42 | +22 | 43.99 | 1.0167       | 8.65        | 15  | 43.83 | -0.58  | 3.36                | 273.51              |
| 7  | 18   | 58 | 42.38 | 104.6 |   | 7   | 3.53  | +22 | 37.96 | 1.0167       | 8.65        | 15  | 43.84 | -0.13  | 3.47                | 260.27              |
| 8  | 19   | 2  | 38.93 | 105.6 |   | 7   | 7.63  | +22 | 31.54 | 1.0167       | 8.65        | 15  | 43.86 | 0.33   | 3.57                | 247.04              |
| 9  | 19   | 6  | 35.49 | 106.5 |   | 7   | 11.73 | +22 | 24.73 | 1.0167       | 8.65        | 15  | 43.88 | 0.78   | 3.68                | 233.80              |
| 10 | 19   | 10 | 32.04 | 107.5 |   | 7   | 15.82 | +22 | 17.53 | 1.0167       | 8.65        | 15  | 43.90 | 1.23   | 3.78                | 220.57              |
| 11 | 19   | 14 | 28.60 | 108.4 |   | 7   | 19.91 | +22 | 9.95  | 1.0166       | 8.65        | 15  | 43.93 | 1.68   | 3.88                | 207.33              |
| 12 | 19   | 18 | 25.16 | 109.4 |   | 7   | 23.98 | +22 | 1.98  | 1.0166       | 8.65        | 15  | 43.96 | 2.13   | 3.98                | 194.10              |
| 13 | 19   | 22 | 21.71 | 110.3 |   | 7   | 28.05 | +21 | 53.64 | 1.0166       | 8.65        | 15  | 43.99 | 2.57   | 4.08                | 180.86              |
| 14 | 19   | 26 | 18.27 | 111.3 |   | 7   | 32.11 | +21 | 44.93 | 1.0165       | 8.65        | 15  | 44.03 | 3.02   | 4.18                | 167.63              |
| 15 | 19   | 30 | 14.82 | 112.3 |   | 7   | 36.16 | +21 | 35.84 | 1.0165       | 8.65        | 15  | 44.08 | 3.46   | 4.28                | 154.40              |
| 16 | 19   | 34 | 11.38 | 113.2 |   | 7   | 40.20 | +21 | 26.39 | 1.0164       | 8.65        | 15  | 44.12 | 3.91   | 4.38                | 141.16              |
| 17 | 19   | 38 | 7.93  | 114.2 |   | 7   | 44.24 | +21 | 16.57 | 1.0164       | 8.65        | 15  | 44.17 | 4.35   | 4.47                | 127.93              |
| 18 | 19   | 42 | 4.49  | 115.1 |   | 7   | 48.27 | +21 | 6.40  | 1.0163       | 8.65        | 15  | 44.22 | 4.79   | 4.57                | 114.70              |
| 19 | 19   | 46 | 1.04  | 116.1 |   | 7   | 52.28 | +20 | 55.86 | 1.0163       | 8.65        | 15  | 44.28 | 5.22   | 4.66                | 101.47              |
| 20 | 19   | 49 | 57.60 | 117.0 |   | 7   | 56.29 | +20 | 44.97 | 1.0162       | 8.65        | 15  | 44.34 | 5.66   | 4.75                | 88.23               |
| 21 | 19   | 53 | 54.15 | 118.0 |   | 8   | 0.29  | +20 | 33.74 | 1.0161       | 8.65        | 15  | 44.40 | 6.09   | 4.84                | 75.00               |
| 22 | 19   | 57 | 50.71 | 118.9 |   | 8   | 4.28  | +20 | 22.16 | 1.0161       | 8.66        | 15  | 44.46 | 6.52   | 4.93                | 61.77               |
| 23 | 20   | 1  | 47.26 | 119.9 |   | 8   | 8.26  | +20 | 10.23 | 1.0160       | 8.66        | 15  | 44.53 | 6.95   | 5.02                | 48.54               |
| 24 | 20   | 5  | 43.82 | 120.8 |   | 8   | 12.23 | +19 | 57.97 | 1.0159       | 8.66        | 15  | 44.60 | 7.37   | 5.11                | 35.31               |
| 25 | 20   | 9  | 40.38 | 121.8 |   | 8   | 16.19 | +19 | 45.38 | 1.0158       | 8.66        | 15  | 44.68 | 7.79   | 5.19                | 22.08               |
| 26 | 20   | 13 | 36.93 | 122.8 |   | 8   | 20.15 | +19 | 32.46 | 1.0157       | 8.66        | 15  | 44.76 | 8.21   | 5.27                | 8.85                |
| 27 | 20   | 17 | 33.49 | 123.7 |   | 8   | 24.09 | +19 | 19.21 | 1.0156       | 8.66        | 15  | 44.85 | 8.63   | 5.36                | 355.62              |
| 28 | 20   | 21 | 30.04 | 124.7 |   | 8   | 28.02 | +19 | 5.64  | 1.0155       | 8.66        | 15  | 44.94 | 9.04   | 5.44                | 342.40              |
| 29 | 20   | 25 | 26.60 | 125.6 |   | 8   | 31.94 | +18 | 51.76 | 1.0154       | 8.66        | 15  | 45.03 | 9.45   | 5.52                | 329.17              |
| 30 | 20   | 29 | 23.15 | 126.6 |   | 8   | 35.86 | +18 | 37.56 | 1.0153       | 8.66        | 15  | 45.13 | 9.86   | 5.59                | 315.94              |
| 31 | 20   | 33 | 19.71 | 127.5 |   | 8   | 39.76 | +18 | 23.06 | 1.0152       | 8.66        | 15  | 45.24 | 10.27  | 5.67                | 302.72              |

## 臺北市 日出、日沒、曙光始、暮光終 時間表

七 月

東經：121°31' 5" ，北緯：25°5' 44"

本表採用東經 120°平太陽時

| 日<br>期 | 天 文<br>曙光始<br>h m | 航 海<br>曙光始<br>h m | 民 用<br>曙光始<br>h m | 日 出<br>時間 方位<br>h m ° | 中 天<br>時間 仰角<br>h m ° | 日 沒<br>時間 方位<br>h m ° | 民 用<br>暮光終<br>h m | 航 海<br>暮光終<br>h m | 天 文<br>暮光終<br>h m |
|--------|-------------------|-------------------|-------------------|-----------------------|-----------------------|-----------------------|-------------------|-------------------|-------------------|
| 1      | 03:38             | 04:11             | 04:42             | 05:07 64              | 11:58 88S             | 18:48 296             | 19:14             | 19:45             | 20:17             |
| 2      | 03:39             | 04:11             | 04:42             | 05:08 64              | 11:58 88S             | 18:48 296             | 19:14             | 19:44             | 20:17             |
| 3      | 03:39             | 04:11             | 04:42             | 05:08 64              | 11:58 88S             | 18:48 296             | 19:14             | 19:44             | 20:17             |
| 4      | 03:40             | 04:12             | 04:43             | 05:08 64              | 11:58 88S             | 18:48 296             | 19:14             | 19:44             | 20:17             |
| 5      | 03:40             | 04:12             | 04:43             | 05:09 64              | 11:58 88S             | 18:48 296             | 19:14             | 19:44             | 20:16             |
| 6      | 03:41             | 04:13             | 04:44             | 05:09 64              | 11:59 88S             | 18:48 296             | 19:13             | 19:44             | 20:16             |
| 7      | 03:41             | 04:13             | 04:44             | 05:10 64              | 11:59 88S             | 18:48 296             | 19:13             | 19:44             | 20:16             |
| 8      | 03:42             | 04:14             | 04:44             | 05:10 65              | 11:59 87S             | 18:48 295             | 19:13             | 19:44             | 20:16             |
| 9      | 03:42             | 04:14             | 04:45             | 05:10 65              | 11:59 87S             | 18:48 295             | 19:13             | 19:44             | 20:16             |
| 10     | 03:43             | 04:15             | 04:45             | 05:11 65              | 11:59 87S             | 18:47 295             | 19:13             | 19:44             | 20:15             |
| 11     | 03:43             | 04:15             | 04:46             | 05:11 65              | 11:59 87S             | 18:47 295             | 19:13             | 19:43             | 20:15             |
| 12     | 03:44             | 04:16             | 04:46             | 05:12 65              | 11:59 87S             | 18:47 295             | 19:13             | 19:43             | 20:15             |
| 13     | 03:44             | 04:16             | 04:47             | 05:12 65              | 12:00 87S             | 18:47 295             | 19:12             | 19:43             | 20:14             |
| 14     | 03:45             | 04:17             | 04:47             | 05:13 65              | 12:00 87S             | 18:47 295             | 19:12             | 19:42             | 20:14             |
| 15     | 03:46             | 04:17             | 04:48             | 05:13 66              | 12:00 86S             | 18:46 294             | 19:12             | 19:42             | 20:14             |
| 16     | 03:46             | 04:18             | 04:48             | 05:14 66              | 12:00 86S             | 18:46 294             | 19:11             | 19:42             | 20:13             |
| 17     | 03:47             | 04:18             | 04:49             | 05:14 66              | 12:00 86S             | 18:46 294             | 19:11             | 19:41             | 20:13             |
| 18     | 03:48             | 04:19             | 04:49             | 05:14 66              | 12:00 86S             | 18:46 294             | 19:11             | 19:41             | 20:12             |
| 19     | 03:48             | 04:20             | 04:50             | 05:15 66              | 12:00 86S             | 18:45 294             | 19:10             | 19:41             | 20:12             |
| 20     | 03:49             | 04:20             | 04:50             | 05:15 67              | 12:00 86S             | 18:45 293             | 19:10             | 19:40             | 20:11             |
| 21     | 03:49             | 04:21             | 04:51             | 05:16 67              | 12:00 85S             | 18:45 293             | 19:10             | 19:40             | 20:11             |
| 22     | 03:50             | 04:21             | 04:51             | 05:16 67              | 12:00 85S             | 18:44 293             | 19:09             | 19:39             | 20:10             |
| 23     | 03:51             | 04:22             | 04:52             | 05:17 67              | 12:00 85S             | 18:44 293             | 19:09             | 19:39             | 20:10             |
| 24     | 03:51             | 04:22             | 04:52             | 05:17 67              | 12:00 85S             | 18:43 292             | 19:08             | 19:38             | 20:09             |
| 25     | 03:52             | 04:23             | 04:53             | 05:18 68              | 12:00 85S             | 18:43 292             | 19:08             | 19:37             | 20:08             |
| 26     | 03:53             | 04:24             | 04:53             | 05:18 68              | 12:00 84S             | 18:42 292             | 19:07             | 19:37             | 20:08             |
| 27     | 03:54             | 04:24             | 04:54             | 05:19 68              | 12:00 84S             | 18:42 292             | 19:07             | 19:36             | 20:07             |
| 28     | 03:54             | 04:25             | 04:54             | 05:19 68              | 12:00 84S             | 18:41 291             | 19:06             | 19:36             | 20:06             |
| 29     | 03:55             | 04:25             | 04:55             | 05:20 69              | 12:00 84S             | 18:41 291             | 19:06             | 19:35             | 20:05             |
| 30     | 03:56             | 04:26             | 04:55             | 05:20 69              | 12:00 84S             | 18:40 291             | 19:05             | 19:34             | 20:05             |
| 31     | 03:56             | 04:27             | 04:56             | 05:21 69              | 12:00 83S             | 18:40 291             | 19:04             | 19:34             | 20:04             |

# 太陽位置與日面座標

## 八 月

本表採用世界時 0 時

| 日期 | GMST |    |       | 視黃經   |   | 視赤經 |       | 視赤緯 |       | 距離<br>( AU ) | 視差<br>" | 視半徑 |       | P<br>° | B <sub>0</sub><br>° | L <sub>0</sub><br>° |
|----|------|----|-------|-------|---|-----|-------|-----|-------|--------------|---------|-----|-------|--------|---------------------|---------------------|
|    | h    | m  | s     | °     | ' | h   | m     | °   | '     |              |         | '   | "     |        |                     |                     |
| 1  | 20   | 37 | 16.26 | 128.5 |   | 8   | 43.66 | +18 | 8.26  | 1.0151       | 8.66    | 15  | 45.35 | 10.67  | 5.75                | 289.49              |
| 2  | 20   | 41 | 12.82 | 129.4 |   | 8   | 47.54 | +17 | 53.16 | 1.0150       | 8.66    | 15  | 45.46 | 11.06  | 5.82                | 276.26              |
| 3  | 20   | 45 | 9.37  | 130.4 |   | 8   | 51.41 | +17 | 37.77 | 1.0148       | 8.67    | 15  | 45.59 | 11.46  | 5.89                | 263.04              |
| 4  | 20   | 49 | 5.93  | 131.4 |   | 8   | 55.27 | +17 | 22.10 | 1.0147       | 8.67    | 15  | 45.71 | 11.85  | 5.96                | 249.82              |
| 5  | 20   | 53 | 2.48  | 132.3 |   | 8   | 59.13 | +17 | 6.14  | 1.0146       | 8.67    | 15  | 45.85 | 12.23  | 6.03                | 236.59              |
| 6  | 20   | 56 | 59.04 | 133.3 |   | 9   | 2.97  | +16 | 49.91 | 1.0144       | 8.67    | 15  | 45.98 | 12.61  | 6.10                | 223.37              |
| 7  | 21   | 0  | 55.60 | 134.2 |   | 9   | 6.80  | +16 | 33.40 | 1.0143       | 8.67    | 15  | 46.13 | 12.99  | 6.16                | 210.14              |
| 8  | 21   | 4  | 52.15 | 135.2 |   | 9   | 10.62 | +16 | 16.63 | 1.0141       | 8.67    | 15  | 46.27 | 13.36  | 6.22                | 196.92              |
| 9  | 21   | 8  | 48.71 | 136.1 |   | 9   | 14.43 | +15 | 59.60 | 1.0139       | 8.67    | 15  | 46.42 | 13.73  | 6.28                | 183.70              |
| 10 | 21   | 12 | 45.26 | 137.1 |   | 9   | 18.24 | +15 | 42.31 | 1.0138       | 8.67    | 15  | 46.58 | 14.10  | 6.34                | 170.48              |
| 11 | 21   | 16 | 41.82 | 138.1 |   | 9   | 22.03 | +15 | 24.78 | 1.0136       | 8.68    | 15  | 46.73 | 14.46  | 6.40                | 157.26              |
| 12 | 21   | 20 | 38.37 | 139.0 |   | 9   | 25.81 | +15 | 6.99  | 1.0134       | 8.68    | 15  | 46.89 | 14.82  | 6.46                | 144.03              |
| 13 | 21   | 24 | 34.93 | 140.0 |   | 9   | 29.58 | +14 | 48.97 | 1.0133       | 8.68    | 15  | 47.05 | 15.17  | 6.51                | 130.81              |
| 14 | 21   | 28 | 31.48 | 140.9 |   | 9   | 33.34 | +14 | 30.71 | 1.0131       | 8.68    | 15  | 47.22 | 15.52  | 6.57                | 117.59              |
| 15 | 21   | 32 | 28.04 | 141.9 |   | 9   | 37.10 | +14 | 12.23 | 1.0129       | 8.68    | 15  | 47.39 | 15.86  | 6.62                | 104.37              |
| 16 | 21   | 36 | 24.59 | 142.9 |   | 9   | 40.84 | +13 | 53.51 | 1.0127       | 8.68    | 15  | 47.56 | 16.20  | 6.67                | 91.16               |
| 17 | 21   | 40 | 21.15 | 143.8 |   | 9   | 44.58 | +13 | 34.58 | 1.0126       | 8.68    | 15  | 47.73 | 16.53  | 6.71                | 77.94               |
| 18 | 21   | 44 | 17.70 | 144.8 |   | 9   | 48.31 | +13 | 15.43 | 1.0124       | 8.69    | 15  | 47.90 | 16.86  | 6.76                | 64.72               |
| 19 | 21   | 48 | 14.26 | 145.7 |   | 9   | 52.03 | +12 | 56.08 | 1.0122       | 8.69    | 15  | 48.08 | 17.19  | 6.80                | 51.50               |
| 20 | 21   | 52 | 10.81 | 146.7 |   | 9   | 55.74 | +12 | 36.52 | 1.0120       | 8.69    | 15  | 48.26 | 17.51  | 6.84                | 38.29               |
| 21 | 21   | 56 | 7.37  | 147.7 |   | 9   | 59.44 | +12 | 16.75 | 1.0118       | 8.69    | 15  | 48.44 | 17.82  | 6.88                | 25.07               |
| 22 | 22   | 0  | 3.93  | 148.6 |   | 10  | 3.13  | +11 | 56.80 | 1.0116       | 8.69    | 15  | 48.62 | 18.13  | 6.92                | 11.85               |
| 23 | 22   | 3  | 60.48 | 149.6 |   | 10  | 6.82  | +11 | 36.65 | 1.0114       | 8.69    | 15  | 48.81 | 18.44  | 6.96                | 358.64              |
| 24 | 22   | 7  | 57.04 | 150.6 |   | 10  | 10.50 | +11 | 16.32 | 1.0112       | 8.70    | 15  | 49.00 | 18.74  | 6.99                | 345.42              |
| 25 | 22   | 11 | 53.59 | 151.5 |   | 10  | 14.18 | +10 | 55.80 | 1.0110       | 8.70    | 15  | 49.20 | 19.04  | 7.02                | 332.21              |
| 26 | 22   | 15 | 50.15 | 152.5 |   | 10  | 17.85 | +10 | 35.12 | 1.0108       | 8.70    | 15  | 49.39 | 19.33  | 7.05                | 319.00              |
| 27 | 22   | 19 | 46.70 | 153.5 |   | 10  | 21.51 | +10 | 14.26 | 1.0106       | 8.70    | 15  | 49.60 | 19.61  | 7.08                | 305.79              |
| 28 | 22   | 23 | 43.26 | 154.4 |   | 10  | 25.16 | +9  | 53.24 | 1.0103       | 8.70    | 15  | 49.80 | 19.89  | 7.10                | 292.57              |
| 29 | 22   | 27 | 39.81 | 155.4 |   | 10  | 28.81 | +9  | 32.06 | 1.0101       | 8.71    | 15  | 50.01 | 20.16  | 7.13                | 279.36              |
| 30 | 22   | 31 | 36.37 | 156.4 |   | 10  | 32.46 | +9  | 10.73 | 1.0099       | 8.71    | 15  | 50.22 | 20.43  | 7.15                | 266.15              |
| 31 | 22   | 35 | 32.92 | 157.3 |   | 10  | 36.09 | +8  | 49.26 | 1.0097       | 8.71    | 15  | 50.44 | 20.70  | 7.17                | 252.94              |

## 臺北市 日出、日沒、曙光始、暮光終 時間表

八 月

東經：121°31' 5" ，北緯：25°5' 44"

本表採用東經 120°平太陽時

| 日<br>期 | 天 文<br>曙光始<br>h m | 航 海<br>曙光始<br>h m | 民 用<br>曙光始<br>h m | 日 出<br>時間 方位<br>h m ° | 中 天<br>時間 仰角<br>h m ° | 日 沒<br>時間 方位<br>h m ° | 民 用<br>暮光終<br>h m | 航 海<br>暮光終<br>h m | 天 文<br>暮光終<br>h m |
|--------|-------------------|-------------------|-------------------|-----------------------|-----------------------|-----------------------|-------------------|-------------------|-------------------|
| 1      | 03:57             | 04:27             | 04:56             | 05:21 69              | 12:00 83S             | 18:39 290             | 19:04             | 19:33             | 20:03             |
| 2      | 03:58             | 04:28             | 04:57             | 05:22 70              | 12:00 83S             | 18:39 290             | 19:03             | 19:32             | 20:02             |
| 3      | 03:58             | 04:28             | 04:58             | 05:22 70              | 12:00 83S             | 18:38 290             | 19:02             | 19:32             | 20:02             |
| 4      | 03:59             | 04:29             | 04:58             | 05:22 70              | 12:00 82S             | 18:37 290             | 19:02             | 19:31             | 20:01             |
| 5      | 04:00             | 04:30             | 04:59             | 05:23 71              | 12:00 82S             | 18:37 289             | 19:01             | 19:30             | 20:00             |
| 6      | 04:00             | 04:30             | 04:59             | 05:23 71              | 12:00 82S             | 18:36 289             | 19:00             | 19:29             | 19:59             |
| 7      | 04:01             | 04:31             | 05:00             | 05:24 71              | 12:00 81S             | 18:35 289             | 19:00             | 19:28             | 19:58             |
| 8      | 04:02             | 04:31             | 05:00             | 05:24 72              | 12:00 81S             | 18:35 288             | 18:59             | 19:28             | 19:57             |
| 9      | 04:02             | 04:32             | 05:01             | 05:25 72              | 12:00 81S             | 18:34 288             | 18:58             | 19:27             | 19:56             |
| 10     | 04:03             | 04:32             | 05:01             | 05:25 72              | 11:59 81S             | 18:33 288             | 18:57             | 19:26             | 19:55             |
| 11     | 04:04             | 04:33             | 05:02             | 05:26 72              | 11:59 80S             | 18:32 287             | 18:56             | 19:25             | 19:54             |
| 12     | 04:04             | 04:34             | 05:02             | 05:26 73              | 11:59 80S             | 18:32 287             | 18:56             | 19:24             | 19:53             |
| 13     | 04:05             | 04:34             | 05:03             | 05:27 73              | 11:59 80S             | 18:31 287             | 18:55             | 19:23             | 19:52             |
| 14     | 04:06             | 04:35             | 05:03             | 05:27 73              | 11:59 79S             | 18:30 286             | 18:54             | 19:22             | 19:51             |
| 15     | 04:06             | 04:35             | 05:04             | 05:27 74              | 11:59 79S             | 18:29 286             | 18:53             | 19:21             | 19:50             |
| 16     | 04:07             | 04:36             | 05:04             | 05:28 74              | 11:58 79S             | 18:28 286             | 18:52             | 19:20             | 19:49             |
| 17     | 04:07             | 04:36             | 05:04             | 05:28 75              | 11:58 78S             | 18:28 285             | 18:51             | 19:19             | 19:48             |
| 18     | 04:08             | 04:37             | 05:05             | 05:29 75              | 11:58 78S             | 18:27 285             | 18:50             | 19:18             | 19:47             |
| 19     | 04:09             | 04:37             | 05:05             | 05:29 75              | 11:58 78S             | 18:26 285             | 18:50             | 19:17             | 19:46             |
| 20     | 04:09             | 04:38             | 05:06             | 05:30 76              | 11:57 77S             | 18:25 284             | 18:49             | 19:16             | 19:45             |
| 21     | 04:10             | 04:38             | 05:06             | 05:30 76              | 11:57 77S             | 18:24 284             | 18:48             | 19:15             | 19:44             |
| 22     | 04:10             | 04:39             | 05:07             | 05:30 76              | 11:57 77S             | 18:23 283             | 18:47             | 19:14             | 19:43             |
| 23     | 04:11             | 04:39             | 05:07             | 05:31 77              | 11:57 76S             | 18:22 283             | 18:46             | 19:13             | 19:42             |
| 24     | 04:12             | 04:40             | 05:08             | 05:31 77              | 11:56 76S             | 18:21 283             | 18:45             | 19:12             | 19:41             |
| 25     | 04:12             | 04:40             | 05:08             | 05:32 77              | 11:56 76S             | 18:20 282             | 18:44             | 19:11             | 19:40             |
| 26     | 04:13             | 04:41             | 05:09             | 05:32 78              | 11:56 75S             | 18:19 282             | 18:43             | 19:10             | 19:38             |
| 27     | 04:13             | 04:41             | 05:09             | 05:32 78              | 11:56 75S             | 18:18 282             | 18:42             | 19:09             | 19:37             |
| 28     | 04:14             | 04:42             | 05:09             | 05:33 79              | 11:55 75S             | 18:17 281             | 18:41             | 19:08             | 19:36             |
| 29     | 04:14             | 04:42             | 05:10             | 05:33 79              | 11:55 74S             | 18:16 281             | 18:40             | 19:07             | 19:35             |
| 30     | 04:15             | 04:43             | 05:10             | 05:34 79              | 11:55 74S             | 18:15 280             | 18:39             | 19:06             | 19:34             |
| 31     | 04:16             | 04:43             | 05:11             | 05:34 80              | 11:54 74S             | 18:14 280             | 18:38             | 19:05             | 19:33             |

# 太陽位置與日面座標

## 九 月

本表採用世界時 0 時

| 日期 | GMST |    |       | 視黃經   | 視赤經 |       | 視赤緯 |       | 距離     | 視差   |    | 視半徑   |       | P    | B <sub>0</sub> | L <sub>0</sub> |
|----|------|----|-------|-------|-----|-------|-----|-------|--------|------|----|-------|-------|------|----------------|----------------|
|    | h    | m  | s     | °     | h   | m     | °   | '     | ( AU ) | "    | '  | "     | °     | °    | °              |                |
| 1  | 22   | 39 | 29.48 | 158.3 | 10  | 39.73 | +8  | 27.64 | 1.0094 | 8.71 | 15 | 50.66 | 20.96 | 7.19 | 239.73         |                |
| 2  | 22   | 43 | 26.03 | 159.3 | 10  | 43.35 | +8  | 5.88  | 1.0092 | 8.71 | 15 | 50.89 | 21.21 | 7.20 | 226.52         |                |
| 3  | 22   | 47 | 22.59 | 160.2 | 10  | 46.97 | +7  | 44.00 | 1.0089 | 8.72 | 15 | 51.12 | 21.46 | 7.21 | 213.31         |                |
| 4  | 22   | 51 | 19.15 | 161.2 | 10  | 50.59 | +7  | 21.99 | 1.0087 | 8.72 | 15 | 51.35 | 21.70 | 7.23 | 200.11         |                |
| 5  | 22   | 55 | 15.70 | 162.2 | 10  | 54.20 | +6  | 59.87 | 1.0084 | 8.72 | 15 | 51.59 | 21.93 | 7.24 | 186.90         |                |
| 6  | 22   | 59 | 12.26 | 163.1 | 10  | 57.81 | +6  | 37.63 | 1.0082 | 8.72 | 15 | 51.83 | 22.16 | 7.24 | 173.69         |                |
| 7  | 23   | 3  | 8.81  | 164.1 | 11  | 1.42  | +6  | 15.29 | 1.0079 | 8.72 | 15 | 52.07 | 22.39 | 7.25 | 160.48         |                |
| 8  | 23   | 7  | 5.37  | 165.1 | 11  | 5.02  | +5  | 52.84 | 1.0077 | 8.73 | 15 | 52.32 | 22.61 | 7.25 | 147.28         |                |
| 9  | 23   | 11 | 1.92  | 166.0 | 11  | 8.62  | +5  | 30.30 | 1.0074 | 8.73 | 15 | 52.56 | 22.82 | 7.25 | 134.07         |                |
| 10 | 23   | 14 | 58.48 | 167.0 | 11  | 12.21 | +5  | 7.66  | 1.0071 | 8.73 | 15 | 52.81 | 23.03 | 7.25 | 120.87         |                |
| 11 | 23   | 18 | 55.03 | 168.0 | 11  | 15.80 | +4  | 44.94 | 1.0069 | 8.73 | 15 | 53.06 | 23.23 | 7.25 | 107.66         |                |
| 12 | 23   | 22 | 51.59 | 169.0 | 11  | 19.39 | +4  | 22.15 | 1.0066 | 8.74 | 15 | 53.31 | 23.42 | 7.24 | 94.46          |                |
| 13 | 23   | 26 | 48.14 | 169.9 | 11  | 22.98 | +3  | 59.27 | 1.0064 | 8.74 | 15 | 53.56 | 23.61 | 7.24 | 81.25          |                |
| 14 | 23   | 30 | 44.70 | 170.9 | 11  | 26.56 | +3  | 36.33 | 1.0061 | 8.74 | 15 | 53.81 | 23.79 | 7.23 | 68.05          |                |
| 15 | 23   | 34 | 41.25 | 171.9 | 11  | 30.15 | +3  | 13.32 | 1.0058 | 8.74 | 15 | 54.07 | 23.97 | 7.21 | 54.84          |                |
| 16 | 23   | 38 | 37.81 | 172.8 | 11  | 33.73 | +2  | 50.25 | 1.0056 | 8.75 | 15 | 54.32 | 24.14 | 7.20 | 41.64          |                |
| 17 | 23   | 42 | 34.37 | 173.8 | 11  | 37.32 | +2  | 27.13 | 1.0053 | 8.75 | 15 | 54.58 | 24.30 | 7.18 | 28.44          |                |
| 18 | 23   | 46 | 30.92 | 174.8 | 11  | 40.90 | +2  | 3.96  | 1.0050 | 8.75 | 15 | 54.83 | 24.46 | 7.17 | 15.24          |                |
| 19 | 23   | 50 | 27.48 | 175.8 | 11  | 44.49 | +1  | 40.75 | 1.0048 | 8.75 | 15 | 55.09 | 24.61 | 7.15 | 2.04           |                |
| 20 | 23   | 54 | 24.03 | 176.7 | 11  | 48.07 | +1  | 17.49 | 1.0045 | 8.75 | 15 | 55.34 | 24.76 | 7.12 | 348.83         |                |
| 21 | 23   | 58 | 20.59 | 177.7 | 11  | 51.66 | +0  | 54.21 | 1.0042 | 8.76 | 15 | 55.60 | 24.90 | 7.10 | 335.63         |                |
| 22 | 0    | 2  | 17.14 | 178.7 | 11  | 55.25 | +0  | 30.89 | 1.0039 | 8.76 | 15 | 55.86 | 25.03 | 7.07 | 322.43         |                |
| 23 | 0    | 6  | 13.70 | 179.7 | 11  | 58.83 | +0  | 7.56  | 1.0037 | 8.76 | 15 | 56.12 | 25.16 | 7.05 | 309.24         |                |
| 24 | 0    | 10 | 10.25 | 180.7 | 12  | 2.43  | -0  | 15.80 | 1.0034 | 8.76 | 15 | 56.38 | 25.28 | 7.02 | 296.04         |                |
| 25 | 0    | 14 | 6.81  | 181.6 | 12  | 6.02  | -0  | 39.16 | 1.0031 | 8.77 | 15 | 56.64 | 25.39 | 6.98 | 282.84         |                |
| 26 | 0    | 18 | 3.36  | 182.6 | 12  | 9.62  | -1  | 2.53  | 1.0028 | 8.77 | 15 | 56.91 | 25.50 | 6.95 | 269.64         |                |
| 27 | 0    | 21 | 59.92 | 183.6 | 12  | 13.22 | -1  | 25.90 | 1.0026 | 8.77 | 15 | 57.17 | 25.60 | 6.91 | 256.44         |                |
| 28 | 0    | 25 | 56.47 | 184.6 | 12  | 16.82 | -1  | 49.26 | 1.0023 | 8.77 | 15 | 57.44 | 25.69 | 6.87 | 243.25         |                |
| 29 | 0    | 29 | 53.03 | 185.6 | 12  | 20.43 | -2  | 12.61 | 1.0020 | 8.78 | 15 | 57.72 | 25.78 | 6.83 | 230.05         |                |
| 30 | 0    | 33 | 49.59 | 186.5 | 12  | 24.04 | -2  | 35.94 | 1.0017 | 8.78 | 15 | 57.99 | 25.85 | 6.79 | 216.85         |                |

## 臺北市 日出、日沒、曙光始、暮光終 時間表

九 月

東經：121°31' 5" ，北緯：25°5' 44"

本表採用東經 120°平太陽時

| 日<br>期 | 天 文<br>曙光始<br>h m | 航 海<br>曙光始<br>h m | 民 用<br>曙光始<br>h m | 日 出<br>時間 方位<br>h m ° | 中 天<br>時間 仰角<br>h m ° | 日 沒<br>時間 方位<br>h m ° | 民 用<br>暮光終<br>h m | 航 海<br>暮光終<br>h m | 天 文<br>暮光終<br>h m |
|--------|-------------------|-------------------|-------------------|-----------------------|-----------------------|-----------------------|-------------------|-------------------|-------------------|
| 1      | 04:16             | 04:44             | 05:11             | 05:34 80              | 11:54 73S             | 18:13 280             | 18:37             | 19:04             | 19:32             |
| 2      | 04:17             | 04:44             | 05:12             | 05:35 81              | 11:54 73S             | 18:12 279             | 18:36             | 19:03             | 19:30             |
| 3      | 04:17             | 04:45             | 05:12             | 05:35 81              | 11:53 73S             | 18:11 279             | 18:35             | 19:02             | 19:29             |
| 4      | 04:18             | 04:45             | 05:12             | 05:36 81              | 11:53 72S             | 18:10 278             | 18:33             | 19:01             | 19:28             |
| 5      | 04:18             | 04:46             | 05:13             | 05:36 82              | 11:53 72S             | 18:09 278             | 18:32             | 18:59             | 19:27             |
| 6      | 04:19             | 04:46             | 05:13             | 05:36 82              | 11:52 71S             | 18:08 278             | 18:31             | 18:58             | 19:26             |
| 7      | 04:19             | 04:47             | 05:14             | 05:37 83              | 11:52 71S             | 18:07 277             | 18:30             | 18:57             | 19:25             |
| 8      | 04:20             | 04:47             | 05:14             | 05:37 83              | 11:52 71S             | 18:06 277             | 18:29             | 18:56             | 19:23             |
| 9      | 04:20             | 04:47             | 05:14             | 05:37 83              | 11:51 70S             | 18:05 276             | 18:28             | 18:55             | 19:22             |
| 10     | 04:21             | 04:48             | 05:15             | 05:38 84              | 11:51 70S             | 18:04 276             | 18:27             | 18:54             | 19:21             |
| 11     | 04:21             | 04:48             | 05:15             | 05:38 84              | 11:51 70S             | 18:03 275             | 18:26             | 18:53             | 19:20             |
| 12     | 04:22             | 04:49             | 05:16             | 05:39 85              | 11:50 69S             | 18:02 275             | 18:25             | 18:52             | 19:19             |
| 13     | 04:22             | 04:49             | 05:16             | 05:39 85              | 11:50 69S             | 18:01 275             | 18:24             | 18:51             | 19:18             |
| 14     | 04:22             | 04:50             | 05:16             | 05:39 86              | 11:50 68S             | 18:00 274             | 18:23             | 18:49             | 19:16             |
| 15     | 04:23             | 04:50             | 05:17             | 05:40 86              | 11:49 68S             | 17:59 274             | 18:22             | 18:48             | 19:15             |
| 16     | 04:23             | 04:50             | 05:17             | 05:40 86              | 11:49 68S             | 17:58 273             | 18:20             | 18:47             | 19:14             |
| 17     | 04:24             | 04:51             | 05:17             | 05:40 87              | 11:49 67S             | 17:56 273             | 18:19             | 18:46             | 19:13             |
| 18     | 04:24             | 04:51             | 05:18             | 05:41 87              | 11:48 67S             | 17:55 272             | 18:18             | 18:45             | 19:12             |
| 19     | 04:25             | 04:52             | 05:18             | 05:41 88              | 11:48 67S             | 17:54 272             | 18:17             | 18:44             | 19:11             |
| 20     | 04:25             | 04:52             | 05:19             | 05:41 88              | 11:48 66S             | 17:53 272             | 18:16             | 18:43             | 19:09             |
| 21     | 04:26             | 04:52             | 05:19             | 05:42 89              | 11:47 66S             | 17:52 271             | 18:15             | 18:42             | 19:08             |
| 22     | 04:26             | 04:53             | 05:19             | 05:42 89              | 11:47 65S             | 17:51 271             | 18:14             | 18:40             | 19:07             |
| 23     | 04:26             | 04:53             | 05:20             | 05:43 89              | 11:46 65S             | 17:50 270             | 18:13             | 18:39             | 19:06             |
| 24     | 04:27             | 04:54             | 05:20             | 05:43 90              | 11:46 65S             | 17:49 270             | 18:12             | 18:38             | 19:05             |
| 25     | 04:27             | 04:54             | 05:21             | 05:43 90              | 11:46 64S             | 17:48 269             | 18:11             | 18:37             | 19:04             |
| 26     | 04:28             | 04:54             | 05:21             | 05:44 91              | 11:45 64S             | 17:47 269             | 18:10             | 18:36             | 19:03             |
| 27     | 04:28             | 04:55             | 05:21             | 05:44 91              | 11:45 63S             | 17:46 269             | 18:08             | 18:35             | 19:02             |
| 28     | 04:29             | 04:55             | 05:22             | 05:45 92              | 11:45 63S             | 17:45 268             | 18:07             | 18:34             | 19:01             |
| 29     | 04:29             | 04:56             | 05:22             | 05:45 92              | 11:44 63S             | 17:44 268             | 18:06             | 18:33             | 18:59             |
| 30     | 04:29             | 04:56             | 05:22             | 05:45 92              | 11:44 62S             | 17:43 267             | 18:05             | 18:32             | 18:58             |

# 太陽位置與日面座標

## 十 月

本表採用世界時 0 時

| 日期 | GMST |    |       | 視黃經   |          | 視赤經       |        | 視赤緯  |          | 距離<br>( AU ) | 視差<br>" ' " | 視半徑    |   | P<br>° | B <sub>0</sub><br>° | L <sub>0</sub><br>° |
|----|------|----|-------|-------|----------|-----------|--------|------|----------|--------------|-------------|--------|---|--------|---------------------|---------------------|
|    | h    | m  | s     | °     | '        | °         | '      | °    | '        |              |             | "      | ' |        |                     |                     |
| 1  | 0    | 37 | 46.14 | 187.5 | 12 27.66 | -2 59.25  | 1.0014 | 8.78 | 15 58.27 | 25.93        | 6.74        | 203.66 |   |        |                     |                     |
| 2  | 0    | 41 | 42.70 | 188.5 | 12 31.28 | -3 22.52  | 1.0011 | 8.78 | 15 58.54 | 25.99        | 6.70        | 190.46 |   |        |                     |                     |
| 3  | 0    | 45 | 39.25 | 189.5 | 12 34.90 | -3 45.76  | 1.0008 | 8.79 | 15 58.82 | 26.05        | 6.65        | 177.27 |   |        |                     |                     |
| 4  | 0    | 49 | 35.81 | 190.5 | 12 38.53 | -4 8.95   | 1.0005 | 8.79 | 15 59.11 | 26.10        | 6.60        | 164.07 |   |        |                     |                     |
| 5  | 0    | 53 | 32.36 | 191.5 | 12 42.17 | -4 32.09  | 1.0002 | 8.79 | 15 59.39 | 26.15        | 6.55        | 150.88 |   |        |                     |                     |
| 6  | 0    | 57 | 28.92 | 192.4 | 12 45.81 | -4 55.17  | 1.0000 | 8.79 | 15 59.67 | 26.18        | 6.49        | 137.68 |   |        |                     |                     |
| 7  | 1    | 1  | 25.47 | 193.4 | 12 49.45 | -5 18.19  | 0.9997 | 8.80 | 15 59.95 | 26.22        | 6.43        | 124.49 |   |        |                     |                     |
| 8  | 1    | 5  | 22.03 | 194.4 | 12 53.11 | -5 41.14  | 0.9994 | 8.80 | 16 0.23  | 26.24        | 6.38        | 111.30 |   |        |                     |                     |
| 9  | 1    | 9  | 18.58 | 195.4 | 12 56.77 | -6 4.02   | 0.9991 | 8.80 | 16 0.52  | 26.25        | 6.31        | 98.10  |   |        |                     |                     |
| 10 | 1    | 13 | 15.14 | 196.4 | 13 0.43  | -6 26.82  | 0.9988 | 8.80 | 16 0.80  | 26.26        | 6.25        | 84.91  |   |        |                     |                     |
| 11 | 1    | 17 | 11.69 | 197.4 | 13 4.11  | -6 49.53  | 0.9985 | 8.81 | 16 1.08  | 26.26        | 6.19        | 71.72  |   |        |                     |                     |
| 12 | 1    | 21 | 8.25  | 198.4 | 13 7.79  | -7 12.14  | 0.9982 | 8.81 | 16 1.36  | 26.26        | 6.12        | 58.52  |   |        |                     |                     |
| 13 | 1    | 25 | 4.80  | 199.4 | 13 11.48 | -7 34.66  | 0.9979 | 8.81 | 16 1.64  | 26.24        | 6.05        | 45.33  |   |        |                     |                     |
| 14 | 1    | 29 | 1.36  | 200.3 | 13 15.18 | -7 57.07  | 0.9976 | 8.81 | 16 1.91  | 26.22        | 5.98        | 32.14  |   |        |                     |                     |
| 15 | 1    | 32 | 57.92 | 201.3 | 13 18.89 | -8 19.38  | 0.9973 | 8.82 | 16 2.19  | 26.20        | 5.91        | 18.95  |   |        |                     |                     |
| 16 | 1    | 36 | 54.47 | 202.3 | 13 22.60 | -8 41.56  | 0.9971 | 8.82 | 16 2.46  | 26.16        | 5.84        | 5.76   |   |        |                     |                     |
| 17 | 1    | 40 | 51.03 | 203.3 | 13 26.33 | -9 3.63   | 0.9968 | 8.82 | 16 2.73  | 26.12        | 5.76        | 352.56 |   |        |                     |                     |
| 18 | 1    | 44 | 47.58 | 204.3 | 13 30.07 | -9 25.56  | 0.9965 | 8.82 | 16 3.00  | 26.07        | 5.69        | 339.37 |   |        |                     |                     |
| 19 | 1    | 48 | 44.14 | 205.3 | 13 33.81 | -9 47.36  | 0.9962 | 8.83 | 16 3.27  | 26.01        | 5.61        | 326.18 |   |        |                     |                     |
| 20 | 1    | 52 | 40.69 | 206.3 | 13 37.57 | -10 9.02  | 0.9959 | 8.83 | 16 3.53  | 25.94        | 5.53        | 312.99 |   |        |                     |                     |
| 21 | 1    | 56 | 37.25 | 207.3 | 13 41.34 | -10 30.54 | 0.9957 | 8.83 | 16 3.80  | 25.87        | 5.44        | 299.80 |   |        |                     |                     |
| 22 | 2    | 0  | 33.80 | 208.3 | 13 45.12 | -10 51.90 | 0.9954 | 8.83 | 16 4.06  | 25.79        | 5.36        | 286.61 |   |        |                     |                     |
| 23 | 2    | 4  | 30.36 | 209.3 | 13 48.91 | -11 13.10 | 0.9951 | 8.84 | 16 4.33  | 25.70        | 5.27        | 273.43 |   |        |                     |                     |
| 24 | 2    | 8  | 26.91 | 210.3 | 13 52.71 | -11 34.14 | 0.9949 | 8.84 | 16 4.59  | 25.60        | 5.19        | 260.24 |   |        |                     |                     |
| 25 | 2    | 12 | 23.47 | 211.3 | 13 56.52 | -11 55.00 | 0.9946 | 8.84 | 16 4.85  | 25.49        | 5.10        | 247.05 |   |        |                     |                     |
| 26 | 2    | 16 | 20.02 | 212.3 | 14 0.35  | -12 15.68 | 0.9943 | 8.84 | 16 5.11  | 25.38        | 5.01        | 233.86 |   |        |                     |                     |
| 27 | 2    | 20 | 16.58 | 213.3 | 14 4.19  | -12 36.17 | 0.9941 | 8.85 | 16 5.37  | 25.26        | 4.92        | 220.67 |   |        |                     |                     |
| 28 | 2    | 24 | 13.14 | 214.3 | 14 8.04  | -12 56.48 | 0.9938 | 8.85 | 16 5.63  | 25.13        | 4.82        | 207.49 |   |        |                     |                     |
| 29 | 2    | 28 | 9.69  | 215.3 | 14 11.90 | -13 16.58 | 0.9935 | 8.85 | 16 5.89  | 25.00        | 4.73        | 194.30 |   |        |                     |                     |
| 30 | 2    | 32 | 6.25  | 216.3 | 14 15.78 | -13 36.47 | 0.9932 | 8.85 | 16 6.15  | 24.85        | 4.63        | 181.11 |   |        |                     |                     |
| 31 | 2    | 36 | 2.80  | 217.3 | 14 19.67 | -13 56.15 | 0.9930 | 8.86 | 16 6.41  | 24.70        | 4.53        | 167.93 |   |        |                     |                     |



## 臺北市 日出、日沒、曙光始、暮光終 時間表

十 月

東經：121°31' 5" ，北緯：25°5' 44"

本表採用東經 120°平太陽時

| 日<br>期 | 天 文<br>曙光始<br>h m | 航 海<br>曙光始<br>h m | 民 用<br>曙光始<br>h m | 日 出<br>時 間 方 位<br>h m ° | 中 天<br>時 間 仰 角<br>h m ° | 日 沒<br>時 間 方 位<br>h m ° | 民 用<br>暮光終<br>h m | 航 海<br>暮光終<br>h m | 天 文<br>暮光終<br>h m |
|--------|-------------------|-------------------|-------------------|-------------------------|-------------------------|-------------------------|-------------------|-------------------|-------------------|
| 1      | 04:30             | 04:56             | 05:23             | 05:46 93                | 11:44 62S               | 17:41 267               | 18:04             | 18:31             | 18:57             |
| 2      | 04:30             | 04:57             | 05:23             | 05:46 93                | 11:43 61S               | 17:40 266               | 18:03             | 18:30             | 18:56             |
| 3      | 04:31             | 04:57             | 05:24             | 05:47 94                | 11:43 61S               | 17:39 266               | 18:02             | 18:29             | 18:55             |
| 4      | 04:31             | 04:58             | 05:24             | 05:47 94                | 11:43 61S               | 17:38 266               | 18:01             | 18:28             | 18:54             |
| 5      | 04:31             | 04:58             | 05:24             | 05:47 95                | 11:42 60S               | 17:37 265               | 18:00             | 18:27             | 18:53             |
| 6      | 04:32             | 04:58             | 05:25             | 05:48 95                | 11:42 60S               | 17:36 265               | 17:59             | 18:26             | 18:52             |
| 7      | 04:32             | 04:59             | 05:25             | 05:48 95                | 11:42 60S               | 17:35 264               | 17:58             | 18:25             | 18:51             |
| 8      | 04:33             | 04:59             | 05:26             | 05:49 96                | 11:42 59S               | 17:34 264               | 17:57             | 18:24             | 18:50             |
| 9      | 04:33             | 05:00             | 05:26             | 05:49 96                | 11:41 59S               | 17:33 264               | 17:56             | 18:23             | 18:49             |
| 10     | 04:33             | 05:00             | 05:27             | 05:49 97                | 11:41 58S               | 17:32 263               | 17:55             | 18:22             | 18:48             |
| 11     | 04:34             | 05:00             | 05:27             | 05:50 97                | 11:41 58S               | 17:31 263               | 17:54             | 18:21             | 18:47             |
| 12     | 04:34             | 05:01             | 05:27             | 05:50 98                | 11:41 58S               | 17:30 262               | 17:53             | 18:20             | 18:46             |
| 13     | 04:35             | 05:01             | 05:28             | 05:51 98                | 11:40 57S               | 17:29 262               | 17:52             | 18:19             | 18:45             |
| 14     | 04:35             | 05:02             | 05:28             | 05:51 98                | 11:40 57S               | 17:28 261               | 17:51             | 18:18             | 18:44             |
| 15     | 04:36             | 05:02             | 05:29             | 05:52 99                | 11:40 57S               | 17:27 261               | 17:51             | 18:17             | 18:44             |
| 16     | 04:36             | 05:03             | 05:29             | 05:52 99                | 11:40 56S               | 17:27 261               | 17:50             | 18:16             | 18:43             |
| 17     | 04:36             | 05:03             | 05:30             | 05:53 100               | 11:39 56S               | 17:26 260               | 17:49             | 18:15             | 18:42             |
| 18     | 04:37             | 05:03             | 05:30             | 05:53 100               | 11:39 55S               | 17:25 260               | 17:48             | 18:14             | 18:41             |
| 19     | 04:37             | 05:04             | 05:31             | 05:54 100               | 11:39 55S               | 17:24 259               | 17:47             | 18:14             | 18:40             |
| 20     | 04:38             | 05:04             | 05:31             | 05:54 101               | 11:39 55S               | 17:23 259               | 17:46             | 18:13             | 18:39             |
| 21     | 04:38             | 05:05             | 05:32             | 05:55 101               | 11:39 54S               | 17:22 259               | 17:45             | 18:12             | 18:39             |
| 22     | 04:39             | 05:05             | 05:32             | 05:55 102               | 11:38 54S               | 17:21 258               | 17:44             | 18:11             | 18:38             |
| 23     | 04:39             | 05:06             | 05:33             | 05:56 102               | 11:38 54S               | 17:20 258               | 17:44             | 18:10             | 18:37             |
| 24     | 04:40             | 05:06             | 05:33             | 05:56 102               | 11:38 53S               | 17:20 257               | 17:43             | 18:10             | 18:36             |
| 25     | 04:40             | 05:07             | 05:34             | 05:57 103               | 11:38 53S               | 17:19 257               | 17:42             | 18:09             | 18:36             |
| 26     | 04:41             | 05:07             | 05:34             | 05:57 103               | 11:38 53S               | 17:18 257               | 17:41             | 18:08             | 18:35             |
| 27     | 04:41             | 05:08             | 05:35             | 05:58 104               | 11:38 52S               | 17:17 256               | 17:41             | 18:08             | 18:34             |
| 28     | 04:42             | 05:08             | 05:35             | 05:59 104               | 11:38 52S               | 17:17 256               | 17:40             | 18:07             | 18:34             |
| 29     | 04:42             | 05:09             | 05:36             | 05:59 104               | 11:38 52S               | 17:16 256               | 17:39             | 18:06             | 18:33             |
| 30     | 04:43             | 05:09             | 05:36             | 06:00 105               | 11:38 51S               | 17:15 255               | 17:39             | 18:06             | 18:32             |
| 31     | 04:43             | 05:10             | 05:37             | 06:00 105               | 11:38 51S               | 17:14 255               | 17:38             | 18:05             | 18:32             |

# 太陽位置與日面座標

## 十 一 月

本表採用世界時 0 時

| 日期 | GMST |    |       | 視黃經   | 視赤經 |       | 視赤緯 |       | 距離     | 視差   | 視半徑 |       | P     | B <sub>0</sub> | L <sub>0</sub> |
|----|------|----|-------|-------|-----|-------|-----|-------|--------|------|-----|-------|-------|----------------|----------------|
|    | h    | m  | s     | °     | h   | m     | °   | '     | ( AU ) | "    | '   | "     | °     | °              | °              |
| 1  | 2    | 39 | 59.36 | 218.3 | 14  | 23.57 | -14 | 15.60 | 0.9927 | 8.86 | 16  | 6.67  | 24.54 | 4.43           | 154.74         |
| 2  | 2    | 43 | 55.91 | 219.3 | 14  | 27.48 | -14 | 34.83 | 0.9924 | 8.86 | 16  | 6.93  | 24.37 | 4.33           | 141.55         |
| 3  | 2    | 47 | 52.47 | 220.3 | 14  | 31.41 | -14 | 53.81 | 0.9922 | 8.86 | 16  | 7.19  | 24.20 | 4.23           | 128.37         |
| 4  | 2    | 51 | 49.02 | 221.3 | 14  | 35.35 | -15 | 12.56 | 0.9919 | 8.87 | 16  | 7.44  | 24.02 | 4.13           | 115.18         |
| 5  | 2    | 55 | 45.58 | 222.3 | 14  | 39.31 | -15 | 31.05 | 0.9917 | 8.87 | 16  | 7.70  | 23.83 | 4.02           | 102.00         |
| 6  | 2    | 59 | 42.13 | 223.3 | 14  | 43.28 | -15 | 49.29 | 0.9914 | 8.87 | 16  | 7.95  | 23.63 | 3.92           | 88.81          |
| 7  | 3    | 3  | 38.69 | 224.3 | 14  | 47.26 | -16 | 7.27  | 0.9912 | 8.87 | 16  | 8.20  | 23.42 | 3.81           | 75.63          |
| 8  | 3    | 7  | 35.24 | 225.3 | 14  | 51.25 | -16 | 24.97 | 0.9909 | 8.87 | 16  | 8.44  | 23.21 | 3.70           | 62.44          |
| 9  | 3    | 11 | 31.80 | 226.3 | 14  | 55.26 | -16 | 42.40 | 0.9907 | 8.88 | 16  | 8.68  | 22.98 | 3.59           | 49.26          |
| 10 | 3    | 15 | 28.36 | 227.3 | 14  | 59.28 | -16 | 59.54 | 0.9904 | 8.88 | 16  | 8.92  | 22.75 | 3.48           | 36.07          |
| 11 | 3    | 19 | 24.91 | 228.3 | 15  | 3.32  | -17 | 16.39 | 0.9902 | 8.88 | 16  | 9.16  | 22.52 | 3.37           | 22.89          |
| 12 | 3    | 23 | 21.47 | 229.3 | 15  | 7.37  | -17 | 32.95 | 0.9899 | 8.88 | 16  | 9.39  | 22.27 | 3.25           | 9.70           |
| 13 | 3    | 27 | 18.02 | 230.3 | 15  | 11.44 | -17 | 49.20 | 0.9897 | 8.89 | 16  | 9.62  | 22.02 | 3.14           | 356.52         |
| 14 | 3    | 31 | 14.58 | 231.3 | 15  | 15.52 | -18 | 5.15  | 0.9895 | 8.89 | 16  | 9.84  | 21.76 | 3.03           | 343.34         |
| 15 | 3    | 35 | 11.13 | 232.3 | 15  | 19.61 | -18 | 20.78 | 0.9893 | 8.89 | 16  | 10.06 | 21.49 | 2.91           | 330.15         |
| 16 | 3    | 39 | 7.69  | 233.3 | 15  | 23.72 | -18 | 36.09 | 0.9890 | 8.89 | 16  | 10.27 | 21.21 | 2.79           | 316.97         |
| 17 | 3    | 43 | 4.24  | 234.3 | 15  | 27.84 | -18 | 51.07 | 0.9888 | 8.89 | 16  | 10.48 | 20.93 | 2.67           | 303.79         |
| 18 | 3    | 46 | 60.80 | 235.3 | 15  | 31.98 | -19 | 5.72  | 0.9886 | 8.90 | 16  | 10.69 | 20.64 | 2.56           | 290.60         |
| 19 | 3    | 50 | 57.35 | 236.3 | 15  | 36.13 | -19 | 20.03 | 0.9884 | 8.90 | 16  | 10.89 | 20.34 | 2.44           | 277.42         |
| 20 | 3    | 54 | 53.91 | 237.3 | 15  | 40.29 | -19 | 33.99 | 0.9882 | 8.90 | 16  | 11.09 | 20.04 | 2.32           | 264.24         |
| 21 | 3    | 58 | 50.46 | 238.4 | 15  | 44.47 | -19 | 47.60 | 0.9880 | 8.90 | 16  | 11.28 | 19.73 | 2.19           | 251.06         |
| 22 | 4    | 2  | 47.02 | 239.4 | 15  | 48.66 | -20 | 0.85  | 0.9878 | 8.90 | 16  | 11.48 | 19.41 | 2.07           | 237.88         |
| 23 | 4    | 6  | 43.57 | 240.4 | 15  | 52.87 | -20 | 13.74 | 0.9876 | 8.90 | 16  | 11.66 | 19.08 | 1.95           | 224.70         |
| 24 | 4    | 10 | 40.13 | 241.4 | 15  | 57.09 | -20 | 26.26 | 0.9874 | 8.91 | 16  | 11.85 | 18.75 | 1.83           | 211.52         |
| 25 | 4    | 14 | 36.69 | 242.4 | 16  | 1.32  | -20 | 38.40 | 0.9872 | 8.91 | 16  | 12.04 | 18.41 | 1.70           | 198.33         |
| 26 | 4    | 18 | 33.24 | 243.4 | 16  | 5.56  | -20 | 50.16 | 0.9871 | 8.91 | 16  | 12.22 | 18.06 | 1.58           | 185.15         |
| 27 | 4    | 22 | 29.80 | 244.4 | 16  | 9.82  | -21 | 1.53  | 0.9869 | 8.91 | 16  | 12.40 | 17.70 | 1.45           | 171.98         |
| 28 | 4    | 26 | 26.35 | 245.4 | 16  | 14.09 | -21 | 12.50 | 0.9867 | 8.91 | 16  | 12.58 | 17.34 | 1.33           | 158.80         |
| 29 | 4    | 30 | 22.91 | 246.5 | 16  | 18.38 | -21 | 23.08 | 0.9865 | 8.91 | 16  | 12.75 | 16.98 | 1.20           | 145.62         |
| 30 | 4    | 34 | 19.46 | 247.5 | 16  | 22.67 | -21 | 33.25 | 0.9863 | 8.92 | 16  | 12.92 | 16.61 | 1.08           | 132.44         |

## 臺北市 日出、日沒、曙光始、暮光終 時間表

十 一 月

東經：121°31' 5" ，北緯：25°5' 44"

本表採用東經 120°平太陽時

| 日<br>期 | 天 文<br>曙光始<br>h m | 航 海<br>曙光始<br>h m | 民 用<br>曙光始<br>h m | 日 出<br>時間 方位<br>h m ° | 中 天<br>時間 仰角<br>h m ° | 日 沒<br>時間 方位<br>h m ° | 民 用<br>暮光終<br>h m | 航 海<br>暮光終<br>h m | 天 文<br>暮光終<br>h m |
|--------|-------------------|-------------------|-------------------|-----------------------|-----------------------|-----------------------|-------------------|-------------------|-------------------|
| 1      | 04:44             | 05:10             | 05:37             | 06:01 105             | 11:37 51S             | 17:14 254             | 17:37             | 18:04             | 18:31             |
| 2      | 04:44             | 05:11             | 05:38             | 06:02 106             | 11:37 50S             | 17:13 254             | 17:37             | 18:04             | 18:31             |
| 3      | 04:45             | 05:11             | 05:39             | 06:02 106             | 11:37 50S             | 17:12 254             | 17:36             | 18:03             | 18:30             |
| 4      | 04:45             | 05:12             | 05:39             | 06:03 106             | 11:37 50S             | 17:12 253             | 17:35             | 18:03             | 18:30             |
| 5      | 04:46             | 05:13             | 05:40             | 06:03 107             | 11:37 49S             | 17:11 253             | 17:35             | 18:02             | 18:29             |
| 6      | 04:46             | 05:13             | 05:40             | 06:04 107             | 11:37 49S             | 17:11 253             | 17:34             | 18:02             | 18:29             |
| 7      | 04:47             | 05:14             | 05:41             | 06:05 107             | 11:38 49S             | 17:10 252             | 17:34             | 18:01             | 18:28             |
| 8      | 04:47             | 05:14             | 05:42             | 06:05 108             | 11:38 48S             | 17:10 252             | 17:33             | 18:01             | 18:28             |
| 9      | 04:48             | 05:15             | 05:42             | 06:06 108             | 11:38 48S             | 17:09 252             | 17:33             | 18:00             | 18:27             |
| 10     | 04:48             | 05:15             | 05:43             | 06:07 108             | 11:38 48S             | 17:09 251             | 17:32             | 18:00             | 18:27             |
| 11     | 04:49             | 05:16             | 05:43             | 06:07 109             | 11:38 48S             | 17:08 251             | 17:32             | 17:59             | 18:27             |
| 12     | 04:49             | 05:17             | 05:44             | 06:08 109             | 11:38 47S             | 17:08 251             | 17:32             | 17:59             | 18:26             |
| 13     | 04:50             | 05:17             | 05:45             | 06:09 109             | 11:38 47S             | 17:07 251             | 17:31             | 17:59             | 18:26             |
| 14     | 04:51             | 05:18             | 05:45             | 06:09 110             | 11:38 47S             | 17:07 250             | 17:31             | 17:58             | 18:26             |
| 15     | 04:51             | 05:18             | 05:46             | 06:10 110             | 11:38 47S             | 17:06 250             | 17:30             | 17:58             | 18:25             |
| 16     | 04:52             | 05:19             | 05:47             | 06:11 110             | 11:39 46S             | 17:06 250             | 17:30             | 17:58             | 18:25             |
| 17     | 04:52             | 05:20             | 05:47             | 06:11 110             | 11:39 46S             | 17:06 249             | 17:30             | 17:58             | 18:25             |
| 18     | 04:53             | 05:20             | 05:48             | 06:12 111             | 11:39 46S             | 17:05 249             | 17:30             | 17:57             | 18:25             |
| 19     | 04:53             | 05:21             | 05:49             | 06:13 111             | 11:39 46S             | 17:05 249             | 17:29             | 17:57             | 18:25             |
| 20     | 04:54             | 05:22             | 05:49             | 06:14 111             | 11:39 45S             | 17:05 249             | 17:29             | 17:57             | 18:24             |
| 21     | 04:55             | 05:22             | 05:50             | 06:14 112             | 11:40 45S             | 17:05 248             | 17:29             | 17:57             | 18:24             |
| 22     | 04:55             | 05:23             | 05:51             | 06:15 112             | 11:40 45S             | 17:04 248             | 17:29             | 17:57             | 18:24             |
| 23     | 04:56             | 05:23             | 05:51             | 06:16 112             | 11:40 45S             | 17:04 248             | 17:29             | 17:57             | 18:24             |
| 24     | 04:57             | 05:24             | 05:52             | 06:16 112             | 11:40 44S             | 17:04 248             | 17:29             | 17:56             | 18:24             |
| 25     | 04:57             | 05:25             | 05:53             | 06:17 112             | 11:41 44S             | 17:04 247             | 17:28             | 17:56             | 18:24             |
| 26     | 04:58             | 05:25             | 05:53             | 06:18 113             | 11:41 44S             | 17:04 247             | 17:28             | 17:56             | 18:24             |
| 27     | 04:58             | 05:26             | 05:54             | 06:19 113             | 11:41 44S             | 17:04 247             | 17:28             | 17:56             | 18:24             |
| 28     | 04:59             | 05:27             | 05:55             | 06:19 113             | 11:42 44S             | 17:04 247             | 17:28             | 17:56             | 18:24             |
| 29     | 05:00             | 05:27             | 05:55             | 06:20 113             | 11:42 44S             | 17:04 247             | 17:28             | 17:56             | 18:24             |
| 30     | 05:00             | 05:28             | 05:56             | 06:21 113             | 11:42 43S             | 17:04 246             | 17:28             | 17:56             | 18:24             |

# 太陽位置與日面座標

## 十二月

本表採用世界時 0 時

| 日期 | GMST |    |       | 視黃經   | 視赤經 |       | 視赤緯 |       | 距離     | 視差   | 視半徑 |       | P     | B <sub>0</sub> | L <sub>0</sub> |
|----|------|----|-------|-------|-----|-------|-----|-------|--------|------|-----|-------|-------|----------------|----------------|
|    | h    | m  | s     | °     | h   | m     | °   | '     | ( AU ) | "    | '   | "     | °     | °              | °              |
| 1  | 4    | 38 | 16.02 | 248.5 | 16  | 26.97 | -21 | 43.01 | 0.9862 | 8.92 | 16  | 13.09 | 16.23 | 0.95           | 119.26         |
| 2  | 4    | 42 | 12.57 | 249.5 | 16  | 31.29 | -21 | 52.36 | 0.9860 | 8.92 | 16  | 13.26 | 15.84 | 0.82           | 106.08         |
| 3  | 4    | 46 | 9.13  | 250.5 | 16  | 35.61 | -22 | 1.28  | 0.9858 | 8.92 | 16  | 13.42 | 15.45 | 0.70           | 92.90          |
| 4  | 4    | 50 | 5.68  | 251.5 | 16  | 39.95 | -22 | 9.78  | 0.9857 | 8.92 | 16  | 13.58 | 15.05 | 0.57           | 79.72          |
| 5  | 4    | 54 | 2.24  | 252.5 | 16  | 44.29 | -22 | 17.85 | 0.9855 | 8.92 | 16  | 13.73 | 14.65 | 0.44           | 66.55          |
| 6  | 4    | 57 | 58.79 | 253.5 | 16  | 48.65 | -22 | 25.49 | 0.9854 | 8.92 | 16  | 13.88 | 14.24 | 0.31           | 53.37          |
| 7  | 5    | 1  | 55.35 | 254.6 | 16  | 53.01 | -22 | 32.69 | 0.9852 | 8.93 | 16  | 14.02 | 13.83 | 0.18           | 40.19          |
| 8  | 5    | 5  | 51.91 | 255.6 | 16  | 57.38 | -22 | 39.45 | 0.9851 | 8.93 | 16  | 14.16 | 13.41 | 0.06           | 27.01          |
| 9  | 5    | 9  | 48.46 | 256.6 | 17  | 1.76  | -22 | 45.76 | 0.9849 | 8.93 | 16  | 14.30 | 12.99 | -0.07          | 13.84          |
| 10 | 5    | 13 | 45.02 | 257.6 | 17  | 6.15  | -22 | 51.63 | 0.9848 | 8.93 | 16  | 14.43 | 12.56 | -0.20          | 0.66           |
| 11 | 5    | 17 | 41.57 | 258.6 | 17  | 10.54 | -22 | 57.04 | 0.9847 | 8.93 | 16  | 14.55 | 12.13 | -0.33          | 347.48         |
| 12 | 5    | 21 | 38.13 | 259.6 | 17  | 14.94 | -23 | 2.01  | 0.9846 | 8.93 | 16  | 14.67 | 11.69 | -0.46          | 334.31         |
| 13 | 5    | 25 | 34.68 | 260.7 | 17  | 19.35 | -23 | 6.51  | 0.9845 | 8.93 | 16  | 14.78 | 11.25 | -0.58          | 321.13         |
| 14 | 5    | 29 | 31.24 | 261.7 | 17  | 23.76 | -23 | 10.56 | 0.9844 | 8.93 | 16  | 14.89 | 10.81 | -0.71          | 307.95         |
| 15 | 5    | 33 | 27.79 | 262.7 | 17  | 28.18 | -23 | 14.15 | 0.9843 | 8.93 | 16  | 14.99 | 10.36 | -0.84          | 294.78         |
| 16 | 5    | 37 | 24.35 | 263.7 | 17  | 32.60 | -23 | 17.28 | 0.9842 | 8.94 | 16  | 15.08 | 9.91  | -0.97          | 281.60         |
| 17 | 5    | 41 | 20.90 | 264.7 | 17  | 37.03 | -23 | 19.94 | 0.9841 | 8.94 | 16  | 15.17 | 9.45  | -1.10          | 268.43         |
| 18 | 5    | 45 | 17.46 | 265.7 | 17  | 41.46 | -23 | 22.14 | 0.9840 | 8.94 | 16  | 15.25 | 8.99  | -1.22          | 255.25         |
| 19 | 5    | 49 | 14.01 | 266.8 | 17  | 45.89 | -23 | 23.87 | 0.9839 | 8.94 | 16  | 15.33 | 8.53  | -1.35          | 242.08         |
| 20 | 5    | 53 | 10.57 | 267.8 | 17  | 50.33 | -23 | 25.13 | 0.9838 | 8.94 | 16  | 15.40 | 8.06  | -1.47          | 228.90         |
| 21 | 5    | 57 | 7.13  | 268.8 | 17  | 54.77 | -23 | 25.92 | 0.9838 | 8.94 | 16  | 15.47 | 7.60  | -1.60          | 215.73         |
| 22 | 6    | 1  | 3.68  | 269.8 | 17  | 59.21 | -23 | 26.24 | 0.9837 | 8.94 | 16  | 15.53 | 7.12  | -1.73          | 202.56         |
| 23 | 6    | 4  | 60.24 | 270.8 | 18  | 3.65  | -23 | 26.09 | 0.9836 | 8.94 | 16  | 15.59 | 6.65  | -1.85          | 189.39         |
| 24 | 6    | 8  | 56.79 | 271.9 | 18  | 8.09  | -23 | 25.47 | 0.9836 | 8.94 | 16  | 15.64 | 6.18  | -1.97          | 176.21         |
| 25 | 6    | 12 | 53.35 | 272.9 | 18  | 12.53 | -23 | 24.37 | 0.9835 | 8.94 | 16  | 15.69 | 5.70  | -2.10          | 163.04         |
| 26 | 6    | 16 | 49.90 | 273.9 | 18  | 16.97 | -23 | 22.81 | 0.9835 | 8.94 | 16  | 15.74 | 5.22  | -2.22          | 149.87         |
| 27 | 6    | 20 | 46.46 | 274.9 | 18  | 21.41 | -23 | 20.78 | 0.9834 | 8.94 | 16  | 15.79 | 4.74  | -2.34          | 136.70         |
| 28 | 6    | 24 | 43.01 | 275.9 | 18  | 25.85 | -23 | 18.28 | 0.9834 | 8.94 | 16  | 15.83 | 4.26  | -2.46          | 123.53         |
| 29 | 6    | 28 | 39.57 | 277.0 | 18  | 30.28 | -23 | 15.31 | 0.9834 | 8.94 | 16  | 15.86 | 3.78  | -2.58          | 110.35         |
| 30 | 6    | 32 | 36.12 | 278.0 | 18  | 34.72 | -23 | 11.88 | 0.9833 | 8.94 | 16  | 15.90 | 3.29  | -2.70          | 97.18          |
| 31 | 6    | 36 | 32.68 | 279.0 | 18  | 39.14 | -23 | 7.98  | 0.9833 | 8.94 | 16  | 15.93 | 2.81  | -2.82          | 84.01          |

## 臺北市 日出、日沒、曙光始、暮光終 時間表

十 二 月

東經：121°31' 5" · 北緯：25°5' 44"

本表採用東經 120°平太陽時

| 日<br>期 | 天 文<br>曙光始<br>h m | 航 海<br>曙光始<br>h m | 民 用<br>曙光始<br>h m | 日 出<br>時間 方位<br>h m ° | 中 天<br>時間 仰角<br>h m ° | 日 沒<br>時間 方位<br>h m ° | 民 用<br>暮光終<br>h m | 航 海<br>暮光終<br>h m | 天 文<br>暮光終<br>h m |
|--------|-------------------|-------------------|-------------------|-----------------------|-----------------------|-----------------------|-------------------|-------------------|-------------------|
| 1      | 05:01             | 05:29             | 05:57             | 06:22 114             | 11:43 43S             | 17:04 246             | 17:28             | 17:57             | 18:24             |
| 2      | 05:02             | 05:29             | 05:58             | 06:22 114             | 11:43 43S             | 17:04 246             | 17:28             | 17:57             | 18:25             |
| 3      | 05:02             | 05:30             | 05:58             | 06:23 114             | 11:44 43S             | 17:04 246             | 17:29             | 17:57             | 18:25             |
| 4      | 05:03             | 05:31             | 05:59             | 06:24 114             | 11:44 43S             | 17:04 246             | 17:29             | 17:57             | 18:25             |
| 5      | 05:04             | 05:31             | 06:00             | 06:24 114             | 11:44 43S             | 17:04 246             | 17:29             | 17:57             | 18:25             |
| 6      | 05:04             | 05:32             | 06:00             | 06:25 115             | 11:45 42S             | 17:04 245             | 17:29             | 17:57             | 18:25             |
| 7      | 05:05             | 05:33             | 06:01             | 06:26 115             | 11:45 42S             | 17:04 245             | 17:29             | 17:58             | 18:26             |
| 8      | 05:05             | 05:33             | 06:02             | 06:27 115             | 11:46 42S             | 17:05 245             | 17:29             | 17:58             | 18:26             |
| 9      | 05:06             | 05:34             | 06:02             | 06:27 115             | 11:46 42S             | 17:05 245             | 17:30             | 17:58             | 18:26             |
| 10     | 05:07             | 05:35             | 06:03             | 06:28 115             | 11:47 42S             | 17:05 245             | 17:30             | 17:58             | 18:26             |
| 11     | 05:07             | 05:35             | 06:04             | 06:29 115             | 11:47 42S             | 17:05 245             | 17:30             | 17:59             | 18:27             |
| 12     | 05:08             | 05:36             | 06:04             | 06:29 115             | 11:47 42S             | 17:06 245             | 17:31             | 17:59             | 18:27             |
| 13     | 05:08             | 05:36             | 06:05             | 06:30 115             | 11:48 42S             | 17:06 245             | 17:31             | 17:59             | 18:27             |
| 14     | 05:09             | 05:37             | 06:05             | 06:30 115             | 11:48 42S             | 17:06 245             | 17:31             | 18:00             | 18:28             |
| 15     | 05:09             | 05:38             | 06:06             | 06:31 115             | 11:49 42S             | 17:07 245             | 17:32             | 18:00             | 18:28             |
| 16     | 05:10             | 05:38             | 06:07             | 06:32 115             | 11:49 42S             | 17:07 245             | 17:32             | 18:01             | 18:29             |
| 17     | 05:11             | 05:39             | 06:07             | 06:32 116             | 11:50 42S             | 17:07 244             | 17:32             | 18:01             | 18:29             |
| 18     | 05:11             | 05:39             | 06:08             | 06:33 116             | 11:50 42S             | 17:08 244             | 17:33             | 18:01             | 18:29             |
| 19     | 05:12             | 05:40             | 06:08             | 06:33 116             | 11:51 42S             | 17:08 244             | 17:33             | 18:02             | 18:30             |
| 20     | 05:12             | 05:40             | 06:09             | 06:34 116             | 11:51 42S             | 17:09 244             | 17:34             | 18:02             | 18:30             |
| 21     | 05:13             | 05:41             | 06:09             | 06:34 116             | 11:52 42S             | 17:09 244             | 17:34             | 18:03             | 18:31             |
| 22     | 05:13             | 05:41             | 06:10             | 06:35 116             | 11:52 42S             | 17:10 244             | 17:35             | 18:03             | 18:31             |
| 23     | 05:14             | 05:42             | 06:10             | 06:35 116             | 11:53 42S             | 17:10 244             | 17:35             | 18:04             | 18:32             |
| 24     | 05:14             | 05:42             | 06:11             | 06:36 116             | 11:53 42S             | 17:11 244             | 17:36             | 18:04             | 18:32             |
| 25     | 05:15             | 05:43             | 06:11             | 06:36 116             | 11:54 42S             | 17:11 244             | 17:36             | 18:05             | 18:33             |
| 26     | 05:15             | 05:43             | 06:12             | 06:37 116             | 11:54 42S             | 17:12 244             | 17:37             | 18:05             | 18:33             |
| 27     | 05:16             | 05:44             | 06:12             | 06:37 116             | 11:55 42S             | 17:12 245             | 17:37             | 18:06             | 18:34             |
| 28     | 05:16             | 05:44             | 06:13             | 06:38 115             | 11:55 42S             | 17:13 245             | 17:38             | 18:07             | 18:35             |
| 29     | 05:16             | 05:44             | 06:13             | 06:38 115             | 11:56 42S             | 17:14 245             | 17:39             | 18:07             | 18:35             |
| 30     | 05:17             | 05:45             | 06:13             | 06:38 115             | 11:56 42S             | 17:14 245             | 17:39             | 18:08             | 18:36             |
| 31     | 05:17             | 05:45             | 06:14             | 06:39 115             | 11:57 42S             | 17:15 245             | 17:40             | 18:08             | 18:36             |

基隆、新北  
一月（桃園、新竹）地區日出、日沒時間表

| 日期 | 基隆    |     |       |     | 新北    |     |       |     | 桃園    |     |       |     | 新竹    |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
| 1  | 06:38 | 115 | 17:15 | 245 | 06:39 | 115 | 17:16 | 245 | 06:40 | 115 | 17:17 | 245 | 06:41 | 115 | 17:18 | 245 |
| 2  | 06:38 | 115 | 17:15 | 245 | 06:39 | 115 | 17:17 | 245 | 06:40 | 115 | 17:17 | 245 | 06:41 | 115 | 17:19 | 245 |
| 3  | 06:39 | 115 | 17:16 | 245 | 06:40 | 115 | 17:17 | 245 | 06:40 | 115 | 17:18 | 245 | 06:41 | 115 | 17:20 | 245 |
| 4  | 06:39 | 115 | 17:17 | 245 | 06:40 | 115 | 17:18 | 245 | 06:40 | 115 | 17:19 | 245 | 06:41 | 115 | 17:20 | 245 |
| 5  | 06:39 | 115 | 17:17 | 245 | 06:40 | 115 | 17:19 | 245 | 06:41 | 115 | 17:19 | 245 | 06:42 | 115 | 17:21 | 245 |
| 6  | 06:39 | 115 | 17:18 | 245 | 06:40 | 115 | 17:19 | 245 | 06:41 | 115 | 17:20 | 245 | 06:42 | 115 | 17:22 | 245 |
| 7  | 06:40 | 115 | 17:19 | 246 | 06:40 | 114 | 17:20 | 246 | 06:41 | 114 | 17:21 | 246 | 06:42 | 114 | 17:22 | 246 |
| 8  | 06:40 | 114 | 17:19 | 246 | 06:41 | 114 | 17:21 | 246 | 06:41 | 114 | 17:21 | 246 | 06:42 | 114 | 17:23 | 246 |
| 9  | 06:40 | 114 | 17:20 | 246 | 06:41 | 114 | 17:21 | 246 | 06:41 | 114 | 17:22 | 246 | 06:42 | 114 | 17:24 | 246 |
| 10 | 06:40 | 114 | 17:21 | 246 | 06:41 | 114 | 17:22 | 246 | 06:41 | 114 | 17:23 | 246 | 06:42 | 114 | 17:25 | 246 |
| 11 | 06:40 | 114 | 17:22 | 246 | 06:41 | 114 | 17:23 | 246 | 06:42 | 114 | 17:24 | 246 | 06:43 | 114 | 17:25 | 246 |
| 12 | 06:40 | 114 | 17:22 | 246 | 06:41 | 114 | 17:24 | 246 | 06:42 | 114 | 17:24 | 246 | 06:43 | 114 | 17:26 | 246 |
| 13 | 06:40 | 114 | 17:23 | 247 | 06:41 | 114 | 17:24 | 247 | 06:42 | 114 | 17:25 | 247 | 06:43 | 113 | 17:27 | 247 |
| 14 | 06:40 | 113 | 17:24 | 247 | 06:41 | 113 | 17:25 | 247 | 06:42 | 113 | 17:26 | 247 | 06:43 | 113 | 17:27 | 247 |
| 15 | 06:40 | 113 | 17:25 | 247 | 06:41 | 113 | 17:26 | 247 | 06:42 | 113 | 17:27 | 247 | 06:43 | 113 | 17:28 | 247 |
| 16 | 06:40 | 113 | 17:25 | 247 | 06:41 | 113 | 17:27 | 247 | 06:42 | 113 | 17:27 | 247 | 06:43 | 113 | 17:29 | 247 |
| 17 | 06:40 | 113 | 17:26 | 247 | 06:41 | 113 | 17:27 | 247 | 06:42 | 113 | 17:28 | 247 | 06:43 | 113 | 17:30 | 247 |
| 18 | 06:40 | 113 | 17:27 | 248 | 06:41 | 112 | 17:28 | 248 | 06:41 | 112 | 17:29 | 248 | 06:42 | 112 | 17:30 | 248 |
| 19 | 06:40 | 112 | 17:28 | 248 | 06:41 | 112 | 17:29 | 248 | 06:41 | 112 | 17:30 | 248 | 06:42 | 112 | 17:31 | 248 |
| 20 | 06:40 | 112 | 17:28 | 248 | 06:41 | 112 | 17:30 | 248 | 06:41 | 112 | 17:30 | 248 | 06:42 | 112 | 17:32 | 248 |
| 21 | 06:40 | 112 | 17:29 | 248 | 06:40 | 112 | 17:30 | 248 | 06:41 | 112 | 17:31 | 248 | 06:42 | 112 | 17:33 | 248 |
| 22 | 06:39 | 112 | 17:30 | 249 | 06:40 | 112 | 17:31 | 249 | 06:41 | 112 | 17:32 | 249 | 06:42 | 112 | 17:33 | 249 |
| 23 | 06:39 | 111 | 17:31 | 249 | 06:40 | 111 | 17:32 | 249 | 06:41 | 111 | 17:33 | 249 | 06:42 | 111 | 17:34 | 249 |
| 24 | 06:39 | 111 | 17:31 | 249 | 06:40 | 111 | 17:33 | 249 | 06:40 | 111 | 17:33 | 249 | 06:41 | 111 | 17:35 | 249 |
| 25 | 06:39 | 111 | 17:32 | 249 | 06:40 | 111 | 17:33 | 249 | 06:40 | 111 | 17:34 | 249 | 06:41 | 111 | 17:36 | 249 |
| 26 | 06:38 | 110 | 17:33 | 250 | 06:39 | 110 | 17:34 | 250 | 06:40 | 110 | 17:35 | 250 | 06:41 | 110 | 17:36 | 250 |
| 27 | 06:38 | 110 | 17:34 | 250 | 06:39 | 110 | 17:35 | 250 | 06:40 | 110 | 17:36 | 250 | 06:41 | 110 | 17:37 | 250 |
| 28 | 06:38 | 110 | 17:34 | 250 | 06:39 | 110 | 17:36 | 250 | 06:39 | 110 | 17:36 | 250 | 06:40 | 110 | 17:38 | 250 |
| 29 | 06:37 | 110 | 17:35 | 251 | 06:38 | 110 | 17:36 | 251 | 06:39 | 110 | 17:37 | 251 | 06:40 | 110 | 17:39 | 251 |
| 30 | 06:37 | 109 | 17:36 | 251 | 06:38 | 109 | 17:37 | 251 | 06:38 | 109 | 17:38 | 251 | 06:40 | 109 | 17:39 | 251 |
| 31 | 06:37 | 109 | 17:36 | 251 | 06:37 | 109 | 17:38 | 251 | 06:38 | 109 | 17:38 | 251 | 06:39 | 109 | 17:40 | 251 |

基隆市（中正區） 新北市（板橋區）

桃園市（桃園區） 新竹市（東區）

基隆、新北  
二月（桃園、新竹）地區日出、日沒時間表

| 日期 | 基隆    |     |       |     | 新北    |     |       |     | 桃園    |     |       |     | 新竹    |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
| 1  | 06:36 | 109 | 17:37 | 251 | 06:37 | 109 | 17:38 | 251 | 06:38 | 109 | 17:39 | 251 | 06:39 | 109 | 17:41 | 251 |
| 2  | 06:36 | 108 | 17:38 | 252 | 06:37 | 108 | 17:39 | 252 | 06:37 | 108 | 17:40 | 252 | 06:38 | 108 | 17:41 | 252 |
| 3  | 06:35 | 108 | 17:39 | 252 | 06:36 | 108 | 17:40 | 252 | 06:37 | 108 | 17:41 | 252 | 06:38 | 108 | 17:42 | 252 |
| 4  | 06:35 | 108 | 17:39 | 252 | 06:36 | 108 | 17:41 | 252 | 06:36 | 108 | 17:41 | 252 | 06:37 | 108 | 17:43 | 252 |
| 5  | 06:34 | 107 | 17:40 | 253 | 06:35 | 107 | 17:41 | 253 | 06:36 | 107 | 17:42 | 253 | 06:37 | 107 | 17:44 | 253 |
| 6  | 06:34 | 107 | 17:41 | 253 | 06:35 | 107 | 17:42 | 253 | 06:35 | 107 | 17:43 | 253 | 06:36 | 107 | 17:44 | 253 |
| 7  | 06:33 | 107 | 17:41 | 253 | 06:34 | 107 | 17:43 | 253 | 06:35 | 107 | 17:43 | 253 | 06:36 | 107 | 17:45 | 253 |
| 8  | 06:33 | 106 | 17:42 | 254 | 06:34 | 106 | 17:43 | 254 | 06:34 | 106 | 17:44 | 254 | 06:35 | 106 | 17:46 | 254 |
| 9  | 06:32 | 106 | 17:43 | 254 | 06:33 | 106 | 17:44 | 254 | 06:34 | 106 | 17:45 | 254 | 06:35 | 106 | 17:46 | 254 |
| 10 | 06:31 | 106 | 17:43 | 254 | 06:32 | 106 | 17:45 | 254 | 06:33 | 106 | 17:45 | 254 | 06:34 | 106 | 17:47 | 255 |
| 11 | 06:31 | 105 | 17:44 | 255 | 06:32 | 105 | 17:45 | 255 | 06:32 | 105 | 17:46 | 255 | 06:33 | 105 | 17:48 | 255 |
| 12 | 06:30 | 105 | 17:45 | 255 | 06:31 | 105 | 17:46 | 255 | 06:32 | 105 | 17:47 | 255 | 06:33 | 105 | 17:48 | 255 |
| 13 | 06:29 | 105 | 17:45 | 256 | 06:30 | 105 | 17:47 | 256 | 06:31 | 105 | 17:47 | 256 | 06:32 | 105 | 17:49 | 256 |
| 14 | 06:29 | 104 | 17:46 | 256 | 06:30 | 104 | 17:47 | 256 | 06:30 | 104 | 17:48 | 256 | 06:31 | 104 | 17:50 | 256 |
| 15 | 06:28 | 104 | 17:47 | 256 | 06:29 | 104 | 17:48 | 256 | 06:30 | 104 | 17:49 | 256 | 06:31 | 104 | 17:50 | 256 |
| 16 | 06:27 | 103 | 17:47 | 257 | 06:28 | 103 | 17:49 | 257 | 06:29 | 103 | 17:49 | 257 | 06:30 | 103 | 17:51 | 257 |
| 17 | 06:27 | 103 | 17:48 | 257 | 06:28 | 103 | 17:49 | 257 | 06:28 | 103 | 17:50 | 257 | 06:29 | 103 | 17:51 | 257 |
| 18 | 06:26 | 103 | 17:49 | 257 | 06:27 | 103 | 17:50 | 258 | 06:27 | 103 | 17:50 | 258 | 06:29 | 103 | 17:52 | 258 |
| 19 | 06:25 | 102 | 17:49 | 258 | 06:26 | 102 | 17:50 | 258 | 06:27 | 102 | 17:51 | 258 | 06:28 | 102 | 17:53 | 258 |
| 20 | 06:24 | 102 | 17:50 | 258 | 06:25 | 102 | 17:51 | 258 | 06:26 | 102 | 17:52 | 258 | 06:27 | 102 | 17:53 | 258 |
| 21 | 06:23 | 102 | 17:50 | 259 | 06:24 | 101 | 17:52 | 259 | 06:25 | 101 | 17:52 | 259 | 06:26 | 101 | 17:54 | 259 |
| 22 | 06:23 | 101 | 17:51 | 259 | 06:24 | 101 | 17:52 | 259 | 06:24 | 101 | 17:53 | 259 | 06:25 | 101 | 17:54 | 259 |
| 23 | 06:22 | 101 | 17:51 | 259 | 06:23 | 101 | 17:53 | 259 | 06:23 | 101 | 17:53 | 259 | 06:25 | 101 | 17:55 | 260 |
| 24 | 06:21 | 100 | 17:52 | 260 | 06:22 | 100 | 17:53 | 260 | 06:23 | 100 | 17:54 | 260 | 06:24 | 100 | 17:55 | 260 |
| 25 | 06:20 | 100 | 17:53 | 260 | 06:21 | 100 | 17:54 | 260 | 06:22 | 100 | 17:54 | 260 | 06:23 | 100 | 17:56 | 260 |
| 26 | 06:19 | 99  | 17:53 | 261 | 06:20 | 99  | 17:54 | 261 | 06:21 | 99  | 17:55 | 261 | 06:22 | 99  | 17:56 | 261 |
| 27 | 06:18 | 99  | 17:54 | 261 | 06:19 | 99  | 17:55 | 261 | 06:20 | 99  | 17:56 | 261 | 06:21 | 99  | 17:57 | 261 |
| 28 | 06:17 | 99  | 17:54 | 262 | 06:18 | 99  | 17:55 | 262 | 06:19 | 99  | 17:56 | 262 | 06:20 | 99  | 17:58 | 262 |

基隆、新北  
三月（桃園、新竹）地區日出、日沒時間表

| 日期 | 基隆    |    |       |     | 新北    |    |       |     | 桃園    |    |       |     | 新竹    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 06:17 | 98 | 17:55 | 262 | 06:18 | 98 | 17:56 | 262 | 06:18 | 98 | 17:57 | 262 | 06:19 | 98 | 17:58 | 262 |
| 2  | 06:16 | 98 | 17:55 | 262 | 06:17 | 98 | 17:56 | 262 | 06:17 | 98 | 17:57 | 262 | 06:19 | 98 | 17:59 | 262 |
| 3  | 06:15 | 97 | 17:56 | 263 | 06:16 | 97 | 17:57 | 263 | 06:16 | 97 | 17:58 | 263 | 06:18 | 97 | 17:59 | 263 |
| 4  | 06:14 | 97 | 17:56 | 263 | 06:15 | 97 | 17:57 | 263 | 06:15 | 97 | 17:58 | 263 | 06:17 | 97 | 18:00 | 263 |
| 5  | 06:13 | 97 | 17:57 | 264 | 06:14 | 97 | 17:58 | 264 | 06:15 | 97 | 17:59 | 264 | 06:16 | 97 | 18:00 | 264 |
| 6  | 06:12 | 96 | 17:57 | 264 | 06:13 | 96 | 17:59 | 264 | 06:14 | 96 | 17:59 | 264 | 06:15 | 96 | 18:01 | 264 |
| 7  | 06:11 | 96 | 17:58 | 265 | 06:12 | 96 | 17:59 | 265 | 06:13 | 96 | 18:00 | 265 | 06:14 | 96 | 18:01 | 265 |
| 8  | 06:10 | 95 | 17:58 | 265 | 06:11 | 95 | 17:59 | 265 | 06:12 | 95 | 18:00 | 265 | 06:13 | 95 | 18:02 | 265 |
| 9  | 06:09 | 95 | 17:59 | 265 | 06:10 | 95 | 18:00 | 265 | 06:11 | 95 | 18:01 | 265 | 06:12 | 95 | 18:02 | 265 |
| 10 | 06:08 | 94 | 17:59 | 266 | 06:09 | 94 | 18:00 | 266 | 06:10 | 94 | 18:01 | 266 | 06:11 | 94 | 18:03 | 266 |
| 11 | 06:07 | 94 | 18:00 | 266 | 06:08 | 94 | 18:01 | 266 | 06:09 | 94 | 18:02 | 266 | 06:10 | 94 | 18:03 | 266 |
| 12 | 06:06 | 94 | 18:00 | 267 | 06:07 | 94 | 18:01 | 267 | 06:08 | 94 | 18:02 | 267 | 06:09 | 94 | 18:03 | 267 |
| 13 | 06:05 | 93 | 18:01 | 267 | 06:06 | 93 | 18:02 | 267 | 06:07 | 93 | 18:03 | 267 | 06:08 | 93 | 18:04 | 267 |
| 14 | 06:04 | 93 | 18:01 | 268 | 06:05 | 93 | 18:02 | 268 | 06:06 | 93 | 18:03 | 268 | 06:07 | 93 | 18:04 | 268 |
| 15 | 06:03 | 92 | 18:02 | 268 | 06:04 | 92 | 18:03 | 268 | 06:05 | 92 | 18:03 | 268 | 06:06 | 92 | 18:05 | 268 |
| 16 | 06:02 | 92 | 18:02 | 268 | 06:03 | 92 | 18:03 | 268 | 06:04 | 92 | 18:04 | 268 | 06:05 | 92 | 18:05 | 268 |
| 17 | 06:01 | 91 | 18:03 | 269 | 06:02 | 91 | 18:04 | 269 | 06:03 | 91 | 18:04 | 269 | 06:04 | 91 | 18:06 | 269 |
| 18 | 06:00 | 91 | 18:03 | 269 | 06:01 | 91 | 18:04 | 269 | 06:02 | 91 | 18:05 | 269 | 06:03 | 91 | 18:06 | 269 |
| 19 | 05:59 | 90 | 18:03 | 270 | 06:00 | 90 | 18:05 | 270 | 06:01 | 90 | 18:05 | 270 | 06:02 | 90 | 18:07 | 270 |
| 20 | 05:58 | 90 | 18:04 | 270 | 05:59 | 90 | 18:05 | 270 | 06:00 | 90 | 18:06 | 270 | 06:01 | 90 | 18:07 | 270 |
| 21 | 05:57 | 90 | 18:04 | 271 | 05:58 | 90 | 18:05 | 271 | 05:59 | 90 | 18:06 | 271 | 06:00 | 90 | 18:07 | 271 |
| 22 | 05:56 | 89 | 18:05 | 271 | 05:57 | 89 | 18:06 | 271 | 05:58 | 89 | 18:07 | 271 | 05:59 | 89 | 18:08 | 271 |
| 23 | 05:55 | 89 | 18:05 | 271 | 05:56 | 89 | 18:06 | 271 | 05:57 | 89 | 18:07 | 271 | 05:58 | 89 | 18:08 | 271 |
| 24 | 05:54 | 88 | 18:06 | 272 | 05:55 | 88 | 18:07 | 272 | 05:55 | 88 | 18:07 | 272 | 05:57 | 88 | 18:09 | 272 |
| 25 | 05:53 | 88 | 18:06 | 272 | 05:54 | 88 | 18:07 | 272 | 05:54 | 88 | 18:08 | 272 | 05:56 | 88 | 18:09 | 272 |
| 26 | 05:52 | 87 | 18:07 | 273 | 05:53 | 87 | 18:08 | 273 | 05:53 | 87 | 18:08 | 273 | 05:55 | 87 | 18:10 | 273 |
| 27 | 05:51 | 87 | 18:07 | 273 | 05:52 | 87 | 18:08 | 273 | 05:52 | 87 | 18:09 | 273 | 05:54 | 87 | 18:10 | 273 |
| 28 | 05:50 | 87 | 18:07 | 274 | 05:51 | 87 | 18:09 | 274 | 05:51 | 87 | 18:09 | 274 | 05:53 | 87 | 18:10 | 274 |
| 29 | 05:48 | 86 | 18:08 | 274 | 05:50 | 86 | 18:09 | 274 | 05:50 | 86 | 18:10 | 274 | 05:52 | 86 | 18:11 | 274 |
| 30 | 05:47 | 86 | 18:08 | 275 | 05:49 | 86 | 18:09 | 275 | 05:49 | 86 | 18:10 | 275 | 05:51 | 86 | 18:11 | 274 |
| 31 | 05:46 | 85 | 18:09 | 275 | 05:48 | 85 | 18:10 | 275 | 05:48 | 85 | 18:10 | 275 | 05:50 | 85 | 18:12 | 275 |



基隆、新北  
四月（桃園、新竹）地區日出、日沒時間表

| 日期 | 基隆    |    |       |     | 新北    |    |       |     | 桃園    |    |       |     | 新竹    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 05:45 | 85 | 18:09 | 275 | 05:47 | 85 | 18:10 | 275 | 05:47 | 85 | 18:11 | 275 | 05:49 | 85 | 18:12 | 275 |
| 2  | 05:44 | 84 | 18:10 | 276 | 05:46 | 84 | 18:11 | 276 | 05:46 | 84 | 18:11 | 276 | 05:48 | 84 | 18:13 | 276 |
| 3  | 05:43 | 84 | 18:10 | 276 | 05:45 | 84 | 18:11 | 276 | 05:45 | 84 | 18:12 | 276 | 05:47 | 84 | 18:13 | 276 |
| 4  | 05:42 | 84 | 18:10 | 277 | 05:43 | 84 | 18:12 | 277 | 05:44 | 84 | 18:12 | 277 | 05:46 | 84 | 18:13 | 277 |
| 5  | 05:41 | 83 | 18:11 | 277 | 05:42 | 83 | 18:12 | 277 | 05:43 | 83 | 18:13 | 277 | 05:45 | 83 | 18:14 | 277 |
| 6  | 05:40 | 83 | 18:11 | 277 | 05:41 | 83 | 18:12 | 277 | 05:42 | 83 | 18:13 | 277 | 05:44 | 83 | 18:14 | 277 |
| 7  | 05:39 | 82 | 18:12 | 278 | 05:40 | 82 | 18:13 | 278 | 05:41 | 82 | 18:13 | 278 | 05:43 | 82 | 18:15 | 278 |
| 8  | 05:38 | 82 | 18:12 | 278 | 05:39 | 82 | 18:13 | 278 | 05:40 | 82 | 18:14 | 278 | 05:42 | 82 | 18:15 | 278 |
| 9  | 05:37 | 81 | 18:13 | 279 | 05:38 | 81 | 18:14 | 279 | 05:39 | 81 | 18:14 | 279 | 05:41 | 82 | 18:16 | 279 |
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| 11 | 05:35 | 81 | 18:14 | 280 | 05:37 | 81 | 18:15 | 280 | 05:37 | 81 | 18:15 | 280 | 05:39 | 81 | 18:16 | 280 |
| 12 | 05:34 | 80 | 18:14 | 280 | 05:36 | 80 | 18:15 | 280 | 05:36 | 80 | 18:16 | 280 | 05:38 | 80 | 18:17 | 280 |
| 13 | 05:33 | 80 | 18:14 | 280 | 05:35 | 80 | 18:15 | 280 | 05:35 | 80 | 18:16 | 280 | 05:37 | 80 | 18:17 | 280 |
| 14 | 05:32 | 79 | 18:15 | 281 | 05:34 | 79 | 18:16 | 281 | 05:34 | 79 | 18:17 | 281 | 05:36 | 79 | 18:18 | 281 |
| 15 | 05:31 | 79 | 18:15 | 281 | 05:33 | 79 | 18:16 | 281 | 05:33 | 79 | 18:17 | 281 | 05:35 | 79 | 18:18 | 281 |
| 16 | 05:31 | 79 | 18:16 | 282 | 05:32 | 79 | 18:17 | 282 | 05:32 | 79 | 18:17 | 282 | 05:34 | 79 | 18:19 | 282 |
| 17 | 05:30 | 78 | 18:16 | 282 | 05:31 | 78 | 18:17 | 282 | 05:32 | 78 | 18:18 | 282 | 05:33 | 78 | 18:19 | 282 |
| 18 | 05:29 | 78 | 18:17 | 282 | 05:30 | 78 | 18:18 | 282 | 05:31 | 78 | 18:18 | 282 | 05:32 | 78 | 18:20 | 282 |
| 19 | 05:28 | 77 | 18:17 | 283 | 05:29 | 77 | 18:18 | 283 | 05:30 | 77 | 18:19 | 283 | 05:31 | 78 | 18:20 | 283 |
| 20 | 05:27 | 77 | 18:18 | 283 | 05:28 | 77 | 18:19 | 283 | 05:29 | 77 | 18:19 | 283 | 05:30 | 77 | 18:20 | 283 |
| 21 | 05:26 | 77 | 18:18 | 283 | 05:27 | 77 | 18:19 | 283 | 05:28 | 77 | 18:20 | 283 | 05:29 | 77 | 18:21 | 283 |
| 22 | 05:25 | 76 | 18:19 | 284 | 05:26 | 76 | 18:20 | 284 | 05:27 | 76 | 18:20 | 284 | 05:29 | 76 | 18:21 | 284 |
| 23 | 05:24 | 76 | 18:19 | 284 | 05:25 | 76 | 18:20 | 284 | 05:26 | 76 | 18:21 | 284 | 05:28 | 76 | 18:22 | 284 |
| 24 | 05:23 | 76 | 18:20 | 285 | 05:25 | 76 | 18:21 | 285 | 05:25 | 76 | 18:21 | 285 | 05:27 | 76 | 18:22 | 285 |
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| 26 | 05:22 | 75 | 18:21 | 285 | 05:23 | 75 | 18:21 | 285 | 05:24 | 75 | 18:22 | 285 | 05:25 | 75 | 18:23 | 285 |
| 27 | 05:21 | 75 | 18:21 | 286 | 05:22 | 75 | 18:22 | 286 | 05:23 | 75 | 18:23 | 286 | 05:24 | 75 | 18:24 | 286 |
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| 29 | 05:19 | 74 | 18:22 | 286 | 05:21 | 74 | 18:23 | 286 | 05:21 | 74 | 18:24 | 286 | 05:23 | 74 | 18:25 | 286 |
| 30 | 05:19 | 73 | 18:22 | 287 | 05:20 | 73 | 18:23 | 287 | 05:20 | 73 | 18:24 | 287 | 05:22 | 73 | 18:25 | 287 |

基隆、新北  
五月 ( 桃園、新竹 ) 地區日出、日沒時間表

| 日期 | 基隆    |    |       |     | 新北    |    |       |     | 桃園    |    |       |     | 新竹    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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| 3  | 05:16 | 72 | 18:24 | 288 | 05:18 | 72 | 18:25 | 288 | 05:18 | 72 | 18:26 | 288 | 05:20 | 72 | 18:27 | 288 |
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| 7  | 05:14 | 71 | 18:26 | 289 | 05:15 | 71 | 18:27 | 289 | 05:16 | 71 | 18:28 | 289 | 05:17 | 71 | 18:29 | 289 |
| 8  | 05:13 | 71 | 18:27 | 289 | 05:14 | 71 | 18:27 | 289 | 05:15 | 71 | 18:28 | 289 | 05:17 | 71 | 18:29 | 289 |
| 9  | 05:12 | 71 | 18:27 | 290 | 05:14 | 71 | 18:28 | 290 | 05:14 | 71 | 18:29 | 290 | 05:16 | 71 | 18:30 | 290 |
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| 11 | 05:11 | 70 | 18:28 | 290 | 05:12 | 70 | 18:29 | 290 | 05:13 | 70 | 18:30 | 290 | 05:15 | 70 | 18:31 | 290 |
| 12 | 05:11 | 70 | 18:29 | 291 | 05:12 | 70 | 18:30 | 290 | 05:13 | 70 | 18:30 | 290 | 05:14 | 70 | 18:31 | 290 |
| 13 | 05:10 | 69 | 18:29 | 291 | 05:11 | 69 | 18:30 | 291 | 05:12 | 69 | 18:31 | 291 | 05:14 | 69 | 18:32 | 291 |
| 14 | 05:09 | 69 | 18:30 | 291 | 05:11 | 69 | 18:31 | 291 | 05:11 | 69 | 18:31 | 291 | 05:13 | 69 | 18:32 | 291 |
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| 17 | 05:08 | 68 | 18:31 | 292 | 05:09 | 68 | 18:32 | 292 | 05:10 | 68 | 18:33 | 292 | 05:12 | 68 | 18:34 | 292 |
| 18 | 05:07 | 68 | 18:32 | 292 | 05:09 | 68 | 18:33 | 292 | 05:09 | 68 | 18:33 | 292 | 05:11 | 68 | 18:34 | 292 |
| 19 | 05:07 | 68 | 18:32 | 292 | 05:08 | 68 | 18:33 | 292 | 05:09 | 68 | 18:34 | 292 | 05:11 | 68 | 18:35 | 292 |
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| 21 | 05:06 | 67 | 18:33 | 293 | 05:08 | 67 | 18:34 | 293 | 05:08 | 67 | 18:35 | 293 | 05:10 | 67 | 18:36 | 293 |
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| 23 | 05:05 | 67 | 18:34 | 293 | 05:07 | 67 | 18:35 | 293 | 05:07 | 67 | 18:36 | 293 | 05:09 | 67 | 18:37 | 293 |
| 24 | 05:05 | 67 | 18:35 | 293 | 05:06 | 67 | 18:36 | 293 | 05:07 | 67 | 18:36 | 293 | 05:09 | 67 | 18:37 | 293 |
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| 27 | 05:04 | 66 | 18:36 | 294 | 05:06 | 66 | 18:37 | 294 | 05:06 | 66 | 18:38 | 294 | 05:08 | 66 | 18:39 | 294 |
| 28 | 05:04 | 66 | 18:37 | 294 | 05:05 | 66 | 18:38 | 294 | 05:06 | 66 | 18:38 | 294 | 05:08 | 66 | 18:39 | 294 |
| 29 | 05:04 | 66 | 18:37 | 294 | 05:05 | 66 | 18:38 | 294 | 05:06 | 66 | 18:39 | 294 | 05:07 | 66 | 18:40 | 294 |
| 30 | 05:03 | 65 | 18:38 | 295 | 05:05 | 66 | 18:39 | 295 | 05:06 | 66 | 18:39 | 295 | 05:07 | 66 | 18:40 | 295 |
| 31 | 05:03 | 65 | 18:38 | 295 | 05:05 | 65 | 18:39 | 295 | 05:05 | 65 | 18:40 | 295 | 05:07 | 65 | 18:41 | 295 |

基隆、新北  
六月（桃園、新竹）地區日出、日沒時間表

| 日期 | 基隆    |    |       |     | 新北    |    |       |     | 桃園    |    |       |     | 新竹    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 05:03 | 65 | 18:39 | 295 | 05:04 | 65 | 18:40 | 295 | 05:05 | 65 | 18:40 | 295 | 05:07 | 65 | 18:41 | 295 |
| 2  | 05:03 | 65 | 18:39 | 295 | 05:04 | 65 | 18:40 | 295 | 05:05 | 65 | 18:41 | 295 | 05:07 | 65 | 18:42 | 295 |
| 3  | 05:03 | 65 | 18:40 | 295 | 05:04 | 65 | 18:40 | 295 | 05:05 | 65 | 18:41 | 295 | 05:07 | 65 | 18:42 | 295 |
| 4  | 05:03 | 65 | 18:40 | 295 | 05:04 | 65 | 18:41 | 295 | 05:05 | 65 | 18:41 | 295 | 05:06 | 65 | 18:42 | 295 |
| 5  | 05:03 | 65 | 18:40 | 295 | 05:04 | 65 | 18:41 | 295 | 05:05 | 65 | 18:42 | 295 | 05:06 | 65 | 18:43 | 295 |
| 6  | 05:03 | 64 | 18:41 | 296 | 05:04 | 64 | 18:42 | 296 | 05:05 | 65 | 18:42 | 296 | 05:06 | 65 | 18:43 | 296 |
| 7  | 05:02 | 64 | 18:41 | 296 | 05:04 | 64 | 18:42 | 296 | 05:05 | 64 | 18:43 | 296 | 05:06 | 64 | 18:44 | 296 |
| 8  | 05:02 | 64 | 18:42 | 296 | 05:04 | 64 | 18:43 | 296 | 05:05 | 64 | 18:43 | 296 | 05:06 | 64 | 18:44 | 296 |
| 9  | 05:02 | 64 | 18:42 | 296 | 05:04 | 64 | 18:43 | 296 | 05:04 | 64 | 18:44 | 296 | 05:06 | 64 | 18:44 | 296 |
| 10 | 05:02 | 64 | 18:42 | 296 | 05:04 | 64 | 18:43 | 296 | 05:04 | 64 | 18:44 | 296 | 05:06 | 64 | 18:45 | 296 |
| 11 | 05:02 | 64 | 18:43 | 296 | 05:04 | 64 | 18:44 | 296 | 05:05 | 64 | 18:44 | 296 | 05:06 | 64 | 18:45 | 296 |
| 12 | 05:02 | 64 | 18:43 | 296 | 05:04 | 64 | 18:44 | 296 | 05:05 | 64 | 18:45 | 296 | 05:06 | 64 | 18:46 | 296 |
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| 20 | 05:03 | 64 | 18:46 | 296 | 05:05 | 64 | 18:46 | 296 | 05:06 | 64 | 18:47 | 296 | 05:07 | 64 | 18:48 | 296 |
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| 22 | 05:04 | 64 | 18:46 | 296 | 05:05 | 64 | 18:47 | 296 | 05:06 | 64 | 18:47 | 296 | 05:08 | 64 | 18:48 | 296 |
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基隆、新北  
七月（桃園、新竹）地區日出、日沒時間表

| 日期 | 基隆    |    |       |     | 新北    |    |       |     | 桃園    |    |       |     | 新竹    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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| 2  | 05:07 | 64 | 18:47 | 296 | 05:08 | 64 | 18:48 | 296 | 05:09 | 64 | 18:49 | 296 | 05:11 | 64 | 18:50 | 296 |
| 3  | 05:07 | 64 | 18:47 | 296 | 05:08 | 64 | 18:48 | 296 | 05:09 | 64 | 18:49 | 296 | 05:11 | 64 | 18:50 | 296 |
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| 31 | 05:20 | 69 | 18:39 | 291 | 05:21 | 69 | 18:40 | 291 | 05:22 | 69 | 18:41 | 291 | 05:23 | 69 | 18:42 | 291 |

基隆、新北  
八月（桃園、新竹）地區日出、日沒時間表

| 日期 | 基隆    |    |       |     | 新北    |    |       |     | 桃園    |    |       |     | 新竹    |    |       |     |
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| 8  | 05:23 | 72 | 18:34 | 288 | 05:25 | 72 | 18:35 | 288 | 05:25 | 72 | 18:35 | 288 | 05:27 | 72 | 18:36 | 288 |
| 9  | 05:24 | 72 | 18:33 | 288 | 05:25 | 72 | 18:34 | 288 | 05:26 | 72 | 18:35 | 288 | 05:27 | 72 | 18:36 | 288 |
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| 16 | 05:27 | 74 | 18:28 | 286 | 05:28 | 74 | 18:29 | 286 | 05:29 | 74 | 18:29 | 286 | 05:30 | 74 | 18:30 | 286 |
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| 19 | 05:28 | 75 | 18:25 | 285 | 05:30 | 75 | 18:26 | 285 | 05:30 | 75 | 18:27 | 285 | 05:32 | 75 | 18:28 | 285 |
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| 23 | 05:30 | 77 | 18:21 | 283 | 05:31 | 77 | 18:22 | 283 | 05:32 | 77 | 18:23 | 283 | 05:33 | 77 | 18:24 | 283 |
| 24 | 05:30 | 77 | 18:20 | 283 | 05:32 | 77 | 18:21 | 283 | 05:32 | 77 | 18:22 | 283 | 05:34 | 77 | 18:23 | 283 |
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| 27 | 05:32 | 78 | 18:18 | 282 | 05:33 | 78 | 18:19 | 282 | 05:33 | 78 | 18:19 | 282 | 05:35 | 78 | 18:20 | 282 |
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| 31 | 05:33 | 80 | 18:14 | 280 | 05:34 | 80 | 18:15 | 280 | 05:35 | 80 | 18:15 | 280 | 05:36 | 80 | 18:16 | 280 |

基隆、新北  
九月 ( 桃園、新竹 ) 地區日出、日沒時間表

| 日期 | 基隆    |    |       |     | 新北    |    |       |     | 桃園    |    |       |     | 新竹    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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| 6  | 05:35 | 82 | 18:07 | 278 | 05:37 | 82 | 18:08 | 278 | 05:37 | 82 | 18:09 | 278 | 05:39 | 82 | 18:10 | 278 |
| 7  | 05:36 | 83 | 18:06 | 277 | 05:37 | 83 | 18:07 | 277 | 05:38 | 83 | 18:08 | 277 | 05:39 | 83 | 18:09 | 277 |
| 8  | 05:36 | 83 | 18:05 | 277 | 05:37 | 83 | 18:06 | 277 | 05:38 | 83 | 18:07 | 277 | 05:39 | 83 | 18:08 | 277 |
| 9  | 05:37 | 83 | 18:04 | 276 | 05:38 | 83 | 18:05 | 276 | 05:38 | 83 | 18:06 | 276 | 05:40 | 84 | 18:07 | 276 |
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| 11 | 05:37 | 84 | 18:02 | 275 | 05:38 | 84 | 18:03 | 275 | 05:39 | 84 | 18:04 | 275 | 05:41 | 84 | 18:05 | 275 |
| 12 | 05:38 | 85 | 18:01 | 275 | 05:39 | 85 | 18:02 | 275 | 05:39 | 85 | 18:03 | 275 | 05:41 | 85 | 18:04 | 275 |
| 13 | 05:38 | 85 | 18:00 | 275 | 05:39 | 85 | 18:01 | 275 | 05:40 | 85 | 18:02 | 275 | 05:41 | 85 | 18:03 | 275 |
| 14 | 05:38 | 86 | 17:59 | 274 | 05:40 | 86 | 18:00 | 274 | 05:40 | 86 | 18:01 | 274 | 05:42 | 86 | 18:02 | 274 |
| 15 | 05:39 | 86 | 17:58 | 274 | 05:40 | 86 | 17:59 | 274 | 05:41 | 86 | 18:00 | 274 | 05:42 | 86 | 18:01 | 274 |
| 16 | 05:39 | 86 | 17:57 | 273 | 05:40 | 86 | 17:58 | 273 | 05:41 | 86 | 17:58 | 273 | 05:42 | 86 | 18:00 | 273 |
| 17 | 05:39 | 87 | 17:56 | 273 | 05:41 | 87 | 17:57 | 273 | 05:41 | 87 | 17:57 | 273 | 05:43 | 87 | 17:59 | 273 |
| 18 | 05:40 | 87 | 17:55 | 272 | 05:41 | 87 | 17:56 | 272 | 05:42 | 87 | 17:56 | 272 | 05:43 | 87 | 17:58 | 272 |
| 19 | 05:40 | 88 | 17:53 | 272 | 05:41 | 88 | 17:55 | 272 | 05:42 | 88 | 17:55 | 272 | 05:43 | 88 | 17:56 | 272 |
| 20 | 05:41 | 88 | 17:52 | 272 | 05:42 | 88 | 17:53 | 272 | 05:42 | 88 | 17:54 | 272 | 05:44 | 88 | 17:55 | 272 |
| 21 | 05:41 | 89 | 17:51 | 271 | 05:42 | 89 | 17:52 | 271 | 05:43 | 89 | 17:53 | 271 | 05:44 | 89 | 17:54 | 271 |
| 22 | 05:41 | 89 | 17:50 | 271 | 05:42 | 89 | 17:51 | 271 | 05:43 | 89 | 17:52 | 271 | 05:44 | 89 | 17:53 | 271 |
| 23 | 05:42 | 89 | 17:49 | 270 | 05:43 | 89 | 17:50 | 270 | 05:43 | 89 | 17:51 | 270 | 05:45 | 89 | 17:52 | 270 |
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| 25 | 05:42 | 90 | 17:47 | 269 | 05:44 | 90 | 17:48 | 269 | 05:44 | 90 | 17:49 | 269 | 05:46 | 90 | 17:50 | 269 |
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| 30 | 05:44 | 92 | 17:42 | 267 | 05:46 | 92 | 17:43 | 267 | 05:46 | 92 | 17:43 | 267 | 05:47 | 92 | 17:45 | 267 |

基隆、新北  
十月（桃園、新竹）地區日出、日沒時間表

| 日期 | 基隆    |     |       |     | 新北    |     |       |     | 桃園    |     |       |     | 新竹    |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
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| 12 | 05:50 | 98  | 17:29 | 262 | 05:51 | 98  | 17:31 | 262 | 05:51 | 98  | 17:31 | 262 | 05:52 | 98  | 17:33 | 262 |
| 13 | 05:50 | 98  | 17:28 | 262 | 05:51 | 98  | 17:30 | 262 | 05:52 | 98  | 17:30 | 262 | 05:53 | 98  | 17:32 | 262 |
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| 15 | 05:51 | 99  | 17:27 | 261 | 05:52 | 99  | 17:28 | 261 | 05:53 | 99  | 17:28 | 261 | 05:54 | 99  | 17:30 | 261 |
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基隆、新北  
十一月 ( 桃園、新竹 ) 地區日出、日沒時間表

| 日期 | 基隆    |     |       |     | 新北    |     |       |     | 桃園    |     |       |     | 新竹    |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
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| 30 | 06:20 | 114 | 17:03 | 246 | 06:21 | 113 | 17:04 | 246 | 06:22 | 113 | 17:05 | 246 | 06:22 | 113 | 17:06 | 246 |



基隆、新北  
十二月 ( 桃園、新竹 ) 地區日出、日沒時間表

| 日期 | 基隆    |     |       |     | 新北    |     |       |     | 桃園    |     |       |     | 新竹    |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
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|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
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| 15 | 06:30 | 115 | 17:05 | 245 | 06:31 | 115 | 17:07 | 245 | 06:32 | 115 | 17:08 | 245 | 06:33 | 115 | 17:09 | 245 |
| 16 | 06:31 | 115 | 17:06 | 245 | 06:32 | 115 | 17:07 | 245 | 06:32 | 115 | 17:08 | 245 | 06:33 | 115 | 17:10 | 245 |
| 17 | 06:31 | 116 | 17:06 | 244 | 06:32 | 115 | 17:08 | 244 | 06:33 | 115 | 17:08 | 245 | 06:34 | 115 | 17:10 | 245 |
| 18 | 06:32 | 116 | 17:07 | 244 | 06:33 | 116 | 17:08 | 244 | 06:33 | 116 | 17:09 | 244 | 06:34 | 115 | 17:10 | 245 |
| 19 | 06:32 | 116 | 17:07 | 244 | 06:33 | 116 | 17:08 | 244 | 06:34 | 116 | 17:09 | 244 | 06:35 | 116 | 17:11 | 244 |
| 20 | 06:33 | 116 | 17:08 | 244 | 06:34 | 116 | 17:09 | 244 | 06:34 | 116 | 17:10 | 244 | 06:35 | 116 | 17:11 | 244 |
| 21 | 06:33 | 116 | 17:08 | 244 | 06:34 | 116 | 17:09 | 244 | 06:35 | 116 | 17:10 | 244 | 06:36 | 116 | 17:12 | 244 |
| 22 | 06:34 | 116 | 17:09 | 244 | 06:35 | 116 | 17:10 | 244 | 06:35 | 116 | 17:11 | 244 | 06:36 | 116 | 17:12 | 244 |
| 23 | 06:34 | 116 | 17:09 | 244 | 06:35 | 116 | 17:10 | 244 | 06:36 | 116 | 17:11 | 244 | 06:37 | 116 | 17:13 | 244 |
| 24 | 06:35 | 116 | 17:10 | 244 | 06:36 | 116 | 17:11 | 244 | 06:36 | 116 | 17:12 | 244 | 06:37 | 116 | 17:13 | 244 |
| 25 | 06:35 | 116 | 17:10 | 244 | 06:36 | 116 | 17:11 | 244 | 06:37 | 116 | 17:12 | 244 | 06:38 | 116 | 17:14 | 244 |
| 26 | 06:36 | 116 | 17:11 | 244 | 06:37 | 116 | 17:12 | 244 | 06:37 | 116 | 17:13 | 244 | 06:38 | 115 | 17:14 | 245 |
| 27 | 06:36 | 116 | 17:11 | 244 | 06:37 | 116 | 17:13 | 245 | 06:38 | 115 | 17:13 | 245 | 06:39 | 115 | 17:15 | 245 |
| 28 | 06:37 | 115 | 17:12 | 245 | 06:38 | 115 | 17:13 | 245 | 06:38 | 115 | 17:14 | 245 | 06:39 | 115 | 17:16 | 245 |
| 29 | 06:37 | 115 | 17:12 | 245 | 06:38 | 115 | 17:14 | 245 | 06:39 | 115 | 17:15 | 245 | 06:40 | 115 | 17:16 | 245 |
| 30 | 06:37 | 115 | 17:13 | 245 | 06:38 | 115 | 17:14 | 245 | 06:39 | 115 | 17:15 | 245 | 06:40 | 115 | 17:17 | 245 |
| 31 | 06:38 | 115 | 17:14 | 245 | 06:39 | 115 | 17:15 | 245 | 06:39 | 115 | 17:16 | 245 | 06:40 | 115 | 17:17 | 245 |

苗栗、臺中  
一月（彰化、雲林）地區日出、日沒時間表

| 日期 | 苗 栗   |     |       |     | 臺 中   |     |       |     | 彰 化   |     |       |     | 雲 林   |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
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| 5  | 06:42 | 115 | 17:22 | 245 | 06:42 | 115 | 17:24 | 245 | 06:42 | 115 | 17:24 | 245 | 06:42 | 115 | 17:25 | 246 |
| 6  | 06:42 | 115 | 17:23 | 246 | 06:42 | 114 | 17:24 | 246 | 06:42 | 114 | 17:25 | 246 | 06:42 | 114 | 17:25 | 246 |
| 7  | 06:42 | 114 | 17:23 | 246 | 06:42 | 114 | 17:25 | 246 | 06:42 | 114 | 17:26 | 246 | 06:42 | 114 | 17:26 | 246 |
| 8  | 06:42 | 114 | 17:24 | 246 | 06:42 | 114 | 17:26 | 246 | 06:42 | 114 | 17:26 | 246 | 06:42 | 114 | 17:27 | 246 |
| 9  | 06:42 | 114 | 17:25 | 246 | 06:42 | 114 | 17:26 | 246 | 06:43 | 114 | 17:27 | 246 | 06:42 | 114 | 17:27 | 246 |
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| 11 | 06:43 | 114 | 17:26 | 246 | 06:43 | 114 | 17:28 | 246 | 06:43 | 114 | 17:28 | 246 | 06:43 | 114 | 17:29 | 246 |
| 12 | 06:43 | 114 | 17:27 | 246 | 06:43 | 114 | 17:29 | 247 | 06:43 | 114 | 17:29 | 247 | 06:43 | 113 | 17:30 | 247 |
| 13 | 06:43 | 113 | 17:28 | 247 | 06:43 | 113 | 17:29 | 247 | 06:43 | 113 | 17:30 | 247 | 06:43 | 113 | 17:30 | 247 |
| 14 | 06:43 | 113 | 17:29 | 247 | 06:43 | 113 | 17:30 | 247 | 06:43 | 113 | 17:31 | 247 | 06:43 | 113 | 17:31 | 247 |
| 15 | 06:43 | 113 | 17:29 | 247 | 06:43 | 113 | 17:31 | 247 | 06:43 | 113 | 17:31 | 247 | 06:43 | 113 | 17:32 | 247 |
| 16 | 06:43 | 113 | 17:30 | 247 | 06:43 | 113 | 17:31 | 247 | 06:43 | 113 | 17:32 | 247 | 06:43 | 113 | 17:32 | 247 |
| 17 | 06:43 | 113 | 17:31 | 247 | 06:43 | 113 | 17:32 | 248 | 06:43 | 113 | 17:33 | 248 | 06:43 | 113 | 17:33 | 248 |
| 18 | 06:43 | 112 | 17:32 | 248 | 06:43 | 112 | 17:33 | 248 | 06:43 | 112 | 17:33 | 248 | 06:43 | 112 | 17:34 | 248 |
| 19 | 06:42 | 112 | 17:32 | 248 | 06:42 | 112 | 17:34 | 248 | 06:43 | 112 | 17:34 | 248 | 06:42 | 112 | 17:35 | 248 |
| 20 | 06:42 | 112 | 17:33 | 248 | 06:42 | 112 | 17:34 | 248 | 06:43 | 112 | 17:35 | 248 | 06:42 | 112 | 17:35 | 248 |
| 21 | 06:42 | 112 | 17:34 | 248 | 06:42 | 112 | 17:35 | 248 | 06:42 | 112 | 17:36 | 248 | 06:42 | 112 | 17:36 | 249 |
| 22 | 06:42 | 111 | 17:34 | 249 | 06:42 | 111 | 17:36 | 249 | 06:42 | 111 | 17:36 | 249 | 06:42 | 111 | 17:37 | 249 |
| 23 | 06:42 | 111 | 17:35 | 249 | 06:42 | 111 | 17:37 | 249 | 06:42 | 111 | 17:37 | 249 | 06:42 | 111 | 17:38 | 249 |
| 24 | 06:42 | 111 | 17:36 | 249 | 06:42 | 111 | 17:37 | 249 | 06:42 | 111 | 17:38 | 249 | 06:42 | 111 | 17:38 | 249 |
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| 27 | 06:41 | 110 | 17:38 | 250 | 06:41 | 110 | 17:39 | 250 | 06:41 | 110 | 17:40 | 250 | 06:41 | 110 | 17:40 | 250 |
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| 29 | 06:40 | 110 | 17:40 | 251 | 06:40 | 109 | 17:41 | 251 | 06:40 | 109 | 17:41 | 251 | 06:40 | 109 | 17:42 | 251 |
| 30 | 06:40 | 109 | 17:40 | 251 | 06:40 | 109 | 17:42 | 251 | 06:40 | 109 | 17:42 | 251 | 06:40 | 109 | 17:42 | 251 |
| 31 | 06:39 | 109 | 17:41 | 251 | 06:39 | 109 | 17:42 | 251 | 06:40 | 109 | 17:43 | 251 | 06:40 | 109 | 17:43 | 251 |

苗栗縣（苗栗市）臺中市（西屯區）

彰化縣（彰化市）雲林縣（斗六市）

苗栗、臺中  
二月（彰化、雲林）地區日出、日沒時間表

| 日期 | 苗 栗   |     |       |     | 臺 中   |     |       |     | 彰 化   |     |       |     | 雲 林   |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
| 1  | 06:39 | 109 | 17:42 | 252 | 06:39 | 109 | 17:43 | 252 | 06:39 | 109 | 17:44 | 252 | 06:39 | 109 | 17:44 | 252 |
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| 3  | 06:38 | 108 | 17:43 | 252 | 06:38 | 108 | 17:44 | 252 | 06:38 | 108 | 17:45 | 252 | 06:38 | 108 | 17:45 | 252 |
| 4  | 06:38 | 108 | 17:44 | 252 | 06:38 | 108 | 17:45 | 253 | 06:38 | 108 | 17:46 | 253 | 06:38 | 108 | 17:46 | 253 |
| 5  | 06:37 | 107 | 17:45 | 253 | 06:37 | 107 | 17:46 | 253 | 06:38 | 107 | 17:46 | 253 | 06:37 | 107 | 17:47 | 253 |
| 6  | 06:37 | 107 | 17:45 | 253 | 06:37 | 107 | 17:46 | 253 | 06:37 | 107 | 17:47 | 253 | 06:37 | 107 | 17:47 | 253 |
| 7  | 06:36 | 107 | 17:46 | 253 | 06:36 | 107 | 17:47 | 254 | 06:37 | 107 | 17:48 | 254 | 06:36 | 107 | 17:48 | 254 |
| 8  | 06:36 | 106 | 17:47 | 254 | 06:36 | 106 | 17:48 | 254 | 06:36 | 106 | 17:48 | 254 | 06:36 | 106 | 17:49 | 254 |
| 9  | 06:35 | 106 | 17:47 | 254 | 06:35 | 106 | 17:48 | 254 | 06:35 | 106 | 17:49 | 254 | 06:35 | 106 | 17:49 | 254 |
| 10 | 06:34 | 106 | 17:48 | 255 | 06:35 | 106 | 17:49 | 255 | 06:35 | 106 | 17:50 | 255 | 06:35 | 106 | 17:50 | 255 |
| 11 | 06:34 | 105 | 17:48 | 255 | 06:34 | 105 | 17:50 | 255 | 06:34 | 105 | 17:50 | 255 | 06:34 | 105 | 17:50 | 255 |
| 12 | 06:33 | 105 | 17:49 | 255 | 06:33 | 105 | 17:50 | 255 | 06:34 | 105 | 17:51 | 255 | 06:33 | 105 | 17:51 | 255 |
| 13 | 06:32 | 105 | 17:50 | 256 | 06:33 | 104 | 17:51 | 256 | 06:33 | 104 | 17:51 | 256 | 06:33 | 104 | 17:52 | 256 |
| 14 | 06:32 | 104 | 17:50 | 256 | 06:32 | 104 | 17:52 | 256 | 06:32 | 104 | 17:52 | 256 | 06:32 | 104 | 17:52 | 256 |
| 15 | 06:31 | 104 | 17:51 | 256 | 06:31 | 104 | 17:52 | 256 | 06:32 | 104 | 17:53 | 256 | 06:32 | 104 | 17:53 | 256 |
| 16 | 06:30 | 103 | 17:52 | 257 | 06:31 | 103 | 17:53 | 257 | 06:31 | 103 | 17:53 | 257 | 06:31 | 103 | 17:53 | 257 |
| 17 | 06:30 | 103 | 17:52 | 257 | 06:30 | 103 | 17:53 | 257 | 06:30 | 103 | 17:54 | 257 | 06:30 | 103 | 17:54 | 257 |
| 18 | 06:29 | 103 | 17:53 | 258 | 06:29 | 103 | 17:54 | 258 | 06:30 | 103 | 17:54 | 258 | 06:29 | 103 | 17:55 | 258 |
| 19 | 06:28 | 102 | 17:53 | 258 | 06:28 | 102 | 17:54 | 258 | 06:29 | 102 | 17:55 | 258 | 06:29 | 102 | 17:55 | 258 |
| 20 | 06:27 | 102 | 17:54 | 258 | 06:28 | 102 | 17:55 | 258 | 06:28 | 102 | 17:55 | 258 | 06:28 | 102 | 17:56 | 258 |
| 21 | 06:27 | 101 | 17:54 | 259 | 06:27 | 101 | 17:56 | 259 | 06:27 | 101 | 17:56 | 259 | 06:27 | 101 | 17:56 | 259 |
| 22 | 06:26 | 101 | 17:55 | 259 | 06:26 | 101 | 17:56 | 259 | 06:27 | 101 | 17:57 | 259 | 06:26 | 101 | 17:57 | 259 |
| 23 | 06:25 | 101 | 17:56 | 260 | 06:25 | 101 | 17:57 | 260 | 06:26 | 101 | 17:57 | 260 | 06:26 | 101 | 17:57 | 260 |
| 24 | 06:24 | 100 | 17:56 | 260 | 06:25 | 100 | 17:57 | 260 | 06:25 | 100 | 17:58 | 260 | 06:25 | 100 | 17:58 | 260 |
| 25 | 06:23 | 100 | 17:57 | 260 | 06:24 | 100 | 17:58 | 260 | 06:24 | 100 | 17:58 | 260 | 06:24 | 100 | 17:58 | 260 |
| 26 | 06:22 | 99  | 17:57 | 261 | 06:23 | 99  | 17:58 | 261 | 06:23 | 99  | 17:59 | 261 | 06:23 | 99  | 17:59 | 261 |
| 27 | 06:22 | 99  | 17:58 | 261 | 06:22 | 99  | 17:59 | 261 | 06:22 | 99  | 17:59 | 261 | 06:22 | 99  | 17:59 | 261 |
| 28 | 06:21 | 99  | 17:58 | 262 | 06:21 | 99  | 17:59 | 262 | 06:22 | 99  | 18:00 | 262 | 06:22 | 99  | 18:00 | 262 |

苗栗、臺中  
三月（彰化、雲林）地區日出、日沒時間表

| 日期 | 苗 栗   |    |       |     | 臺 中   |    |       |     | 彰 化   |    |       |     | 雲 林   |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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| 2  | 06:19 | 98 | 17:59 | 262 | 06:19 | 98 | 18:00 | 262 | 06:20 | 98 | 18:01 | 262 | 06:20 | 98 | 18:01 | 262 |
| 3  | 06:18 | 97 | 18:00 | 263 | 06:19 | 97 | 18:01 | 263 | 06:19 | 97 | 18:01 | 263 | 06:19 | 97 | 18:01 | 263 |
| 4  | 06:17 | 97 | 18:00 | 263 | 06:18 | 97 | 18:01 | 263 | 06:18 | 97 | 18:02 | 263 | 06:18 | 97 | 18:02 | 263 |
| 5  | 06:16 | 97 | 18:01 | 264 | 06:17 | 97 | 18:02 | 264 | 06:17 | 97 | 18:02 | 264 | 06:17 | 96 | 18:02 | 264 |
| 6  | 06:15 | 96 | 18:01 | 264 | 06:16 | 96 | 18:02 | 264 | 06:16 | 96 | 18:03 | 264 | 06:16 | 96 | 18:03 | 264 |
| 7  | 06:14 | 96 | 18:02 | 265 | 06:15 | 96 | 18:03 | 265 | 06:15 | 96 | 18:03 | 265 | 06:15 | 96 | 18:03 | 265 |
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| 9  | 06:12 | 95 | 18:03 | 265 | 06:13 | 95 | 18:04 | 265 | 06:13 | 95 | 18:04 | 265 | 06:13 | 95 | 18:04 | 265 |
| 10 | 06:11 | 94 | 18:03 | 266 | 06:12 | 94 | 18:04 | 266 | 06:12 | 94 | 18:04 | 266 | 06:12 | 94 | 18:05 | 266 |
| 11 | 06:11 | 94 | 18:04 | 266 | 06:11 | 94 | 18:04 | 266 | 06:11 | 94 | 18:05 | 266 | 06:11 | 94 | 18:05 | 266 |
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| 18 | 06:04 | 91 | 18:07 | 269 | 06:04 | 91 | 18:07 | 269 | 06:05 | 91 | 18:08 | 269 | 06:05 | 91 | 18:08 | 269 |
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| 21 | 06:01 | 90 | 18:08 | 271 | 06:01 | 90 | 18:09 | 271 | 06:02 | 90 | 18:09 | 271 | 06:02 | 90 | 18:09 | 271 |
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| 31 | 05:50 | 85 | 18:12 | 275 | 05:51 | 85 | 18:13 | 275 | 05:52 | 85 | 18:13 | 275 | 05:52 | 85 | 18:13 | 275 |

苗栗、臺中  
四月（彰化、雲林）地區日出、日沒時間表

| 日期 | 苗 栗   |    |       |     | 臺 中   |    |       |     | 彰 化   |    |       |     | 雲 林   |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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| 4  | 05:46 | 84 | 18:14 | 277 | 05:47 | 84 | 18:14 | 277 | 05:48 | 84 | 18:15 | 277 | 05:48 | 84 | 18:15 | 277 |
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| 21 | 05:30 | 77 | 18:21 | 283 | 05:31 | 77 | 18:22 | 283 | 05:32 | 77 | 18:22 | 283 | 05:32 | 77 | 18:22 | 283 |
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苗栗、臺中  
五月 (彰化、雲林) 地區日出、日沒時間表

| 日期 | 苗 栗   |    |       |     | 臺 中   |    |       |     | 彰 化   |    |       |     | 雲 林   |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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苗栗、臺中  
六月（彰化、雲林）地區日出、日沒時間表

| 日期 | 苗 栗   |    |       |     | 臺 中   |    |       |     | 彰 化   |    |       |     | 雲 林   |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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苗栗、臺中  
七月（彰化、雲林）地區日出、日沒時間表

| 日期 | 苗 栗   |    |       |     | 臺 中   |    |       |     | 彰 化   |    |       |     | 雲 林   |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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苗栗、臺中  
八月（彰化、雲林）地區日出、日沒時間表

| 日期 | 苗 栗   |    |       |     | 臺 中   |    |       |     | 彰 化   |    |       |     | 雲 林   |    |       |     |
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| 31 | 05:37 | 80 | 18:17 | 280 | 05:38 | 80 | 18:17 | 280 | 05:39 | 80 | 18:18 | 280 | 05:39 | 80 | 18:17 | 280 |

苗栗、臺中  
九月 (彰化、雲林) 地區日出、日沒時間表

| 日期 | 苗 栗   |    |       |     | 臺 中   |    |       |     | 彰 化   |    |       |     | 雲 林   |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 05:38 | 80 | 18:16 | 280 | 05:39 | 80 | 18:16 | 279 | 05:39 | 80 | 18:17 | 279 | 05:39 | 80 | 18:17 | 279 |
| 2  | 05:38 | 81 | 18:15 | 279 | 05:39 | 81 | 18:15 | 279 | 05:39 | 81 | 18:16 | 279 | 05:40 | 81 | 18:16 | 279 |
| 3  | 05:38 | 81 | 18:14 | 279 | 05:39 | 81 | 18:14 | 279 | 05:40 | 81 | 18:15 | 279 | 05:40 | 81 | 18:15 | 279 |
| 4  | 05:39 | 81 | 18:13 | 278 | 05:40 | 82 | 18:13 | 278 | 05:40 | 82 | 18:14 | 278 | 05:40 | 82 | 18:14 | 278 |
| 5  | 05:39 | 82 | 18:12 | 278 | 05:40 | 82 | 18:12 | 278 | 05:41 | 82 | 18:13 | 278 | 05:41 | 82 | 18:13 | 278 |
| 6  | 05:39 | 82 | 18:11 | 277 | 05:40 | 82 | 18:11 | 277 | 05:41 | 82 | 18:12 | 277 | 05:41 | 82 | 18:12 | 277 |
| 7  | 05:40 | 83 | 18:10 | 277 | 05:41 | 83 | 18:10 | 277 | 05:41 | 83 | 18:11 | 277 | 05:41 | 83 | 18:11 | 277 |
| 8  | 05:40 | 83 | 18:09 | 277 | 05:41 | 83 | 18:09 | 277 | 05:42 | 83 | 18:10 | 277 | 05:42 | 83 | 18:10 | 277 |
| 9  | 05:41 | 84 | 18:08 | 276 | 05:41 | 84 | 18:08 | 276 | 05:42 | 84 | 18:09 | 276 | 05:42 | 84 | 18:08 | 276 |
| 10 | 05:41 | 84 | 18:07 | 276 | 05:42 | 84 | 18:07 | 276 | 05:42 | 84 | 18:07 | 276 | 05:42 | 84 | 18:07 | 276 |
| 11 | 05:41 | 84 | 18:06 | 275 | 05:42 | 84 | 18:06 | 275 | 05:43 | 84 | 18:06 | 275 | 05:43 | 84 | 18:06 | 275 |
| 12 | 05:42 | 85 | 18:04 | 275 | 05:42 | 85 | 18:05 | 275 | 05:43 | 85 | 18:05 | 275 | 05:43 | 85 | 18:05 | 275 |
| 13 | 05:42 | 85 | 18:03 | 275 | 05:43 | 85 | 18:04 | 275 | 05:43 | 85 | 18:04 | 275 | 05:43 | 85 | 18:04 | 275 |
| 14 | 05:42 | 86 | 18:02 | 274 | 05:43 | 86 | 18:03 | 274 | 05:44 | 86 | 18:03 | 274 | 05:44 | 86 | 18:03 | 274 |
| 15 | 05:43 | 86 | 18:01 | 274 | 05:43 | 86 | 18:02 | 274 | 05:44 | 86 | 18:02 | 274 | 05:44 | 86 | 18:02 | 274 |
| 16 | 05:43 | 86 | 18:00 | 273 | 05:44 | 86 | 18:01 | 273 | 05:44 | 86 | 18:01 | 273 | 05:44 | 86 | 18:01 | 273 |
| 17 | 05:43 | 87 | 17:59 | 273 | 05:44 | 87 | 18:00 | 273 | 05:45 | 87 | 18:00 | 273 | 05:45 | 87 | 18:00 | 273 |
| 18 | 05:44 | 87 | 17:58 | 272 | 05:44 | 87 | 17:59 | 272 | 05:45 | 87 | 17:59 | 272 | 05:45 | 87 | 17:59 | 272 |
| 19 | 05:44 | 88 | 17:57 | 272 | 05:45 | 88 | 17:58 | 272 | 05:45 | 88 | 17:58 | 272 | 05:45 | 88 | 17:58 | 272 |
| 20 | 05:44 | 88 | 17:56 | 272 | 05:45 | 88 | 17:57 | 272 | 05:46 | 88 | 17:57 | 272 | 05:46 | 88 | 17:57 | 272 |
| 21 | 05:45 | 89 | 17:55 | 271 | 05:45 | 89 | 17:56 | 271 | 05:46 | 89 | 17:56 | 271 | 05:46 | 89 | 17:56 | 271 |
| 22 | 05:45 | 89 | 17:54 | 271 | 05:46 | 89 | 17:55 | 271 | 05:46 | 89 | 17:55 | 271 | 05:46 | 89 | 17:55 | 271 |
| 23 | 05:45 | 89 | 17:53 | 270 | 05:46 | 89 | 17:53 | 270 | 05:47 | 89 | 17:54 | 270 | 05:47 | 89 | 17:54 | 270 |
| 24 | 05:46 | 90 | 17:52 | 270 | 05:46 | 90 | 17:52 | 270 | 05:47 | 90 | 17:53 | 270 | 05:47 | 90 | 17:53 | 270 |
| 25 | 05:46 | 90 | 17:51 | 269 | 05:47 | 90 | 17:51 | 269 | 05:47 | 90 | 17:52 | 269 | 05:47 | 90 | 17:52 | 269 |
| 26 | 05:47 | 91 | 17:50 | 269 | 05:47 | 91 | 17:50 | 269 | 05:48 | 91 | 17:51 | 269 | 05:48 | 91 | 17:51 | 269 |
| 27 | 05:47 | 91 | 17:49 | 269 | 05:48 | 91 | 17:49 | 269 | 05:48 | 91 | 17:50 | 269 | 05:48 | 91 | 17:50 | 269 |
| 28 | 05:47 | 92 | 17:48 | 268 | 05:48 | 92 | 17:48 | 268 | 05:48 | 92 | 17:49 | 268 | 05:48 | 92 | 17:49 | 268 |
| 29 | 05:48 | 92 | 17:46 | 268 | 05:48 | 92 | 17:47 | 268 | 05:49 | 92 | 17:48 | 268 | 05:49 | 92 | 17:48 | 268 |
| 30 | 05:48 | 92 | 17:45 | 267 | 05:49 | 92 | 17:46 | 267 | 05:49 | 92 | 17:47 | 267 | 05:49 | 92 | 17:47 | 267 |

苗栗、臺中  
十月（彰化、雲林）地區日出、日沒時間表

| 日期 | 苗 栗   |     |       |     | 臺 中   |     |       |     | 彰 化   |     |       |     | 雲 林   |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
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| 2  | 05:49 | 93  | 17:43 | 266 | 05:49 | 93  | 17:44 | 267 | 05:50 | 93  | 17:45 | 267 | 05:50 | 93  | 17:45 | 267 |
| 3  | 05:49 | 94  | 17:42 | 266 | 05:50 | 94  | 17:43 | 266 | 05:50 | 94  | 17:44 | 266 | 05:50 | 94  | 17:44 | 266 |
| 4  | 05:50 | 94  | 17:41 | 266 | 05:50 | 94  | 17:42 | 266 | 05:51 | 94  | 17:43 | 266 | 05:51 | 94  | 17:43 | 266 |
| 5  | 05:50 | 95  | 17:40 | 265 | 05:51 | 95  | 17:41 | 265 | 05:51 | 95  | 17:42 | 265 | 05:51 | 95  | 17:42 | 265 |
| 6  | 05:50 | 95  | 17:39 | 265 | 05:51 | 95  | 17:40 | 265 | 05:51 | 95  | 17:41 | 265 | 05:51 | 95  | 17:41 | 265 |
| 7  | 05:51 | 95  | 17:38 | 264 | 05:51 | 95  | 17:39 | 264 | 05:52 | 95  | 17:40 | 264 | 05:52 | 95  | 17:40 | 264 |
| 8  | 05:51 | 96  | 17:37 | 264 | 05:52 | 96  | 17:38 | 264 | 05:52 | 96  | 17:39 | 264 | 05:52 | 96  | 17:39 | 264 |
| 9  | 05:52 | 96  | 17:36 | 264 | 05:52 | 96  | 17:37 | 264 | 05:52 | 96  | 17:38 | 264 | 05:52 | 96  | 17:38 | 264 |
| 10 | 05:52 | 97  | 17:35 | 263 | 05:53 | 97  | 17:36 | 263 | 05:53 | 97  | 17:37 | 263 | 05:53 | 97  | 17:37 | 263 |
| 11 | 05:52 | 97  | 17:34 | 263 | 05:53 | 97  | 17:35 | 263 | 05:53 | 97  | 17:36 | 263 | 05:53 | 97  | 17:36 | 263 |
| 12 | 05:53 | 98  | 17:33 | 262 | 05:53 | 97  | 17:34 | 262 | 05:54 | 97  | 17:35 | 262 | 05:54 | 97  | 17:35 | 262 |
| 13 | 05:53 | 98  | 17:33 | 262 | 05:54 | 98  | 17:33 | 262 | 05:54 | 98  | 17:34 | 262 | 05:54 | 98  | 17:34 | 262 |
| 14 | 05:54 | 98  | 17:32 | 261 | 05:54 | 98  | 17:33 | 261 | 05:55 | 98  | 17:33 | 261 | 05:55 | 98  | 17:33 | 262 |
| 15 | 05:54 | 99  | 17:31 | 261 | 05:55 | 99  | 17:32 | 261 | 05:55 | 99  | 17:32 | 261 | 05:55 | 99  | 17:32 | 261 |
| 16 | 05:55 | 99  | 17:30 | 261 | 05:55 | 99  | 17:31 | 261 | 05:55 | 99  | 17:31 | 261 | 05:55 | 99  | 17:31 | 261 |
| 17 | 05:55 | 100 | 17:29 | 260 | 05:56 | 100 | 17:30 | 260 | 05:56 | 100 | 17:30 | 260 | 05:56 | 100 | 17:31 | 260 |
| 18 | 05:56 | 100 | 17:28 | 260 | 05:56 | 100 | 17:29 | 260 | 05:56 | 100 | 17:29 | 260 | 05:56 | 100 | 17:30 | 260 |
| 19 | 05:56 | 100 | 17:27 | 259 | 05:57 | 100 | 17:28 | 259 | 05:57 | 100 | 17:29 | 259 | 05:57 | 100 | 17:29 | 260 |
| 20 | 05:57 | 101 | 17:26 | 259 | 05:57 | 101 | 17:27 | 259 | 05:57 | 101 | 17:28 | 259 | 05:57 | 101 | 17:28 | 259 |
| 21 | 05:57 | 101 | 17:25 | 259 | 05:57 | 101 | 17:26 | 259 | 05:58 | 101 | 17:27 | 259 | 05:58 | 101 | 17:27 | 259 |
| 22 | 05:58 | 102 | 17:25 | 258 | 05:58 | 102 | 17:26 | 258 | 05:58 | 102 | 17:26 | 258 | 05:58 | 101 | 17:26 | 258 |
| 23 | 05:58 | 102 | 17:24 | 258 | 05:58 | 102 | 17:25 | 258 | 05:59 | 102 | 17:25 | 258 | 05:59 | 102 | 17:26 | 258 |
| 24 | 05:59 | 102 | 17:23 | 258 | 05:59 | 102 | 17:24 | 258 | 05:59 | 102 | 17:25 | 258 | 05:59 | 102 | 17:25 | 258 |
| 25 | 05:59 | 103 | 17:22 | 257 | 06:00 | 103 | 17:23 | 257 | 06:00 | 103 | 17:24 | 257 | 06:00 | 103 | 17:24 | 257 |
| 26 | 06:00 | 103 | 17:21 | 257 | 06:00 | 103 | 17:23 | 257 | 06:00 | 103 | 17:23 | 257 | 06:00 | 103 | 17:23 | 257 |
| 27 | 06:00 | 103 | 17:21 | 256 | 06:01 | 103 | 17:22 | 256 | 06:01 | 103 | 17:22 | 256 | 06:01 | 103 | 17:23 | 256 |
| 28 | 06:01 | 104 | 17:20 | 256 | 06:01 | 104 | 17:21 | 256 | 06:01 | 104 | 17:22 | 256 | 06:01 | 104 | 17:22 | 256 |
| 29 | 06:01 | 104 | 17:19 | 256 | 06:02 | 104 | 17:20 | 256 | 06:02 | 104 | 17:21 | 256 | 06:02 | 104 | 17:21 | 256 |
| 30 | 06:02 | 105 | 17:19 | 255 | 06:02 | 105 | 17:20 | 255 | 06:03 | 105 | 17:20 | 255 | 06:02 | 105 | 17:20 | 255 |
| 31 | 06:03 | 105 | 17:18 | 255 | 06:03 | 105 | 17:19 | 255 | 06:03 | 105 | 17:20 | 255 | 06:03 | 105 | 17:20 | 255 |

苗栗、臺中  
十一月（彰化、雲林）地區日出、日沒時間表

| 日期 | 苗 栗   |     |       |     | 臺 中   |     |       |     | 彰 化   |     |       |     | 雲 林   |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
| 1  | 06:03 | 105 | 17:17 | 255 | 06:03 | 105 | 17:18 | 255 | 06:04 | 105 | 17:19 | 255 | 06:04 | 105 | 17:19 | 255 |
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| 3  | 06:04 | 106 | 17:16 | 254 | 06:05 | 106 | 17:17 | 254 | 06:05 | 106 | 17:18 | 254 | 06:05 | 106 | 17:18 | 254 |
| 4  | 06:05 | 106 | 17:15 | 253 | 06:05 | 106 | 17:17 | 254 | 06:05 | 106 | 17:17 | 254 | 06:05 | 106 | 17:17 | 254 |
| 5  | 06:06 | 107 | 17:15 | 253 | 06:06 | 107 | 17:16 | 253 | 06:06 | 107 | 17:16 | 253 | 06:06 | 107 | 17:17 | 253 |
| 6  | 06:06 | 107 | 17:14 | 253 | 06:06 | 107 | 17:15 | 253 | 06:07 | 107 | 17:16 | 253 | 06:06 | 107 | 17:16 | 253 |
| 7  | 06:07 | 107 | 17:14 | 252 | 06:07 | 107 | 17:15 | 253 | 06:07 | 107 | 17:15 | 253 | 06:07 | 107 | 17:16 | 253 |
| 8  | 06:07 | 108 | 17:13 | 252 | 06:08 | 108 | 17:14 | 252 | 06:08 | 108 | 17:15 | 252 | 06:08 | 108 | 17:15 | 252 |
| 9  | 06:08 | 108 | 17:13 | 252 | 06:08 | 108 | 17:14 | 252 | 06:08 | 108 | 17:14 | 252 | 06:08 | 108 | 17:15 | 252 |
| 10 | 06:09 | 108 | 17:12 | 252 | 06:09 | 108 | 17:13 | 252 | 06:09 | 108 | 17:14 | 252 | 06:09 | 108 | 17:14 | 252 |
| 11 | 06:09 | 109 | 17:12 | 251 | 06:09 | 109 | 17:13 | 251 | 06:10 | 109 | 17:13 | 251 | 06:10 | 109 | 17:14 | 251 |
| 12 | 06:10 | 109 | 17:11 | 251 | 06:10 | 109 | 17:13 | 251 | 06:10 | 109 | 17:13 | 251 | 06:10 | 109 | 17:13 | 251 |
| 13 | 06:11 | 109 | 17:11 | 251 | 06:11 | 109 | 17:12 | 251 | 06:11 | 109 | 17:13 | 251 | 06:11 | 109 | 17:13 | 251 |
| 14 | 06:11 | 110 | 17:10 | 250 | 06:11 | 109 | 17:12 | 250 | 06:12 | 109 | 17:12 | 250 | 06:12 | 109 | 17:13 | 250 |
| 15 | 06:12 | 110 | 17:10 | 250 | 06:12 | 110 | 17:11 | 250 | 06:12 | 110 | 17:12 | 250 | 06:12 | 110 | 17:12 | 250 |
| 16 | 06:13 | 110 | 17:10 | 250 | 06:13 | 110 | 17:11 | 250 | 06:13 | 110 | 17:12 | 250 | 06:13 | 110 | 17:12 | 250 |
| 17 | 06:13 | 110 | 17:09 | 249 | 06:13 | 110 | 17:11 | 250 | 06:14 | 110 | 17:11 | 250 | 06:14 | 110 | 17:12 | 250 |
| 18 | 06:14 | 111 | 17:09 | 249 | 06:14 | 111 | 17:10 | 249 | 06:14 | 111 | 17:11 | 249 | 06:14 | 111 | 17:11 | 249 |
| 19 | 06:15 | 111 | 17:09 | 249 | 06:15 | 111 | 17:10 | 249 | 06:15 | 111 | 17:11 | 249 | 06:15 | 111 | 17:11 | 249 |
| 20 | 06:16 | 111 | 17:09 | 249 | 06:16 | 111 | 17:10 | 249 | 06:16 | 111 | 17:11 | 249 | 06:16 | 111 | 17:11 | 249 |
| 21 | 06:16 | 111 | 17:08 | 248 | 06:16 | 111 | 17:10 | 249 | 06:16 | 111 | 17:10 | 249 | 06:16 | 111 | 17:11 | 249 |
| 22 | 06:17 | 112 | 17:08 | 248 | 06:17 | 112 | 17:10 | 248 | 06:17 | 112 | 17:10 | 248 | 06:17 | 112 | 17:10 | 248 |
| 23 | 06:18 | 112 | 17:08 | 248 | 06:18 | 112 | 17:09 | 248 | 06:18 | 112 | 17:10 | 248 | 06:18 | 112 | 17:10 | 248 |
| 24 | 06:18 | 112 | 17:08 | 248 | 06:18 | 112 | 17:09 | 248 | 06:19 | 112 | 17:10 | 248 | 06:18 | 112 | 17:10 | 248 |
| 25 | 06:19 | 112 | 17:08 | 248 | 06:19 | 112 | 17:09 | 248 | 06:19 | 112 | 17:10 | 248 | 06:19 | 112 | 17:10 | 248 |
| 26 | 06:20 | 113 | 17:08 | 247 | 06:20 | 113 | 17:09 | 247 | 06:20 | 113 | 17:10 | 247 | 06:20 | 112 | 17:10 | 247 |
| 27 | 06:20 | 113 | 17:08 | 247 | 06:20 | 113 | 17:09 | 247 | 06:21 | 113 | 17:10 | 247 | 06:20 | 113 | 17:10 | 247 |
| 28 | 06:21 | 113 | 17:07 | 247 | 06:21 | 113 | 17:09 | 247 | 06:21 | 113 | 17:10 | 247 | 06:21 | 113 | 17:10 | 247 |
| 29 | 06:22 | 113 | 17:07 | 247 | 06:22 | 113 | 17:09 | 247 | 06:22 | 113 | 17:09 | 247 | 06:22 | 113 | 17:10 | 247 |
| 30 | 06:23 | 113 | 17:07 | 247 | 06:23 | 113 | 17:09 | 247 | 06:23 | 113 | 17:10 | 247 | 06:23 | 113 | 17:10 | 247 |

苗栗、臺中  
十二月（彰化、雲林）地區日出、日沒時間表

| 日期 | 苗 栗   |     |       |     | 臺 中   |     |       |     | 彰 化   |     |       |     | 雲 林   |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
| 1  | 06:23 | 114 | 17:08 | 246 | 06:23 | 114 | 17:09 | 246 | 06:24 | 113 | 17:10 | 246 | 06:23 | 113 | 17:10 | 246 |
| 2  | 06:24 | 114 | 17:08 | 246 | 06:24 | 114 | 17:09 | 246 | 06:24 | 114 | 17:10 | 246 | 06:24 | 114 | 17:10 | 246 |
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| 4  | 06:25 | 114 | 17:08 | 246 | 06:25 | 114 | 17:09 | 246 | 06:26 | 114 | 17:10 | 246 | 06:25 | 114 | 17:10 | 246 |
| 5  | 06:26 | 114 | 17:08 | 246 | 06:26 | 114 | 17:09 | 246 | 06:26 | 114 | 17:10 | 246 | 06:26 | 114 | 17:10 | 246 |
| 6  | 06:27 | 114 | 17:08 | 246 | 06:27 | 114 | 17:09 | 246 | 06:27 | 114 | 17:10 | 246 | 06:27 | 114 | 17:10 | 246 |
| 7  | 06:27 | 115 | 17:08 | 245 | 06:27 | 114 | 17:10 | 246 | 06:28 | 114 | 17:10 | 246 | 06:27 | 114 | 17:11 | 246 |
| 8  | 06:28 | 115 | 17:08 | 245 | 06:28 | 115 | 17:10 | 245 | 06:28 | 115 | 17:10 | 245 | 06:28 | 115 | 17:11 | 245 |
| 9  | 06:29 | 115 | 17:09 | 245 | 06:29 | 115 | 17:10 | 245 | 06:29 | 115 | 17:11 | 245 | 06:29 | 115 | 17:11 | 245 |
| 10 | 06:29 | 115 | 17:09 | 245 | 06:29 | 115 | 17:10 | 245 | 06:30 | 115 | 17:11 | 245 | 06:29 | 115 | 17:11 | 245 |
| 11 | 06:30 | 115 | 17:09 | 245 | 06:30 | 115 | 17:11 | 245 | 06:30 | 115 | 17:11 | 245 | 06:30 | 115 | 17:12 | 245 |
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| 13 | 06:31 | 115 | 17:10 | 245 | 06:31 | 115 | 17:11 | 245 | 06:31 | 115 | 17:12 | 245 | 06:31 | 115 | 17:12 | 245 |
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| 15 | 06:33 | 115 | 17:10 | 245 | 06:32 | 115 | 17:12 | 245 | 06:33 | 115 | 17:12 | 245 | 06:32 | 115 | 17:13 | 245 |
| 16 | 06:33 | 115 | 17:11 | 245 | 06:33 | 115 | 17:12 | 245 | 06:33 | 115 | 17:13 | 245 | 06:33 | 115 | 17:13 | 245 |
| 17 | 06:34 | 115 | 17:11 | 245 | 06:34 | 115 | 17:13 | 245 | 06:34 | 115 | 17:13 | 245 | 06:34 | 115 | 17:14 | 245 |
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| 19 | 06:35 | 115 | 17:12 | 245 | 06:35 | 115 | 17:14 | 245 | 06:35 | 115 | 17:14 | 245 | 06:35 | 115 | 17:15 | 245 |
| 20 | 06:35 | 115 | 17:12 | 245 | 06:35 | 115 | 17:14 | 245 | 06:36 | 115 | 17:15 | 245 | 06:35 | 115 | 17:15 | 245 |
| 21 | 06:36 | 116 | 17:13 | 244 | 06:36 | 115 | 17:14 | 245 | 06:36 | 115 | 17:15 | 245 | 06:36 | 115 | 17:15 | 245 |
| 22 | 06:36 | 116 | 17:13 | 244 | 06:36 | 115 | 17:15 | 245 | 06:37 | 115 | 17:16 | 245 | 06:36 | 115 | 17:16 | 245 |
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| 24 | 06:37 | 115 | 17:14 | 245 | 06:37 | 115 | 17:16 | 245 | 06:38 | 115 | 17:17 | 245 | 06:37 | 115 | 17:17 | 245 |
| 25 | 06:38 | 115 | 17:15 | 245 | 06:38 | 115 | 17:17 | 245 | 06:38 | 115 | 17:17 | 245 | 06:38 | 115 | 17:18 | 245 |
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| 30 | 06:40 | 115 | 17:18 | 245 | 06:40 | 115 | 17:19 | 245 | 06:40 | 115 | 17:20 | 245 | 06:40 | 115 | 17:21 | 245 |
| 31 | 06:40 | 115 | 17:19 | 245 | 06:40 | 115 | 17:20 | 245 | 06:40 | 115 | 17:21 | 245 | 06:40 | 115 | 17:21 | 245 |

嘉義、臺南  
一月（高雄、屏東）地區日出、日沒時間表

| 日期 | 嘉 義   |     |       |     | 臺 南   |     |       |     | 高 雄   |     |       |     | 屏 東   |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
| 1  | 06:40 | 115 | 17:23 | 245 | 06:40 | 115 | 17:24 | 245 | 06:38 | 115 | 17:25 | 245 | 06:38 | 115 | 17:25 | 245 |
| 2  | 06:40 | 115 | 17:24 | 245 | 06:40 | 115 | 17:25 | 245 | 06:39 | 115 | 17:26 | 245 | 06:39 | 115 | 17:25 | 245 |
| 3  | 06:41 | 115 | 17:24 | 245 | 06:41 | 115 | 17:25 | 245 | 06:39 | 115 | 17:26 | 246 | 06:39 | 115 | 17:26 | 246 |
| 4  | 06:41 | 115 | 17:25 | 245 | 06:41 | 115 | 17:26 | 246 | 06:39 | 114 | 17:27 | 246 | 06:39 | 114 | 17:26 | 246 |
| 5  | 06:41 | 114 | 17:26 | 246 | 06:41 | 114 | 17:27 | 246 | 06:39 | 114 | 17:28 | 246 | 06:39 | 114 | 17:27 | 246 |
| 6  | 06:41 | 114 | 17:26 | 246 | 06:41 | 114 | 17:27 | 246 | 06:40 | 114 | 17:28 | 246 | 06:40 | 114 | 17:28 | 246 |
| 7  | 06:41 | 114 | 17:27 | 246 | 06:42 | 114 | 17:28 | 246 | 06:40 | 114 | 17:29 | 246 | 06:40 | 114 | 17:28 | 246 |
| 8  | 06:42 | 114 | 17:28 | 246 | 06:42 | 114 | 17:29 | 246 | 06:40 | 114 | 17:30 | 246 | 06:40 | 114 | 17:29 | 246 |
| 9  | 06:42 | 114 | 17:28 | 246 | 06:42 | 114 | 17:29 | 246 | 06:40 | 114 | 17:31 | 246 | 06:40 | 114 | 17:30 | 246 |
| 10 | 06:42 | 114 | 17:29 | 246 | 06:42 | 114 | 17:30 | 246 | 06:40 | 114 | 17:31 | 246 | 06:40 | 114 | 17:31 | 246 |
| 11 | 06:42 | 114 | 17:30 | 246 | 06:42 | 114 | 17:31 | 247 | 06:41 | 113 | 17:32 | 247 | 06:40 | 113 | 17:31 | 247 |
| 12 | 06:42 | 113 | 17:31 | 247 | 06:42 | 113 | 17:31 | 247 | 06:41 | 113 | 17:33 | 247 | 06:40 | 113 | 17:32 | 247 |
| 13 | 06:42 | 113 | 17:31 | 247 | 06:42 | 113 | 17:32 | 247 | 06:41 | 113 | 17:33 | 247 | 06:41 | 113 | 17:33 | 247 |
| 14 | 06:42 | 113 | 17:32 | 247 | 06:42 | 113 | 17:33 | 247 | 06:41 | 113 | 17:34 | 247 | 06:41 | 113 | 17:33 | 247 |
| 15 | 06:42 | 113 | 17:33 | 247 | 06:42 | 113 | 17:34 | 247 | 06:41 | 113 | 17:35 | 247 | 06:41 | 113 | 17:34 | 247 |
| 16 | 06:42 | 113 | 17:33 | 247 | 06:42 | 113 | 17:34 | 247 | 06:41 | 113 | 17:35 | 248 | 06:41 | 113 | 17:35 | 248 |
| 17 | 06:42 | 112 | 17:34 | 248 | 06:42 | 112 | 17:35 | 248 | 06:41 | 112 | 17:36 | 248 | 06:41 | 112 | 17:35 | 248 |
| 18 | 06:42 | 112 | 17:35 | 248 | 06:42 | 112 | 17:36 | 248 | 06:41 | 112 | 17:37 | 248 | 06:41 | 112 | 17:36 | 248 |
| 19 | 06:42 | 112 | 17:36 | 248 | 06:42 | 112 | 17:36 | 248 | 06:41 | 112 | 17:38 | 248 | 06:40 | 112 | 17:37 | 248 |
| 20 | 06:42 | 112 | 17:36 | 248 | 06:42 | 112 | 17:37 | 248 | 06:41 | 112 | 17:38 | 248 | 06:40 | 112 | 17:38 | 248 |
| 21 | 06:42 | 112 | 17:37 | 249 | 06:42 | 112 | 17:38 | 249 | 06:40 | 111 | 17:39 | 249 | 06:40 | 111 | 17:38 | 249 |
| 22 | 06:42 | 111 | 17:38 | 249 | 06:42 | 111 | 17:39 | 249 | 06:40 | 111 | 17:40 | 249 | 06:40 | 111 | 17:39 | 249 |
| 23 | 06:41 | 111 | 17:39 | 249 | 06:42 | 111 | 17:39 | 249 | 06:40 | 111 | 17:40 | 249 | 06:40 | 111 | 17:40 | 249 |
| 24 | 06:41 | 111 | 17:39 | 249 | 06:42 | 111 | 17:40 | 249 | 06:40 | 111 | 17:41 | 249 | 06:40 | 111 | 17:40 | 249 |
| 25 | 06:41 | 111 | 17:40 | 250 | 06:41 | 110 | 17:41 | 250 | 06:40 | 110 | 17:42 | 250 | 06:40 | 110 | 17:41 | 250 |
| 26 | 06:41 | 110 | 17:41 | 250 | 06:41 | 110 | 17:41 | 250 | 06:40 | 110 | 17:42 | 250 | 06:39 | 110 | 17:42 | 250 |
| 27 | 06:41 | 110 | 17:41 | 250 | 06:41 | 110 | 17:42 | 250 | 06:39 | 110 | 17:43 | 250 | 06:39 | 110 | 17:42 | 250 |
| 28 | 06:40 | 110 | 17:42 | 250 | 06:41 | 110 | 17:43 | 250 | 06:39 | 110 | 17:44 | 251 | 06:39 | 110 | 17:43 | 251 |
| 29 | 06:40 | 109 | 17:43 | 251 | 06:40 | 109 | 17:44 | 251 | 06:39 | 109 | 17:44 | 251 | 06:39 | 109 | 17:44 | 251 |
| 30 | 06:40 | 109 | 17:43 | 251 | 06:40 | 109 | 17:44 | 251 | 06:38 | 109 | 17:45 | 251 | 06:38 | 109 | 17:44 | 251 |
| 31 | 06:39 | 109 | 17:44 | 251 | 06:40 | 109 | 17:45 | 251 | 06:38 | 109 | 17:46 | 251 | 06:38 | 109 | 17:45 | 251 |

嘉義縣（嘉義市）臺南市（新營區）

高雄市（小港區）屏東縣（屏東市）

嘉義、臺南  
二月（高雄、屏東）地區日出、日沒時間表

| 日期 | 嘉 義   |     |       |     | 臺 南   |     |       |     | 高 雄   |     |       |     | 屏 東   |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
| 1  | 06:39 | 108 | 17:45 | 252 | 06:39 | 108 | 17:46 | 252 | 06:38 | 108 | 17:46 | 252 | 06:38 | 108 | 17:46 | 252 |
| 2  | 06:38 | 108 | 17:45 | 252 | 06:39 | 108 | 17:46 | 252 | 06:37 | 108 | 17:47 | 252 | 06:37 | 108 | 17:46 | 252 |
| 3  | 06:38 | 108 | 17:46 | 252 | 06:38 | 108 | 17:47 | 252 | 06:37 | 108 | 17:48 | 252 | 06:37 | 108 | 17:47 | 252 |
| 4  | 06:38 | 108 | 17:47 | 253 | 06:38 | 108 | 17:48 | 253 | 06:37 | 107 | 17:48 | 253 | 06:36 | 107 | 17:48 | 253 |
| 5  | 06:37 | 107 | 17:47 | 253 | 06:37 | 107 | 17:48 | 253 | 06:36 | 107 | 17:49 | 253 | 06:36 | 107 | 17:48 | 253 |
| 6  | 06:37 | 107 | 17:48 | 253 | 06:37 | 107 | 17:49 | 253 | 06:36 | 107 | 17:50 | 253 | 06:35 | 107 | 17:49 | 253 |
| 7  | 06:36 | 107 | 17:49 | 254 | 06:36 | 107 | 17:50 | 254 | 06:35 | 106 | 17:50 | 254 | 06:35 | 106 | 17:50 | 254 |
| 8  | 06:36 | 106 | 17:49 | 254 | 06:36 | 106 | 17:50 | 254 | 06:35 | 106 | 17:51 | 254 | 06:34 | 106 | 17:50 | 254 |
| 9  | 06:35 | 106 | 17:50 | 254 | 06:35 | 106 | 17:51 | 254 | 06:34 | 106 | 17:51 | 254 | 06:34 | 106 | 17:51 | 254 |
| 10 | 06:34 | 106 | 17:51 | 255 | 06:35 | 105 | 17:51 | 255 | 06:34 | 105 | 17:52 | 255 | 06:33 | 105 | 17:51 | 255 |
| 11 | 06:34 | 105 | 17:51 | 255 | 06:34 | 105 | 17:52 | 255 | 06:33 | 105 | 17:53 | 255 | 06:33 | 105 | 17:52 | 255 |
| 12 | 06:33 | 105 | 17:52 | 255 | 06:34 | 105 | 17:53 | 255 | 06:33 | 105 | 17:53 | 255 | 06:32 | 105 | 17:53 | 255 |
| 13 | 06:33 | 104 | 17:52 | 256 | 06:33 | 104 | 17:53 | 256 | 06:32 | 104 | 17:54 | 256 | 06:32 | 104 | 17:53 | 256 |
| 14 | 06:32 | 104 | 17:53 | 256 | 06:32 | 104 | 17:54 | 256 | 06:31 | 104 | 17:54 | 256 | 06:31 | 104 | 17:54 | 256 |
| 15 | 06:31 | 104 | 17:54 | 256 | 06:32 | 104 | 17:54 | 257 | 06:31 | 104 | 17:55 | 257 | 06:30 | 104 | 17:54 | 257 |
| 16 | 06:31 | 103 | 17:54 | 257 | 06:31 | 103 | 17:55 | 257 | 06:30 | 103 | 17:55 | 257 | 06:30 | 103 | 17:55 | 257 |
| 17 | 06:30 | 103 | 17:55 | 257 | 06:30 | 103 | 17:55 | 257 | 06:29 | 103 | 17:56 | 257 | 06:29 | 103 | 17:55 | 257 |
| 18 | 06:29 | 103 | 17:55 | 258 | 06:30 | 103 | 17:56 | 258 | 06:29 | 102 | 17:56 | 258 | 06:28 | 102 | 17:56 | 258 |
| 19 | 06:29 | 102 | 17:56 | 258 | 06:29 | 102 | 17:57 | 258 | 06:28 | 102 | 17:57 | 258 | 06:28 | 102 | 17:56 | 258 |
| 20 | 06:28 | 102 | 17:56 | 258 | 06:28 | 102 | 17:57 | 258 | 06:27 | 102 | 17:57 | 258 | 06:27 | 102 | 17:57 | 258 |
| 21 | 06:27 | 101 | 17:57 | 259 | 06:28 | 101 | 17:58 | 259 | 06:27 | 101 | 17:58 | 259 | 06:26 | 101 | 17:57 | 259 |
| 22 | 06:26 | 101 | 17:57 | 259 | 06:27 | 101 | 17:58 | 259 | 06:26 | 101 | 17:58 | 259 | 06:26 | 101 | 17:58 | 259 |
| 23 | 06:26 | 101 | 17:58 | 260 | 06:26 | 101 | 17:59 | 260 | 06:25 | 101 | 17:59 | 260 | 06:25 | 101 | 17:58 | 260 |
| 24 | 06:25 | 100 | 17:58 | 260 | 06:25 | 100 | 17:59 | 260 | 06:24 | 100 | 17:59 | 260 | 06:24 | 100 | 17:59 | 260 |
| 25 | 06:24 | 100 | 17:59 | 260 | 06:24 | 100 | 18:00 | 260 | 06:24 | 100 | 18:00 | 260 | 06:23 | 100 | 17:59 | 260 |
| 26 | 06:23 | 99  | 17:59 | 261 | 06:24 | 99  | 18:00 | 261 | 06:23 | 99  | 18:00 | 261 | 06:22 | 99  | 18:00 | 261 |
| 27 | 06:22 | 99  | 18:00 | 261 | 06:23 | 99  | 18:01 | 261 | 06:22 | 99  | 18:01 | 261 | 06:22 | 99  | 18:00 | 261 |
| 28 | 06:22 | 99  | 18:00 | 262 | 06:22 | 99  | 18:01 | 262 | 06:21 | 99  | 18:01 | 262 | 06:21 | 99  | 18:01 | 262 |

嘉義、臺南  
三月（高雄、屏東）地區日出、日沒時間表

| 日期 | 嘉 義   |    |       |     | 臺 南   |    |       |     | 高 雄   |    |       |     | 屏 東   |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 06:21 | 98 | 18:01 | 262 | 06:21 | 98 | 18:02 | 262 | 06:20 | 98 | 18:02 | 262 | 06:20 | 98 | 18:01 | 262 |
| 2  | 06:20 | 98 | 18:01 | 262 | 06:20 | 98 | 18:02 | 262 | 06:20 | 98 | 18:02 | 263 | 06:19 | 98 | 18:02 | 262 |
| 3  | 06:19 | 97 | 18:02 | 263 | 06:19 | 97 | 18:03 | 263 | 06:19 | 97 | 18:03 | 263 | 06:18 | 97 | 18:02 | 263 |
| 4  | 06:18 | 97 | 18:02 | 263 | 06:19 | 97 | 18:03 | 263 | 06:18 | 97 | 18:03 | 263 | 06:17 | 97 | 18:03 | 263 |
| 5  | 06:17 | 96 | 18:03 | 264 | 06:18 | 96 | 18:03 | 264 | 06:17 | 96 | 18:03 | 264 | 06:17 | 96 | 18:03 | 264 |
| 6  | 06:16 | 96 | 18:03 | 264 | 06:17 | 96 | 18:04 | 264 | 06:16 | 96 | 18:04 | 264 | 06:16 | 96 | 18:03 | 264 |
| 7  | 06:15 | 96 | 18:04 | 265 | 06:16 | 96 | 18:04 | 265 | 06:15 | 96 | 18:04 | 265 | 06:15 | 96 | 18:04 | 265 |
| 8  | 06:14 | 95 | 18:04 | 265 | 06:15 | 95 | 18:05 | 265 | 06:14 | 95 | 18:05 | 265 | 06:14 | 95 | 18:04 | 265 |
| 9  | 06:14 | 95 | 18:05 | 265 | 06:14 | 95 | 18:05 | 265 | 06:13 | 95 | 18:05 | 265 | 06:13 | 95 | 18:05 | 265 |
| 10 | 06:13 | 94 | 18:05 | 266 | 06:13 | 94 | 18:06 | 266 | 06:13 | 94 | 18:06 | 266 | 06:12 | 94 | 18:05 | 266 |
| 11 | 06:12 | 94 | 18:05 | 266 | 06:12 | 94 | 18:06 | 266 | 06:12 | 94 | 18:06 | 266 | 06:11 | 94 | 18:06 | 266 |
| 12 | 06:11 | 94 | 18:06 | 267 | 06:11 | 94 | 18:06 | 267 | 06:11 | 93 | 18:06 | 267 | 06:10 | 93 | 18:06 | 267 |
| 13 | 06:10 | 93 | 18:06 | 267 | 06:10 | 93 | 18:07 | 267 | 06:10 | 93 | 18:07 | 267 | 06:09 | 93 | 18:06 | 267 |
| 14 | 06:09 | 93 | 18:07 | 268 | 06:09 | 93 | 18:07 | 268 | 06:09 | 93 | 18:07 | 268 | 06:09 | 93 | 18:07 | 268 |
| 15 | 06:08 | 92 | 18:07 | 268 | 06:08 | 92 | 18:08 | 268 | 06:08 | 92 | 18:07 | 268 | 06:08 | 92 | 18:07 | 268 |
| 16 | 06:07 | 92 | 18:07 | 268 | 06:07 | 92 | 18:08 | 268 | 06:07 | 92 | 18:08 | 268 | 06:07 | 92 | 18:07 | 268 |
| 17 | 06:06 | 91 | 18:08 | 269 | 06:06 | 91 | 18:08 | 269 | 06:06 | 91 | 18:08 | 269 | 06:06 | 91 | 18:08 | 269 |
| 18 | 06:05 | 91 | 18:08 | 269 | 06:05 | 91 | 18:09 | 269 | 06:05 | 91 | 18:09 | 269 | 06:05 | 91 | 18:08 | 269 |
| 19 | 06:04 | 90 | 18:09 | 270 | 06:05 | 91 | 18:09 | 270 | 06:04 | 91 | 18:09 | 270 | 06:04 | 91 | 18:09 | 270 |
| 20 | 06:03 | 90 | 18:09 | 270 | 06:04 | 90 | 18:10 | 270 | 06:03 | 90 | 18:09 | 270 | 06:03 | 90 | 18:09 | 270 |
| 21 | 06:02 | 90 | 18:09 | 271 | 06:03 | 90 | 18:10 | 271 | 06:02 | 90 | 18:10 | 271 | 06:02 | 90 | 18:09 | 271 |
| 22 | 06:01 | 89 | 18:10 | 271 | 06:02 | 89 | 18:10 | 271 | 06:01 | 89 | 18:10 | 271 | 06:01 | 89 | 18:10 | 271 |
| 23 | 06:00 | 89 | 18:10 | 271 | 06:01 | 89 | 18:11 | 271 | 06:00 | 89 | 18:10 | 271 | 06:00 | 89 | 18:10 | 271 |
| 24 | 05:59 | 88 | 18:11 | 272 | 06:00 | 88 | 18:11 | 272 | 05:59 | 88 | 18:11 | 272 | 05:59 | 88 | 18:10 | 272 |
| 25 | 05:58 | 88 | 18:11 | 272 | 05:59 | 88 | 18:12 | 272 | 05:58 | 88 | 18:11 | 272 | 05:58 | 88 | 18:11 | 272 |
| 26 | 05:57 | 87 | 18:11 | 273 | 05:58 | 87 | 18:12 | 273 | 05:58 | 88 | 18:11 | 273 | 05:57 | 88 | 18:11 | 273 |
| 27 | 05:56 | 87 | 18:12 | 273 | 05:57 | 87 | 18:12 | 273 | 05:57 | 87 | 18:12 | 273 | 05:56 | 87 | 18:11 | 273 |
| 28 | 05:55 | 87 | 18:12 | 274 | 05:56 | 87 | 18:13 | 274 | 05:56 | 87 | 18:12 | 274 | 05:55 | 87 | 18:12 | 274 |
| 29 | 05:54 | 86 | 18:13 | 274 | 05:55 | 86 | 18:13 | 274 | 05:55 | 86 | 18:12 | 274 | 05:54 | 86 | 18:12 | 274 |
| 30 | 05:53 | 86 | 18:13 | 274 | 05:54 | 86 | 18:13 | 274 | 05:54 | 86 | 18:13 | 274 | 05:53 | 86 | 18:12 | 274 |
| 31 | 05:52 | 85 | 18:13 | 275 | 05:53 | 85 | 18:14 | 275 | 05:53 | 85 | 18:13 | 275 | 05:52 | 85 | 18:13 | 275 |



嘉義、臺南  
四月（高雄、屏東）地區日出、日沒時間表

| 日期 | 嘉 義   |    |       |     | 臺 南   |    |       |     | 高 雄   |    |       |     | 屏 東   |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 05:51 | 85 | 18:14 | 275 | 05:52 | 85 | 18:14 | 275 | 05:52 | 85 | 18:14 | 275 | 05:51 | 85 | 18:13 | 275 |
| 2  | 05:50 | 85 | 18:14 | 276 | 05:51 | 85 | 18:15 | 276 | 05:51 | 85 | 18:14 | 276 | 05:50 | 85 | 18:14 | 276 |
| 3  | 05:49 | 84 | 18:14 | 276 | 05:50 | 84 | 18:15 | 276 | 05:50 | 84 | 18:14 | 276 | 05:49 | 84 | 18:14 | 276 |
| 4  | 05:48 | 84 | 18:15 | 277 | 05:49 | 84 | 18:15 | 277 | 05:49 | 84 | 18:15 | 276 | 05:49 | 84 | 18:14 | 276 |
| 5  | 05:47 | 83 | 18:15 | 277 | 05:48 | 83 | 18:16 | 277 | 05:48 | 83 | 18:15 | 277 | 05:48 | 83 | 18:15 | 277 |
| 6  | 05:46 | 83 | 18:16 | 277 | 05:47 | 83 | 18:16 | 277 | 05:47 | 83 | 18:15 | 277 | 05:47 | 83 | 18:15 | 277 |
| 7  | 05:45 | 82 | 18:16 | 278 | 05:46 | 82 | 18:16 | 278 | 05:46 | 83 | 18:16 | 278 | 05:46 | 82 | 18:15 | 278 |
| 8  | 05:44 | 82 | 18:16 | 278 | 05:45 | 82 | 18:17 | 278 | 05:45 | 82 | 18:16 | 278 | 05:45 | 82 | 18:16 | 278 |
| 9  | 05:44 | 82 | 18:17 | 279 | 05:44 | 82 | 18:17 | 279 | 05:44 | 82 | 18:16 | 279 | 05:44 | 82 | 18:16 | 279 |
| 10 | 05:43 | 81 | 18:17 | 279 | 05:43 | 81 | 18:18 | 279 | 05:43 | 81 | 18:17 | 279 | 05:43 | 81 | 18:16 | 279 |
| 11 | 05:42 | 81 | 18:18 | 279 | 05:42 | 81 | 18:18 | 279 | 05:43 | 81 | 18:17 | 279 | 05:42 | 81 | 18:17 | 279 |
| 12 | 05:41 | 80 | 18:18 | 280 | 05:41 | 80 | 18:18 | 280 | 05:42 | 80 | 18:17 | 280 | 05:41 | 80 | 18:17 | 280 |
| 13 | 05:40 | 80 | 18:18 | 280 | 05:41 | 80 | 18:19 | 280 | 05:41 | 80 | 18:18 | 280 | 05:40 | 80 | 18:18 | 280 |
| 14 | 05:39 | 80 | 18:19 | 281 | 05:40 | 80 | 18:19 | 281 | 05:40 | 80 | 18:18 | 281 | 05:39 | 80 | 18:18 | 281 |
| 15 | 05:38 | 79 | 18:19 | 281 | 05:39 | 79 | 18:20 | 281 | 05:39 | 79 | 18:19 | 281 | 05:39 | 79 | 18:18 | 281 |
| 16 | 05:37 | 79 | 18:20 | 281 | 05:38 | 79 | 18:20 | 281 | 05:38 | 79 | 18:19 | 281 | 05:38 | 79 | 18:19 | 281 |
| 17 | 05:36 | 78 | 18:20 | 282 | 05:37 | 78 | 18:20 | 282 | 05:37 | 79 | 18:19 | 282 | 05:37 | 79 | 18:19 | 282 |
| 18 | 05:35 | 78 | 18:20 | 282 | 05:36 | 78 | 18:21 | 282 | 05:36 | 78 | 18:20 | 282 | 05:36 | 78 | 18:19 | 282 |
| 19 | 05:35 | 78 | 18:21 | 283 | 05:35 | 78 | 18:21 | 283 | 05:36 | 78 | 18:20 | 282 | 05:35 | 78 | 18:20 | 282 |
| 20 | 05:34 | 77 | 18:21 | 283 | 05:34 | 77 | 18:22 | 283 | 05:35 | 77 | 18:21 | 283 | 05:34 | 77 | 18:20 | 283 |
| 21 | 05:33 | 77 | 18:22 | 283 | 05:34 | 77 | 18:22 | 283 | 05:34 | 77 | 18:21 | 283 | 05:33 | 77 | 18:21 | 283 |
| 22 | 05:32 | 77 | 18:22 | 284 | 05:33 | 77 | 18:22 | 284 | 05:33 | 77 | 18:21 | 284 | 05:33 | 77 | 18:21 | 284 |
| 23 | 05:31 | 76 | 18:22 | 284 | 05:32 | 76 | 18:23 | 284 | 05:32 | 76 | 18:22 | 284 | 05:32 | 76 | 18:21 | 284 |
| 24 | 05:30 | 76 | 18:23 | 284 | 05:31 | 76 | 18:23 | 284 | 05:32 | 76 | 18:22 | 284 | 05:31 | 76 | 18:22 | 284 |
| 25 | 05:30 | 75 | 18:23 | 285 | 05:30 | 75 | 18:24 | 285 | 05:31 | 76 | 18:22 | 285 | 05:30 | 76 | 18:22 | 285 |
| 26 | 05:29 | 75 | 18:24 | 285 | 05:30 | 75 | 18:24 | 285 | 05:30 | 75 | 18:23 | 285 | 05:30 | 75 | 18:23 | 285 |
| 27 | 05:28 | 75 | 18:24 | 285 | 05:29 | 75 | 18:25 | 285 | 05:29 | 75 | 18:23 | 285 | 05:29 | 75 | 18:23 | 285 |
| 28 | 05:27 | 74 | 18:25 | 286 | 05:28 | 74 | 18:25 | 286 | 05:29 | 75 | 18:24 | 286 | 05:28 | 74 | 18:23 | 286 |
| 29 | 05:27 | 74 | 18:25 | 286 | 05:27 | 74 | 18:25 | 286 | 05:28 | 74 | 18:24 | 286 | 05:27 | 74 | 18:24 | 286 |
| 30 | 05:26 | 74 | 18:25 | 286 | 05:27 | 74 | 18:26 | 286 | 05:27 | 74 | 18:25 | 286 | 05:27 | 74 | 18:24 | 286 |

嘉義、臺南  
五月 ( 高雄、屏東 ) 地區日出、日沒時間表

| 日期 | 嘉 義   |    |       |     | 臺 南   |    |       |     | 高 雄   |    |       |     | 屏 東   |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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| 2  | 05:24 | 73 | 18:26 | 287 | 05:25 | 73 | 18:27 | 287 | 05:26 | 73 | 18:25 | 287 | 05:25 | 73 | 18:25 | 287 |
| 3  | 05:24 | 73 | 18:27 | 287 | 05:25 | 73 | 18:27 | 287 | 05:25 | 73 | 18:26 | 287 | 05:25 | 73 | 18:26 | 287 |
| 4  | 05:23 | 72 | 18:27 | 288 | 05:24 | 72 | 18:28 | 288 | 05:25 | 73 | 18:26 | 288 | 05:24 | 72 | 18:26 | 288 |
| 5  | 05:22 | 72 | 18:28 | 288 | 05:23 | 72 | 18:28 | 288 | 05:24 | 72 | 18:27 | 288 | 05:23 | 72 | 18:27 | 288 |
| 6  | 05:22 | 72 | 18:28 | 288 | 05:23 | 72 | 18:29 | 288 | 05:23 | 72 | 18:27 | 288 | 05:23 | 72 | 18:27 | 288 |
| 7  | 05:21 | 71 | 18:29 | 289 | 05:22 | 71 | 18:29 | 289 | 05:23 | 72 | 18:28 | 289 | 05:22 | 72 | 18:27 | 289 |
| 8  | 05:21 | 71 | 18:29 | 289 | 05:21 | 71 | 18:30 | 289 | 05:22 | 71 | 18:28 | 289 | 05:22 | 71 | 18:28 | 289 |
| 9  | 05:20 | 71 | 18:30 | 289 | 05:21 | 71 | 18:30 | 289 | 05:22 | 71 | 18:29 | 289 | 05:21 | 71 | 18:28 | 289 |
| 10 | 05:19 | 71 | 18:30 | 290 | 05:20 | 71 | 18:30 | 290 | 05:21 | 71 | 18:29 | 289 | 05:21 | 71 | 18:29 | 290 |
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| 31 | 05:12 | 66 | 18:40 | 294 | 05:13 | 66 | 18:40 | 294 | 05:14 | 66 | 18:38 | 294 | 05:13 | 66 | 18:38 | 294 |

嘉義、臺南  
六月（高雄、屏東）地區日出、日沒時間表

| 日期 | 嘉 義   |    |       |     | 臺 南   |    |       |     | 高 雄   |    |       |     | 屏 東   |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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| 30 | 05:15 | 64 | 18:49 | 296 | 05:16 | 64 | 18:49 | 296 | 05:17 | 64 | 18:47 | 296 | 05:16 | 64 | 18:47 | 296 |

嘉義、臺南  
七月（高雄、屏東）地區日出、日沒時間表

| 日期 | 嘉 義   |    |       |     | 臺 南   |    |       |     | 高 雄   |    |       |     | 屏 東   |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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| 8  | 05:18 | 65 | 18:49 | 295 | 05:19 | 65 | 18:49 | 295 | 05:20 | 65 | 18:47 | 295 | 05:19 | 65 | 18:47 | 295 |
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嘉義、臺南  
八月（高雄、屏東）地區日出、日沒時間表

| 日期 | 嘉 義   |    |       |     | 臺 南   |    |       |     | 高 雄   |    |       |     | 屏 東   |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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嘉義、臺南  
九月（高雄、屏東）地區日出、日沒時間表

| 日期 | 嘉義    |    |       |     | 臺南    |    |       |     | 高雄    |    |       |     | 屏東    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
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| 16 | 05:45 | 87 | 18:01 | 273 | 05:45 | 87 | 18:02 | 273 | 05:45 | 87 | 18:01 | 273 | 05:45 | 87 | 18:01 | 273 |
| 17 | 05:45 | 87 | 18:00 | 273 | 05:46 | 87 | 18:01 | 273 | 05:46 | 87 | 18:00 | 273 | 05:45 | 87 | 18:00 | 273 |
| 18 | 05:45 | 87 | 17:59 | 272 | 05:46 | 87 | 18:00 | 272 | 05:46 | 87 | 17:59 | 272 | 05:45 | 87 | 17:59 | 272 |
| 19 | 05:46 | 88 | 17:58 | 272 | 05:46 | 88 | 17:59 | 272 | 05:46 | 88 | 17:58 | 272 | 05:46 | 88 | 17:58 | 272 |
| 20 | 05:46 | 88 | 17:57 | 272 | 05:47 | 88 | 17:58 | 272 | 05:46 | 88 | 17:57 | 272 | 05:46 | 88 | 17:57 | 272 |
| 21 | 05:46 | 89 | 17:56 | 271 | 05:47 | 89 | 17:57 | 271 | 05:47 | 89 | 17:56 | 271 | 05:46 | 89 | 17:56 | 271 |
| 22 | 05:47 | 89 | 17:55 | 271 | 05:47 | 89 | 17:56 | 271 | 05:47 | 89 | 17:55 | 271 | 05:47 | 89 | 17:55 | 271 |
| 23 | 05:47 | 89 | 17:54 | 270 | 05:48 | 89 | 17:55 | 270 | 05:47 | 89 | 17:54 | 270 | 05:47 | 89 | 17:54 | 270 |
| 24 | 05:47 | 90 | 17:53 | 270 | 05:48 | 90 | 17:54 | 270 | 05:48 | 90 | 17:53 | 270 | 05:47 | 90 | 17:53 | 270 |
| 25 | 05:48 | 90 | 17:52 | 269 | 05:48 | 90 | 17:53 | 269 | 05:48 | 90 | 17:52 | 269 | 05:47 | 90 | 17:52 | 269 |
| 26 | 05:48 | 91 | 17:51 | 269 | 05:48 | 91 | 17:52 | 269 | 05:48 | 91 | 17:51 | 269 | 05:48 | 91 | 17:51 | 269 |
| 27 | 05:48 | 91 | 17:50 | 269 | 05:49 | 91 | 17:51 | 269 | 05:48 | 91 | 17:50 | 269 | 05:48 | 91 | 17:50 | 269 |
| 28 | 05:49 | 92 | 17:49 | 268 | 05:49 | 92 | 17:50 | 268 | 05:49 | 92 | 17:50 | 268 | 05:48 | 92 | 17:49 | 268 |
| 29 | 05:49 | 92 | 17:48 | 268 | 05:49 | 92 | 17:49 | 268 | 05:49 | 92 | 17:49 | 268 | 05:49 | 92 | 17:48 | 268 |
| 30 | 05:49 | 92 | 17:47 | 267 | 05:50 | 92 | 17:48 | 267 | 05:49 | 92 | 17:48 | 267 | 05:49 | 92 | 17:47 | 267 |

嘉義、臺南  
十月（高雄、屏東）地區日出、日沒時間表

| 日期 | 嘉 義   |     |       |     | 臺 南   |     |       |     | 高 雄   |     |       |     | 屏 東   |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
| 1  | 05:50 | 93  | 17:46 | 267 | 05:50 | 93  | 17:47 | 267 | 05:50 | 93  | 17:47 | 267 | 05:49 | 93  | 17:46 | 267 |
| 2  | 05:50 | 93  | 17:45 | 267 | 05:50 | 93  | 17:46 | 267 | 05:50 | 93  | 17:46 | 267 | 05:50 | 93  | 17:45 | 267 |
| 3  | 05:50 | 94  | 17:44 | 266 | 05:51 | 94  | 17:45 | 266 | 05:50 | 94  | 17:45 | 266 | 05:50 | 94  | 17:44 | 266 |
| 4  | 05:51 | 94  | 17:43 | 266 | 05:51 | 94  | 17:44 | 266 | 05:51 | 94  | 17:44 | 266 | 05:50 | 94  | 17:43 | 266 |
| 5  | 05:51 | 95  | 17:42 | 265 | 05:52 | 95  | 17:43 | 265 | 05:51 | 95  | 17:43 | 265 | 05:51 | 95  | 17:42 | 265 |
| 6  | 05:51 | 95  | 17:41 | 265 | 05:52 | 95  | 17:42 | 265 | 05:51 | 95  | 17:42 | 265 | 05:51 | 95  | 17:41 | 265 |
| 7  | 05:52 | 95  | 17:40 | 264 | 05:52 | 95  | 17:41 | 264 | 05:52 | 95  | 17:41 | 264 | 05:51 | 95  | 17:40 | 264 |
| 8  | 05:52 | 96  | 17:39 | 264 | 05:53 | 96  | 17:40 | 264 | 05:52 | 96  | 17:40 | 264 | 05:52 | 96  | 17:40 | 264 |
| 9  | 05:53 | 96  | 17:38 | 264 | 05:53 | 96  | 17:39 | 264 | 05:52 | 96  | 17:39 | 264 | 05:52 | 96  | 17:39 | 264 |
| 10 | 05:53 | 97  | 17:37 | 263 | 05:53 | 97  | 17:38 | 263 | 05:53 | 97  | 17:38 | 263 | 05:52 | 97  | 17:38 | 263 |
| 11 | 05:53 | 97  | 17:36 | 263 | 05:54 | 97  | 17:37 | 263 | 05:53 | 97  | 17:37 | 263 | 05:53 | 97  | 17:37 | 263 |
| 12 | 05:54 | 97  | 17:36 | 262 | 05:54 | 97  | 17:36 | 262 | 05:53 | 97  | 17:36 | 262 | 05:53 | 97  | 17:36 | 262 |
| 13 | 05:54 | 98  | 17:35 | 262 | 05:55 | 98  | 17:35 | 262 | 05:54 | 98  | 17:35 | 262 | 05:54 | 98  | 17:35 | 262 |
| 14 | 05:55 | 98  | 17:34 | 262 | 05:55 | 98  | 17:34 | 262 | 05:54 | 98  | 17:35 | 262 | 05:54 | 98  | 17:34 | 262 |
| 15 | 05:55 | 99  | 17:33 | 261 | 05:55 | 99  | 17:34 | 261 | 05:55 | 99  | 17:34 | 261 | 05:54 | 99  | 17:33 | 261 |
| 16 | 05:55 | 99  | 17:32 | 261 | 05:56 | 99  | 17:33 | 261 | 05:55 | 99  | 17:33 | 261 | 05:55 | 99  | 17:32 | 261 |
| 17 | 05:56 | 99  | 17:31 | 260 | 05:56 | 99  | 17:32 | 260 | 05:55 | 99  | 17:32 | 260 | 05:55 | 99  | 17:32 | 260 |
| 18 | 05:56 | 100 | 17:30 | 260 | 05:57 | 100 | 17:31 | 260 | 05:56 | 100 | 17:31 | 260 | 05:56 | 100 | 17:31 | 260 |
| 19 | 05:57 | 100 | 17:29 | 260 | 05:57 | 100 | 17:30 | 260 | 05:56 | 100 | 17:30 | 260 | 05:56 | 100 | 17:30 | 260 |
| 20 | 05:57 | 101 | 17:29 | 259 | 05:58 | 101 | 17:29 | 259 | 05:57 | 101 | 17:30 | 259 | 05:56 | 101 | 17:29 | 259 |
| 21 | 05:58 | 101 | 17:28 | 259 | 05:58 | 101 | 17:29 | 259 | 05:57 | 101 | 17:29 | 259 | 05:57 | 101 | 17:28 | 259 |
| 22 | 05:58 | 101 | 17:27 | 258 | 05:59 | 101 | 17:28 | 258 | 05:58 | 101 | 17:28 | 258 | 05:57 | 101 | 17:28 | 258 |
| 23 | 05:59 | 102 | 17:26 | 258 | 05:59 | 102 | 17:27 | 258 | 05:58 | 102 | 17:27 | 258 | 05:58 | 102 | 17:27 | 258 |
| 24 | 05:59 | 102 | 17:25 | 258 | 06:00 | 102 | 17:26 | 258 | 05:59 | 102 | 17:27 | 258 | 05:58 | 102 | 17:26 | 258 |
| 25 | 06:00 | 103 | 17:25 | 257 | 06:00 | 103 | 17:25 | 257 | 05:59 | 103 | 17:26 | 257 | 05:59 | 103 | 17:25 | 257 |
| 26 | 06:00 | 103 | 17:24 | 257 | 06:01 | 103 | 17:25 | 257 | 05:59 | 103 | 17:25 | 257 | 05:59 | 103 | 17:25 | 257 |
| 27 | 06:01 | 103 | 17:23 | 256 | 06:01 | 103 | 17:24 | 256 | 06:00 | 103 | 17:24 | 257 | 06:00 | 103 | 17:24 | 257 |
| 28 | 06:01 | 104 | 17:23 | 256 | 06:02 | 104 | 17:23 | 256 | 06:00 | 104 | 17:24 | 256 | 06:00 | 104 | 17:23 | 256 |
| 29 | 06:02 | 104 | 17:22 | 256 | 06:02 | 104 | 17:23 | 256 | 06:01 | 104 | 17:23 | 256 | 06:01 | 104 | 17:23 | 256 |
| 30 | 06:02 | 104 | 17:21 | 255 | 06:03 | 104 | 17:22 | 255 | 06:01 | 104 | 17:23 | 255 | 06:01 | 104 | 17:22 | 255 |
| 31 | 06:03 | 105 | 17:21 | 255 | 06:03 | 105 | 17:21 | 255 | 06:02 | 105 | 17:22 | 255 | 06:02 | 105 | 17:21 | 255 |

嘉義、臺南  
十一月（高雄、屏東）地區日出、日沒時間表

| 日期 | 嘉 義   |     |       |     | 臺 南   |     |       |     | 高 雄   |     |       |     | 屏 東   |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
| 1  | 06:03 | 105 | 17:20 | 255 | 06:04 | 105 | 17:21 | 255 | 06:03 | 105 | 17:21 | 255 | 06:02 | 105 | 17:21 | 255 |
| 2  | 06:04 | 106 | 17:19 | 254 | 06:04 | 106 | 17:20 | 254 | 06:03 | 105 | 17:21 | 254 | 06:03 | 105 | 17:20 | 254 |
| 3  | 06:04 | 106 | 17:19 | 254 | 06:05 | 106 | 17:20 | 254 | 06:04 | 106 | 17:20 | 254 | 06:03 | 106 | 17:20 | 254 |
| 4  | 06:05 | 106 | 17:18 | 254 | 06:05 | 106 | 17:19 | 254 | 06:04 | 106 | 17:20 | 254 | 06:04 | 106 | 17:19 | 254 |
| 5  | 06:06 | 107 | 17:18 | 253 | 06:06 | 107 | 17:18 | 253 | 06:05 | 106 | 17:19 | 253 | 06:04 | 106 | 17:19 | 253 |
| 6  | 06:06 | 107 | 17:17 | 253 | 06:07 | 107 | 17:18 | 253 | 06:05 | 107 | 17:19 | 253 | 06:05 | 107 | 17:18 | 253 |
| 7  | 06:07 | 107 | 17:17 | 253 | 06:07 | 107 | 17:17 | 253 | 06:06 | 107 | 17:18 | 253 | 06:06 | 107 | 17:18 | 253 |
| 8  | 06:07 | 108 | 17:16 | 252 | 06:08 | 108 | 17:17 | 252 | 06:06 | 107 | 17:18 | 252 | 06:06 | 107 | 17:17 | 252 |
| 9  | 06:08 | 108 | 17:16 | 252 | 06:08 | 108 | 17:16 | 252 | 06:07 | 108 | 17:17 | 252 | 06:07 | 108 | 17:17 | 252 |
| 10 | 06:09 | 108 | 17:15 | 252 | 06:09 | 108 | 17:16 | 252 | 06:08 | 108 | 17:17 | 252 | 06:07 | 108 | 17:16 | 252 |
| 11 | 06:09 | 108 | 17:15 | 251 | 06:10 | 108 | 17:16 | 251 | 06:08 | 108 | 17:16 | 251 | 06:08 | 108 | 17:16 | 251 |
| 12 | 06:10 | 109 | 17:14 | 251 | 06:10 | 109 | 17:15 | 251 | 06:09 | 109 | 17:16 | 251 | 06:09 | 109 | 17:15 | 251 |
| 13 | 06:11 | 109 | 17:14 | 251 | 06:11 | 109 | 17:15 | 251 | 06:09 | 109 | 17:16 | 251 | 06:09 | 109 | 17:15 | 251 |
| 14 | 06:11 | 109 | 17:14 | 250 | 06:11 | 109 | 17:14 | 251 | 06:10 | 109 | 17:15 | 251 | 06:10 | 109 | 17:15 | 251 |
| 15 | 06:12 | 110 | 17:13 | 250 | 06:12 | 110 | 17:14 | 250 | 06:11 | 110 | 17:15 | 250 | 06:10 | 110 | 17:14 | 250 |
| 16 | 06:12 | 110 | 17:13 | 250 | 06:13 | 110 | 17:14 | 250 | 06:11 | 110 | 17:15 | 250 | 06:11 | 110 | 17:14 | 250 |
| 17 | 06:13 | 110 | 17:13 | 250 | 06:13 | 110 | 17:13 | 250 | 06:12 | 110 | 17:14 | 250 | 06:12 | 110 | 17:14 | 250 |
| 18 | 06:14 | 110 | 17:12 | 249 | 06:14 | 110 | 17:13 | 249 | 06:13 | 110 | 17:14 | 250 | 06:12 | 110 | 17:14 | 250 |
| 19 | 06:14 | 111 | 17:12 | 249 | 06:15 | 111 | 17:13 | 249 | 06:13 | 111 | 17:14 | 249 | 06:13 | 111 | 17:13 | 249 |
| 20 | 06:15 | 111 | 17:12 | 249 | 06:15 | 111 | 17:13 | 249 | 06:14 | 111 | 17:14 | 249 | 06:14 | 111 | 17:13 | 249 |
| 21 | 06:16 | 111 | 17:12 | 249 | 06:16 | 111 | 17:13 | 249 | 06:15 | 111 | 17:13 | 249 | 06:14 | 111 | 17:13 | 249 |
| 22 | 06:17 | 112 | 17:12 | 248 | 06:17 | 111 | 17:12 | 248 | 06:15 | 111 | 17:13 | 249 | 06:15 | 111 | 17:13 | 249 |
| 23 | 06:17 | 112 | 17:11 | 248 | 06:17 | 112 | 17:12 | 248 | 06:16 | 112 | 17:13 | 248 | 06:16 | 112 | 17:13 | 248 |
| 24 | 06:18 | 112 | 17:11 | 248 | 06:18 | 112 | 17:12 | 248 | 06:17 | 112 | 17:13 | 248 | 06:16 | 112 | 17:12 | 248 |
| 25 | 06:19 | 112 | 17:11 | 248 | 06:19 | 112 | 17:12 | 248 | 06:17 | 112 | 17:13 | 248 | 06:17 | 112 | 17:12 | 248 |
| 26 | 06:19 | 112 | 17:11 | 247 | 06:20 | 112 | 17:12 | 248 | 06:18 | 112 | 17:13 | 248 | 06:18 | 112 | 17:12 | 248 |
| 27 | 06:20 | 113 | 17:11 | 247 | 06:20 | 113 | 17:12 | 247 | 06:19 | 112 | 17:13 | 247 | 06:18 | 112 | 17:12 | 247 |
| 28 | 06:21 | 113 | 17:11 | 247 | 06:21 | 113 | 17:12 | 247 | 06:19 | 113 | 17:13 | 247 | 06:19 | 113 | 17:12 | 247 |
| 29 | 06:21 | 113 | 17:11 | 247 | 06:22 | 113 | 17:12 | 247 | 06:20 | 113 | 17:13 | 247 | 06:20 | 113 | 17:12 | 247 |
| 30 | 06:22 | 113 | 17:11 | 247 | 06:22 | 113 | 17:12 | 247 | 06:21 | 113 | 17:13 | 247 | 06:20 | 113 | 17:12 | 247 |



嘉義、臺南  
十二月 ( 高雄、屏東 ) 地區日出、日沒時間表

| 日期 | 嘉 義   |     |       |     | 臺 南   |     |       |     | 高 雄   |     |       |     | 屏 東   |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
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| 2  | 06:23 | 114 | 17:11 | 246 | 06:24 | 114 | 17:12 | 246 | 06:22 | 113 | 17:13 | 247 | 06:22 | 113 | 17:12 | 247 |
| 3  | 06:24 | 114 | 17:11 | 246 | 06:24 | 114 | 17:12 | 246 | 06:23 | 114 | 17:13 | 246 | 06:22 | 114 | 17:13 | 246 |
| 4  | 06:25 | 114 | 17:11 | 246 | 06:25 | 114 | 17:12 | 246 | 06:23 | 114 | 17:13 | 246 | 06:23 | 114 | 17:13 | 246 |
| 5  | 06:25 | 114 | 17:11 | 246 | 06:26 | 114 | 17:12 | 246 | 06:24 | 114 | 17:13 | 246 | 06:24 | 114 | 17:13 | 246 |
| 6  | 06:26 | 114 | 17:12 | 246 | 06:26 | 114 | 17:13 | 246 | 06:25 | 114 | 17:14 | 246 | 06:24 | 114 | 17:13 | 246 |
| 7  | 06:27 | 114 | 17:12 | 246 | 06:27 | 114 | 17:13 | 246 | 06:25 | 114 | 17:14 | 246 | 06:25 | 114 | 17:13 | 246 |
| 8  | 06:27 | 114 | 17:12 | 246 | 06:28 | 114 | 17:13 | 246 | 06:26 | 114 | 17:14 | 246 | 06:26 | 114 | 17:13 | 246 |
| 9  | 06:28 | 115 | 17:12 | 245 | 06:28 | 115 | 17:13 | 245 | 06:27 | 114 | 17:14 | 246 | 06:26 | 114 | 17:14 | 246 |
| 10 | 06:29 | 115 | 17:12 | 245 | 06:29 | 115 | 17:13 | 245 | 06:27 | 114 | 17:15 | 245 | 06:27 | 115 | 17:14 | 245 |
| 11 | 06:29 | 115 | 17:13 | 245 | 06:30 | 115 | 17:14 | 245 | 06:28 | 115 | 17:15 | 245 | 06:28 | 115 | 17:14 | 245 |
| 12 | 06:30 | 115 | 17:13 | 245 | 06:30 | 115 | 17:14 | 245 | 06:28 | 115 | 17:15 | 245 | 06:28 | 115 | 17:15 | 245 |
| 13 | 06:31 | 115 | 17:13 | 245 | 06:31 | 115 | 17:14 | 245 | 06:29 | 115 | 17:15 | 245 | 06:29 | 115 | 17:15 | 245 |
| 14 | 06:31 | 115 | 17:14 | 245 | 06:31 | 115 | 17:15 | 245 | 06:30 | 115 | 17:16 | 245 | 06:30 | 115 | 17:15 | 245 |
| 15 | 06:32 | 115 | 17:14 | 245 | 06:32 | 115 | 17:15 | 245 | 06:30 | 115 | 17:16 | 245 | 06:30 | 115 | 17:16 | 245 |
| 16 | 06:32 | 115 | 17:14 | 245 | 06:33 | 115 | 17:15 | 245 | 06:31 | 115 | 17:17 | 245 | 06:31 | 115 | 17:16 | 245 |
| 17 | 06:33 | 115 | 17:15 | 245 | 06:33 | 115 | 17:16 | 245 | 06:31 | 115 | 17:17 | 245 | 06:31 | 115 | 17:16 | 245 |
| 18 | 06:34 | 115 | 17:15 | 245 | 06:34 | 115 | 17:16 | 245 | 06:32 | 115 | 17:17 | 245 | 06:32 | 115 | 17:17 | 245 |
| 19 | 06:34 | 115 | 17:16 | 245 | 06:34 | 115 | 17:17 | 245 | 06:33 | 115 | 17:18 | 245 | 06:32 | 115 | 17:17 | 245 |
| 20 | 06:35 | 115 | 17:16 | 245 | 06:35 | 115 | 17:17 | 245 | 06:33 | 115 | 17:18 | 245 | 06:33 | 115 | 17:18 | 245 |
| 21 | 06:35 | 115 | 17:17 | 245 | 06:35 | 115 | 17:18 | 245 | 06:34 | 115 | 17:19 | 245 | 06:33 | 115 | 17:18 | 245 |
| 22 | 06:36 | 115 | 17:17 | 245 | 06:36 | 115 | 17:18 | 245 | 06:34 | 115 | 17:19 | 245 | 06:34 | 115 | 17:19 | 245 |
| 23 | 06:36 | 115 | 17:18 | 245 | 06:36 | 115 | 17:19 | 245 | 06:35 | 115 | 17:20 | 245 | 06:34 | 115 | 17:19 | 245 |
| 24 | 06:37 | 115 | 17:18 | 245 | 06:37 | 115 | 17:19 | 245 | 06:35 | 115 | 17:20 | 245 | 06:35 | 115 | 17:20 | 245 |
| 25 | 06:37 | 115 | 17:19 | 245 | 06:37 | 115 | 17:20 | 245 | 06:36 | 115 | 17:21 | 245 | 06:35 | 115 | 17:20 | 245 |
| 26 | 06:38 | 115 | 17:19 | 245 | 06:38 | 115 | 17:20 | 245 | 06:36 | 115 | 17:21 | 245 | 06:36 | 115 | 17:21 | 245 |
| 27 | 06:38 | 115 | 17:20 | 245 | 06:38 | 115 | 17:21 | 245 | 06:36 | 115 | 17:22 | 245 | 06:36 | 115 | 17:21 | 245 |
| 28 | 06:38 | 115 | 17:20 | 245 | 06:39 | 115 | 17:21 | 245 | 06:37 | 115 | 17:23 | 245 | 06:37 | 115 | 17:22 | 245 |
| 29 | 06:39 | 115 | 17:21 | 245 | 06:39 | 115 | 17:22 | 245 | 06:37 | 115 | 17:23 | 245 | 06:37 | 115 | 17:23 | 245 |
| 30 | 06:39 | 115 | 17:22 | 245 | 06:39 | 115 | 17:23 | 245 | 06:38 | 115 | 17:24 | 245 | 06:37 | 115 | 17:23 | 245 |
| 31 | 06:40 | 115 | 17:22 | 245 | 06:40 | 115 | 17:23 | 245 | 06:38 | 115 | 17:24 | 245 | 06:38 | 115 | 17:24 | 245 |

宜蘭、花蓮  
一月（臺東、南投）地區日出、日沒時間表

| 日期 | 宜蘭       |          |          |          | 花蓮       |          |          |          | 臺東       |          |          |          | 南投       |          |          |          |
|----|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|    | 日出<br>時間 | 日出<br>方位 | 日沒<br>時間 | 日沒<br>方位 | 日出<br>時間 | 日出<br>方位 | 日沒<br>時間 | 日沒<br>方位 | 日出<br>時間 | 日出<br>方位 | 日沒<br>時間 | 日沒<br>方位 | 日出<br>時間 | 日出<br>方位 | 日沒<br>時間 | 日沒<br>方位 |
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| 4  | 06:38    | 115      | 17:17    | 245      | 06:37    | 115      | 17:19    | 245      | 06:37    | 114      | 17:24    | 246      | 06:41    | 115      | 17:23    | 245      |
| 5  | 06:38    | 115      | 17:18    | 245      | 06:37    | 115      | 17:20    | 246      | 06:37    | 114      | 17:24    | 246      | 06:41    | 115      | 17:24    | 246      |
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| 12 | 06:39    | 114      | 17:23    | 246      | 06:38    | 114      | 17:25    | 247      | 06:38    | 113      | 17:29    | 247      | 06:42    | 113      | 17:29    | 247      |
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| 17 | 06:39    | 113      | 17:27    | 247      | 06:38    | 113      | 17:29    | 248      | 06:38    | 112      | 17:33    | 248      | 06:42    | 113      | 17:32    | 248      |
| 18 | 06:39    | 112      | 17:27    | 248      | 06:38    | 112      | 17:29    | 248      | 06:38    | 112      | 17:33    | 248      | 06:42    | 112      | 17:33    | 248      |
| 19 | 06:39    | 112      | 17:28    | 248      | 06:38    | 112      | 17:30    | 248      | 06:38    | 112      | 17:34    | 248      | 06:42    | 112      | 17:34    | 248      |
| 20 | 06:39    | 112      | 17:29    | 248      | 06:38    | 112      | 17:31    | 248      | 06:38    | 112      | 17:35    | 248      | 06:42    | 112      | 17:35    | 248      |
| 21 | 06:39    | 112      | 17:30    | 248      | 06:38    | 112      | 17:32    | 248      | 06:38    | 111      | 17:36    | 249      | 06:42    | 112      | 17:35    | 249      |
| 22 | 06:39    | 111      | 17:30    | 249      | 06:38    | 111      | 17:32    | 249      | 06:38    | 111      | 17:36    | 249      | 06:41    | 111      | 17:36    | 249      |
| 23 | 06:38    | 111      | 17:31    | 249      | 06:38    | 111      | 17:33    | 249      | 06:37    | 111      | 17:37    | 249      | 06:41    | 111      | 17:37    | 249      |
| 24 | 06:38    | 111      | 17:32    | 249      | 06:37    | 111      | 17:34    | 249      | 06:37    | 111      | 17:38    | 249      | 06:41    | 111      | 17:38    | 249      |
| 25 | 06:38    | 111      | 17:33    | 249      | 06:37    | 111      | 17:34    | 250      | 06:37    | 110      | 17:38    | 250      | 06:41    | 111      | 17:38    | 250      |
| 26 | 06:38    | 110      | 17:33    | 250      | 06:37    | 110      | 17:35    | 250      | 06:37    | 110      | 17:39    | 250      | 06:41    | 110      | 17:39    | 250      |
| 27 | 06:37    | 110      | 17:34    | 250      | 06:37    | 110      | 17:36    | 250      | 06:37    | 110      | 17:40    | 250      | 06:40    | 110      | 17:40    | 250      |
| 28 | 06:37    | 110      | 17:35    | 250      | 06:36    | 110      | 17:37    | 250      | 06:36    | 110      | 17:40    | 251      | 06:40    | 110      | 17:40    | 250      |
| 29 | 06:37    | 110      | 17:36    | 251      | 06:36    | 109      | 17:37    | 251      | 06:36    | 109      | 17:41    | 251      | 06:40    | 109      | 17:41    | 251      |
| 30 | 06:36    | 109      | 17:36    | 251      | 06:36    | 109      | 17:38    | 251      | 06:36    | 109      | 17:42    | 251      | 06:39    | 109      | 17:42    | 251      |
| 31 | 06:36    | 109      | 17:37    | 251      | 06:35    | 109      | 17:39    | 251      | 06:35    | 109      | 17:42    | 251      | 06:39    | 109      | 17:43    | 251      |

宜蘭縣（宜蘭市） 花蓮縣（花蓮市）

臺東縣（臺東市） 南投縣（南投市）

宜蘭、花蓮  
二月（臺東、南投）地區日出、日沒時間表

| 日期 | 宜蘭    |     |       |     | 花蓮    |     |       |     | 臺東    |     |       |     | 南投    |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
| 1  | 06:35 | 109 | 17:38 | 251 | 06:35 | 109 | 17:39 | 252 | 06:35 | 108 | 17:43 | 252 | 06:39 | 109 | 17:43 | 252 |
| 2  | 06:35 | 108 | 17:38 | 252 | 06:35 | 108 | 17:40 | 252 | 06:35 | 108 | 17:44 | 252 | 06:38 | 108 | 17:44 | 252 |
| 3  | 06:35 | 108 | 17:39 | 252 | 06:34 | 108 | 17:41 | 252 | 06:34 | 108 | 17:44 | 252 | 06:38 | 108 | 17:45 | 252 |
| 4  | 06:34 | 108 | 17:40 | 252 | 06:34 | 108 | 17:41 | 253 | 06:34 | 107 | 17:45 | 253 | 06:37 | 108 | 17:45 | 253 |
| 5  | 06:34 | 107 | 17:41 | 253 | 06:33 | 107 | 17:42 | 253 | 06:33 | 107 | 17:46 | 253 | 06:37 | 107 | 17:46 | 253 |
| 6  | 06:33 | 107 | 17:41 | 253 | 06:33 | 107 | 17:43 | 253 | 06:33 | 107 | 17:46 | 253 | 06:36 | 107 | 17:47 | 253 |
| 7  | 06:33 | 107 | 17:42 | 253 | 06:32 | 107 | 17:43 | 254 | 06:32 | 106 | 17:47 | 254 | 06:36 | 107 | 17:47 | 254 |
| 8  | 06:32 | 106 | 17:43 | 254 | 06:32 | 106 | 17:44 | 254 | 06:32 | 106 | 17:47 | 254 | 06:35 | 106 | 17:48 | 254 |
| 9  | 06:31 | 106 | 17:43 | 254 | 06:31 | 106 | 17:45 | 254 | 06:31 | 106 | 17:48 | 254 | 06:35 | 106 | 17:49 | 254 |
| 10 | 06:31 | 106 | 17:44 | 255 | 06:30 | 106 | 17:45 | 255 | 06:31 | 105 | 17:49 | 255 | 06:34 | 106 | 17:49 | 255 |
| 11 | 06:30 | 105 | 17:45 | 255 | 06:30 | 105 | 17:46 | 255 | 06:30 | 105 | 17:49 | 255 | 06:33 | 105 | 17:50 | 255 |
| 12 | 06:30 | 105 | 17:45 | 255 | 06:29 | 105 | 17:47 | 255 | 06:30 | 105 | 17:50 | 255 | 06:33 | 105 | 17:50 | 255 |
| 13 | 06:29 | 105 | 17:46 | 256 | 06:29 | 104 | 17:47 | 256 | 06:29 | 104 | 17:50 | 256 | 06:32 | 104 | 17:51 | 256 |
| 14 | 06:28 | 104 | 17:46 | 256 | 06:28 | 104 | 17:48 | 256 | 06:28 | 104 | 17:51 | 256 | 06:32 | 104 | 17:52 | 256 |
| 15 | 06:27 | 104 | 17:47 | 256 | 06:27 | 104 | 17:48 | 256 | 06:28 | 104 | 17:52 | 257 | 06:31 | 104 | 17:52 | 256 |
| 16 | 06:27 | 103 | 17:48 | 257 | 06:27 | 103 | 17:49 | 257 | 06:27 | 103 | 17:52 | 257 | 06:30 | 103 | 17:53 | 257 |
| 17 | 06:26 | 103 | 17:48 | 257 | 06:26 | 103 | 17:50 | 257 | 06:27 | 103 | 17:53 | 257 | 06:30 | 103 | 17:53 | 257 |
| 18 | 06:25 | 103 | 17:49 | 258 | 06:25 | 103 | 17:50 | 258 | 06:26 | 102 | 17:53 | 258 | 06:29 | 103 | 17:54 | 258 |
| 19 | 06:25 | 102 | 17:49 | 258 | 06:24 | 102 | 17:51 | 258 | 06:25 | 102 | 17:54 | 258 | 06:28 | 102 | 17:54 | 258 |
| 20 | 06:24 | 102 | 17:50 | 258 | 06:24 | 102 | 17:51 | 258 | 06:24 | 102 | 17:54 | 258 | 06:27 | 102 | 17:55 | 258 |
| 21 | 06:23 | 101 | 17:51 | 259 | 06:23 | 101 | 17:52 | 259 | 06:24 | 101 | 17:55 | 259 | 06:27 | 101 | 17:56 | 259 |
| 22 | 06:22 | 101 | 17:51 | 259 | 06:22 | 101 | 17:52 | 259 | 06:23 | 101 | 17:55 | 259 | 06:26 | 101 | 17:56 | 259 |
| 23 | 06:21 | 101 | 17:52 | 260 | 06:21 | 101 | 17:53 | 260 | 06:22 | 101 | 17:56 | 260 | 06:25 | 101 | 17:57 | 260 |
| 24 | 06:21 | 100 | 17:52 | 260 | 06:21 | 100 | 17:53 | 260 | 06:21 | 100 | 17:56 | 260 | 06:24 | 100 | 17:57 | 260 |
| 25 | 06:20 | 100 | 17:53 | 260 | 06:20 | 100 | 17:54 | 260 | 06:21 | 100 | 17:57 | 260 | 06:23 | 100 | 17:58 | 260 |
| 26 | 06:19 | 99  | 17:53 | 261 | 06:19 | 99  | 17:54 | 261 | 06:20 | 99  | 17:57 | 261 | 06:23 | 99  | 17:58 | 261 |
| 27 | 06:18 | 99  | 17:54 | 261 | 06:18 | 99  | 17:55 | 261 | 06:19 | 99  | 17:58 | 261 | 06:22 | 99  | 17:59 | 261 |
| 28 | 06:17 | 99  | 17:54 | 262 | 06:17 | 99  | 17:55 | 262 | 06:18 | 99  | 17:58 | 262 | 06:21 | 99  | 17:59 | 262 |

宜蘭、花蓮  
三月（臺東、南投）地區日出、日沒時間表

| 日期 | 宜蘭    |    |       |     | 花蓮    |    |       |     | 臺東    |    |       |     | 南投    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 06:16 | 98 | 17:55 | 262 | 06:16 | 98 | 17:56 | 262 | 06:17 | 98 | 17:59 | 262 | 06:20 | 98 | 18:00 | 262 |
| 2  | 06:15 | 98 | 17:55 | 262 | 06:15 | 98 | 17:56 | 262 | 06:17 | 98 | 17:59 | 262 | 06:19 | 98 | 18:00 | 262 |
| 3  | 06:14 | 97 | 17:56 | 263 | 06:15 | 97 | 17:57 | 263 | 06:16 | 97 | 17:59 | 263 | 06:18 | 97 | 18:01 | 263 |
| 4  | 06:13 | 97 | 17:56 | 263 | 06:14 | 97 | 17:57 | 263 | 06:15 | 97 | 18:00 | 263 | 06:17 | 97 | 18:01 | 263 |
| 5  | 06:13 | 97 | 17:57 | 264 | 06:13 | 97 | 17:58 | 264 | 06:14 | 96 | 18:00 | 264 | 06:16 | 96 | 18:02 | 264 |
| 6  | 06:12 | 96 | 17:57 | 264 | 06:12 | 96 | 17:58 | 264 | 06:13 | 96 | 18:01 | 264 | 06:16 | 96 | 18:02 | 264 |
| 7  | 06:11 | 96 | 17:58 | 265 | 06:11 | 96 | 17:59 | 265 | 06:12 | 96 | 18:01 | 265 | 06:15 | 96 | 18:03 | 265 |
| 8  | 06:10 | 95 | 17:58 | 265 | 06:10 | 95 | 17:59 | 265 | 06:11 | 95 | 18:02 | 265 | 06:14 | 95 | 18:03 | 265 |
| 9  | 06:09 | 95 | 17:59 | 265 | 06:09 | 95 | 18:00 | 265 | 06:10 | 95 | 18:02 | 265 | 06:13 | 95 | 18:03 | 265 |
| 10 | 06:08 | 94 | 17:59 | 266 | 06:08 | 94 | 18:00 | 266 | 06:10 | 94 | 18:02 | 266 | 06:12 | 94 | 18:04 | 266 |
| 11 | 06:07 | 94 | 18:00 | 266 | 06:07 | 94 | 18:01 | 266 | 06:09 | 94 | 18:03 | 266 | 06:11 | 94 | 18:04 | 266 |
| 12 | 06:06 | 94 | 18:00 | 267 | 06:06 | 94 | 18:01 | 267 | 06:08 | 94 | 18:03 | 267 | 06:10 | 94 | 18:05 | 267 |
| 13 | 06:05 | 93 | 18:01 | 267 | 06:05 | 93 | 18:01 | 267 | 06:07 | 93 | 18:04 | 267 | 06:09 | 93 | 18:05 | 267 |
| 14 | 06:04 | 93 | 18:01 | 268 | 06:04 | 93 | 18:02 | 268 | 06:06 | 93 | 18:04 | 268 | 06:08 | 93 | 18:06 | 268 |
| 15 | 06:03 | 92 | 18:02 | 268 | 06:03 | 92 | 18:02 | 268 | 06:05 | 92 | 18:04 | 268 | 06:07 | 92 | 18:06 | 268 |
| 16 | 06:02 | 92 | 18:02 | 268 | 06:02 | 92 | 18:03 | 268 | 06:04 | 92 | 18:05 | 268 | 06:06 | 92 | 18:06 | 268 |
| 17 | 06:01 | 91 | 18:03 | 269 | 06:01 | 91 | 18:03 | 269 | 06:03 | 91 | 18:05 | 269 | 06:05 | 91 | 18:07 | 269 |
| 18 | 06:00 | 91 | 18:03 | 269 | 06:00 | 91 | 18:04 | 269 | 06:02 | 91 | 18:06 | 269 | 06:04 | 91 | 18:07 | 269 |
| 19 | 05:59 | 90 | 18:03 | 270 | 05:59 | 90 | 18:04 | 270 | 06:01 | 91 | 18:06 | 270 | 06:03 | 90 | 18:08 | 270 |
| 20 | 05:58 | 90 | 18:04 | 270 | 05:58 | 90 | 18:04 | 270 | 06:00 | 90 | 18:06 | 270 | 06:02 | 90 | 18:08 | 270 |
| 21 | 05:57 | 90 | 18:04 | 271 | 05:57 | 90 | 18:05 | 271 | 05:59 | 90 | 18:07 | 271 | 06:01 | 90 | 18:09 | 271 |
| 22 | 05:56 | 89 | 18:05 | 271 | 05:56 | 89 | 18:05 | 271 | 05:58 | 89 | 18:07 | 271 | 06:00 | 89 | 18:09 | 271 |
| 23 | 05:55 | 89 | 18:05 | 271 | 05:55 | 89 | 18:06 | 271 | 05:57 | 89 | 18:07 | 271 | 05:59 | 89 | 18:09 | 271 |
| 24 | 05:54 | 88 | 18:06 | 272 | 05:54 | 88 | 18:06 | 272 | 05:56 | 88 | 18:08 | 272 | 05:58 | 88 | 18:10 | 272 |
| 25 | 05:53 | 88 | 18:06 | 272 | 05:53 | 88 | 18:06 | 272 | 05:55 | 88 | 18:08 | 272 | 05:57 | 88 | 18:10 | 272 |
| 26 | 05:52 | 87 | 18:06 | 273 | 05:52 | 87 | 18:07 | 273 | 05:54 | 88 | 18:08 | 273 | 05:56 | 87 | 18:11 | 273 |
| 27 | 05:51 | 87 | 18:07 | 273 | 05:51 | 87 | 18:07 | 273 | 05:53 | 87 | 18:09 | 273 | 05:55 | 87 | 18:11 | 273 |
| 28 | 05:50 | 87 | 18:07 | 274 | 05:50 | 87 | 18:08 | 274 | 05:53 | 87 | 18:09 | 274 | 05:54 | 87 | 18:11 | 274 |
| 29 | 05:49 | 86 | 18:08 | 274 | 05:49 | 86 | 18:08 | 274 | 05:52 | 86 | 18:10 | 274 | 05:53 | 86 | 18:12 | 274 |
| 30 | 05:48 | 86 | 18:08 | 274 | 05:48 | 86 | 18:08 | 274 | 05:51 | 86 | 18:10 | 274 | 05:52 | 86 | 18:12 | 274 |
| 31 | 05:46 | 85 | 18:09 | 275 | 05:47 | 85 | 18:09 | 275 | 05:50 | 85 | 18:10 | 275 | 05:51 | 85 | 18:12 | 275 |

宜蘭、花蓮  
四月（臺東、南投）地區日出、日沒時間表

| 日期 | 宜蘭    |    |       |     | 花蓮    |    |       |     | 臺東    |    |       |     | 南投    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 05:45 | 85 | 18:09 | 275 | 05:46 | 85 | 18:09 | 275 | 05:49 | 85 | 18:11 | 275 | 05:50 | 85 | 18:13 | 275 |
| 2  | 05:44 | 84 | 18:09 | 276 | 05:45 | 84 | 18:10 | 276 | 05:48 | 85 | 18:11 | 276 | 05:49 | 84 | 18:13 | 276 |
| 3  | 05:43 | 84 | 18:10 | 276 | 05:44 | 84 | 18:10 | 276 | 05:47 | 84 | 18:11 | 276 | 05:48 | 84 | 18:14 | 276 |
| 4  | 05:42 | 84 | 18:10 | 277 | 05:43 | 84 | 18:10 | 277 | 05:46 | 84 | 18:12 | 276 | 05:47 | 84 | 18:14 | 277 |
| 5  | 05:41 | 83 | 18:11 | 277 | 05:42 | 83 | 18:11 | 277 | 05:45 | 83 | 18:12 | 277 | 05:46 | 83 | 18:14 | 277 |
| 6  | 05:40 | 83 | 18:11 | 277 | 05:41 | 83 | 18:11 | 277 | 05:44 | 83 | 18:12 | 277 | 05:45 | 83 | 18:15 | 277 |
| 7  | 05:39 | 82 | 18:11 | 278 | 05:40 | 82 | 18:12 | 278 | 05:43 | 82 | 18:13 | 278 | 05:44 | 82 | 18:15 | 278 |
| 8  | 05:38 | 82 | 18:12 | 278 | 05:39 | 82 | 18:12 | 278 | 05:42 | 82 | 18:13 | 278 | 05:43 | 82 | 18:16 | 278 |
| 9  | 05:37 | 82 | 18:12 | 279 | 05:39 | 82 | 18:12 | 279 | 05:41 | 82 | 18:13 | 279 | 05:42 | 82 | 18:16 | 279 |
| 10 | 05:37 | 81 | 18:13 | 279 | 05:38 | 81 | 18:13 | 279 | 05:40 | 81 | 18:14 | 279 | 05:41 | 81 | 18:16 | 279 |
| 11 | 05:36 | 81 | 18:13 | 280 | 05:37 | 81 | 18:13 | 279 | 05:39 | 81 | 18:14 | 279 | 05:40 | 81 | 18:17 | 279 |
| 12 | 05:35 | 80 | 18:14 | 280 | 05:36 | 80 | 18:14 | 280 | 05:38 | 80 | 18:15 | 280 | 05:39 | 80 | 18:17 | 280 |
| 13 | 05:34 | 80 | 18:14 | 280 | 05:35 | 80 | 18:14 | 280 | 05:38 | 80 | 18:15 | 280 | 05:39 | 80 | 18:18 | 280 |
| 14 | 05:33 | 79 | 18:15 | 281 | 05:34 | 80 | 18:14 | 281 | 05:37 | 80 | 18:15 | 281 | 05:38 | 80 | 18:18 | 281 |
| 15 | 05:32 | 79 | 18:15 | 281 | 05:33 | 79 | 18:15 | 281 | 05:36 | 79 | 18:16 | 281 | 05:37 | 79 | 18:19 | 281 |
| 16 | 05:31 | 79 | 18:15 | 282 | 05:32 | 79 | 18:15 | 281 | 05:35 | 79 | 18:16 | 281 | 05:36 | 79 | 18:19 | 281 |
| 17 | 05:30 | 78 | 18:16 | 282 | 05:31 | 78 | 18:16 | 282 | 05:34 | 79 | 18:16 | 282 | 05:35 | 78 | 18:19 | 282 |
| 18 | 05:29 | 78 | 18:16 | 282 | 05:30 | 78 | 18:16 | 282 | 05:33 | 78 | 18:17 | 282 | 05:34 | 78 | 18:20 | 282 |
| 19 | 05:28 | 78 | 18:17 | 283 | 05:29 | 78 | 18:17 | 283 | 05:32 | 78 | 18:17 | 282 | 05:33 | 78 | 18:20 | 283 |
| 20 | 05:27 | 77 | 18:17 | 283 | 05:29 | 77 | 18:17 | 283 | 05:32 | 77 | 18:18 | 283 | 05:32 | 77 | 18:21 | 283 |
| 21 | 05:26 | 77 | 18:18 | 283 | 05:28 | 77 | 18:17 | 283 | 05:31 | 77 | 18:18 | 283 | 05:31 | 77 | 18:21 | 283 |
| 22 | 05:25 | 76 | 18:18 | 284 | 05:27 | 76 | 18:18 | 284 | 05:30 | 77 | 18:18 | 284 | 05:31 | 76 | 18:22 | 284 |
| 23 | 05:25 | 76 | 18:19 | 284 | 05:26 | 76 | 18:18 | 284 | 05:29 | 76 | 18:19 | 284 | 05:30 | 76 | 18:22 | 284 |
| 24 | 05:24 | 76 | 18:19 | 285 | 05:25 | 76 | 18:19 | 284 | 05:28 | 76 | 18:19 | 284 | 05:29 | 76 | 18:22 | 284 |
| 25 | 05:23 | 75 | 18:19 | 285 | 05:24 | 75 | 18:19 | 285 | 05:28 | 76 | 18:20 | 285 | 05:28 | 75 | 18:23 | 285 |
| 26 | 05:22 | 75 | 18:20 | 285 | 05:24 | 75 | 18:20 | 285 | 05:27 | 75 | 18:20 | 285 | 05:27 | 75 | 18:23 | 285 |
| 27 | 05:21 | 75 | 18:20 | 286 | 05:23 | 75 | 18:20 | 286 | 05:26 | 75 | 18:21 | 285 | 05:27 | 75 | 18:24 | 286 |
| 28 | 05:21 | 74 | 18:21 | 286 | 05:22 | 74 | 18:21 | 286 | 05:25 | 74 | 18:21 | 286 | 05:26 | 74 | 18:24 | 286 |
| 29 | 05:20 | 74 | 18:21 | 286 | 05:21 | 74 | 18:21 | 286 | 05:25 | 74 | 18:21 | 286 | 05:25 | 74 | 18:25 | 286 |
| 30 | 05:19 | 74 | 18:22 | 287 | 05:21 | 74 | 18:21 | 287 | 05:24 | 74 | 18:22 | 286 | 05:24 | 74 | 18:25 | 287 |

宜蘭、花蓮  
五月 ( 臺東、南投 ) 地區日出、日沒時間表

| 日期 | 宜蘭    |    |       |     | 花蓮    |    |       |     | 臺東    |    |       |     | 南投    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 05:18 | 73 | 18:22 | 287 | 05:20 | 73 | 18:22 | 287 | 05:23 | 73 | 18:22 | 287 | 05:24 | 73 | 18:26 | 287 |
| 2  | 05:17 | 73 | 18:23 | 287 | 05:19 | 73 | 18:22 | 287 | 05:23 | 73 | 18:23 | 287 | 05:23 | 73 | 18:26 | 287 |
| 3  | 05:17 | 72 | 18:23 | 288 | 05:18 | 73 | 18:23 | 288 | 05:22 | 73 | 18:23 | 287 | 05:22 | 73 | 18:27 | 288 |
| 4  | 05:16 | 72 | 18:24 | 288 | 05:18 | 72 | 18:23 | 288 | 05:21 | 72 | 18:24 | 288 | 05:22 | 72 | 18:27 | 288 |
| 5  | 05:15 | 72 | 18:24 | 288 | 05:17 | 72 | 18:24 | 288 | 05:21 | 72 | 18:24 | 288 | 05:21 | 72 | 18:27 | 288 |
| 6  | 05:15 | 72 | 18:25 | 289 | 05:16 | 72 | 18:24 | 289 | 05:20 | 72 | 18:24 | 288 | 05:20 | 72 | 18:28 | 289 |
| 7  | 05:14 | 71 | 18:25 | 289 | 05:16 | 71 | 18:25 | 289 | 05:19 | 72 | 18:25 | 289 | 05:20 | 71 | 18:28 | 289 |
| 8  | 05:13 | 71 | 18:26 | 289 | 05:15 | 71 | 18:25 | 289 | 05:19 | 71 | 18:25 | 289 | 05:19 | 71 | 18:29 | 289 |
| 9  | 05:13 | 71 | 18:26 | 290 | 05:15 | 71 | 18:26 | 289 | 05:18 | 71 | 18:26 | 289 | 05:18 | 71 | 18:29 | 289 |
| 10 | 05:12 | 70 | 18:27 | 290 | 05:14 | 70 | 18:26 | 290 | 05:18 | 71 | 18:26 | 290 | 05:18 | 70 | 18:30 | 290 |
| 11 | 05:12 | 70 | 18:27 | 290 | 05:13 | 70 | 18:27 | 290 | 05:17 | 70 | 18:27 | 290 | 05:17 | 70 | 18:30 | 290 |
| 12 | 05:11 | 70 | 18:28 | 290 | 05:13 | 70 | 18:27 | 290 | 05:17 | 70 | 18:27 | 290 | 05:17 | 70 | 18:31 | 290 |
| 13 | 05:11 | 69 | 18:28 | 291 | 05:12 | 70 | 18:28 | 291 | 05:16 | 70 | 18:28 | 290 | 05:16 | 70 | 18:31 | 291 |
| 14 | 05:10 | 69 | 18:29 | 291 | 05:12 | 69 | 18:28 | 291 | 05:16 | 70 | 18:28 | 291 | 05:16 | 69 | 18:32 | 291 |
| 15 | 05:10 | 69 | 18:29 | 291 | 05:11 | 69 | 18:29 | 291 | 05:15 | 69 | 18:29 | 291 | 05:15 | 69 | 18:32 | 291 |
| 16 | 05:09 | 69 | 18:30 | 292 | 05:11 | 69 | 18:29 | 291 | 05:15 | 69 | 18:29 | 291 | 05:15 | 69 | 18:33 | 291 |
| 17 | 05:09 | 68 | 18:30 | 292 | 05:10 | 69 | 18:30 | 292 | 05:14 | 69 | 18:29 | 291 | 05:14 | 69 | 18:33 | 292 |
| 18 | 05:08 | 68 | 18:31 | 292 | 05:10 | 68 | 18:30 | 292 | 05:14 | 68 | 18:30 | 292 | 05:14 | 68 | 18:34 | 292 |
| 19 | 05:08 | 68 | 18:31 | 292 | 05:10 | 68 | 18:31 | 292 | 05:14 | 68 | 18:30 | 292 | 05:13 | 68 | 18:34 | 292 |
| 20 | 05:07 | 68 | 18:32 | 292 | 05:09 | 68 | 18:31 | 292 | 05:13 | 68 | 18:31 | 292 | 05:13 | 68 | 18:35 | 292 |
| 21 | 05:07 | 67 | 18:32 | 293 | 05:09 | 68 | 18:32 | 293 | 05:13 | 68 | 18:31 | 292 | 05:13 | 68 | 18:35 | 293 |
| 22 | 05:06 | 67 | 18:33 | 293 | 05:08 | 67 | 18:32 | 293 | 05:13 | 68 | 18:32 | 293 | 05:12 | 67 | 18:36 | 293 |
| 23 | 05:06 | 67 | 18:33 | 293 | 05:08 | 67 | 18:33 | 293 | 05:12 | 67 | 18:32 | 293 | 05:12 | 67 | 18:36 | 293 |
| 24 | 05:06 | 67 | 18:34 | 293 | 05:08 | 67 | 18:33 | 293 | 05:12 | 67 | 18:33 | 293 | 05:12 | 67 | 18:37 | 293 |
| 25 | 05:05 | 67 | 18:34 | 294 | 05:07 | 67 | 18:34 | 293 | 05:12 | 67 | 18:33 | 293 | 05:11 | 67 | 18:37 | 293 |
| 26 | 05:05 | 66 | 18:35 | 294 | 05:07 | 66 | 18:34 | 294 | 05:11 | 67 | 18:34 | 293 | 05:11 | 67 | 18:38 | 294 |
| 27 | 05:05 | 66 | 18:35 | 294 | 05:07 | 66 | 18:35 | 294 | 05:11 | 67 | 18:34 | 294 | 05:11 | 66 | 18:38 | 294 |
| 28 | 05:05 | 66 | 18:36 | 294 | 05:07 | 66 | 18:35 | 294 | 05:11 | 66 | 18:35 | 294 | 05:11 | 66 | 18:39 | 294 |
| 29 | 05:04 | 66 | 18:36 | 294 | 05:06 | 66 | 18:35 | 294 | 05:11 | 66 | 18:35 | 294 | 05:10 | 66 | 18:39 | 294 |
| 30 | 05:04 | 66 | 18:37 | 295 | 05:06 | 66 | 18:36 | 294 | 05:11 | 66 | 18:35 | 294 | 05:10 | 66 | 18:39 | 294 |
| 31 | 05:04 | 65 | 18:37 | 295 | 05:06 | 66 | 18:36 | 295 | 05:10 | 66 | 18:36 | 294 | 05:10 | 66 | 18:40 | 294 |

宜蘭、花蓮  
六月（臺東、南投）地區日出、日沒時間表

| 日期 | 宜蘭    |    |       |     | 花蓮    |    |       |     | 臺東    |    |       |     | 南投    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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| 6  | 05:03 | 65 | 18:40 | 296 | 05:05 | 65 | 18:39 | 295 | 05:10 | 65 | 18:38 | 295 | 05:09 | 65 | 18:43 | 295 |
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| 9  | 05:03 | 64 | 18:41 | 296 | 05:05 | 64 | 18:40 | 296 | 05:10 | 65 | 18:39 | 295 | 05:09 | 64 | 18:44 | 296 |
| 10 | 05:03 | 64 | 18:42 | 296 | 05:05 | 64 | 18:41 | 296 | 05:10 | 65 | 18:40 | 295 | 05:09 | 64 | 18:44 | 296 |
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| 20 | 05:04 | 64 | 18:45 | 296 | 05:06 | 64 | 18:44 | 296 | 05:11 | 64 | 18:43 | 296 | 05:10 | 64 | 18:47 | 296 |
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| 22 | 05:05 | 64 | 18:45 | 296 | 05:07 | 64 | 18:44 | 296 | 05:11 | 64 | 18:43 | 296 | 05:11 | 64 | 18:48 | 296 |
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| 30 | 05:07 | 64 | 18:46 | 296 | 05:09 | 64 | 18:45 | 296 | 05:14 | 64 | 18:44 | 296 | 05:13 | 64 | 18:49 | 296 |

宜蘭、花蓮  
七月 ( 臺東、南投 ) 地區日出、日沒時間表

| 日期 | 宜蘭    |    |       |     | 花蓮    |    |       |     | 臺東    |    |       |     | 南投    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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| 5  | 05:09 | 64 | 18:46 | 296 | 05:11 | 64 | 18:45 | 295 | 05:15 | 65 | 18:45 | 295 | 05:15 | 64 | 18:49 | 295 |
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| 7  | 05:09 | 64 | 18:46 | 295 | 05:12 | 65 | 18:45 | 295 | 05:16 | 65 | 18:44 | 295 | 05:15 | 65 | 18:49 | 295 |
| 8  | 05:10 | 65 | 18:46 | 295 | 05:12 | 65 | 18:45 | 295 | 05:16 | 65 | 18:44 | 295 | 05:16 | 65 | 18:49 | 295 |
| 9  | 05:10 | 65 | 18:46 | 295 | 05:12 | 65 | 18:45 | 295 | 05:17 | 65 | 18:44 | 295 | 05:16 | 65 | 18:48 | 295 |
| 10 | 05:11 | 65 | 18:46 | 295 | 05:13 | 65 | 18:45 | 295 | 05:17 | 65 | 18:44 | 295 | 05:17 | 65 | 18:48 | 295 |
| 11 | 05:11 | 65 | 18:46 | 295 | 05:13 | 65 | 18:45 | 295 | 05:18 | 65 | 18:44 | 294 | 05:17 | 65 | 18:48 | 295 |
| 12 | 05:11 | 65 | 18:45 | 295 | 05:14 | 65 | 18:45 | 295 | 05:18 | 66 | 18:44 | 294 | 05:17 | 65 | 18:48 | 295 |
| 13 | 05:12 | 65 | 18:45 | 295 | 05:14 | 65 | 18:44 | 294 | 05:18 | 66 | 18:44 | 294 | 05:18 | 66 | 18:48 | 294 |
| 14 | 05:12 | 65 | 18:45 | 294 | 05:14 | 66 | 18:44 | 294 | 05:19 | 66 | 18:44 | 294 | 05:18 | 66 | 18:48 | 294 |
| 15 | 05:13 | 66 | 18:45 | 294 | 05:15 | 66 | 18:44 | 294 | 05:19 | 66 | 18:43 | 294 | 05:19 | 66 | 18:47 | 294 |
| 16 | 05:13 | 66 | 18:45 | 294 | 05:15 | 66 | 18:44 | 294 | 05:20 | 66 | 18:43 | 294 | 05:19 | 66 | 18:47 | 294 |
| 17 | 05:14 | 66 | 18:44 | 294 | 05:16 | 66 | 18:43 | 294 | 05:20 | 66 | 18:43 | 293 | 05:20 | 66 | 18:47 | 294 |
| 18 | 05:14 | 66 | 18:44 | 294 | 05:16 | 66 | 18:43 | 294 | 05:20 | 67 | 18:43 | 293 | 05:20 | 66 | 18:47 | 294 |
| 19 | 05:15 | 66 | 18:44 | 293 | 05:17 | 67 | 18:43 | 293 | 05:21 | 67 | 18:42 | 293 | 05:20 | 67 | 18:46 | 293 |
| 20 | 05:15 | 67 | 18:43 | 293 | 05:17 | 67 | 18:42 | 293 | 05:21 | 67 | 18:42 | 293 | 05:21 | 67 | 18:46 | 293 |
| 21 | 05:16 | 67 | 18:43 | 293 | 05:17 | 67 | 18:42 | 293 | 05:22 | 67 | 18:42 | 293 | 05:21 | 67 | 18:46 | 293 |
| 22 | 05:16 | 67 | 18:43 | 293 | 05:18 | 67 | 18:42 | 293 | 05:22 | 67 | 18:41 | 292 | 05:22 | 67 | 18:45 | 293 |
| 23 | 05:16 | 67 | 18:42 | 293 | 05:18 | 67 | 18:41 | 292 | 05:23 | 68 | 18:41 | 292 | 05:22 | 67 | 18:45 | 292 |
| 24 | 05:17 | 67 | 18:42 | 292 | 05:19 | 68 | 18:41 | 292 | 05:23 | 68 | 18:41 | 292 | 05:23 | 68 | 18:45 | 292 |
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| 26 | 05:18 | 68 | 18:41 | 292 | 05:20 | 68 | 18:40 | 292 | 05:24 | 68 | 18:40 | 292 | 05:24 | 68 | 18:44 | 292 |
| 27 | 05:18 | 68 | 18:40 | 292 | 05:20 | 68 | 18:40 | 292 | 05:24 | 69 | 18:39 | 291 | 05:24 | 68 | 18:43 | 292 |
| 28 | 05:19 | 68 | 18:40 | 291 | 05:21 | 69 | 18:39 | 291 | 05:25 | 69 | 18:39 | 291 | 05:25 | 69 | 18:43 | 291 |
| 29 | 05:19 | 69 | 18:39 | 291 | 05:21 | 69 | 18:39 | 291 | 05:25 | 69 | 18:38 | 291 | 05:25 | 69 | 18:42 | 291 |
| 30 | 05:20 | 69 | 18:39 | 291 | 05:22 | 69 | 18:38 | 291 | 05:26 | 69 | 18:38 | 291 | 05:25 | 69 | 18:42 | 291 |
| 31 | 05:20 | 69 | 18:38 | 291 | 05:22 | 69 | 18:38 | 290 | 05:26 | 70 | 18:37 | 290 | 05:26 | 69 | 18:41 | 290 |



宜蘭、花蓮  
八月 ( 臺東、南投 ) 地區日出、日沒時間表

| 日期 | 宜蘭    |    |       |     | 花蓮    |    |       |     | 臺東    |    |       |     | 南投    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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| 2  | 05:21 | 70 | 18:37 | 290 | 05:23 | 70 | 18:36 | 290 | 05:27 | 70 | 18:36 | 290 | 05:27 | 70 | 18:40 | 290 |
| 3  | 05:22 | 70 | 18:36 | 290 | 05:23 | 70 | 18:36 | 290 | 05:27 | 70 | 18:36 | 289 | 05:27 | 70 | 18:39 | 290 |
| 4  | 05:22 | 70 | 18:36 | 289 | 05:24 | 71 | 18:35 | 289 | 05:28 | 71 | 18:35 | 289 | 05:28 | 71 | 18:39 | 289 |
| 5  | 05:23 | 71 | 18:35 | 289 | 05:24 | 71 | 18:35 | 289 | 05:28 | 71 | 18:35 | 289 | 05:28 | 71 | 18:38 | 289 |
| 6  | 05:23 | 71 | 18:35 | 289 | 05:25 | 71 | 18:34 | 289 | 05:28 | 71 | 18:34 | 289 | 05:29 | 71 | 18:38 | 289 |
| 7  | 05:23 | 71 | 18:34 | 289 | 05:25 | 71 | 18:33 | 288 | 05:29 | 72 | 18:33 | 288 | 05:29 | 71 | 18:37 | 288 |
| 8  | 05:24 | 72 | 18:33 | 288 | 05:26 | 72 | 18:33 | 288 | 05:29 | 72 | 18:33 | 288 | 05:29 | 72 | 18:36 | 288 |
| 9  | 05:24 | 72 | 18:32 | 288 | 05:26 | 72 | 18:32 | 288 | 05:30 | 72 | 18:32 | 288 | 05:30 | 72 | 18:36 | 288 |
| 10 | 05:25 | 72 | 18:32 | 288 | 05:26 | 72 | 18:31 | 287 | 05:30 | 73 | 18:31 | 287 | 05:30 | 72 | 18:35 | 287 |
| 11 | 05:25 | 73 | 18:31 | 287 | 05:27 | 73 | 18:31 | 287 | 05:30 | 73 | 18:31 | 287 | 05:31 | 73 | 18:34 | 287 |
| 12 | 05:26 | 73 | 18:30 | 287 | 05:27 | 73 | 18:30 | 287 | 05:31 | 73 | 18:30 | 287 | 05:31 | 73 | 18:33 | 287 |
| 13 | 05:26 | 73 | 18:29 | 287 | 05:28 | 73 | 18:29 | 286 | 05:31 | 74 | 18:29 | 286 | 05:32 | 73 | 18:33 | 286 |
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| 16 | 05:27 | 74 | 18:27 | 286 | 05:29 | 74 | 18:27 | 285 | 05:32 | 75 | 18:27 | 285 | 05:33 | 74 | 18:30 | 285 |
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| 24 | 05:31 | 77 | 18:20 | 283 | 05:32 | 77 | 18:20 | 283 | 05:35 | 77 | 18:20 | 282 | 05:36 | 77 | 18:23 | 283 |
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宜蘭、花蓮  
九月 ( 臺東、南投 ) 地區日出、日沒時間表

| 日期 | 宜蘭    |    |       |     | 花蓮    |    |       |     | 臺東    |    |       |     | 南投    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
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|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
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| 6  | 05:36 | 82 | 18:07 | 278 | 05:37 | 82 | 18:07 | 277 | 05:39 | 82 | 18:08 | 277 | 05:40 | 82 | 18:11 | 277 |
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| 28 | 05:44 | 92 | 17:44 | 268 | 05:44 | 92 | 17:44 | 268 | 05:46 | 92 | 17:46 | 268 | 05:48 | 92 | 17:48 | 268 |
| 29 | 05:44 | 92 | 17:43 | 268 | 05:44 | 92 | 17:43 | 268 | 05:46 | 92 | 17:45 | 268 | 05:48 | 92 | 17:47 | 268 |
| 30 | 05:44 | 92 | 17:42 | 267 | 05:45 | 92 | 17:42 | 267 | 05:46 | 92 | 17:44 | 267 | 05:48 | 92 | 17:46 | 267 |

宜蘭、花蓮  
十月（臺東、南投）地區日出、日沒時間表

| 日期 | 宜蘭    |     |       |     | 花蓮    |     |       |     | 臺東    |     |       |     | 南投    |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
| 1  | 05:45 | 93  | 17:41 | 267 | 05:45 | 93  | 17:41 | 267 | 05:47 | 93  | 17:44 | 267 | 05:49 | 93  | 17:45 | 267 |
| 2  | 05:45 | 93  | 17:40 | 266 | 05:45 | 93  | 17:40 | 267 | 05:47 | 93  | 17:43 | 267 | 05:49 | 93  | 17:44 | 267 |
| 3  | 05:45 | 94  | 17:39 | 266 | 05:46 | 94  | 17:39 | 266 | 05:47 | 94  | 17:42 | 266 | 05:50 | 94  | 17:43 | 266 |
| 4  | 05:46 | 94  | 17:38 | 266 | 05:46 | 94  | 17:38 | 266 | 05:48 | 94  | 17:41 | 266 | 05:50 | 94  | 17:42 | 266 |
| 5  | 05:46 | 95  | 17:36 | 265 | 05:47 | 95  | 17:37 | 265 | 05:48 | 95  | 17:40 | 265 | 05:50 | 95  | 17:41 | 265 |
| 6  | 05:47 | 95  | 17:35 | 265 | 05:47 | 95  | 17:36 | 265 | 05:48 | 95  | 17:39 | 265 | 05:51 | 95  | 17:40 | 265 |
| 7  | 05:47 | 95  | 17:34 | 264 | 05:47 | 95  | 17:35 | 264 | 05:49 | 95  | 17:38 | 264 | 05:51 | 95  | 17:39 | 264 |
| 8  | 05:48 | 96  | 17:33 | 264 | 05:48 | 96  | 17:34 | 264 | 05:49 | 96  | 17:37 | 264 | 05:51 | 96  | 17:38 | 264 |
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| 10 | 05:48 | 97  | 17:32 | 263 | 05:49 | 97  | 17:32 | 263 | 05:50 | 97  | 17:35 | 263 | 05:52 | 97  | 17:36 | 263 |
| 11 | 05:49 | 97  | 17:31 | 263 | 05:49 | 97  | 17:32 | 263 | 05:50 | 97  | 17:34 | 263 | 05:53 | 97  | 17:35 | 263 |
| 12 | 05:49 | 98  | 17:30 | 262 | 05:49 | 97  | 17:31 | 262 | 05:51 | 97  | 17:33 | 262 | 05:53 | 97  | 17:34 | 262 |
| 13 | 05:50 | 98  | 17:29 | 262 | 05:50 | 98  | 17:30 | 262 | 05:51 | 98  | 17:32 | 262 | 05:53 | 98  | 17:33 | 262 |
| 14 | 05:50 | 98  | 17:28 | 261 | 05:50 | 98  | 17:29 | 262 | 05:51 | 98  | 17:31 | 262 | 05:54 | 98  | 17:33 | 262 |
| 15 | 05:51 | 99  | 17:27 | 261 | 05:51 | 99  | 17:28 | 261 | 05:52 | 99  | 17:31 | 261 | 05:54 | 99  | 17:32 | 261 |
| 16 | 05:51 | 99  | 17:26 | 261 | 05:51 | 99  | 17:27 | 261 | 05:52 | 99  | 17:30 | 261 | 05:55 | 99  | 17:31 | 261 |
| 17 | 05:52 | 100 | 17:25 | 260 | 05:52 | 100 | 17:26 | 260 | 05:53 | 99  | 17:29 | 260 | 05:55 | 100 | 17:30 | 260 |
| 18 | 05:52 | 100 | 17:24 | 260 | 05:52 | 100 | 17:25 | 260 | 05:53 | 100 | 17:28 | 260 | 05:56 | 100 | 17:29 | 260 |
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| 20 | 05:53 | 101 | 17:22 | 259 | 05:53 | 101 | 17:24 | 259 | 05:54 | 101 | 17:26 | 259 | 05:57 | 101 | 17:27 | 259 |
| 21 | 05:54 | 101 | 17:21 | 259 | 05:53 | 101 | 17:23 | 259 | 05:54 | 101 | 17:26 | 259 | 05:57 | 101 | 17:27 | 259 |
| 22 | 05:54 | 102 | 17:21 | 258 | 05:54 | 101 | 17:22 | 258 | 05:55 | 101 | 17:25 | 258 | 05:58 | 101 | 17:26 | 258 |
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| 24 | 05:55 | 102 | 17:19 | 257 | 05:55 | 102 | 17:20 | 258 | 05:56 | 102 | 17:23 | 258 | 05:59 | 102 | 17:24 | 258 |
| 25 | 05:56 | 103 | 17:18 | 257 | 05:55 | 103 | 17:20 | 257 | 05:56 | 103 | 17:23 | 257 | 05:59 | 103 | 17:23 | 257 |
| 26 | 05:56 | 103 | 17:17 | 257 | 05:56 | 103 | 17:19 | 257 | 05:57 | 103 | 17:22 | 257 | 06:00 | 103 | 17:23 | 257 |
| 27 | 05:57 | 103 | 17:17 | 256 | 05:57 | 103 | 17:18 | 256 | 05:57 | 103 | 17:21 | 257 | 06:00 | 103 | 17:22 | 256 |
| 28 | 05:57 | 104 | 17:16 | 256 | 05:57 | 104 | 17:17 | 256 | 05:58 | 104 | 17:21 | 256 | 06:01 | 104 | 17:21 | 256 |
| 29 | 05:58 | 104 | 17:15 | 256 | 05:58 | 104 | 17:17 | 256 | 05:58 | 104 | 17:20 | 256 | 06:01 | 104 | 17:20 | 256 |
| 30 | 05:58 | 105 | 17:15 | 255 | 05:58 | 105 | 17:16 | 255 | 05:59 | 104 | 17:19 | 255 | 06:02 | 105 | 17:20 | 255 |
| 31 | 05:59 | 105 | 17:14 | 255 | 05:59 | 105 | 17:15 | 255 | 05:59 | 105 | 17:19 | 255 | 06:02 | 105 | 17:19 | 255 |

宜蘭、花蓮  
十一月 ( 臺東、南投 ) 地區日出、日沒時間表

| 日期 | 宜蘭    |     |       |     | 花蓮    |     |       |     | 臺東    |     |       |     | 南投    |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
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| 4  | 06:01 | 106 | 17:11 | 253 | 06:01 | 106 | 17:13 | 254 | 06:01 | 106 | 17:16 | 254 | 06:05 | 106 | 17:17 | 254 |
| 5  | 06:02 | 107 | 17:11 | 253 | 06:02 | 107 | 17:12 | 253 | 06:02 | 106 | 17:16 | 253 | 06:05 | 107 | 17:16 | 253 |
| 6  | 06:03 | 107 | 17:10 | 253 | 06:02 | 107 | 17:12 | 253 | 06:02 | 107 | 17:15 | 253 | 06:06 | 107 | 17:16 | 253 |
| 7  | 06:03 | 107 | 17:10 | 252 | 06:03 | 107 | 17:11 | 253 | 06:03 | 107 | 17:15 | 253 | 06:06 | 107 | 17:15 | 253 |
| 8  | 06:04 | 108 | 17:09 | 252 | 06:03 | 108 | 17:11 | 252 | 06:04 | 107 | 17:14 | 252 | 06:07 | 108 | 17:15 | 252 |
| 9  | 06:05 | 108 | 17:09 | 252 | 06:04 | 108 | 17:10 | 252 | 06:04 | 108 | 17:14 | 252 | 06:08 | 108 | 17:14 | 252 |
| 10 | 06:05 | 108 | 17:08 | 252 | 06:05 | 108 | 17:10 | 252 | 06:05 | 108 | 17:13 | 252 | 06:08 | 108 | 17:14 | 252 |
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| 20 | 06:12 | 111 | 17:05 | 249 | 06:11 | 111 | 17:06 | 249 | 06:11 | 111 | 17:10 | 249 | 06:15 | 111 | 17:10 | 249 |
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| 29 | 06:18 | 113 | 17:03 | 247 | 06:18 | 113 | 17:05 | 247 | 06:17 | 113 | 17:10 | 247 | 06:21 | 113 | 17:09 | 247 |
| 30 | 06:19 | 113 | 17:03 | 246 | 06:18 | 113 | 17:05 | 247 | 06:18 | 113 | 17:10 | 247 | 06:22 | 113 | 17:09 | 247 |

宜蘭、花蓮  
十二月 ( 臺東、南投 ) 地區日出、日沒時間表

| 日期 | 宜蘭    |     |       |     | 花蓮    |     |       |     | 臺東    |     |       |     | 南投    |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
| 1  | 06:20 | 114 | 17:03 | 246 | 06:19 | 113 | 17:05 | 246 | 06:19 | 113 | 17:10 | 247 | 06:23 | 113 | 17:09 | 246 |
| 2  | 06:21 | 114 | 17:03 | 246 | 06:20 | 114 | 17:05 | 246 | 06:19 | 113 | 17:10 | 246 | 06:23 | 114 | 17:09 | 246 |
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| 9  | 06:25 | 115 | 17:04 | 245 | 06:24 | 115 | 17:07 | 245 | 06:24 | 114 | 17:11 | 246 | 06:28 | 115 | 17:10 | 245 |
| 10 | 06:26 | 115 | 17:05 | 245 | 06:25 | 115 | 17:07 | 245 | 06:25 | 115 | 17:11 | 245 | 06:29 | 115 | 17:11 | 245 |
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| 13 | 06:28 | 115 | 17:06 | 245 | 06:27 | 115 | 17:08 | 245 | 06:26 | 115 | 17:12 | 245 | 06:31 | 115 | 17:12 | 245 |
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| 22 | 06:33 | 116 | 17:09 | 244 | 06:32 | 115 | 17:11 | 245 | 06:31 | 115 | 17:16 | 245 | 06:36 | 115 | 17:15 | 245 |
| 23 | 06:34 | 116 | 17:10 | 244 | 06:33 | 115 | 17:12 | 245 | 06:32 | 115 | 17:16 | 245 | 06:36 | 115 | 17:16 | 245 |
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| 31 | 06:37 | 115 | 17:14 | 245 | 06:36 | 115 | 17:17 | 245 | 06:35 | 115 | 17:21 | 245 | 06:39 | 115 | 17:20 | 245 |

金門、連江  
一月（澎湖、蘭嶼）地區日出、日沒時間表

| 日期 | 金門    |     |       |     | 連江    |     |       |     | 澎湖    |     |       |     | 蘭嶼    |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
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| 31 | 06:49 | 109 | 17:51 | 251 | 06:45 | 109 | 17:42 | 251 | 06:43 | 109 | 17:48 | 251 | 06:33 | 109 | 17:42 | 252 |

金門縣（金城鎮）連江市（南竿鄉）

澎湖縣（馬公市）蘭嶼

金門、連江  
二月（澎湖、蘭嶼）地區日出、日沒時間表

| 日期 | 金門    |     |       |     | 連江    |     |       |     | 澎湖    |     |       |     | 蘭嶼    |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
| 1  | 06:49 | 109 | 17:52 | 252 | 06:45 | 109 | 17:43 | 251 | 06:43 | 109 | 17:48 | 252 | 06:32 | 108 | 17:42 | 252 |
| 2  | 06:48 | 108 | 17:53 | 252 | 06:44 | 109 | 17:44 | 252 | 06:42 | 108 | 17:49 | 252 | 06:32 | 108 | 17:43 | 252 |
| 3  | 06:48 | 108 | 17:53 | 252 | 06:44 | 108 | 17:44 | 252 | 06:42 | 108 | 17:50 | 252 | 06:32 | 108 | 17:44 | 252 |
| 4  | 06:47 | 108 | 17:54 | 252 | 06:43 | 108 | 17:45 | 252 | 06:41 | 108 | 17:50 | 253 | 06:31 | 107 | 17:44 | 253 |
| 5  | 06:47 | 107 | 17:55 | 253 | 06:43 | 108 | 17:46 | 253 | 06:41 | 107 | 17:51 | 253 | 06:31 | 107 | 17:45 | 253 |
| 6  | 06:46 | 107 | 17:55 | 253 | 06:42 | 107 | 17:47 | 253 | 06:40 | 107 | 17:52 | 253 | 06:30 | 107 | 17:46 | 253 |
| 7  | 06:46 | 107 | 17:56 | 254 | 06:42 | 107 | 17:47 | 253 | 06:40 | 107 | 17:52 | 254 | 06:30 | 106 | 17:46 | 254 |
| 8  | 06:45 | 106 | 17:57 | 254 | 06:41 | 107 | 17:48 | 254 | 06:39 | 106 | 17:53 | 254 | 06:29 | 106 | 17:47 | 254 |
| 9  | 06:45 | 106 | 17:57 | 254 | 06:40 | 106 | 17:49 | 254 | 06:39 | 106 | 17:53 | 254 | 06:29 | 106 | 17:47 | 254 |
| 10 | 06:44 | 106 | 17:58 | 255 | 06:40 | 106 | 17:49 | 254 | 06:38 | 106 | 17:54 | 255 | 06:28 | 105 | 17:48 | 255 |
| 11 | 06:44 | 105 | 17:59 | 255 | 06:39 | 105 | 17:50 | 255 | 06:38 | 105 | 17:55 | 255 | 06:28 | 105 | 17:49 | 255 |
| 12 | 06:43 | 105 | 17:59 | 255 | 06:38 | 105 | 17:51 | 255 | 06:37 | 105 | 17:55 | 255 | 06:27 | 105 | 17:49 | 256 |
| 13 | 06:42 | 105 | 18:00 | 256 | 06:38 | 105 | 17:51 | 255 | 06:36 | 104 | 17:56 | 256 | 06:27 | 104 | 17:50 | 256 |
| 14 | 06:42 | 104 | 18:01 | 256 | 06:37 | 104 | 17:52 | 256 | 06:36 | 104 | 17:56 | 256 | 06:26 | 104 | 17:50 | 256 |
| 15 | 06:41 | 104 | 18:01 | 256 | 06:36 | 104 | 17:53 | 256 | 06:35 | 104 | 17:57 | 256 | 06:26 | 104 | 17:51 | 257 |
| 16 | 06:40 | 103 | 18:02 | 257 | 06:36 | 104 | 17:53 | 257 | 06:34 | 103 | 17:58 | 257 | 06:25 | 103 | 17:51 | 257 |
| 17 | 06:40 | 103 | 18:02 | 257 | 06:35 | 103 | 17:54 | 257 | 06:34 | 103 | 17:58 | 257 | 06:24 | 103 | 17:52 | 257 |
| 18 | 06:39 | 103 | 18:03 | 258 | 06:34 | 103 | 17:55 | 257 | 06:33 | 103 | 17:59 | 258 | 06:24 | 102 | 17:52 | 258 |
| 19 | 06:38 | 102 | 18:03 | 258 | 06:33 | 102 | 17:55 | 258 | 06:32 | 102 | 17:59 | 258 | 06:23 | 102 | 17:53 | 258 |
| 20 | 06:37 | 102 | 18:04 | 258 | 06:32 | 102 | 17:56 | 258 | 06:32 | 102 | 18:00 | 258 | 06:22 | 102 | 17:53 | 259 |
| 21 | 06:37 | 101 | 18:05 | 259 | 06:32 | 102 | 17:57 | 259 | 06:31 | 101 | 18:00 | 259 | 06:22 | 101 | 17:54 | 259 |
| 22 | 06:36 | 101 | 18:05 | 259 | 06:31 | 101 | 17:57 | 259 | 06:30 | 101 | 18:01 | 259 | 06:21 | 101 | 17:54 | 259 |
| 23 | 06:35 | 101 | 18:06 | 260 | 06:30 | 101 | 17:58 | 259 | 06:29 | 101 | 18:01 | 260 | 06:20 | 100 | 17:55 | 260 |
| 24 | 06:34 | 100 | 18:06 | 260 | 06:29 | 100 | 17:58 | 260 | 06:28 | 100 | 18:02 | 260 | 06:19 | 100 | 17:55 | 260 |
| 25 | 06:33 | 100 | 18:07 | 260 | 06:28 | 100 | 17:59 | 260 | 06:28 | 100 | 18:02 | 260 | 06:19 | 100 | 17:56 | 260 |
| 26 | 06:32 | 99  | 18:07 | 261 | 06:27 | 100 | 18:00 | 261 | 06:27 | 99  | 18:03 | 261 | 06:18 | 99  | 17:56 | 261 |
| 27 | 06:32 | 99  | 18:08 | 261 | 06:26 | 99  | 18:00 | 261 | 06:26 | 99  | 18:03 | 261 | 06:17 | 99  | 17:57 | 261 |
| 28 | 06:31 | 99  | 18:08 | 262 | 06:25 | 99  | 18:01 | 261 | 06:25 | 99  | 18:04 | 262 | 06:16 | 98  | 17:57 | 262 |

金門、連江  
三月（澎湖、蘭嶼）地區日出、日沒時間表

| 日期 | 金門    |    |       |     | 連江    |    |       |     | 澎湖    |    |       |     | 蘭嶼    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 06:30 | 98 | 18:09 | 262 | 06:24 | 98 | 18:01 | 262 | 06:24 | 98 | 18:04 | 262 | 06:15 | 98 | 17:57 | 262 |
| 2  | 06:29 | 98 | 18:09 | 262 | 06:23 | 98 | 18:02 | 262 | 06:23 | 98 | 18:05 | 262 | 06:15 | 98 | 17:58 | 263 |
| 3  | 06:28 | 97 | 18:10 | 263 | 06:22 | 97 | 18:02 | 263 | 06:23 | 97 | 18:05 | 263 | 06:14 | 97 | 17:58 | 263 |
| 4  | 06:27 | 97 | 18:10 | 263 | 06:21 | 97 | 18:03 | 263 | 06:22 | 97 | 18:06 | 263 | 06:13 | 97 | 17:59 | 263 |
| 5  | 06:26 | 97 | 18:11 | 264 | 06:21 | 97 | 18:03 | 264 | 06:21 | 96 | 18:06 | 264 | 06:12 | 96 | 17:59 | 264 |
| 6  | 06:25 | 96 | 18:11 | 264 | 06:20 | 96 | 18:04 | 264 | 06:20 | 96 | 18:07 | 264 | 06:11 | 96 | 18:00 | 264 |
| 7  | 06:24 | 96 | 18:12 | 265 | 06:19 | 96 | 18:05 | 264 | 06:19 | 96 | 18:07 | 265 | 06:10 | 96 | 18:00 | 265 |
| 8  | 06:23 | 95 | 18:12 | 265 | 06:18 | 95 | 18:05 | 265 | 06:18 | 95 | 18:08 | 265 | 06:10 | 95 | 18:00 | 265 |
| 9  | 06:22 | 95 | 18:13 | 265 | 06:17 | 95 | 18:06 | 265 | 06:17 | 95 | 18:08 | 265 | 06:09 | 95 | 18:01 | 265 |
| 10 | 06:21 | 94 | 18:13 | 266 | 06:16 | 94 | 18:06 | 266 | 06:16 | 94 | 18:09 | 266 | 06:08 | 94 | 18:01 | 266 |
| 11 | 06:20 | 94 | 18:14 | 266 | 06:14 | 94 | 18:07 | 266 | 06:15 | 94 | 18:09 | 266 | 06:07 | 94 | 18:01 | 266 |
| 12 | 06:20 | 94 | 18:14 | 267 | 06:13 | 94 | 18:07 | 267 | 06:14 | 94 | 18:09 | 267 | 06:06 | 93 | 18:02 | 267 |
| 13 | 06:19 | 93 | 18:15 | 267 | 06:12 | 93 | 18:08 | 267 | 06:13 | 93 | 18:10 | 267 | 06:05 | 93 | 18:02 | 267 |
| 14 | 06:18 | 93 | 18:15 | 268 | 06:11 | 93 | 18:08 | 268 | 06:12 | 93 | 18:10 | 268 | 06:04 | 93 | 18:03 | 268 |
| 15 | 06:17 | 92 | 18:15 | 268 | 06:10 | 92 | 18:09 | 268 | 06:11 | 92 | 18:11 | 268 | 06:03 | 92 | 18:03 | 268 |
| 16 | 06:16 | 92 | 18:16 | 268 | 06:09 | 92 | 18:09 | 268 | 06:10 | 92 | 18:11 | 268 | 06:02 | 92 | 18:03 | 268 |
| 17 | 06:15 | 91 | 18:16 | 269 | 06:08 | 91 | 18:10 | 269 | 06:09 | 91 | 18:11 | 269 | 06:01 | 91 | 18:04 | 269 |
| 18 | 06:14 | 91 | 18:17 | 269 | 06:07 | 91 | 18:10 | 269 | 06:08 | 91 | 18:12 | 269 | 06:00 | 91 | 18:04 | 269 |
| 19 | 06:13 | 90 | 18:17 | 270 | 06:06 | 90 | 18:11 | 270 | 06:08 | 90 | 18:12 | 270 | 06:00 | 91 | 18:04 | 270 |
| 20 | 06:12 | 90 | 18:18 | 270 | 06:05 | 90 | 18:11 | 270 | 06:07 | 90 | 18:13 | 270 | 05:59 | 90 | 18:05 | 270 |
| 21 | 06:11 | 90 | 18:18 | 271 | 06:04 | 90 | 18:12 | 271 | 06:06 | 90 | 18:13 | 271 | 05:58 | 90 | 18:05 | 271 |
| 22 | 06:09 | 89 | 18:18 | 271 | 06:03 | 89 | 18:12 | 271 | 06:05 | 89 | 18:13 | 271 | 05:57 | 89 | 18:05 | 271 |
| 23 | 06:08 | 89 | 18:19 | 271 | 06:02 | 89 | 18:13 | 272 | 06:04 | 89 | 18:14 | 271 | 05:56 | 89 | 18:06 | 271 |
| 24 | 06:07 | 88 | 18:19 | 272 | 06:01 | 88 | 18:13 | 272 | 06:03 | 88 | 18:14 | 272 | 05:55 | 88 | 18:06 | 272 |
| 25 | 06:06 | 88 | 18:20 | 272 | 06:00 | 88 | 18:13 | 272 | 06:02 | 88 | 18:15 | 272 | 05:54 | 88 | 18:06 | 272 |
| 26 | 06:05 | 87 | 18:20 | 273 | 05:59 | 87 | 18:14 | 273 | 06:01 | 87 | 18:15 | 273 | 05:53 | 88 | 18:07 | 273 |
| 27 | 06:04 | 87 | 18:21 | 273 | 05:57 | 87 | 18:14 | 273 | 06:00 | 87 | 18:15 | 273 | 05:52 | 87 | 18:07 | 273 |
| 28 | 06:03 | 87 | 18:21 | 274 | 05:56 | 87 | 18:15 | 274 | 05:59 | 87 | 18:16 | 274 | 05:51 | 87 | 18:07 | 274 |
| 29 | 06:02 | 86 | 18:21 | 274 | 05:55 | 86 | 18:15 | 274 | 05:58 | 86 | 18:16 | 274 | 05:50 | 86 | 18:08 | 274 |
| 30 | 06:01 | 86 | 18:22 | 274 | 05:54 | 86 | 18:16 | 275 | 05:57 | 86 | 18:16 | 274 | 05:49 | 86 | 18:08 | 274 |
| 31 | 06:00 | 85 | 18:22 | 275 | 05:53 | 85 | 18:16 | 275 | 05:56 | 85 | 18:17 | 275 | 05:48 | 85 | 18:08 | 275 |



金門、連江  
四月（澎湖、蘭嶼）地區日出、日沒時間表

| 日期 | 金門    |    |       |     | 連江    |    |       |     | 澎湖    |    |       |     | 蘭嶼    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 05:59 | 85 | 18:23 | 275 | 05:52 | 85 | 18:17 | 275 | 05:55 | 85 | 18:17 | 275 | 05:47 | 85 | 18:09 | 275 |
| 2  | 05:58 | 84 | 18:23 | 276 | 05:51 | 84 | 18:17 | 276 | 05:54 | 85 | 18:18 | 276 | 05:46 | 85 | 18:09 | 276 |
| 3  | 05:57 | 84 | 18:23 | 276 | 05:50 | 84 | 18:18 | 276 | 05:53 | 84 | 18:18 | 276 | 05:46 | 84 | 18:09 | 276 |
| 4  | 05:56 | 84 | 18:24 | 277 | 05:49 | 84 | 18:18 | 277 | 05:52 | 84 | 18:18 | 277 | 05:45 | 84 | 18:10 | 276 |
| 5  | 05:55 | 83 | 18:24 | 277 | 05:48 | 83 | 18:19 | 277 | 05:51 | 83 | 18:19 | 277 | 05:44 | 83 | 18:10 | 277 |
| 6  | 05:54 | 83 | 18:25 | 277 | 05:47 | 83 | 18:19 | 278 | 05:50 | 83 | 18:19 | 277 | 05:43 | 83 | 18:10 | 277 |
| 7  | 05:53 | 82 | 18:25 | 278 | 05:46 | 82 | 18:20 | 278 | 05:49 | 82 | 18:20 | 278 | 05:42 | 83 | 18:11 | 278 |
| 8  | 05:52 | 82 | 18:25 | 278 | 05:45 | 82 | 18:20 | 278 | 05:48 | 82 | 18:20 | 278 | 05:41 | 82 | 18:11 | 278 |
| 9  | 05:51 | 82 | 18:26 | 279 | 05:44 | 81 | 18:21 | 279 | 05:47 | 82 | 18:20 | 279 | 05:40 | 82 | 18:11 | 278 |
| 10 | 05:50 | 81 | 18:26 | 279 | 05:43 | 81 | 18:21 | 279 | 05:46 | 81 | 18:21 | 279 | 05:39 | 81 | 18:12 | 279 |
| 11 | 05:50 | 81 | 18:27 | 279 | 05:42 | 81 | 18:22 | 280 | 05:45 | 81 | 18:21 | 279 | 05:38 | 81 | 18:12 | 279 |
| 12 | 05:49 | 80 | 18:27 | 280 | 05:41 | 80 | 18:22 | 280 | 05:44 | 80 | 18:22 | 280 | 05:37 | 81 | 18:12 | 280 |
| 13 | 05:48 | 80 | 18:28 | 280 | 05:40 | 80 | 18:22 | 280 | 05:43 | 80 | 18:22 | 280 | 05:37 | 80 | 18:13 | 280 |
| 14 | 05:47 | 80 | 18:28 | 281 | 05:39 | 79 | 18:23 | 281 | 05:42 | 80 | 18:22 | 281 | 05:36 | 80 | 18:13 | 280 |
| 15 | 05:46 | 79 | 18:28 | 281 | 05:38 | 79 | 18:23 | 281 | 05:42 | 79 | 18:23 | 281 | 05:35 | 79 | 18:14 | 281 |
| 16 | 05:45 | 79 | 18:29 | 281 | 05:37 | 79 | 18:24 | 282 | 05:41 | 79 | 18:23 | 281 | 05:34 | 79 | 18:14 | 281 |
| 17 | 05:44 | 78 | 18:29 | 282 | 05:36 | 78 | 18:24 | 282 | 05:40 | 78 | 18:24 | 282 | 05:33 | 79 | 18:14 | 282 |
| 18 | 05:43 | 78 | 18:30 | 282 | 05:35 | 78 | 18:25 | 282 | 05:39 | 78 | 18:24 | 282 | 05:32 | 78 | 18:15 | 282 |
| 19 | 05:42 | 78 | 18:30 | 283 | 05:34 | 77 | 18:25 | 283 | 05:38 | 78 | 18:24 | 283 | 05:31 | 78 | 18:15 | 282 |
| 20 | 05:41 | 77 | 18:31 | 283 | 05:33 | 77 | 18:26 | 283 | 05:37 | 77 | 18:25 | 283 | 05:31 | 77 | 18:15 | 283 |
| 21 | 05:40 | 77 | 18:31 | 283 | 05:32 | 77 | 18:26 | 284 | 05:36 | 77 | 18:25 | 283 | 05:30 | 77 | 18:16 | 283 |
| 22 | 05:40 | 76 | 18:32 | 284 | 05:31 | 76 | 18:27 | 284 | 05:35 | 77 | 18:26 | 284 | 05:29 | 77 | 18:16 | 283 |
| 23 | 05:39 | 76 | 18:32 | 284 | 05:30 | 76 | 18:27 | 284 | 05:35 | 76 | 18:26 | 284 | 05:28 | 76 | 18:16 | 284 |
| 24 | 05:38 | 76 | 18:32 | 285 | 05:29 | 75 | 18:28 | 285 | 05:34 | 76 | 18:27 | 284 | 05:28 | 76 | 18:17 | 284 |
| 25 | 05:37 | 75 | 18:33 | 285 | 05:28 | 75 | 18:28 | 285 | 05:33 | 75 | 18:27 | 285 | 05:27 | 76 | 18:17 | 285 |
| 26 | 05:36 | 75 | 18:33 | 285 | 05:28 | 75 | 18:29 | 285 | 05:32 | 75 | 18:27 | 285 | 05:26 | 75 | 18:18 | 285 |
| 27 | 05:35 | 75 | 18:34 | 286 | 05:27 | 74 | 18:29 | 286 | 05:31 | 75 | 18:28 | 285 | 05:25 | 75 | 18:18 | 285 |
| 28 | 05:35 | 74 | 18:34 | 286 | 05:26 | 74 | 18:30 | 286 | 05:31 | 74 | 18:28 | 286 | 05:25 | 75 | 18:18 | 286 |
| 29 | 05:34 | 74 | 18:35 | 286 | 05:25 | 74 | 18:31 | 287 | 05:30 | 74 | 18:29 | 286 | 05:24 | 74 | 18:19 | 286 |
| 30 | 05:33 | 74 | 18:35 | 287 | 05:24 | 73 | 18:31 | 287 | 05:29 | 74 | 18:29 | 287 | 05:23 | 74 | 18:19 | 286 |

金門、連江  
五月 ( 澎湖、蘭嶼 ) 地區日出、日沒時間表

| 日期 | 金門    |    |       |     | 連江    |    |       |     | 澎湖    |    |       |     | 蘭嶼    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 05:32 | 73 | 18:36 | 287 | 05:24 | 73 | 18:32 | 287 | 05:29 | 73 | 18:30 | 287 | 05:23 | 74 | 18:20 | 287 |
| 2  | 05:32 | 73 | 18:36 | 287 | 05:23 | 73 | 18:32 | 288 | 05:28 | 73 | 18:30 | 287 | 05:22 | 73 | 18:20 | 287 |
| 3  | 05:31 | 73 | 18:37 | 288 | 05:22 | 72 | 18:33 | 288 | 05:27 | 73 | 18:31 | 287 | 05:21 | 73 | 18:21 | 287 |
| 4  | 05:30 | 72 | 18:37 | 288 | 05:21 | 72 | 18:33 | 288 | 05:26 | 72 | 18:31 | 288 | 05:21 | 73 | 18:21 | 288 |
| 5  | 05:30 | 72 | 18:38 | 288 | 05:21 | 72 | 18:34 | 289 | 05:26 | 72 | 18:31 | 288 | 05:20 | 72 | 18:21 | 288 |
| 6  | 05:29 | 72 | 18:38 | 289 | 05:20 | 71 | 18:34 | 289 | 05:25 | 72 | 18:32 | 288 | 05:19 | 72 | 18:22 | 288 |
| 7  | 05:28 | 71 | 18:39 | 289 | 05:19 | 71 | 18:35 | 289 | 05:25 | 71 | 18:32 | 289 | 05:19 | 72 | 18:22 | 289 |
| 8  | 05:28 | 71 | 18:39 | 289 | 05:18 | 71 | 18:35 | 290 | 05:24 | 71 | 18:33 | 289 | 05:18 | 71 | 18:23 | 289 |
| 9  | 05:27 | 71 | 18:40 | 290 | 05:18 | 70 | 18:36 | 290 | 05:23 | 71 | 18:33 | 289 | 05:18 | 71 | 18:23 | 289 |
| 10 | 05:26 | 70 | 18:40 | 290 | 05:17 | 70 | 18:36 | 290 | 05:23 | 71 | 18:34 | 290 | 05:17 | 71 | 18:24 | 289 |
| 11 | 05:26 | 70 | 18:41 | 290 | 05:17 | 70 | 18:37 | 290 | 05:22 | 70 | 18:34 | 290 | 05:17 | 70 | 18:24 | 290 |
| 12 | 05:25 | 70 | 18:41 | 290 | 05:16 | 69 | 18:38 | 291 | 05:22 | 70 | 18:35 | 290 | 05:16 | 70 | 18:24 | 290 |
| 13 | 05:25 | 69 | 18:42 | 291 | 05:15 | 69 | 18:38 | 291 | 05:21 | 70 | 18:35 | 290 | 05:16 | 70 | 18:25 | 290 |
| 14 | 05:24 | 69 | 18:42 | 291 | 05:15 | 69 | 18:39 | 291 | 05:21 | 69 | 18:36 | 291 | 05:15 | 70 | 18:25 | 290 |
| 15 | 05:24 | 69 | 18:43 | 291 | 05:14 | 69 | 18:39 | 292 | 05:20 | 69 | 18:36 | 291 | 05:15 | 69 | 18:26 | 291 |
| 16 | 05:23 | 69 | 18:43 | 291 | 05:14 | 68 | 18:40 | 292 | 05:20 | 69 | 18:37 | 291 | 05:14 | 69 | 18:26 | 291 |
| 17 | 05:23 | 68 | 18:44 | 292 | 05:13 | 68 | 18:40 | 292 | 05:19 | 69 | 18:37 | 292 | 05:14 | 69 | 18:27 | 291 |
| 18 | 05:22 | 68 | 18:44 | 292 | 05:13 | 68 | 18:41 | 292 | 05:19 | 68 | 18:38 | 292 | 05:14 | 69 | 18:27 | 292 |
| 19 | 05:22 | 68 | 18:45 | 292 | 05:12 | 68 | 18:41 | 293 | 05:18 | 68 | 18:38 | 292 | 05:13 | 68 | 18:28 | 292 |
| 20 | 05:22 | 68 | 18:45 | 292 | 05:12 | 67 | 18:42 | 293 | 05:18 | 68 | 18:39 | 292 | 05:13 | 68 | 18:28 | 292 |
| 21 | 05:21 | 67 | 18:46 | 293 | 05:11 | 67 | 18:42 | 293 | 05:18 | 68 | 18:39 | 292 | 05:13 | 68 | 18:28 | 292 |
| 22 | 05:21 | 67 | 18:46 | 293 | 05:11 | 67 | 18:43 | 293 | 05:17 | 67 | 18:40 | 293 | 05:12 | 68 | 18:29 | 292 |
| 23 | 05:20 | 67 | 18:47 | 293 | 05:11 | 67 | 18:43 | 293 | 05:17 | 67 | 18:40 | 293 | 05:12 | 67 | 18:29 | 293 |
| 24 | 05:20 | 67 | 18:47 | 293 | 05:10 | 66 | 18:44 | 294 | 05:17 | 67 | 18:41 | 293 | 05:12 | 67 | 18:30 | 293 |
| 25 | 05:20 | 67 | 18:48 | 294 | 05:10 | 66 | 18:44 | 294 | 05:16 | 67 | 18:41 | 293 | 05:11 | 67 | 18:30 | 293 |
| 26 | 05:20 | 66 | 18:48 | 294 | 05:10 | 66 | 18:45 | 294 | 05:16 | 67 | 18:41 | 294 | 05:11 | 67 | 18:31 | 293 |
| 27 | 05:19 | 66 | 18:49 | 294 | 05:09 | 66 | 18:45 | 294 | 05:16 | 66 | 18:42 | 294 | 05:11 | 67 | 18:31 | 293 |
| 28 | 05:19 | 66 | 18:49 | 294 | 05:09 | 66 | 18:46 | 294 | 05:16 | 66 | 18:42 | 294 | 05:11 | 66 | 18:32 | 294 |
| 29 | 05:19 | 66 | 18:50 | 294 | 05:09 | 65 | 18:46 | 295 | 05:15 | 66 | 18:43 | 294 | 05:10 | 66 | 18:32 | 294 |
| 30 | 05:19 | 66 | 18:50 | 294 | 05:09 | 65 | 18:47 | 295 | 05:15 | 66 | 18:43 | 294 | 05:10 | 66 | 18:32 | 294 |
| 31 | 05:18 | 65 | 18:50 | 295 | 05:08 | 65 | 18:47 | 295 | 05:15 | 66 | 18:44 | 294 | 05:10 | 66 | 18:33 | 294 |

金門、連江  
六月（澎湖、蘭嶼）地區日出、日沒時間表

| 日期 | 金門    |    |       |     | 連江    |    |       |     | 澎湖    |    |       |     | 蘭嶼    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 05:18 | 65 | 18:51 | 295 | 05:08 | 65 | 18:48 | 295 | 05:15 | 66 | 18:44 | 295 | 05:10 | 66 | 18:33 | 294 |
| 2  | 05:18 | 65 | 18:51 | 295 | 05:08 | 65 | 18:48 | 295 | 05:15 | 65 | 18:45 | 295 | 05:10 | 66 | 18:34 | 294 |
| 3  | 05:18 | 65 | 18:52 | 295 | 05:08 | 65 | 18:49 | 295 | 05:15 | 65 | 18:45 | 295 | 05:10 | 66 | 18:34 | 295 |
| 4  | 05:18 | 65 | 18:52 | 295 | 05:08 | 64 | 18:49 | 296 | 05:15 | 65 | 18:45 | 295 | 05:10 | 65 | 18:34 | 295 |
| 5  | 05:18 | 65 | 18:53 | 295 | 05:08 | 64 | 18:50 | 296 | 05:15 | 65 | 18:46 | 295 | 05:10 | 65 | 18:35 | 295 |
| 6  | 05:18 | 65 | 18:53 | 295 | 05:08 | 64 | 18:50 | 296 | 05:14 | 65 | 18:46 | 295 | 05:10 | 65 | 18:35 | 295 |
| 7  | 05:18 | 65 | 18:54 | 296 | 05:07 | 64 | 18:51 | 296 | 05:14 | 65 | 18:47 | 295 | 05:10 | 65 | 18:36 | 295 |
| 8  | 05:18 | 64 | 18:54 | 296 | 05:07 | 64 | 18:51 | 296 | 05:14 | 65 | 18:47 | 295 | 05:10 | 65 | 18:36 | 295 |
| 9  | 05:18 | 64 | 18:54 | 296 | 05:07 | 64 | 18:51 | 296 | 05:14 | 65 | 18:47 | 296 | 05:10 | 65 | 18:36 | 295 |
| 10 | 05:18 | 64 | 18:55 | 296 | 05:07 | 64 | 18:52 | 296 | 05:14 | 64 | 18:48 | 296 | 05:10 | 65 | 18:37 | 295 |
| 11 | 05:18 | 64 | 18:55 | 296 | 05:07 | 64 | 18:52 | 296 | 05:14 | 64 | 18:48 | 296 | 05:10 | 65 | 18:37 | 295 |
| 12 | 05:18 | 64 | 18:55 | 296 | 05:07 | 64 | 18:53 | 296 | 05:15 | 64 | 18:49 | 296 | 05:10 | 65 | 18:37 | 295 |
| 13 | 05:18 | 64 | 18:56 | 296 | 05:07 | 64 | 18:53 | 296 | 05:15 | 64 | 18:49 | 296 | 05:10 | 65 | 18:38 | 296 |
| 14 | 05:18 | 64 | 18:56 | 296 | 05:08 | 63 | 18:53 | 297 | 05:15 | 64 | 18:49 | 296 | 05:10 | 64 | 18:38 | 296 |
| 15 | 05:18 | 64 | 18:56 | 296 | 05:08 | 63 | 18:54 | 297 | 05:15 | 64 | 18:50 | 296 | 05:10 | 64 | 18:38 | 296 |
| 16 | 05:18 | 64 | 18:57 | 296 | 05:08 | 63 | 18:54 | 297 | 05:15 | 64 | 18:50 | 296 | 05:10 | 64 | 18:39 | 296 |
| 17 | 05:18 | 64 | 18:57 | 296 | 05:08 | 63 | 18:54 | 297 | 05:15 | 64 | 18:50 | 296 | 05:10 | 64 | 18:39 | 296 |
| 18 | 05:18 | 64 | 18:57 | 296 | 05:08 | 63 | 18:54 | 297 | 05:15 | 64 | 18:50 | 296 | 05:10 | 64 | 18:39 | 296 |
| 19 | 05:18 | 64 | 18:57 | 296 | 05:08 | 63 | 18:55 | 297 | 05:15 | 64 | 18:51 | 296 | 05:11 | 64 | 18:39 | 296 |
| 20 | 05:19 | 64 | 18:58 | 296 | 05:08 | 63 | 18:55 | 297 | 05:16 | 64 | 18:51 | 296 | 05:11 | 64 | 18:40 | 296 |
| 21 | 05:19 | 64 | 18:58 | 296 | 05:09 | 63 | 18:55 | 297 | 05:16 | 64 | 18:51 | 296 | 05:11 | 64 | 18:40 | 296 |
| 22 | 05:19 | 64 | 18:58 | 296 | 05:09 | 63 | 18:55 | 297 | 05:16 | 64 | 18:51 | 296 | 05:11 | 64 | 18:40 | 296 |
| 23 | 05:19 | 64 | 18:58 | 296 | 05:09 | 63 | 18:56 | 297 | 05:16 | 64 | 18:52 | 296 | 05:11 | 64 | 18:40 | 296 |
| 24 | 05:20 | 64 | 18:59 | 296 | 05:09 | 63 | 18:56 | 297 | 05:16 | 64 | 18:52 | 296 | 05:12 | 64 | 18:41 | 296 |
| 25 | 05:20 | 64 | 18:59 | 296 | 05:09 | 63 | 18:56 | 297 | 05:17 | 64 | 18:52 | 296 | 05:12 | 64 | 18:41 | 296 |
| 26 | 05:20 | 64 | 18:59 | 296 | 05:10 | 63 | 18:56 | 297 | 05:17 | 64 | 18:52 | 296 | 05:12 | 64 | 18:41 | 296 |
| 27 | 05:20 | 64 | 18:59 | 296 | 05:10 | 63 | 18:56 | 297 | 05:17 | 64 | 18:52 | 296 | 05:13 | 64 | 18:41 | 296 |
| 28 | 05:21 | 64 | 18:59 | 296 | 05:10 | 63 | 18:56 | 297 | 05:18 | 64 | 18:52 | 296 | 05:13 | 64 | 18:41 | 296 |
| 29 | 05:21 | 64 | 18:59 | 296 | 05:11 | 63 | 18:56 | 297 | 05:18 | 64 | 18:52 | 296 | 05:13 | 64 | 18:41 | 296 |
| 30 | 05:21 | 64 | 18:59 | 296 | 05:11 | 64 | 18:56 | 296 | 05:18 | 64 | 18:52 | 296 | 05:13 | 64 | 18:41 | 295 |

金門、連江  
七月（澎湖、蘭嶼）地區日出、日沒時間表

| 日期 | 金門    |    |       |     | 連江    |    |       |     | 澎湖    |    |       |     | 蘭嶼    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 05:22 | 64 | 18:59 | 296 | 05:11 | 64 | 18:57 | 296 | 05:18 | 64 | 18:52 | 296 | 05:14 | 65 | 18:41 | 295 |
| 2  | 05:22 | 64 | 18:59 | 296 | 05:12 | 64 | 18:57 | 296 | 05:19 | 64 | 18:53 | 296 | 05:14 | 65 | 18:41 | 295 |
| 3  | 05:22 | 64 | 18:59 | 296 | 05:12 | 64 | 18:57 | 296 | 05:19 | 64 | 18:53 | 296 | 05:14 | 65 | 18:41 | 295 |
| 4  | 05:23 | 64 | 18:59 | 296 | 05:12 | 64 | 18:57 | 296 | 05:20 | 64 | 18:53 | 295 | 05:15 | 65 | 18:41 | 295 |
| 5  | 05:23 | 64 | 18:59 | 296 | 05:13 | 64 | 18:56 | 296 | 05:20 | 65 | 18:53 | 295 | 05:15 | 65 | 18:41 | 295 |
| 6  | 05:23 | 64 | 18:59 | 295 | 05:13 | 64 | 18:56 | 296 | 05:20 | 65 | 18:53 | 295 | 05:15 | 65 | 18:41 | 295 |
| 7  | 05:24 | 65 | 18:59 | 295 | 05:14 | 64 | 18:56 | 296 | 05:21 | 65 | 18:52 | 295 | 05:16 | 65 | 18:41 | 295 |
| 8  | 05:24 | 65 | 18:59 | 295 | 05:14 | 64 | 18:56 | 296 | 05:21 | 65 | 18:52 | 295 | 05:16 | 65 | 18:41 | 295 |
| 9  | 05:25 | 65 | 18:59 | 295 | 05:14 | 64 | 18:56 | 296 | 05:21 | 65 | 18:52 | 295 | 05:17 | 65 | 18:41 | 295 |
| 10 | 05:25 | 65 | 18:59 | 295 | 05:15 | 65 | 18:56 | 295 | 05:22 | 65 | 18:52 | 295 | 05:17 | 65 | 18:41 | 294 |
| 11 | 05:25 | 65 | 18:59 | 295 | 05:15 | 65 | 18:56 | 295 | 05:22 | 65 | 18:52 | 295 | 05:17 | 66 | 18:41 | 294 |
| 12 | 05:26 | 65 | 18:59 | 295 | 05:16 | 65 | 18:56 | 295 | 05:23 | 65 | 18:52 | 294 | 05:18 | 66 | 18:41 | 294 |
| 13 | 05:26 | 65 | 18:58 | 295 | 05:16 | 65 | 18:55 | 295 | 05:23 | 66 | 18:52 | 294 | 05:18 | 66 | 18:41 | 294 |
| 14 | 05:27 | 66 | 18:58 | 294 | 05:17 | 65 | 18:55 | 295 | 05:23 | 66 | 18:52 | 294 | 05:18 | 66 | 18:41 | 294 |
| 15 | 05:27 | 66 | 18:58 | 294 | 05:17 | 65 | 18:55 | 295 | 05:24 | 66 | 18:51 | 294 | 05:19 | 66 | 18:40 | 294 |
| 16 | 05:28 | 66 | 18:58 | 294 | 05:18 | 65 | 18:55 | 294 | 05:24 | 66 | 18:51 | 294 | 05:19 | 66 | 18:40 | 294 |
| 17 | 05:28 | 66 | 18:57 | 294 | 05:18 | 66 | 18:54 | 294 | 05:25 | 66 | 18:51 | 294 | 05:20 | 67 | 18:40 | 293 |
| 18 | 05:29 | 66 | 18:57 | 294 | 05:19 | 66 | 18:54 | 294 | 05:25 | 66 | 18:51 | 293 | 05:20 | 67 | 18:40 | 293 |
| 19 | 05:29 | 66 | 18:57 | 293 | 05:19 | 66 | 18:54 | 294 | 05:26 | 67 | 18:50 | 293 | 05:21 | 67 | 18:39 | 293 |
| 20 | 05:29 | 67 | 18:57 | 293 | 05:20 | 66 | 18:53 | 294 | 05:26 | 67 | 18:50 | 293 | 05:21 | 67 | 18:39 | 293 |
| 21 | 05:30 | 67 | 18:56 | 293 | 05:20 | 66 | 18:53 | 293 | 05:27 | 67 | 18:50 | 293 | 05:21 | 67 | 18:39 | 293 |
| 22 | 05:30 | 67 | 18:56 | 293 | 05:21 | 67 | 18:52 | 293 | 05:27 | 67 | 18:49 | 293 | 05:22 | 68 | 18:39 | 292 |
| 23 | 05:31 | 67 | 18:55 | 293 | 05:21 | 67 | 18:52 | 293 | 05:27 | 67 | 18:49 | 292 | 05:22 | 68 | 18:38 | 292 |
| 24 | 05:31 | 68 | 18:55 | 292 | 05:22 | 67 | 18:52 | 293 | 05:28 | 68 | 18:48 | 292 | 05:23 | 68 | 18:38 | 292 |
| 25 | 05:32 | 68 | 18:55 | 292 | 05:22 | 67 | 18:51 | 292 | 05:28 | 68 | 18:48 | 292 | 05:23 | 68 | 18:37 | 292 |
| 26 | 05:32 | 68 | 18:54 | 292 | 05:23 | 68 | 18:51 | 292 | 05:29 | 68 | 18:48 | 292 | 05:23 | 68 | 18:37 | 291 |
| 27 | 05:33 | 68 | 18:54 | 292 | 05:23 | 68 | 18:50 | 292 | 05:29 | 68 | 18:47 | 291 | 05:24 | 69 | 18:37 | 291 |
| 28 | 05:33 | 69 | 18:53 | 291 | 05:24 | 68 | 18:50 | 292 | 05:30 | 69 | 18:47 | 291 | 05:24 | 69 | 18:36 | 291 |
| 29 | 05:34 | 69 | 18:53 | 291 | 05:24 | 68 | 18:49 | 291 | 05:30 | 69 | 18:46 | 291 | 05:25 | 69 | 18:36 | 291 |
| 30 | 05:34 | 69 | 18:52 | 291 | 05:25 | 69 | 18:48 | 291 | 05:31 | 69 | 18:46 | 291 | 05:25 | 69 | 18:35 | 290 |
| 31 | 05:35 | 69 | 18:52 | 291 | 05:25 | 69 | 18:48 | 291 | 05:31 | 69 | 18:45 | 290 | 05:25 | 70 | 18:35 | 290 |

金門、連江  
八月（澎湖、蘭嶼）地區日出、日沒時間表

| 日期 | 金門    |    |       |     | 連江    |    |       |     | 澎湖    |    |       |     | 蘭嶼    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 05:35 | 70 | 18:51 | 290 | 05:26 | 69 | 18:47 | 291 | 05:31 | 70 | 18:45 | 290 | 05:26 | 70 | 18:34 | 290 |
| 2  | 05:35 | 70 | 18:50 | 290 | 05:26 | 70 | 18:47 | 290 | 05:32 | 70 | 18:44 | 290 | 05:26 | 70 | 18:34 | 290 |
| 3  | 05:36 | 70 | 18:50 | 290 | 05:27 | 70 | 18:46 | 290 | 05:32 | 70 | 18:43 | 290 | 05:27 | 71 | 18:33 | 289 |
| 4  | 05:36 | 70 | 18:49 | 289 | 05:27 | 70 | 18:45 | 290 | 05:33 | 71 | 18:43 | 289 | 05:27 | 71 | 18:33 | 289 |
| 5  | 05:37 | 71 | 18:49 | 289 | 05:28 | 70 | 18:45 | 289 | 05:33 | 71 | 18:42 | 289 | 05:27 | 71 | 18:32 | 289 |
| 6  | 05:37 | 71 | 18:48 | 289 | 05:28 | 71 | 18:44 | 289 | 05:34 | 71 | 18:42 | 289 | 05:28 | 71 | 18:31 | 288 |
| 7  | 05:38 | 71 | 18:47 | 289 | 05:29 | 71 | 18:43 | 289 | 05:34 | 71 | 18:41 | 288 | 05:28 | 72 | 18:31 | 288 |
| 8  | 05:38 | 72 | 18:47 | 288 | 05:29 | 71 | 18:43 | 288 | 05:34 | 72 | 18:40 | 288 | 05:29 | 72 | 18:30 | 288 |
| 9  | 05:39 | 72 | 18:46 | 288 | 05:30 | 72 | 18:42 | 288 | 05:35 | 72 | 18:40 | 288 | 05:29 | 72 | 18:30 | 288 |
| 10 | 05:39 | 72 | 18:45 | 288 | 05:30 | 72 | 18:41 | 288 | 05:35 | 72 | 18:39 | 287 | 05:29 | 73 | 18:29 | 287 |
| 11 | 05:39 | 73 | 18:44 | 287 | 05:30 | 72 | 18:40 | 288 | 05:36 | 73 | 18:38 | 287 | 05:30 | 73 | 18:28 | 287 |
| 12 | 05:40 | 73 | 18:44 | 287 | 05:31 | 73 | 18:39 | 287 | 05:36 | 73 | 18:37 | 287 | 05:30 | 73 | 18:28 | 287 |
| 13 | 05:40 | 73 | 18:43 | 287 | 05:31 | 73 | 18:39 | 287 | 05:36 | 73 | 18:37 | 286 | 05:30 | 74 | 18:27 | 286 |
| 14 | 05:41 | 74 | 18:42 | 286 | 05:32 | 73 | 18:38 | 286 | 05:37 | 74 | 18:36 | 286 | 05:31 | 74 | 18:26 | 286 |
| 15 | 05:41 | 74 | 18:41 | 286 | 05:32 | 74 | 18:37 | 286 | 05:37 | 74 | 18:35 | 286 | 05:31 | 74 | 18:25 | 286 |
| 16 | 05:42 | 74 | 18:40 | 286 | 05:33 | 74 | 18:36 | 286 | 05:38 | 74 | 18:34 | 285 | 05:32 | 75 | 18:25 | 285 |
| 17 | 05:42 | 75 | 18:40 | 285 | 05:33 | 74 | 18:35 | 285 | 05:38 | 75 | 18:34 | 285 | 05:32 | 75 | 18:24 | 285 |
| 18 | 05:42 | 75 | 18:39 | 285 | 05:34 | 75 | 18:34 | 285 | 05:38 | 75 | 18:33 | 285 | 05:32 | 75 | 18:23 | 285 |
| 19 | 05:43 | 75 | 18:38 | 284 | 05:34 | 75 | 18:33 | 285 | 05:39 | 75 | 18:32 | 284 | 05:33 | 76 | 18:22 | 284 |
| 20 | 05:43 | 76 | 18:37 | 284 | 05:35 | 75 | 18:32 | 284 | 05:39 | 76 | 18:31 | 284 | 05:33 | 76 | 18:21 | 284 |
| 21 | 05:44 | 76 | 18:36 | 284 | 05:35 | 76 | 18:31 | 284 | 05:40 | 76 | 18:30 | 284 | 05:33 | 76 | 18:21 | 283 |
| 22 | 05:44 | 76 | 18:35 | 283 | 05:36 | 76 | 18:31 | 284 | 05:40 | 77 | 18:29 | 283 | 05:34 | 77 | 18:20 | 283 |
| 23 | 05:44 | 77 | 18:34 | 283 | 05:36 | 77 | 18:30 | 283 | 05:40 | 77 | 18:28 | 283 | 05:34 | 77 | 18:19 | 283 |
| 24 | 05:45 | 77 | 18:33 | 283 | 05:36 | 77 | 18:29 | 283 | 05:41 | 77 | 18:28 | 283 | 05:34 | 77 | 18:18 | 282 |
| 25 | 05:45 | 78 | 18:32 | 282 | 05:37 | 77 | 18:28 | 282 | 05:41 | 78 | 18:27 | 282 | 05:34 | 78 | 18:17 | 282 |
| 26 | 05:46 | 78 | 18:32 | 282 | 05:37 | 78 | 18:27 | 282 | 05:41 | 78 | 18:26 | 282 | 05:35 | 78 | 18:16 | 282 |
| 27 | 05:46 | 78 | 18:31 | 281 | 05:38 | 78 | 18:26 | 282 | 05:42 | 78 | 18:25 | 281 | 05:35 | 79 | 18:16 | 281 |
| 28 | 05:46 | 79 | 18:30 | 281 | 05:38 | 79 | 18:25 | 281 | 05:42 | 79 | 18:24 | 281 | 05:35 | 79 | 18:15 | 281 |
| 29 | 05:47 | 79 | 18:29 | 281 | 05:39 | 79 | 18:24 | 281 | 05:42 | 79 | 18:23 | 281 | 05:36 | 79 | 18:14 | 280 |
| 30 | 05:47 | 79 | 18:28 | 280 | 05:39 | 79 | 18:23 | 280 | 05:43 | 80 | 18:22 | 280 | 05:36 | 80 | 18:13 | 280 |
| 31 | 05:47 | 80 | 18:27 | 280 | 05:39 | 80 | 18:22 | 280 | 05:43 | 80 | 18:21 | 280 | 05:36 | 80 | 18:12 | 280 |

金門、連江  
九月 ( 澎湖、蘭嶼 ) 地區日出、日沒時間表

| 日期 | 金門    |    |       |     | 連江    |    |       |     | 澎湖    |    |       |     | 蘭嶼    |    |       |     |
|----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|-------|----|-------|-----|
|    | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     | 日出    |    | 日沒    |     |
|    | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  | 時間    | 方位 | 時間    | 方位  |
| 1  | 05:48 | 80 | 18:26 | 280 | 05:40 | 80 | 18:20 | 280 | 05:43 | 80 | 18:20 | 279 | 05:37 | 80 | 18:11 | 279 |
| 2  | 05:48 | 81 | 18:25 | 279 | 05:40 | 81 | 18:19 | 279 | 05:44 | 81 | 18:19 | 279 | 05:37 | 81 | 18:10 | 279 |
| 3  | 05:48 | 81 | 18:24 | 279 | 05:41 | 81 | 18:18 | 279 | 05:44 | 81 | 18:18 | 279 | 05:37 | 81 | 18:09 | 279 |
| 4  | 05:49 | 81 | 18:23 | 278 | 05:41 | 81 | 18:17 | 278 | 05:44 | 82 | 18:17 | 278 | 05:37 | 82 | 18:08 | 278 |
| 5  | 05:49 | 82 | 18:22 | 278 | 05:42 | 82 | 18:16 | 278 | 05:45 | 82 | 18:16 | 278 | 05:38 | 82 | 18:07 | 278 |
| 6  | 05:50 | 82 | 18:21 | 277 | 05:42 | 82 | 18:15 | 278 | 05:45 | 82 | 18:15 | 277 | 05:38 | 82 | 18:06 | 277 |
| 7  | 05:50 | 83 | 18:20 | 277 | 05:42 | 83 | 18:14 | 277 | 05:45 | 83 | 18:14 | 277 | 05:38 | 83 | 18:05 | 277 |
| 8  | 05:50 | 83 | 18:19 | 277 | 05:43 | 83 | 18:13 | 277 | 05:46 | 83 | 18:13 | 277 | 05:39 | 83 | 18:05 | 277 |
| 9  | 05:51 | 84 | 18:18 | 276 | 05:43 | 83 | 18:12 | 276 | 05:46 | 84 | 18:12 | 276 | 05:39 | 84 | 18:04 | 276 |
| 10 | 05:51 | 84 | 18:17 | 276 | 05:44 | 84 | 18:11 | 276 | 05:46 | 84 | 18:11 | 276 | 05:39 | 84 | 18:03 | 276 |
| 11 | 05:51 | 84 | 18:15 | 275 | 05:44 | 84 | 18:10 | 276 | 05:47 | 84 | 18:10 | 275 | 05:39 | 84 | 18:02 | 275 |
| 12 | 05:52 | 85 | 18:14 | 275 | 05:44 | 85 | 18:09 | 275 | 05:47 | 85 | 18:09 | 275 | 05:40 | 85 | 18:01 | 275 |
| 13 | 05:52 | 85 | 18:13 | 275 | 05:45 | 85 | 18:07 | 275 | 05:47 | 85 | 18:08 | 275 | 05:40 | 85 | 18:00 | 274 |
| 14 | 05:52 | 86 | 18:12 | 274 | 05:45 | 86 | 18:06 | 274 | 05:48 | 86 | 18:07 | 274 | 05:40 | 86 | 17:59 | 274 |
| 15 | 05:53 | 86 | 18:11 | 274 | 05:46 | 86 | 18:05 | 274 | 05:48 | 86 | 18:06 | 274 | 05:40 | 86 | 17:58 | 274 |
| 16 | 05:53 | 86 | 18:10 | 273 | 05:46 | 86 | 18:04 | 273 | 05:48 | 87 | 18:05 | 273 | 05:41 | 87 | 17:57 | 273 |
| 17 | 05:53 | 87 | 18:09 | 273 | 05:46 | 87 | 18:03 | 273 | 05:49 | 87 | 18:04 | 273 | 05:41 | 87 | 17:56 | 273 |
| 18 | 05:54 | 87 | 18:08 | 272 | 05:47 | 87 | 18:02 | 273 | 05:49 | 87 | 18:03 | 272 | 05:41 | 87 | 17:55 | 272 |
| 19 | 05:54 | 88 | 18:07 | 272 | 05:47 | 88 | 18:01 | 272 | 05:49 | 88 | 18:02 | 272 | 05:42 | 88 | 17:54 | 272 |
| 20 | 05:54 | 88 | 18:06 | 272 | 05:48 | 88 | 18:00 | 272 | 05:50 | 88 | 18:01 | 272 | 05:42 | 88 | 17:53 | 272 |
| 21 | 05:55 | 89 | 18:05 | 271 | 05:48 | 89 | 17:59 | 271 | 05:50 | 89 | 18:00 | 271 | 05:42 | 89 | 17:52 | 271 |
| 22 | 05:55 | 89 | 18:04 | 271 | 05:48 | 89 | 17:57 | 271 | 05:50 | 89 | 17:59 | 271 | 05:42 | 89 | 17:51 | 271 |
| 23 | 05:55 | 89 | 18:03 | 270 | 05:49 | 89 | 17:56 | 270 | 05:50 | 89 | 17:58 | 270 | 05:43 | 89 | 17:50 | 270 |
| 24 | 05:56 | 90 | 18:02 | 270 | 05:49 | 90 | 17:55 | 270 | 05:51 | 90 | 17:57 | 270 | 05:43 | 90 | 17:49 | 270 |
| 25 | 05:56 | 90 | 18:01 | 269 | 05:50 | 90 | 17:54 | 270 | 05:51 | 90 | 17:56 | 269 | 05:43 | 90 | 17:48 | 269 |
| 26 | 05:57 | 91 | 18:00 | 269 | 05:50 | 91 | 17:53 | 269 | 05:51 | 91 | 17:55 | 269 | 05:43 | 91 | 17:47 | 269 |
| 27 | 05:57 | 91 | 17:59 | 269 | 05:51 | 91 | 17:52 | 269 | 05:52 | 91 | 17:54 | 269 | 05:44 | 91 | 17:46 | 269 |
| 28 | 05:57 | 92 | 17:58 | 268 | 05:51 | 92 | 17:51 | 268 | 05:52 | 92 | 17:53 | 268 | 05:44 | 92 | 17:45 | 268 |
| 29 | 05:58 | 92 | 17:56 | 268 | 05:51 | 92 | 17:50 | 268 | 05:53 | 92 | 17:52 | 268 | 05:44 | 92 | 17:44 | 268 |
| 30 | 05:58 | 92 | 17:55 | 267 | 05:52 | 92 | 17:49 | 267 | 05:53 | 92 | 17:51 | 267 | 05:45 | 92 | 17:43 | 267 |

金門、連江  
十月（澎湖、蘭嶼）地區日出、日沒時間表

| 日期 | 金門    |     |       |     | 連江    |     |       |     | 澎湖    |     |       |     | 蘭嶼    |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
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| 2  | 05:59 | 93  | 17:53 | 266 | 05:53 | 93  | 17:46 | 266 | 05:54 | 93  | 17:49 | 267 | 05:45 | 93  | 17:41 | 267 |
| 3  | 05:59 | 94  | 17:52 | 266 | 05:53 | 94  | 17:45 | 266 | 05:54 | 94  | 17:48 | 266 | 05:46 | 94  | 17:40 | 266 |
| 4  | 06:00 | 94  | 17:51 | 266 | 05:54 | 94  | 17:44 | 266 | 05:54 | 94  | 17:47 | 266 | 05:46 | 94  | 17:39 | 266 |
| 5  | 06:00 | 95  | 17:50 | 265 | 05:54 | 95  | 17:43 | 265 | 05:55 | 95  | 17:46 | 265 | 05:46 | 95  | 17:38 | 265 |
| 6  | 06:00 | 95  | 17:49 | 265 | 05:54 | 95  | 17:42 | 265 | 05:55 | 95  | 17:45 | 265 | 05:47 | 95  | 17:37 | 265 |
| 7  | 06:01 | 95  | 17:48 | 264 | 05:55 | 95  | 17:41 | 264 | 05:55 | 95  | 17:44 | 264 | 05:47 | 95  | 17:36 | 264 |
| 8  | 06:01 | 96  | 17:47 | 264 | 05:55 | 96  | 17:40 | 264 | 05:56 | 96  | 17:43 | 264 | 05:47 | 96  | 17:36 | 264 |
| 9  | 06:02 | 96  | 17:46 | 264 | 05:56 | 96  | 17:39 | 263 | 05:56 | 96  | 17:42 | 264 | 05:48 | 96  | 17:35 | 264 |
| 10 | 06:02 | 97  | 17:45 | 263 | 05:56 | 97  | 17:38 | 263 | 05:57 | 97  | 17:41 | 263 | 05:48 | 97  | 17:34 | 263 |
| 11 | 06:02 | 97  | 17:44 | 263 | 05:57 | 97  | 17:37 | 263 | 05:57 | 97  | 17:40 | 263 | 05:48 | 97  | 17:33 | 263 |
| 12 | 06:03 | 98  | 17:44 | 262 | 05:57 | 98  | 17:36 | 262 | 05:57 | 97  | 17:39 | 262 | 05:49 | 97  | 17:32 | 262 |
| 13 | 06:03 | 98  | 17:43 | 262 | 05:58 | 98  | 17:35 | 262 | 05:58 | 98  | 17:38 | 262 | 05:49 | 98  | 17:31 | 262 |
| 14 | 06:04 | 98  | 17:42 | 261 | 05:58 | 98  | 17:34 | 261 | 05:58 | 98  | 17:37 | 262 | 05:49 | 98  | 17:30 | 262 |
| 15 | 06:04 | 99  | 17:41 | 261 | 05:59 | 99  | 17:33 | 261 | 05:59 | 99  | 17:36 | 261 | 05:50 | 99  | 17:29 | 261 |
| 16 | 06:05 | 99  | 17:40 | 261 | 05:59 | 99  | 17:32 | 261 | 05:59 | 99  | 17:35 | 261 | 05:50 | 99  | 17:29 | 261 |
| 17 | 06:05 | 100 | 17:39 | 260 | 06:00 | 100 | 17:31 | 260 | 05:59 | 99  | 17:35 | 260 | 05:50 | 99  | 17:28 | 260 |
| 18 | 06:06 | 100 | 17:38 | 260 | 06:00 | 100 | 17:30 | 260 | 06:00 | 100 | 17:34 | 260 | 05:51 | 100 | 17:27 | 260 |
| 19 | 06:06 | 100 | 17:37 | 259 | 06:01 | 100 | 17:29 | 259 | 06:00 | 100 | 17:33 | 260 | 05:51 | 100 | 17:26 | 260 |
| 20 | 06:07 | 101 | 17:36 | 259 | 06:01 | 101 | 17:28 | 259 | 06:01 | 101 | 17:32 | 259 | 05:52 | 101 | 17:25 | 259 |
| 21 | 06:07 | 101 | 17:36 | 259 | 06:02 | 101 | 17:27 | 259 | 06:01 | 101 | 17:31 | 259 | 05:52 | 101 | 17:25 | 259 |
| 22 | 06:08 | 102 | 17:35 | 258 | 06:03 | 102 | 17:27 | 258 | 06:02 | 101 | 17:30 | 258 | 05:53 | 101 | 17:24 | 258 |
| 23 | 06:08 | 102 | 17:34 | 258 | 06:03 | 102 | 17:26 | 258 | 06:02 | 102 | 17:30 | 258 | 05:53 | 102 | 17:23 | 258 |
| 24 | 06:09 | 102 | 17:33 | 258 | 06:04 | 102 | 17:25 | 257 | 06:03 | 102 | 17:29 | 258 | 05:53 | 102 | 17:22 | 258 |
| 25 | 06:09 | 103 | 17:32 | 257 | 06:04 | 103 | 17:24 | 257 | 06:03 | 103 | 17:28 | 257 | 05:54 | 102 | 17:22 | 257 |
| 26 | 06:10 | 103 | 17:32 | 257 | 06:05 | 103 | 17:23 | 257 | 06:04 | 103 | 17:27 | 257 | 05:54 | 103 | 17:21 | 257 |
| 27 | 06:10 | 103 | 17:31 | 256 | 06:05 | 104 | 17:22 | 256 | 06:04 | 103 | 17:27 | 256 | 05:55 | 103 | 17:20 | 257 |
| 28 | 06:11 | 104 | 17:30 | 256 | 06:06 | 104 | 17:22 | 256 | 06:05 | 104 | 17:26 | 256 | 05:55 | 104 | 17:20 | 256 |
| 29 | 06:11 | 104 | 17:29 | 256 | 06:07 | 104 | 17:21 | 255 | 06:05 | 104 | 17:25 | 256 | 05:56 | 104 | 17:19 | 256 |
| 30 | 06:12 | 105 | 17:29 | 255 | 06:07 | 105 | 17:20 | 255 | 06:06 | 104 | 17:25 | 255 | 05:56 | 104 | 17:18 | 256 |
| 31 | 06:12 | 105 | 17:28 | 255 | 06:08 | 105 | 17:19 | 255 | 06:06 | 105 | 17:24 | 255 | 05:57 | 105 | 17:18 | 255 |

金門、連江  
十一月 ( 澎湖、蘭嶼 ) 地區日出、日沒時間表

| 日期 | 金門    |     |       |     | 連江    |     |       |     | 澎湖    |     |       |     | 蘭嶼    |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
| 1  | 06:13 | 105 | 17:27 | 255 | 06:09 | 105 | 17:19 | 254 | 06:07 | 105 | 17:23 | 255 | 05:57 | 105 | 17:17 | 255 |
| 2  | 06:14 | 106 | 17:27 | 254 | 06:09 | 106 | 17:18 | 254 | 06:08 | 106 | 17:23 | 254 | 05:58 | 105 | 17:17 | 254 |
| 3  | 06:14 | 106 | 17:26 | 254 | 06:10 | 106 | 17:17 | 254 | 06:08 | 106 | 17:22 | 254 | 05:58 | 106 | 17:16 | 254 |
| 4  | 06:15 | 106 | 17:25 | 254 | 06:11 | 107 | 17:17 | 253 | 06:09 | 106 | 17:22 | 254 | 05:59 | 106 | 17:16 | 254 |
| 5  | 06:15 | 107 | 17:25 | 253 | 06:11 | 107 | 17:16 | 253 | 06:09 | 107 | 17:21 | 253 | 05:59 | 106 | 17:15 | 253 |
| 6  | 06:16 | 107 | 17:24 | 253 | 06:12 | 107 | 17:15 | 253 | 06:10 | 107 | 17:21 | 253 | 06:00 | 107 | 17:15 | 253 |
| 7  | 06:17 | 107 | 17:24 | 253 | 06:13 | 108 | 17:15 | 252 | 06:10 | 107 | 17:20 | 253 | 06:01 | 107 | 17:14 | 253 |
| 8  | 06:17 | 108 | 17:23 | 252 | 06:13 | 108 | 17:14 | 252 | 06:11 | 108 | 17:20 | 252 | 06:01 | 107 | 17:14 | 252 |
| 9  | 06:18 | 108 | 17:23 | 252 | 06:14 | 108 | 17:14 | 252 | 06:12 | 108 | 17:19 | 252 | 06:02 | 108 | 17:13 | 252 |
| 10 | 06:19 | 108 | 17:22 | 252 | 06:15 | 109 | 17:13 | 251 | 06:12 | 108 | 17:19 | 252 | 06:02 | 108 | 17:13 | 252 |
| 11 | 06:19 | 109 | 17:22 | 251 | 06:15 | 109 | 17:13 | 251 | 06:13 | 108 | 17:18 | 251 | 06:03 | 108 | 17:12 | 252 |
| 12 | 06:20 | 109 | 17:21 | 251 | 06:16 | 109 | 17:12 | 251 | 06:14 | 109 | 17:18 | 251 | 06:03 | 109 | 17:12 | 251 |
| 13 | 06:21 | 109 | 17:21 | 251 | 06:17 | 109 | 17:12 | 250 | 06:14 | 109 | 17:17 | 251 | 06:04 | 109 | 17:12 | 251 |
| 14 | 06:21 | 110 | 17:21 | 250 | 06:17 | 110 | 17:11 | 250 | 06:15 | 109 | 17:17 | 250 | 06:05 | 109 | 17:11 | 251 |
| 15 | 06:22 | 110 | 17:20 | 250 | 06:18 | 110 | 17:11 | 250 | 06:16 | 110 | 17:17 | 250 | 06:05 | 109 | 17:11 | 250 |
| 16 | 06:23 | 110 | 17:20 | 250 | 06:19 | 110 | 17:11 | 250 | 06:16 | 110 | 17:16 | 250 | 06:06 | 110 | 17:11 | 250 |
| 17 | 06:23 | 110 | 17:20 | 250 | 06:20 | 111 | 17:10 | 249 | 06:17 | 110 | 17:16 | 250 | 06:06 | 110 | 17:11 | 250 |
| 18 | 06:24 | 111 | 17:19 | 249 | 06:20 | 111 | 17:10 | 249 | 06:18 | 111 | 17:16 | 249 | 06:07 | 110 | 17:10 | 250 |
| 19 | 06:25 | 111 | 17:19 | 249 | 06:21 | 111 | 17:10 | 249 | 06:18 | 111 | 17:16 | 249 | 06:08 | 111 | 17:10 | 249 |
| 20 | 06:25 | 111 | 17:19 | 249 | 06:22 | 111 | 17:09 | 248 | 06:19 | 111 | 17:15 | 249 | 06:08 | 111 | 17:10 | 249 |
| 21 | 06:26 | 111 | 17:19 | 248 | 06:22 | 112 | 17:09 | 248 | 06:20 | 111 | 17:15 | 249 | 06:09 | 111 | 17:10 | 249 |
| 22 | 06:27 | 112 | 17:18 | 248 | 06:23 | 112 | 17:09 | 248 | 06:20 | 112 | 17:15 | 248 | 06:10 | 111 | 17:10 | 249 |
| 23 | 06:27 | 112 | 17:18 | 248 | 06:24 | 112 | 17:09 | 248 | 06:21 | 112 | 17:15 | 248 | 06:10 | 112 | 17:09 | 248 |
| 24 | 06:28 | 112 | 17:18 | 248 | 06:25 | 112 | 17:08 | 247 | 06:22 | 112 | 17:15 | 248 | 06:11 | 112 | 17:09 | 248 |
| 25 | 06:29 | 112 | 17:18 | 248 | 06:25 | 113 | 17:08 | 247 | 06:22 | 112 | 17:15 | 248 | 06:12 | 112 | 17:09 | 248 |
| 26 | 06:30 | 113 | 17:18 | 247 | 06:26 | 113 | 17:08 | 247 | 06:23 | 112 | 17:14 | 247 | 06:12 | 112 | 17:09 | 248 |
| 27 | 06:30 | 113 | 17:18 | 247 | 06:27 | 113 | 17:08 | 247 | 06:24 | 113 | 17:14 | 247 | 06:13 | 112 | 17:09 | 248 |
| 28 | 06:31 | 113 | 17:18 | 247 | 06:28 | 113 | 17:08 | 247 | 06:24 | 113 | 17:14 | 247 | 06:14 | 113 | 17:09 | 247 |
| 29 | 06:32 | 113 | 17:18 | 247 | 06:28 | 114 | 17:08 | 246 | 06:25 | 113 | 17:14 | 247 | 06:14 | 113 | 17:09 | 247 |
| 30 | 06:32 | 113 | 17:18 | 247 | 06:29 | 114 | 17:08 | 246 | 06:26 | 113 | 17:14 | 247 | 06:15 | 113 | 17:09 | 247 |



金門、連江  
十二月 ( 澎湖、蘭嶼 ) 地區日出、日沒時間表

| 日期 | 金門    |     |       |     | 連江    |     |       |     | 澎湖    |     |       |     | 蘭嶼    |     |       |     |
|----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|    | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     | 日出    |     | 日沒    |     |
|    | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  | 時間    | 方位  |
| 1  | 06:33 | 114 | 17:18 | 246 | 06:30 | 114 | 17:08 | 246 | 06:26 | 113 | 17:14 | 247 | 06:16 | 113 | 17:09 | 247 |
| 2  | 06:34 | 114 | 17:18 | 246 | 06:31 | 114 | 17:08 | 246 | 06:27 | 114 | 17:14 | 246 | 06:16 | 113 | 17:09 | 247 |
| 3  | 06:35 | 114 | 17:18 | 246 | 06:31 | 114 | 17:08 | 246 | 06:28 | 114 | 17:15 | 246 | 06:17 | 113 | 17:10 | 246 |
| 4  | 06:35 | 114 | 17:18 | 246 | 06:32 | 114 | 17:08 | 246 | 06:29 | 114 | 17:15 | 246 | 06:18 | 114 | 17:10 | 246 |
| 5  | 06:36 | 114 | 17:18 | 246 | 06:33 | 115 | 17:08 | 245 | 06:29 | 114 | 17:15 | 246 | 06:18 | 114 | 17:10 | 246 |
| 6  | 06:37 | 114 | 17:18 | 246 | 06:34 | 115 | 17:08 | 245 | 06:30 | 114 | 17:15 | 246 | 06:19 | 114 | 17:10 | 246 |
| 7  | 06:37 | 114 | 17:18 | 245 | 06:34 | 115 | 17:08 | 245 | 06:31 | 114 | 17:15 | 246 | 06:20 | 114 | 17:10 | 246 |
| 8  | 06:38 | 115 | 17:19 | 245 | 06:35 | 115 | 17:09 | 245 | 06:31 | 114 | 17:15 | 245 | 06:20 | 114 | 17:10 | 246 |
| 9  | 06:39 | 115 | 17:19 | 245 | 06:36 | 115 | 17:09 | 245 | 06:32 | 115 | 17:16 | 245 | 06:21 | 114 | 17:11 | 246 |
| 10 | 06:39 | 115 | 17:19 | 245 | 06:36 | 115 | 17:09 | 245 | 06:32 | 115 | 17:16 | 245 | 06:22 | 114 | 17:11 | 246 |
| 11 | 06:40 | 115 | 17:19 | 245 | 06:37 | 115 | 17:09 | 245 | 06:33 | 115 | 17:16 | 245 | 06:22 | 115 | 17:11 | 245 |
| 12 | 06:41 | 115 | 17:20 | 245 | 06:38 | 115 | 17:10 | 245 | 06:34 | 115 | 17:16 | 245 | 06:23 | 115 | 17:12 | 245 |
| 13 | 06:41 | 115 | 17:20 | 245 | 06:38 | 115 | 17:10 | 244 | 06:34 | 115 | 17:17 | 245 | 06:23 | 115 | 17:12 | 245 |
| 14 | 06:42 | 115 | 17:20 | 245 | 06:39 | 116 | 17:10 | 244 | 06:35 | 115 | 17:17 | 245 | 06:24 | 115 | 17:12 | 245 |
| 15 | 06:42 | 115 | 17:21 | 245 | 06:39 | 116 | 17:10 | 244 | 06:36 | 115 | 17:17 | 245 | 06:25 | 115 | 17:13 | 245 |
| 16 | 06:43 | 115 | 17:21 | 245 | 06:40 | 116 | 17:11 | 244 | 06:36 | 115 | 17:18 | 245 | 06:25 | 115 | 17:13 | 245 |
| 17 | 06:44 | 115 | 17:21 | 245 | 06:41 | 116 | 17:11 | 244 | 06:37 | 115 | 17:18 | 245 | 06:26 | 115 | 17:13 | 245 |
| 18 | 06:44 | 115 | 17:22 | 245 | 06:41 | 116 | 17:12 | 244 | 06:37 | 115 | 17:19 | 245 | 06:26 | 115 | 17:14 | 245 |
| 19 | 06:45 | 115 | 17:22 | 245 | 06:42 | 116 | 17:12 | 244 | 06:38 | 115 | 17:19 | 245 | 06:27 | 115 | 17:14 | 245 |
| 20 | 06:45 | 115 | 17:23 | 245 | 06:42 | 116 | 17:13 | 244 | 06:38 | 115 | 17:20 | 245 | 06:27 | 115 | 17:15 | 245 |
| 21 | 06:46 | 115 | 17:23 | 245 | 06:43 | 116 | 17:13 | 244 | 06:39 | 115 | 17:20 | 245 | 06:28 | 115 | 17:15 | 245 |
| 22 | 06:46 | 115 | 17:24 | 245 | 06:43 | 116 | 17:14 | 244 | 06:39 | 115 | 17:21 | 245 | 06:28 | 115 | 17:16 | 245 |
| 23 | 06:47 | 115 | 17:24 | 245 | 06:44 | 116 | 17:14 | 244 | 06:40 | 115 | 17:21 | 245 | 06:29 | 115 | 17:16 | 245 |
| 24 | 06:47 | 115 | 17:25 | 245 | 06:44 | 116 | 17:15 | 244 | 06:40 | 115 | 17:22 | 245 | 06:29 | 115 | 17:17 | 245 |
| 25 | 06:48 | 115 | 17:25 | 245 | 06:45 | 116 | 17:15 | 244 | 06:41 | 115 | 17:22 | 245 | 06:30 | 115 | 17:17 | 245 |
| 26 | 06:48 | 115 | 17:26 | 245 | 06:45 | 116 | 17:16 | 244 | 06:41 | 115 | 17:23 | 245 | 06:30 | 115 | 17:18 | 245 |
| 27 | 06:49 | 115 | 17:26 | 245 | 06:46 | 116 | 17:16 | 244 | 06:42 | 115 | 17:23 | 245 | 06:31 | 115 | 17:18 | 245 |
| 28 | 06:49 | 115 | 17:27 | 245 | 06:46 | 116 | 17:17 | 244 | 06:42 | 115 | 17:24 | 245 | 06:31 | 115 | 17:19 | 245 |
| 29 | 06:49 | 115 | 17:28 | 245 | 06:46 | 116 | 17:17 | 244 | 06:43 | 115 | 17:24 | 245 | 06:32 | 115 | 17:20 | 245 |
| 30 | 06:50 | 115 | 17:28 | 245 | 06:47 | 116 | 17:18 | 244 | 06:43 | 115 | 17:25 | 245 | 06:32 | 115 | 17:20 | 245 |
| 31 | 06:50 | 115 | 17:29 | 245 | 06:47 | 116 | 17:19 | 245 | 06:43 | 115 | 17:26 | 245 | 06:32 | 115 | 17:21 | 245 |

# 月 球 表

月球是地球的天然衛星，以約 27.3 天的週期繞地球公轉一週，稱為一「恆星月」。傳統生活作息中，月相的盈虧變化提供了人們制定陰曆的標準，月相變化週期平均約為 29.5 天，稱為一「朔望月」。以發生朔的當日為初一，取整數計日，大月為 30 天，小月為 29 天。

雖然月球是地球的衛星，但它的運動受到太陽極大的影響。月球繞地運行的軌道稱為白道，與黃道平面約有  $5^\circ$  的夾角。換言之，以地心黃道座標觀察月球的緯度變化，在  $\pm 5^\circ$  之內，而以地球赤道座標為標準時，月球就在赤緯  $\pm 28^\circ$  間改變位置。

月球繞地球公轉的軌道為橢圓形，離心率 0.0549，平均軌道半徑 384000 公里，而地球的半徑有 6378 公里，因此在地球上不同的地區觀察月球，會受到視差的影響而有不同的位置。為

了確實掌握月球的位置，月球表包含了月球位置表與月球升沒時間、相位表。位置表中分別以地心黃道、地心赤道、地表赤道與地平座標，這四種座標值顯示每晚 20 點的月球位置，並且也列出赤道地平視差的值。而升沒時間相位表中，列出月出、中天與月沒時刻，月球視半徑以及月面中心座標、轉軸傾角、亮緣方位角與相位。簡要說明如下。

## 一、黃道座標

黃道座標使用黃經與黃緯表示天體的位置，黃經的標示參考太陽表，黃緯則與赤緯類似，以黃道面為  $0^\circ$ ，上下各分為  $90^\circ$ ，上方為正，下方為負。因為位置在黃道緯度也有變化，所以除了標示月球黃經，也列出月球黃緯度數。

## 二、赤道座標·視差

赤道座標分別以地心與地表兩種方式表示，這是因為月球的視差遠比太陽為大。月球的平均赤道地平視差為  $57' 02''.6$ ，比月球的視半徑還要大了許多，只使用地心赤道座標實不足以表示觀測者所見的實際狀況。

赤經、赤緯與赤道地平視差的說明請參見太陽表中相關的部份。地心赤道座標與地表赤道座標之間的差異只在基準點的選擇上，前者選擇地球中心作基準點；後者以觀測者所在地（臺北市立天文科學教育館）為基準點。本表內所列的視差，是地表觀測點與地心所量測的差值。

## 三、地平座標

月球的位置也可以使用方位角與高度角來表示，稱為地平座標。地平座標以觀測者所在地為中心，地平線投影在天球上所形成的大圓為基準平面，習慣上就以地平面稱之。由地理上的正北方開始為  $0^\circ$ ，往東方轉動沿著地平面等分為  $360^\circ$ ，此稱為「方位角」，用來表示方向；由地平面  $0^\circ$  仰升到觀測者的正上方天頂是四分之一的圓，等分為  $90^\circ$ ，稱為「高度角」或「仰角高度」，用來表示天體的高度。

## 四、月出、中天與月沒

月球繞著地球由西向東轉，每日在天球上東移約  $13^\circ$ ，因此月出時間每日應當延後約 50 分鐘；但因月球的軌道與地球赤道間的夾角變化頗大 ( $23^\circ.5 \pm 5^\circ$ )，因此月球出沒時刻的時間將因觀測者的緯度不同而有所差別；在臺灣地區每日延後的時間約在 30 分鐘至 1 小時左右。

月出、月沒與中天的時刻，均為東經  $120^\circ$  平太陽時。計算是以月面中心位在地平以下  $34' + s - \pi$  為標準， $34'$  是大氣對月光的平均偏折角， $s$  是當時月球的視半徑， $\pi$  是觀測者地表座標與地心座標的差異值。表中所列資料以月出的日期為主，月球過中天及月沒時間則跟隨月出時間的日期；若當日無月出時間，則以空格表示。例如：2019 年 1 月 13 日月沒時間為 23:31，到再次月沒的時間已是 1 月 15 日凌晨 00:24。因此 1 月 14 日當日沒有月沒現象，故月沒欄位以空格表示。同理月出與月球過中天的時間亦依此原則表示。

## 五、月面中心點的經緯度

由於月球自轉與公轉週期相同，所以月球始終以相同的半球表面朝向地球，但因為視差、月球自轉軸的傾斜、以及軌道速度的變化等因素，使得月球相對於地球產生類似天秤的擺動現象，稱為「天秤動」，主要可分為經度天秤動、緯度天秤動、日周天秤動。

※ 經度天秤動：月球公轉地球的軌道為橢圓形，當與地球較近時公轉速度較快，而距離較遠時，公轉速度則較慢，但月球自轉的速度始終不變，因而造成月球在東西方向上的擺動，幅度約為  $7^\circ.5$ 。

※ 緯度天秤動：月球的自轉軸與白道面(月球公轉的軌道平面)間有  $6^\circ.5$  的夾角，因此在月球公轉一周的時間內，月球的南極與北極將分別斜向地球，使我們能看見北極以北或南極以南的部份地區。

※ 日周天秤動：月球與地球之間相距平均只有 38 萬公里，而地球的直徑約 12000 公里，使月球有高達  $1^\circ$  的視差，因此在月球東升與西沒之間，地面上的觀測者看見的月球表面就產生了因視差形成的位置改變，其值與視差相當。

月球的天秤動，使得我們能見到的月球表面累計可達總面積的 59%，但也造成了月面中心點的位置變化，因此須標示月球中心點的經度、緯度與自轉軸的傾斜角（類似太陽面的座標），以反映天秤動的狀況，標示出觀測到的月球表面。

## 六、亮緣方位角

月光來自於反射的太陽光，因此月面中心與亮緣中點連線的延伸方向，就遙指向太陽，其方位的標示係以月面的北點為  $0^\circ$ ，東方為  $90^\circ$ ，西方為  $270^\circ$  來表示，在滿月前亮緣朝向西方，滿月後的亮緣朝向東方，但朔、望前後的亮緣中心點會因為月球在黃道面的上方或下方而接近南方 ( $180^\circ$ ) 或北方 ( $0^\circ$ )。

# 月 球 位 置 表

## — 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 地心黃道座標 |      |    |      | 地心赤道座標 |      |     |      | 地表赤道座標 |      |     |      | 地心地表 |      | 地平座標  |       |
|----|--------|------|----|------|--------|------|-----|------|--------|------|-----|------|------|------|-------|-------|
|    | 黃經     |      | 黃緯 |      | 赤經     |      | 赤緯  |      | 赤經     |      | 赤緯  |      | 視差   |      | 方位    | 仰角    |
|    | °      | '    | °  | '    | h      | m    | °   | '    | h      | m    | °   | '    | '    | "    | °     | °     |
| 1  | 222    | 22.2 | +5 | 4.7  | 14     | 46.0 | -10 | 42.3 | 14     | 46.0 | -11 | 15.8 | 33   | 28.6 | 181.0 | 53.6  |
| 2  | 235    | 14.8 | +4 | 38.3 | 15     | 36.2 | -14 | 33.9 | 15     | 36.9 | -15 | 9.8  | 37   | 12.7 | 163.7 | 48.3  |
| 3  | 247    | 53.5 | +3 | 58.7 | 16     | 27.2 | -17 | 41.6 | 16     | 28.5 | -18 | 18.4 | 41   | 47.3 | 150.4 | 41.1  |
| 4  | 260    | 19.7 | +3 | 8.4  | 17     | 18.9 | -19 | 57.1 | 17     | 20.9 | -20 | 33.3 | 46   | 12.6 | 140.0 | 32.9  |
| 5  | 272    | 35.0 | +2 | 10.0 | 18     | 11.1 | -21 | 14.7 | 18     | 13.7 | -21 | 48.7 | 49   | 52.5 | 131.5 | 24.3  |
| 6  | 284    | 40.9 | +1 | 6.3  | 19     | 3.2  | -21 | 31.7 | 19     | 6.3  | -22 | 2.5  | 52   | 27.9 | 124.0 | 15.4  |
| 7  | 296    | 38.8 | +0 | 0.4  | 19     | 54.7 | -20 | 49.0 | 19     | 58.0 | -21 | 16.1 | 53   | 50.6 | 117.2 | 6.5   |
| 8  | 308    | 30.7 | -1 | 5.1  | 20     | 44.9 | -19 | 10.7 | 20     | 48.4 | -19 | 34.3 | 53   | 59.7 | 110.6 | -2.3  |
| 9  | 320    | 18.9 | -2 | 7.5  | 21     | 33.7 | -16 | 43.6 | 21     | 37.1 | -17 | 4.4  | 52   | 59.5 | 103.9 | -10.9 |
| 10 | 332    | 6.0  | -3 | 4.3  | 22     | 20.9 | -13 | 35.6 | 22     | 24.1 | -13 | 54.7 | 50   | 58.2 | 96.7  | -19.3 |
| 11 | 343    | 55.3 | -3 | 53.5 | 23     | 6.8  | -9  | 54.9 | 23     | 9.8  | -10 | 13.7 | 48   | 7.3  | 88.8  | -27.3 |
| 12 | 355    | 50.6 | -4 | 33.1 | 23     | 52.0 | -5  | 49.7 | 23     | 54.7 | -6  | 9.5  | 44   | 42.0 | 79.5  | -34.8 |
| 13 | 7      | 56.1 | -5 | 1.2  | 0      | 37.1 | -1  | 28.0 | 0      | 39.4 | -1  | 50.0 | 41   | 4.1  | 68.4  | -41.6 |
| 14 | 20     | 16.1 | -5 | 16.1 | 1      | 22.8 | +3  | 2.1  | 1      | 24.7 | +2  | 36.8 | 37   | 45.4 | 54.6  | -47.1 |
| 15 | 32     | 55.2 | -5 | 16.3 | 2      | 10.1 | +7  | 31.4 | 2      | 11.5 | +7  | 2.1  | 35   | 31.5 | 37.9  | -50.8 |
| 16 | 45     | 57.4 | -5 | 0.5  | 2      | 59.9 | +11 | 48.6 | 3      | 0.6  | +11 | 15.0 | 35   | 14.3 | 18.9  | -51.9 |
| 17 | 59     | 25.6 | -4 | 28.1 | 3      | 52.9 | +15 | 39.5 | 3      | 52.9 | +15 | 2.1  | 37   | 25.8 | 359.5 | -49.8 |
| 18 | 73     | 21.3 | -3 | 39.0 | 4      | 49.7 | +18 | 46.6 | 4      | 48.8 | +18 | 6.6  | 41   | 51.3 | 342.0 | -44.8 |
| 19 | 87     | 43.7 | -2 | 34.8 | 5      | 50.3 | +20 | 50.2 | 5      | 48.5 | +20 | 9.7  | 47   | 34.1 | 327.1 | -37.5 |
| 20 | 102    | 29.4 | -1 | 18.7 | 6      | 53.8 | +21 | 32.6 | 6      | 51.1 | +20 | 54.1 | 53   | 20.7 | 314.7 | -28.5 |
| 21 | 117    | 32.0 | +0 | 4.2  | 7      | 58.5 | +20 | 43.2 | 7      | 55.2 | +20 | 8.6  | 58   | 1.5  | 303.9 | -18.5 |
| 22 | 132    | 43.1 | +1 | 27.5 | 9      | 2.5  | +18 | 23.4 | 8      | 58.8 | +17 | 53.5 | 60   | 43.9 | 294.1 | -7.9  |
| 23 | 147    | 53.0 | +2 | 44.6 | 10     | 4.2  | +14 | 46.8 | 10     | 0.3  | +14 | 21.0 | 61   | 1.8  | 284.6 | 2.8   |
| 24 | 162    | 52.4 | +3 | 49.3 | 11     | 2.8  | +10 | 15.3 | 10     | 59.1 | +9  | 51.8 | 58   | 59.9 | 274.9 | 13.2  |
| 25 | 177    | 33.8 | +4 | 37.5 | 11     | 58.4 | +5  | 12.7 | 11     | 55.1 | +4  | 49.4 | 55   | 9.1  | 264.4 | 22.9  |
| 26 | 191    | 52.0 | +5 | 7.1  | 12     | 51.6 | +0  | 1.3  | 12     | 48.7 | -0  | 23.8 | 50   | 18.1 | 252.8 | 31.5  |
| 27 | 205    | 44.7 | +5 | 17.6 | 13     | 43.2 | -5  | 0.8  | 13     | 40.8 | -5  | 28.9 | 45   | 22.6 | 239.4 | 38.6  |
| 28 | 219    | 11.9 | +5 | 10.2 | 14     | 33.9 | -9  | 39.1 | 14     | 32.1 | -10 | 10.8 | 41   | 17.4 | 224.0 | 43.7  |
| 29 | 232    | 15.4 | +4 | 46.8 | 15     | 24.4 | -13 | 42.4 | 15     | 23.3 | -14 | 17.5 | 38   | 46.2 | 207.1 | 46.5  |
| 30 | 244    | 58.3 | +4 | 9.7  | 16     | 15.3 | -17 | 1.7  | 16     | 14.8 | -17 | 39.3 | 38   | 9.6  | 189.7 | 46.7  |
| 31 | 257    | 24.0 | +3 | 21.7 | 17     | 6.6  | -19 | 29.6 | 17     | 6.9  | -20 | 8.6  | 39   | 17.9 | 173.3 | 44.5  |

# 月 球 升 沒 相 位 表

## — 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 月 出       |         | 中 天       |         | 月 沒       |         | 相 位  | 視 半 徑<br>' " | 月地 距離<br>km | 月面中心    |         | 轉軸 傾角<br>° | 亮緣 方位角<br>° |
|----|-----------|---------|-----------|---------|-----------|---------|------|--------------|-------------|---------|---------|------------|-------------|
|    | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |      |              |             | 經度<br>° | 緯度<br>° |            |             |
| 1  | 2:06      | 101     | 7:58      | 54S     | 13:47     | 257     | 0.24 | 15 38        | 387081      | -6.000  | 6.652   | 17.0       | 110.3       |
| 2  | 3:02      | 105     | 8:46      | 50S     | 14:27     | 253     | 0.15 | 15 28        | 390920      | -5.421  | 6.515   | 12.7       | 107.5       |
| 3  | 3:58      | 109     | 9:35      | 46S     | 15:09     | 249     | 0.09 | 15 19        | 394391      | -4.554  | 6.114   | 7.9        | 104.0       |
| 4  | 4:52      | 112     | 10:24     | 44S     | 15:55     | 247     | 0.04 | 15 10        | 397484      | -3.452  | 5.467   | 2.6        | 100.1       |
| 5  | 5:46      | 114     | 11:14     | 43S     | 16:42     | 246     | 0.01 | 15 2         | 400191      | -2.179  | 4.601   | 357.2      | 96.6        |
| 6  | 6:36      | 114     | 12:04     | 43S     | 17:32     | 246     | 0.00 | 14 54        | 402484      | -0.799  | 3.542   | 352.0      | 170.3       |
| 7  | 7:24      | 113     | 12:53     | 44S     | 18:24     | 248     | 0.01 | 14 48        | 404302      | 0.627   | 2.322   | 347.1      | 261.7       |
| 8  | 8:08      | 111     | 13:41     | 46S     | 19:15     | 250     | 0.04 | 14 43        | 405550      | 2.036   | 0.980   | 343.0      | 258.7       |
| 9  | 8:49      | 108     | 14:26     | 48S     | 20:07     | 253     | 0.08 | 14 40        | 406103      | 3.374   | -0.440  | 339.7      | 255.4       |
| 10 | 9:26      | 105     | 15:11     | 52S     | 20:58     | 257     | 0.14 | 14 39        | 405820      | 4.590   | -1.888  | 337.4      | 252.5       |
| 11 | 10:02     | 101     | 15:53     | 56S     | 21:49     | 262     | 0.21 | 14 40        | 404572      | 5.640   | -3.305  | 336.0      | 250.3       |
| 12 | 10:36     | 96      | 16:36     | 60S     | 22:40     | 266     | 0.29 | 14 43        | 402258      | 6.483   | -4.627  | 335.7      | 248.9       |
| 13 | 11:10     | 91      | 17:18     | 65S     | 23:31     | 272     | 0.38 | 14 49        | 398836      | 7.081   | -5.783  | 336.3      | 248.2       |
| 14 | 11:44     | 86      | 18:02     | 70S     |           |         | 0.48 | 14 58        | 394348      | 7.401   | -6.703  | 337.9      | 248.4       |
| 15 | 12:20     | 81      | 18:48     | 74S     | 0:24      | 277     | 0.58 | 15 10        | 388936      | 7.411   | -7.316  | 340.5      | 249.5       |
| 16 | 13:00     | 76      | 19:36     | 78S     | 1:20      | 282     | 0.68 | 15 24        | 382859      | 7.085   | -7.559  | 344.1      | 251.6       |
| 17 | 13:43     | 72      | 20:29     | 82S     | 2:18      | 286     | 0.77 | 15 40        | 376492      | 6.407   | -7.386  | 348.7      | 254.6       |
| 18 | 14:33     | 68      | 21:26     | 85S     | 3:19      | 290     | 0.86 | 15 56        | 370308      | 5.380   | -6.772  | 354.1      | 258.7       |
| 19 | 15:29     | 67      | 22:27     | 86S     | 4:23      | 293     | 0.93 | 16 12        | 364837      | 4.031   | -5.726  | 0.2        | 263.5       |
| 20 | 16:31     | 66      | 23:31     | 86S     | 5:27      | 294     | 0.98 | 16 26        | 360602      | 2.426   | -4.293  | 6.5        | 268.8       |
| 21 | 17:38     | 68      |           |         | 6:28      | 293     | 1.00 | 16 35        | 358028      | 0.666   | -2.560  | 12.6       | 271.3       |
| 22 | 18:47     | 71      | 0:34      | 84S     | 7:26      | 290     | 0.99 | 16 40        | 357370      | -1.116  | -0.648  | 17.7       | 102.3       |
| 23 | 19:54     | 76      | 1:35      | 81S     | 8:18      | 286     | 0.96 | 16 40        | 358656      | -2.777  | 1.300   | 21.5       | 105.8       |
| 24 | 20:59     | 82      | 2:32      | 76S     | 9:05      | 281     | 0.89 | 16 35        | 361689      | -4.187  | 3.137   | 23.7       | 108.7       |
| 25 | 22:02     | 88      | 3:27      | 71S     | 9:48      | 275     | 0.81 | 16 26        | 366094      | -5.247  | 4.732   | 24.2       | 110.5       |
| 26 | 23:02     | 94      | 4:18      | 65S     | 10:29     | 269     | 0.71 | 16 14        | 371398      | -5.905  | 5.987   | 23.3       | 110.9       |
| 27 |           |         | 5:08      | 60S     | 11:08     | 264     | 0.60 | 16 1         | 377117      | -6.148  | 6.844   | 21.2       | 110.2       |
| 28 | 0:00      | 99      | 5:56      | 55S     | 11:47     | 259     | 0.49 | 15 47        | 382820      | -5.996  | 7.286   | 18.0       | 108.4       |
| 29 | 0:57      | 104     | 6:44      | 51S     | 12:27     | 254     | 0.39 | 15 34        | 388170      | -5.491  | 7.327   | 13.9       | 105.6       |
| 30 | 1:53      | 108     | 7:32      | 47S     | 13:09     | 250     | 0.29 | 15 23        | 392941      | -4.685  | 7.007   | 9.2        | 101.8       |
| 31 | 2:48      | 111     | 8:21      | 45S     | 13:53     | 248     | 0.20 | 15 13        | 397002      | -3.637  | 6.379   | 4.0        | 97.3        |

# 月 球 位 置 表

## 二 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 地心黃道座標 |      |    |      | 地心赤道座標 |      |     |      | 地表赤道座標 |      |     |      | 地心地表 |      | 地平座標  |       |
|----|--------|------|----|------|--------|------|-----|------|--------|------|-----|------|------|------|-------|-------|
|    | 黃經     |      | 黃緯 |      | 赤經     |      | 赤緯  |      | 赤經     |      | 赤緯  |      | 視差   |      | 方位    | 仰角    |
|    | °      | '    | °  | '    | h      | m    | °   | '    | h      | m    | °   | '    | '    | "    | °     | °     |
| 1  | 269    | 36.2 | +2 | 25.2 | 17     | 58.3 | -21 | 0.9  | 17     | 59.4 | -21 | 39.9 | 41   | 39.2 | 158.9 | 40.3  |
| 2  | 281    | 38.3 | +1 | 23.1 | 18     | 50.1 | -21 | 32.8 | 18     | 51.8 | -22 | 10.3 | 44   | 35.9 | 146.5 | 34.8  |
| 3  | 293    | 33.3 | +0 | 18.0 | 19     | 41.4 | -21 | 5.1  | 19     | 43.8 | -21 | 40.1 | 47   | 35.7 | 135.8 | 28.4  |
| 4  | 305    | 23.7 | -0 | 47.4 | 20     | 31.8 | -19 | 41.0 | 20     | 34.6 | -20 | 12.6 | 50   | 14.9 | 126.4 | 21.4  |
| 5  | 317    | 11.9 | -1 | 50.4 | 21     | 20.9 | -17 | 25.9 | 21     | 24.0 | -17 | 54.1 | 52   | 17.8 | 117.8 | 14.0  |
| 6  | 329    | 0.0  | -2 | 48.6 | 22     | 8.6  | -14 | 27.2 | 22     | 11.8 | -14 | 52.4 | 53   | 34.4 | 109.8 | 6.4   |
| 7  | 340    | 49.9 | -3 | 39.7 | 22     | 54.9 | -10 | 53.3 | 22     | 58.2 | -11 | 16.5 | 54   | 0.3  | 101.9 | -1.2  |
| 8  | 352    | 43.8 | -4 | 21.4 | 23     | 40.2 | -6  | 53.1 | 23     | 43.5 | -7  | 15.2 | 53   | 34.7 | 93.9  | -8.8  |
| 9  | 4      | 43.9 | -4 | 52.1 | 0      | 25.1 | -2  | 35.3 | 0      | 28.3 | -2  | 57.6 | 52   | 20.7 | 85.6  | -16.2 |
| 10 | 16     | 53.0 | -5 | 10.0 | 1      | 10.2 | +1  | 51.4 | 1      | 13.1 | +1  | 27.7 | 50   | 25.2 | 76.5  | -23.4 |
| 11 | 29     | 14.1 | -5 | 14.0 | 1      | 56.2 | +6  | 18.0 | 1      | 58.9 | +5  | 51.6 | 47   | 59.4 | 66.3  | -30.1 |
| 12 | 41     | 50.6 | -5 | 3.1  | 2      | 43.9 | +10 | 34.4 | 2      | 46.2 | +10 | 4.4  | 45   | 21.2 | 54.5  | -36.1 |
| 13 | 54     | 46.0 | -4 | 36.9 | 3      | 34.3 | +14 | 28.6 | 3      | 36.1 | +13 | 54.6 | 42   | 57.6 | 40.7  | -40.9 |
| 14 | 68     | 3.8  | -3 | 55.2 | 4      | 27.8 | +17 | 46.7 | 4      | 29.0 | +17 | 8.6  | 41   | 25.6 | 24.6  | -44.1 |
| 15 | 81     | 46.5 | -2 | 59.1 | 5      | 25.0 | +20 | 12.1 | 5      | 25.3 | +19 | 30.9 | 41   | 25.3 | 6.9   | -45.1 |
| 16 | 95     | 55.3 | -1 | 50.5 | 6      | 25.4 | +21 | 27.8 | 6      | 24.9 | +20 | 45.3 | 43   | 20.3 | 348.7 | -43.3 |
| 17 | 110    | 29.3 | -0 | 32.9 | 7      | 28.3 | +21 | 19.9 | 7      | 26.7 | +20 | 38.3 | 46   | 58.5 | 331.6 | -39.0 |
| 18 | 125    | 25.0 | +0 | 48.7 | 8      | 31.9 | +19 | 42.0 | 8      | 29.5 | +19 | 3.4  | 51   | 31.8 | 316.5 | -32.4 |
| 19 | 140    | 35.6 | +2 | 8.1  | 9      | 34.8 | +16 | 38.9 | 9      | 31.7 | +16 | 4.6  | 55   | 55.5 | 303.2 | -24.3 |
| 20 | 155    | 52.0 | +3 | 18.6 | 10     | 35.6 | +12 | 26.1 | 10     | 32.1 | +11 | 56.3 | 59   | 10.8 | 291.4 | -15.3 |
| 21 | 171    | 3.7  | +4 | 14.7 | 11     | 33.9 | +7  | 26.6 | 11     | 30.2 | +6  | 59.9 | 60   | 39.8 | 280.5 | -5.8  |
| 22 | 186    | 0.7  | +4 | 52.3 | 12     | 29.8 | +2  | 5.2  | 12     | 26.1 | +1  | 39.8 | 60   | 12.0 | 270.2 | 3.6   |
| 23 | 200    | 34.8 | +5 | 9.8  | 13     | 23.8 | -3  | 14.9 | 13     | 20.3 | -3  | 41.0 | 58   | 1.3  | 259.8 | 12.6  |
| 24 | 214    | 41.2 | +5 | 7.7  | 14     | 16.6 | -8  | 14.7 | 14     | 13.5 | -8  | 43.0 | 54   | 38.2 | 249.0 | 20.9  |
| 25 | 228    | 18.0 | +4 | 48.1 | 15     | 8.8  | -12 | 39.4 | 15     | 6.1  | -13 | 10.8 | 50   | 40.0 | 237.5 | 28.2  |
| 26 | 241    | 26.6 | +4 | 13.8 | 16     | 0.9  | -16 | 18.1 | 15     | 58.7 | -16 | 52.9 | 46   | 44.2 | 225.0 | 34.3  |
| 27 | 254    | 10.0 | +3 | 27.9 | 16     | 53.0 | -19 | 3.3  | 16     | 51.5 | -19 | 40.9 | 43   | 24.3 | 211.2 | 38.8  |
| 28 | 266    | 32.6 | +2 | 33.3 | 17     | 45.2 | -20 | 50.2 | 17     | 44.4 | -21 | 29.7 | 41   | 7.1  | 196.5 | 41.7  |

# 月 球 升 沒 相 位 表

## 二 月

東經：121°31'05" · 北緯：25°05'44"

世界時 0 時

| 日期 | 月 出       |         | 中 天       |         | 月 沒       |         | 相 位  | 視 半 徑<br>' " | 月地 距離<br>Km | 月面中心    |         | 轉軸 傾角<br>° | 亮緣 方位角<br>° |
|----|-----------|---------|-----------|---------|-----------|---------|------|--------------|-------------|---------|---------|------------|-------------|
|    | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |      |              |             | 經度<br>° | 緯度<br>° |            |             |
| 1  | 3:41      | 113     | 9:11      | 43S     | 14:39     | 246     | 0.13 | 15 5         | 400311      | -2.407  | 5.500   | 358.7      | 92.0        |
| 2  | 4:33      | 114     | 10:00     | 43S     | 15:28     | 246     | 0.07 | 14 58        | 402876      | -1.055  | 4.429   | 353.4      | 86.1        |
| 3  | 5:21      | 114     | 10:49     | 43S     | 16:19     | 247     | 0.03 | 14 52        | 404738      | 0.358   | 3.219   | 348.4      | 79.0        |
| 4  | 6:06      | 112     | 11:37     | 45S     | 17:10     | 249     | 0.01 | 14 48        | 405939      | 1.773   | 1.918   | 344.1      | 66.5        |
| 5  | 6:48      | 110     | 12:24     | 47S     | 18:02     | 252     | 0.00 | 14 45        | 406505      | 3.134   | 0.569   | 340.5      | 305.3       |
| 6  | 7:26      | 106     | 13:08     | 51S     | 18:53     | 256     | 0.01 | 14 43        | 406436      | 4.384   | -0.790  | 337.9      | 264.3       |
| 7  | 8:03      | 102     | 13:52     | 54S     | 19:44     | 260     | 0.04 | 14 43        | 405699      | 5.475   | -2.124  | 336.3      | 257.2       |
| 8  | 8:37      | 98      | 14:34     | 59S     | 20:35     | 265     | 0.09 | 14 45        | 404237      | 6.363   | -3.397  | 335.7      | 253.8       |
| 9  | 9:11      | 93      | 15:16     | 63S     | 21:26     | 270     | 0.15 | 14 48        | 401982      | 7.008   | -4.572  | 336.1      | 252.1       |
| 10 | 9:44      | 88      | 15:59     | 68S     | 22:18     | 275     | 0.23 | 14 53        | 398878      | 7.380   | -5.608  | 337.5      | 251.5       |
| 11 | 10:19     | 83      | 16:43     | 73S     | 23:11     | 280     | 0.31 | 15 0         | 394905      | 7.454   | -6.458  | 339.8      | 252.1       |
| 12 | 10:56     | 78      | 17:29     | 77S     |           |         | 0.41 | 15 10        | 390109      | 7.211   | -7.072  | 343.0      | 253.7       |
| 13 | 11:36     | 73      | 18:18     | 81S     | 0:06      | 285     | 0.51 | 15 22        | 384620      | 6.642   | -7.396  | 347.2      | 256.3       |
| 14 | 12:21     | 70      | 19:11     | 84S     | 1:04      | 289     | 0.62 | 15 35        | 378681      | 5.751   | -7.381  | 352.2      | 260.0       |
| 15 | 13:12     | 67      | 20:08     | 86S     | 2:04      | 292     | 0.72 | 15 50        | 372640      | 4.555   | -6.983  | 357.8      | 264.8       |
| 16 | 14:10     | 66      | 21:09     | 86S     | 3:06      | 294     | 0.81 | 16 5         | 366949      | 3.098   | -6.177  | 3.9        | 270.4       |
| 17 | 15:13     | 67      | 22:11     | 85S     | 4:07      | 294     | 0.90 | 16 19        | 362114      | 1.450   | -4.968  | 10.0       | 276.8       |
| 18 | 16:20     | 69      | 23:13     | 83S     | 5:06      | 292     | 0.96 | 16 30        | 358632      | -0.285  | -3.397  | 15.5       | 284.1       |
| 19 | 17:29     | 73      |           |         | 6:01      | 289     | 0.99 | 16 37        | 356904      | -1.980  | -1.553  | 19.9       | 296.2       |
| 20 | 18:37     | 79      | 0:13      | 79S     | 6:52      | 284     | 1.00 | 16 39        | 357152      | -3.498  | 0.434   | 22.8       | 80.7        |
| 21 | 19:43     | 85      | 1:10      | 74S     | 7:38      | 278     | 0.97 | 16 36        | 359369      | -4.714  | 2.402   | 24.1       | 102.9       |
| 22 | 20:46     | 91      | 2:05      | 68S     | 8:21      | 272     | 0.92 | 16 28        | 363315      | -5.541  | 4.184   | 23.8       | 106.9       |
| 23 | 21:48     | 97      | 2:57      | 62S     | 9:02      | 266     | 0.85 | 16 16        | 368573      | -5.937  | 5.638   | 22.1       | 107.7       |
| 24 | 22:48     | 102     | 3:48      | 57S     | 9:43      | 260     | 0.76 | 16 3         | 374627      | -5.909  | 6.663   | 19.2       | 106.8       |
| 25 | 23:46     | 107     | 4:38      | 52S     | 10:24     | 255     | 0.66 | 15 48        | 380949      | -5.496  | 7.214   | 15.3       | 104.6       |
| 26 |           |         | 5:27      | 48S     | 11:06     | 251     | 0.55 | 15 35        | 387070      | -4.758  | 7.296   | 10.7       | 101.2       |
| 27 | 0:42      | 110     | 6:17      | 45S     | 11:50     | 248     | 0.45 | 15 22        | 392616      | -3.762  | 6.952   | 5.5        | 97.0        |
| 28 | 1:37      | 113     | 7:07      | 43S     | 12:36     | 247     | 0.35 | 15 12        | 397331      | -2.575  | 6.252   | 0.2        | 92.1        |

# 月 球 位 置 表

## 三 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 地心黃道座標 |      |    |      | 地心赤道座標 |      |     |      | 地表赤道座標 |      |     |      | 地心地表 |      | 地平座標  |       |
|----|--------|------|----|------|--------|------|-----|------|--------|------|-----|------|------|------|-------|-------|
|    | 黃經     | 黃緯   | 赤經 | 赤緯   | 赤經     | 赤緯   | 赤經  | 赤緯   | 赤經     | 赤緯   | 視差  | 方位   | 仰角   |      |       |       |
|    | °      | '    | °  | '    | h      | m    | °   | '    | h      | m    | °   | '    | "    | °    | °     |       |
| 1  | 278    | 39.4 | +1 | 33.0 | 18     | 37.3 | -21 | 36.4 | 18     | 37.2 | -22 | 16.5 | 40   | 8.0  | 181.2 | 42.6  |
| 2  | 290    | 35.1 | +0 | 29.6 | 19     | 28.7 | -21 | 22.3 | 19     | 29.4 | -22 | 1.7  | 40   | 28.8 | 166.2 | 41.6  |
| 3  | 302    | 24.4 | -0 | 34.5 | 20     | 19.3 | -20 | 10.8 | 20     | 20.6 | -20 | 48.2 | 41   | 57.2 | 152.1 | 38.9  |
| 4  | 314    | 11.0 | -1 | 36.6 | 21     | 8.6  | -18 | 6.7  | 21     | 10.5 | -18 | 41.3 | 44   | 12.2 | 139.3 | 34.9  |
| 5  | 325    | 58.3 | -2 | 34.5 | 21     | 56.5 | -15 | 16.9 | 21     | 58.9 | -15 | 48.2 | 46   | 50.3 | 127.8 | 29.6  |
| 6  | 337    | 48.9 | -3 | 25.9 | 22     | 43.2 | -11 | 49.2 | 22     | 45.9 | -12 | 17.3 | 49   | 29.3 | 117.5 | 23.6  |
| 7  | 349    | 44.6 | -4 | 8.5  | 23     | 28.9 | -7  | 52.0 | 23     | 31.9 | -8  | 17.5 | 51   | 50.7 | 108.0 | 17.0  |
| 8  | 1      | 47.1 | -4 | 40.3 | 0      | 14.0 | -3  | 34.6 | 0      | 17.2 | -3  | 58.3 | 53   | 39.6 | 99.2  | 9.9   |
| 9  | 13     | 57.6 | -4 | 59.8 | 0      | 59.1 | +0  | 53.9 | 1      | 2.4  | +0  | 30.8 | 54   | 45.0 | 90.6  | 2.5   |
| 10 | 26     | 17.3 | -5 | 5.6  | 1      | 44.9 | +5  | 23.6 | 1      | 48.2 | +4  | 59.8 | 54   | 59.9 | 82.1  | -5.0  |
| 12 | 51     | 30.2 | -4 | 33.8 | 3      | 21.2 | +13 | 43.6 | 3      | 24.2 | +13 | 14.7 | 52   | 50.7 | 63.9  | -20.0 |
| 13 | 64     | 27.3 | -3 | 56.2 | 4      | 13.0 | +17 | 9.5  | 4      | 15.6 | +16 | 36.6 | 50   | 35.8 | 53.4  | -27.2 |
| 14 | 77     | 41.4 | -3 | 5.3  | 5      | 7.7  | +19 | 47.4 | 5      | 9.8  | +19 | 10.5 | 47   | 52.7 | 41.4  | -33.8 |
| 15 | 91     | 14.8 | -2 | 2.9  | 6      | 5.3  | +21 | 22.9 | 6      | 6.8  | +20 | 42.5 | 45   | 9.3  | 27.4  | -39.3 |
| 16 | 105    | 9.4  | -0 | 51.7 | 7      | 5.4  | +21 | 43.1 | 7      | 5.9  | +21 | 0.8  | 43   | 7.4  | 11.0  | -43.1 |
| 17 | 119    | 25.9 | +0 | 24.5 | 8      | 6.7  | +20 | 39.9 | 8      | 6.3  | +19 | 57.7 | 42   | 34.6 | 352.7 | -44.6 |
| 18 | 134    | 3.0  | +1 | 40.7 | 9      | 8.1  | +18 | 13.0 | 9      | 6.8  | +17 | 33.0 | 44   | 0.5  | 333.8 | -43.2 |
| 19 | 148    | 56.7 | +2 | 51.3 | 10     | 8.4  | +14 | 30.9 | 10     | 6.3  | +13 | 54.9 | 47   | 12.6 | 316.3 | -39.0 |
| 20 | 164    | 0.3  | +3 | 50.7 | 11     | 7.1  | +9  | 50.3 | 11     | 4.3  | +9  | 18.9 | 51   | 18.0 | 300.9 | -32.6 |
| 21 | 179    | 4.9  | +4 | 34.0 | 12     | 3.9  | +4  | 33.3 | 12     | 0.7  | +4  | 5.8  | 55   | 10.8 | 287.6 | -24.7 |
| 22 | 194    | 0.6  | +4 | 58.1 | 12     | 59.3 | -0  | 56.6 | 12     | 55.8 | -1  | 21.7 | 57   | 57.3 | 276.1 | -15.9 |
| 23 | 208    | 38.2 | +5 | 2.0  | 13     | 53.6 | -6  | 16.7 | 13     | 50.0 | -6  | 41.3 | 59   | 8.2  | 265.8 | -6.8  |
| 24 | 222    | 50.9 | +4 | 47.0 | 14     | 47.5 | -11 | 7.8  | 14     | 43.9 | -11 | 33.6 | 58   | 38.2 | 256.1 | 2.2   |
| 25 | 236    | 35.1 | +4 | 15.6 | 15     | 41.2 | -15 | 14.6 | 15     | 37.8 | -15 | 43.2 | 56   | 40.3 | 246.7 | 11.0  |
| 26 | 249    | 50.4 | +3 | 31.2 | 16     | 35.0 | -18 | 26.4 | 16     | 31.9 | -18 | 58.4 | 53   | 37.7 | 237.0 | 19.2  |
| 27 | 262    | 38.8 | +2 | 37.4 | 17     | 28.6 | -20 | 36.7 | 17     | 26.1 | -21 | 11.9 | 49   | 57.4 | 226.9 | 26.7  |
| 28 | 275    | 4.4  | +1 | 37.6 | 18     | 21.8 | -21 | 42.7 | 18     | 19.9 | -22 | 20.6 | 46   | 7.0  | 215.8 | 33.3  |
| 29 | 287    | 12.2 | +0 | 34.8 | 19     | 14.3 | -21 | 45.3 | 19     | 13.1 | -22 | 24.5 | 42   | 33.7 | 203.4 | 38.8  |
| 30 | 299    | 7.8  | -0 | 28.6 | 20     | 5.5  | -20 | 47.7 | 20     | 5.1  | -21 | 26.9 | 39   | 44.6 | 189.6 | 42.8  |
| 31 | 310    | 56.5 | -1 | 30.0 | 20     | 55.3 | -18 | 55.5 | 20     | 55.6 | -19 | 33.4 | 38   | 4.1  | 174.6 | 45.1  |



# 月 球 升 沒 相 位 表

## 三 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日<br>期 | 月 出       |         | 中 天       |         | 月 沒       |         | 相<br>位 | 視<br>半 徑<br>' " | 月地<br>距離<br>km | 月面中心    |         | 轉軸<br>傾角<br>° | 亮緣<br>方位角<br>° |
|--------|-----------|---------|-----------|---------|-----------|---------|--------|-----------------|----------------|---------|---------|---------------|----------------|
|        | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |        |                 |                | 經度<br>° | 緯度<br>° |               |                |
| 1      | 2:29      | 114     | 7:57      | 43S     | 13:25     | 246     | 0.26   | 15 3            | 401069         | -1.259  | 5.277   | 354.8         | 86.8           |
| 2      | 3:18      | 114     | 8:46      | 43S     | 14:15     | 246     | 0.18   | 14 57           | 403783         | 0.124   | 4.111   | 349.7         | 81.2           |
| 3      | 4:04      | 113     | 9:34      | 44S     | 15:06     | 248     | 0.12   | 14 53           | 405501         | 1.519   | 2.830   | 345.2         | 75.2           |
| 4      | 4:47      | 110     | 10:21     | 46S     | 15:57     | 251     | 0.06   | 14 50           | 406302         | 2.872   | 1.505   | 341.4         | 68.7           |
| 5      | 5:26      | 107     | 11:06     | 49S     | 16:49     | 254     | 0.03   | 14 49           | 406289         | 4.129   | 0.193   | 338.6         | 59.8           |
| 6      | 6:03      | 103     | 11:50     | 53S     | 17:40     | 259     | 0.01   | 14 49           | 405566         | 5.239   | -1.064  | 336.7         | 36.9           |
| 7      | 6:38      | 99      | 12:33     | 57S     | 18:31     | 263     | 0.00   | 14 51           | 404221         | 6.153   | -2.232  | 335.8         | 295.9          |
| 8      | 7:12      | 94      | 13:15     | 62S     | 19:23     | 268     | 0.02   | 14 53           | 402315         | 6.831   | -3.291  | 335.9         | 265.4          |
| 9      | 7:46      | 89      | 13:58     | 67S     | 20:14     | 273     | 0.06   | 14 57           | 399876         | 7.235   | -4.226  | 337.1         | 258.6          |
| 10     | 8:20      | 84      | 14:41     | 71S     | 21:07     | 279     | 0.11   | 15 2            | 396908         | 7.342   | -5.022  | 339.2         | 256.5          |
| 11     | 8:56      | 79      | 15:26     | 76S     | 22:01     | 283     | 0.18   | 15 8            | 393407         | 7.136   | -5.665  | 342.3         | 256.7          |
| 12     | 9:35      | 75      | 16:14     | 80S     | 22:57     | 288     | 0.26   | 15 15           | 389381         | 6.614   | -6.134  | 346.2         | 258.4          |
| 13     | 10:17     | 71      | 17:04     | 83S     | 23:55     | 291     | 0.35   | 15 24           | 384878         | 5.788   | -6.399  | 350.9         | 261.3          |
| 14     | 11:04     | 68      | 17:58     | 85S     |           |         | 0.46   | 15 34           | 380011         | 4.681   | -6.424  | 356.3         | 265.4          |
| 15     | 11:57     | 66      | 18:55     | 87S     | 0:55      | 293     | 0.57   | 15 46           | 374978         | 3.333   | -6.169  | 2.1           | 270.3          |
| 16     | 12:56     | 66      | 19:54     | 86S     | 1:54      | 294     | 0.67   | 15 57           | 370070         | 1.805   | -5.597  | 8.0           | 275.9          |
| 17     | 13:59     | 68      | 20:54     | 84S     | 2:52      | 293     | 0.78   | 16 8            | 365658         | 0.175   | -4.687  | 13.5          | 281.8          |
| 18     | 15:05     | 71      | 21:54     | 81S     | 3:47      | 291     | 0.87   | 16 18           | 362157         | -1.454  | -3.443  | 18.3          | 287.8          |
| 19     | 16:12     | 76      | 22:51     | 76S     | 4:38      | 287     | 0.94   | 16 25           | 359969         | -2.969  | -1.913  | 21.7          | 294.2          |
| 20     | 17:19     | 81      | 23:47     | 71S     | 5:25      | 281     | 0.98   | 16 28           | 359404         | -4.249  | -0.188  | 23.7          | 303.8          |
| 21     | 18:24     | 88      |           |         | 6:09      | 275     | 1.00   | 16 27           | 360614         | -5.192  | 1.597   | 24.1          | 14             |
| 22     | 19:28     | 94      | 0:41      | 65S     | 6:52      | 269     | 0.99   | 16 21           | 363548         | -5.728  | 3.283   | 23.0          | 94.0           |
| 23     | 20:30     | 100     | 1:33      | 60S     | 7:34      | 263     | 0.95   | 16 12           | 367957         | -5.833  | 4.715   | 20.6          | 101.9          |
| 24     | 21:31     | 105     | 2:25      | 54S     | 8:15      | 258     | 0.89   | 16 0            | 373438         | -5.527  | 5.769   | 17.0          | 102.5          |
| 25     | 22:31     | 109     | 3:17      | 50S     | 8:58      | 253     | 0.81   | 15 47           | 379500         | -4.864  | 6.373   | 12.5          | 100.6          |
| 26     | 23:28     | 112     | 4:08      | 46S     | 9:43      | 249     | 0.72   | 15 34           | 385641         | -3.913  | 6.508   | 7.5           | 97.2           |
| 27     |           |         | 5:00      | 44S     | 10:30     | 247     | 0.62   | 15 22           | 391407         | -2.752  | 6.204   | 2.0           | 92.9           |
| 28     | 0:23      | 114     | 5:51      | 43S     | 11:18     | 246     | 0.52   | 15 12           | 396431         | -1.454  | 5.524   | 356.5         | 88.0           |
| 29     | 1:14      | 114     | 6:41      | 42S     | 12:09     | 246     | 0.43   | 15 4            | 400457         | -0.083  | 4.553   | 351.3         | 82.8           |
| 30     | 2:02      | 113     | 7:30      | 43S     | 13:00     | 247     | 0.33   | 14 58           | 403337         | 1.301   | 3.384   | 346.5         | 77.7           |
| 31     | 2:45      | 112     | 8:17      | 45S     | 13:52     | 250     | 0.25   | 14 55           | 405029         | 2.646   | 2.111   | 342.5         | 72.7           |

# 月 球 位 置 表

## 四 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 地心黃道座標 |      |    |      | 地心赤道座標 |      |     |      | 地表赤道座標 |      |     |      | 地心地表 |      | 地平座標  |       |
|----|--------|------|----|------|--------|------|-----|------|--------|------|-----|------|------|------|-------|-------|
|    | 黃經     | 黃緯   | 赤經 | 赤緯   | 赤經     | 赤緯   | 赤經  | 赤緯   | 視差     | 方位   | 仰角  |      |      |      |       |       |
|    | °      | '    | °  | '    | h      | m    | °   | '    | h      | m    | °   | '    | '    | "    | °     | °     |
| 1  | 322    | 43.2 | -2 | 27.2 | 21     | 43.6 | -16 | 15.5 | 21     | 44.5 | -16 | 51.0 | 37   | 49.0 | 158.9 | 45.4  |
| 2  | 334    | 32.3 | -3 | 18.2 | 22     | 30.5 | -12 | 55.1 | 22     | 32.0 | -13 | 27.6 | 39   | 1.4  | 143.5 | 43.7  |
| 3  | 346    | 27.3 | -4 | 0.8  | 23     | 16.5 | -9  | 2.5  | 23     | 18.4 | -9  | 31.6 | 41   | 27.2 | 129.4 | 40.1  |
| 4  | 358    | 30.7 | -4 | 33.1 | 0      | 1.8  | -4  | 46.1 | 0      | 4.2  | -5  | 12.1 | 44   | 40.5 | 116.8 | 35.0  |
| 5  | 10     | 44.3 | -4 | 53.3 | 0      | 47.1 | -0  | 15.0 | 0      | 49.9 | -0  | 38.5 | 48   | 11.8 | 105.6 | 28.6  |
| 6  | 23     | 8.7  | -5 | 0.0  | 1      | 33.1 | +4  | 20.7 | 1      | 36.2 | +3  | 58.7 | 51   | 32.0 | 95.8  | 21.3  |
| 7  | 35     | 44.5 | -4 | 52.3 | 2      | 20.3 | +8  | 50.0 | 2      | 23.6 | +8  | 28.2 | 54   | 15.9 | 86.8  | 13.3  |
| 8  | 48     | 31.5 | -4 | 29.9 | 3      | 9.4  | +13 | 0.6  | 3      | 12.8 | +12 | 37.4 | 56   | 2.7  | 78.3  | 4.9   |
| 9  | 61     | 29.7 | -3 | 53.2 | 4      | 0.8  | +16 | 38.9 | 4      | 4.3  | +16 | 12.9 | 56   | 37.1 | 70.1  | -3.9  |
| 10 | 74     | 39.4 | -3 | 3.7  | 4      | 54.9 | +19 | 30.7 | 4      | 58.2 | +19 | 0.8  | 55   | 50.4 | 61.6  | -12.8 |
| 11 | 88     | 1.3  | -2 | 3.3  | 5      | 51.5 | +21 | 22.0 | 5      | 54.5 | +20 | 47.8 | 53   | 41.7 | 52.5  | -21.7 |
| 12 | 101    | 36.4 | -0 | 54.9 | 6      | 50.1 | +22 | 1.1  | 6      | 52.5 | +21 | 23.1 | 50   | 20.5 | 42.2  | -30.3 |
| 13 | 115    | 25.9 | +0 | 18.0 | 7      | 49.8 | +21 | 20.7 | 7      | 51.4 | +20 | 40.3 | 46   | 11.0 | 30.0  | -38.3 |
| 14 | 129    | 30.5 | +1 | 31.0 | 8      | 49.5 | +19 | 19.9 | 8      | 50.2 | +18 | 39.2 | 41   | 58.1 | 14.9  | -44.9 |
| 15 | 143    | 49.7 | +2 | 39.5 | 9      | 48.2 | +16 | 5.0  | 9      | 48.1 | +15 | 26.3 | 38   | 50.3 | 356.4 | -49.4 |
| 16 | 158    | 21.6 | +3 | 38.7 | 10     | 45.6 | +11 | 48.7 | 10     | 44.6 | +11 | 13.6 | 38   | 1.3  | 335.5 | -50.6 |
| 17 | 173    | 1.8  | +4 | 24.0 | 11     | 41.4 | +6  | 48.3 | 11     | 39.7 | +6  | 17.8 | 40   | 1.5  | 314.9 | -48.2 |
| 18 | 187    | 44.3 | +4 | 51.9 | 12     | 36.1 | +1  | 24.0 | 12     | 33.7 | +0  | 58.0 | 44   | 7.4  | 297.2 | -42.6 |
| 19 | 202    | 21.5 | +5 | 0.5  | 13     | 30.2 | -4  | 3.0  | 13     | 27.3 | -4  | 25.6 | 48   | 55.1 | 282.9 | -34.9 |
| 20 | 216    | 45.7 | +4 | 49.8 | 14     | 24.1 | -9  | 12.2 | 14     | 20.8 | -9  | 33.2 | 53   | 9.3  | 271.4 | -26.0 |
| 21 | 230    | 50.4 | +4 | 21.5 | 15     | 18.4 | -13 | 45.3 | 15     | 14.8 | -14 | 6.7  | 56   | 2.5  | 261.8 | -16.5 |
| 22 | 244    | 31.3 | +3 | 38.7 | 16     | 13.0 | -17 | 27.4 | 16     | 9.4  | -17 | 50.9 | 57   | 14.3 | 253.4 | -6.8  |
| 23 | 257    | 46.5 | +2 | 45.2 | 17     | 7.9  | -20 | 7.9  | 17     | 4.4  | -20 | 34.8 | 56   | 44.4 | 245.7 | 2.9   |
| 24 | 270    | 36.9 | +1 | 44.6 | 18     | 2.6  | -21 | 41.5 | 17     | 59.4 | -22 | 12.0 | 54   | 45.0 | 238.1 | 12.2  |
| 25 | 283    | 5.3  | +0 | 40.5 | 18     | 56.6 | -22 | 7.2  | 18     | 53.8 | -22 | 41.0 | 51   | 34.6 | 230.3 | 21.2  |
| 26 | 295    | 15.9 | -0 | 24.0 | 19     | 49.2 | -21 | 28.4 | 19     | 47.0 | -22 | 4.5  | 47   | 34.3 | 221.8 | 29.7  |
| 27 | 307    | 13.9 | -1 | 26.5 | 20     | 40.1 | -19 | 51.3 | 20     | 38.5 | -20 | 28.2 | 43   | 7.1  | 212.2 | 37.5  |
| 28 | 319    | 4.6  | -2 | 24.5 | 21     | 29.1 | -17 | 23.3 | 21     | 28.2 | -17 | 59.7 | 38   | 40.3 | 200.6 | 44.4  |
| 29 | 330    | 53.5 | -3 | 16.2 | 22     | 16.5 | -14 | 12.6 | 22     | 16.3 | -14 | 47.2 | 34   | 48.9 | 186.5 | 49.9  |
| 30 | 342    | 45.6 | -3 | 59.5 | 23     | 2.6  | -10 | 27.3 | 23     | 3.0  | -10 | 59.1 | 32   | 17.5 | 169.5 | 53.4  |

# 月 球 升 沒 相 位 表

## 四 月

東經：121°31'05" · 北緯：25°05'44"

世界時 0 時

| 日期 | 月 出       |         | 中 天       |         | 月 沒       |         | 相 位  | 視 半 徑<br>' " | 月地 距離<br>km | 月面中心    |         | 轉軸 傾角<br>° | 亮緣 方位角<br>° |
|----|-----------|---------|-----------|---------|-----------|---------|------|--------------|-------------|---------|---------|------------|-------------|
|    | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |      |              |             | 經度<br>° | 緯度<br>° |            |             |
| 1  | 3:26      | 109     | 9:03      | 48S     | 14:43     | 253     | 0.17 | 14 54        | 405577      | 3.900   | 0.818   | 339.3      | 67.9        |
| 2  | 4:03      | 105     | 9:47      | 52S     | 15:35     | 257     | 0.10 | 14 54        | 405095      | 5.017   | -0.421  | 337.1      | 63.2        |
| 3  | 4:39      | 101     | 10:31     | 56S     | 16:26     | 262     | 0.05 | 14 57        | 403739      | 5.948   | -1.550  | 336.0      | 57.6        |
| 4  | 5:13      | 96      | 11:13     | 60S     | 17:17     | 267     | 0.02 | 15 0         | 401686      | 6.649   | -2.530  | 335.8      | 47.9        |
| 5  | 5:47      | 91      | 11:56     | 65S     | 18:09     | 272     | 0.00 | 15 5         | 399112      | 7.081   | -3.340  | 336.7      | 10.9        |
| 6  | 6:21      | 86      | 12:39     | 70S     | 19:02     | 277     | 0.01 | 15 10        | 396170      | 7.213   | -3.975  | 338.6      | 284.1       |
| 7  | 6:57      | 81      | 13:24     | 74S     | 19:57     | 282     | 0.03 | 15 15        | 392977      | 7.026   | -4.443  | 341.5      | 266.2       |
| 8  | 7:34      | 76      | 14:11     | 79S     | 20:53     | 287     | 0.08 | 15 21        | 389617      | 6.518   | -4.756  | 345.3      | 262.9       |
| 9  | 8:16      | 72      | 15:01     | 82S     | 21:51     | 290     | 0.14 | 15 27        | 386137      | 5.701   | -4.924  | 349.8      | 263.6       |
| 10 | 9:01      | 68      | 15:54     | 85S     | 22:50     | 293     | 0.22 | 15 33        | 382572      | 4.609   | -4.948  | 355.1      | 266.4       |
| 11 | 9:52      | 66      | 16:50     | 87S     | 23:48     | 294     | 0.31 | 15 40        | 378963      | 3.288   | -4.820  | 0.8        | 270.5       |
| 12 | 10:48     | 66      | 17:47     | 87S     |           |         | 0.42 | 15 47        | 375382      | 1.803   | -4.518  | 6.7        | 275.4       |
| 13 | 11:48     | 67      | 18:45     | 85S     | 0:45      | 294     | 0.53 | 15 53        | 371955      | 0.229   | -4.018  | 12.2       | 280.7       |
| 14 | 12:51     | 69      | 19:43     | 83S     | 1:40      | 292     | 0.64 | 15 60        | 368870      | -1.343  | -3.296  | 17.1       | 285.9       |
| 15 | 13:56     | 73      | 20:39     | 79S     | 2:30      | 289     | 0.75 | 16 5         | 366372      | -2.816  | -2.346  | 20.8       | 290.6       |
| 16 | 15:00     | 79      | 21:34     | 74S     | 3:17      | 284     | 0.84 | 16 9         | 364733      | -4.089  | -1.185  | 23.2       | 294.9       |
| 17 | 16:04     | 85      | 22:27     | 68S     | 4:01      | 278     | 0.92 | 16 11        | 364209      | -5.071  | 0.130   | 24.1       | 299.0       |
| 18 | 17:08     | 91      | 23:19     | 62S     | 4:43      | 272     | 0.97 | 16 10        | 364987      | -5.686  | 1.507   | 23.6       | 304.5       |
| 19 | 18:11     | 97      |           |         | 5:24      | 266     | 1.00 | 16 7         | 367132      | -5.893  | 2.827   | 21.7       | 324.3       |
| 20 | 19:13     | 103     | 0:11      | 57S     | 6:06      | 260     | 1.00 | 15 60        | 370562      | -5.688  | 3.963   | 18.6       | 75.9        |
| 21 | 20:14     | 108     | 1:03      | 52S     | 6:48      | 255     | 0.97 | 15 51        | 375047      | -5.104  | 4.805   | 14.5       | 94.7        |
| 22 | 21:14     | 111     | 1:55      | 48S     | 7:33      | 251     | 0.92 | 15 41        | 380238      | -4.202  | 5.276   | 9.6        | 95.7        |
| 23 | 22:11     | 114     | 2:48      | 45S     | 8:19      | 248     | 0.86 | 15 30        | 385718      | -3.061  | 5.342   | 4.2        | 93.2        |
| 24 | 23:05     | 115     | 3:40      | 43S     | 9:08      | 246     | 0.78 | 15 20        | 391056      | -1.759  | 5.015   | 358.6      | 89.2        |
| 25 | 23:56     | 114     | 4:32      | 42S     | 9:59      | 245     | 0.69 | 15 11        | 395855      | -0.373  | 4.340   | 353.2      | 84.6        |
| 26 |           |         | 5:23      | 43S     | 10:51     | 246     | 0.60 | 15 4         | 399788      | 1.032   | 3.390   | 348.1      | 79.9        |
| 27 | 0:42      | 113     | 6:12      | 44S     | 11:44     | 248     | 0.50 | 14 59        | 402620      | 2.397   | 2.250   | 343.8      | 75.3        |
| 28 | 1:24      | 110     | 6:58      | 47S     | 12:36     | 251     | 0.40 | 14 57        | 404217      | 3.672   | 1.014   | 340.3      | 71.1        |
| 29 | 2:02      | 107     | 7:43      | 50S     | 13:27     | 255     | 0.31 | 14 57        | 404548      | 4.811   | -0.227  | 337.8      | 67.5        |
| 30 | 2:39      | 103     | 8:27      | 54S     | 14:19     | 260     | 0.23 | 14 59        | 403676      | 5.769   | -1.391  | 336.3      | 64.3        |

# 月 球 位 置 表

## 五 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 地心黃道座標 |      |    |      | 地心赤道座標 |      |     |      | 地表赤道座標 |      |     |      | 地心地表 |      | 地平座標  |       |
|----|--------|------|----|------|--------|------|-----|------|--------|------|-----|------|------|------|-------|-------|
|    | 黃經     | 黃緯   | 赤經 | 赤緯   | 赤經     | 赤緯   | 赤經  | 赤緯   | 視差     | 方位   | 仰角  | °    | '    | °    | '     |       |
|    | °      | '    | °  | '    | h      | m    | °   | '    | h      | m    | °   | '    | '    | "    | °     | °     |
| 1  | 354    | 45.1 | -4 | 32.8 | 23     | 48.0 | -6  | 15.4 | 23     | 48.9 | -6  | 43.9 | 31   | 50.3 | 150.5 | 54.2  |
| 2  | 6      | 55.5 | -4 | 54.2 | 0      | 33.2 | -1  | 45.3 | 0      | 34.7 | -2  | 10.2 | 33   | 45.8 | 131.9 | 52.0  |
| 3  | 19     | 19.4 | -5 | 2.2  | 1      | 19.0 | +2  | 53.8 | 1      | 21.0 | +2  | 32.2 | 37   | 40.5 | 115.6 | 47.1  |
| 4  | 31     | 57.9 | -4 | 55.8 | 2      | 6.0  | +7  | 31.4 | 2      | 8.6  | +7  | 12.2 | 42   | 43.8 | 102.4 | 40.1  |
| 5  | 44     | 51.2 | -4 | 34.3 | 2      | 55.0 | +11 | 55.0 | 2      | 58.1 | +11 | 36.8 | 48   | 1.0  | 91.7  | 31.8  |
| 6  | 57     | 58.6 | -3 | 58.0 | 3      | 46.6 | +15 | 50.3 | 3      | 50.0 | +15 | 31.4 | 52   | 43.8 | 82.7  | 22.4  |
| 7  | 71     | 18.6 | -3 | 8.1  | 4      | 40.9 | +19 | 1.6  | 4      | 44.5 | +18 | 40.2 | 56   | 12.4 | 75.0  | 12.3  |
| 8  | 84     | 49.6 | -2 | 6.9  | 5      | 37.8 | +21 | 13.3 | 5      | 41.5 | +20 | 47.9 | 57   | 57.1 | 67.8  | 1.8   |
| 9  | 98     | 30.3 | -0 | 57.6 | 6      | 36.8 | +22 | 12.3 | 6      | 40.3 | +21 | 42.3 | 57   | 39.6 | 60.8  | -8.9  |
| 10 | 112    | 19.5 | +0 | 16.0 | 7      | 36.6 | +21 | 51.0 | 7      | 39.7 | +21 | 16.7 | 55   | 14.1 | 53.5  | -19.8 |
| 11 | 126    | 16.5 | +1 | 29.3 | 8      | 36.2 | +20 | 8.6  | 8      | 38.7 | +19 | 31.6 | 50   | 49.6 | 45.3  | -30.4 |
| 12 | 140    | 20.7 | +2 | 38.0 | 9      | 34.5 | +17 | 11.9 | 9      | 36.2 | +16 | 34.4 | 44   | 52.3 | 35.2  | -40.6 |
| 13 | 154    | 31.3 | +3 | 37.4 | 10     | 31.0 | +13 | 13.4 | 10     | 31.9 | +12 | 37.5 | 38   | 13.0 | 21.8  | -49.8 |
| 14 | 168    | 46.6 | +4 | 23.8 | 11     | 25.7 | +8  | 29.0 | 11     | 25.8 | +7  | 56.7 | 32   | 19.1 | 3.2   | -56.9 |
| 15 | 183    | 4.2  | +4 | 53.8 | 12     | 19.1 | +3  | 16.4 | 12     | 18.4 | +2  | 48.8 | 29   | 17.0 | 338.6 | -60.3 |
| 16 | 197    | 20.5 | +5 | 5.6  | 13     | 11.7 | -2  | 5.9  | 13     | 10.4 | -2  | 28.7 | 30   | 38.0 | 312.8 | -58.7 |
| 17 | 211    | 30.7 | +4 | 58.5 | 14     | 4.4  | -7  | 19.6 | 14     | 2.4  | -7  | 38.4 | 35   | 30.7 | 292.0 | -52.8 |
| 18 | 225    | 30.1 | +4 | 33.6 | 14     | 57.6 | -12 | 6.7  | 14     | 54.9 | -12 | 23.1 | 41   | 44.1 | 277.3 | -44.3 |
| 19 | 239    | 14.2 | +3 | 53.2 | 15     | 51.6 | -16 | 11.2 | 15     | 48.5 | -16 | 27.1 | 47   | 35.1 | 266.8 | -34.6 |
| 20 | 252    | 39.7 | +3 | 0.6  | 16     | 46.5 | -19 | 19.6 | 16     | 43.0 | -19 | 37.0 | 52   | 6.3  | 258.7 | -24.3 |
| 21 | 265    | 44.9 | +1 | 59.4 | 17     | 41.7 | -21 | 22.7 | 17     | 38.1 | -21 | 43.2 | 54   | 51.4 | 252.2 | -13.8 |
| 22 | 278    | 29.8 | +0 | 53.6 | 18     | 36.7 | -22 | 16.3 | 18     | 33.1 | -22 | 40.7 | 55   | 44.2 | 246.5 | -3.4  |
| 23 | 290    | 56.1 | -0 | 13.3 | 19     | 30.7 | -22 | 1.5  | 19     | 27.3 | -22 | 29.7 | 54   | 50.3 | 241.1 | 6.9   |
| 24 | 303    | 6.9  | -1 | 18.4 | 20     | 22.9 | -20 | 43.8 | 20     | 19.9 | -21 | 15.0 | 52   | 21.3 | 235.8 | 17.0  |
| 25 | 315    | 6.2  | -2 | 19.1 | 21     | 13.1 | -18 | 31.1 | 21     | 10.6 | -19 | 4.0  | 48   | 31.4 | 230.1 | 26.8  |
| 26 | 326    | 58.7 | -3 | 13.2 | 22     | 1.3  | -15 | 32.5 | 21     | 59.4 | -16 | 5.7  | 43   | 36.7 | 223.4 | 36.4  |
| 27 | 338    | 49.4 | -3 | 58.9 | 22     | 47.8 | -11 | 57.0 | 22     | 46.4 | -12 | 29.0 | 37   | 56.2 | 215.1 | 45.5  |
| 28 | 350    | 43.4 | -4 | 34.6 | 23     | 33.2 | -7  | 52.8 | 23     | 32.4 | -8  | 22.5 | 31   | 58.6 | 203.8 | 53.9  |
| 29 | 2      | 45.6 | -4 | 58.6 | 0      | 18.0 | -3  | 28.1 | 0      | 17.8 | -3  | 54.6 | 26   | 36.6 | 187.2 | 60.8  |
| 30 | 15     | 0.2  | -5 | 9.5  | 1      | 3.2  | +1  | 9.0  | 1      | 3.6  | +0  | 46.3 | 23   | 26.2 | 163.5 | 64.7  |
| 31 | 27     | 30.5 | -5 | 6.1  | 1      | 49.5 | +5  | 49.2 | 1      | 50.5 | +5  | 30.3 | 24   | 18.1 | 136.3 | 64.1  |

# 月 球 升 沒 相 位 表

## 五 月

東經：121°31'05" · 北緯：25°05'44"

世界時 0 時

| 日<br>期 | 月 出   |     | 中 天   |     | 月 沒   |     | 相<br>位 | 視<br>半 徑 |    | 月地<br>距離<br>km | 月面中心<br>經度 緯度 |        | 轉軸<br>傾角<br>° | 亮緣<br>方位角<br>° |
|--------|-------|-----|-------|-----|-------|-----|--------|----------|----|----------------|---------------|--------|---------------|----------------|
|        | 時間    | 方位  | 時間    | 仰角  | 時間    | 方位  |        | '        | "  |                | °             | °      |               |                |
| 1      | 3:13  | 98  | 9:09  | 58S | 15:10 | 265 | 0.15   | 15       | 4  | 401747         | 6.505         | -2.407 | 335.8         | 61.5           |
| 2      | 3:47  | 93  | 9:52  | 63S | 16:02 | 270 | 0.09   | 15       | 10 | 398970         | 6.978         | -3.224 | 336.3         | 58.8           |
| 3      | 4:20  | 88  | 10:35 | 68S | 16:54 | 275 | 0.04   | 15       | 17 | 395593         | 7.153         | -3.811 | 337.9         | 54.9           |
| 4      | 4:55  | 82  | 11:20 | 73S | 17:49 | 280 | 0.01   | 15       | 24 | 391879         | 7.005         | -4.160 | 340.5         | 43.8           |
| 5      | 5:33  | 77  | 12:07 | 77S | 18:45 | 285 | 0.00   | 15       | 32 | 388075         | 6.523         | -4.283 | 344.1         | 329.6          |
| 6      | 6:13  | 73  | 12:56 | 81S | 19:44 | 289 | 0.02   | 15       | 38 | 384395         | 5.714         | -4.208 | 348.6         | 275.5          |
| 7      | 6:58  | 69  | 13:49 | 84S | 20:44 | 292 | 0.05   | 15       | 44 | 380994         | 4.611         | -3.970 | 353.8         | 270.0          |
| 8      | 7:48  | 67  | 14:45 | 86S | 21:44 | 294 | 0.11   | 15       | 49 | 377968         | 3.266         | -3.602 | 359.5         | 271.4          |
| 9      | 8:43  | 65  | 15:43 | 87S | 22:42 | 295 | 0.19   | 15       | 52 | 375361         | 1.751         | -3.131 | 5.5           | 275.1          |
| 10     | 9:42  | 66  | 16:41 | 86S | 23:37 | 293 | 0.28   | 15       | 55 | 373179         | 0.154         | -2.568 | 11.2          | 279.7          |
| 11     | 10:44 | 68  | 17:38 | 84S |       |     | 0.39   | 15       | 57 | 371422         | -1.432        | -1.918 | 16.2          | 284.5          |
| 12     | 11:47 | 72  | 18:34 | 80S | 0:28  | 290 | 0.50   | 15       | 58 | 370104         | -2.910        | -1.179 | 20.1          | 288.8          |
| 13     | 12:51 | 76  | 19:27 | 76S | 1:15  | 286 | 0.61   | 15       | 58 | 369273         | -4.189        | -0.353 | 22.8          | 292.4          |
| 14     | 13:53 | 82  | 20:19 | 70S | 1:59  | 281 | 0.72   | 15       | 57 | 369011         | -5.187        | 0.546  | 24.0          | 295.1          |
| 15     | 14:55 | 88  | 21:10 | 65S | 2:40  | 275 | 0.82   | 15       | 56 | 369429         | -5.841        | 1.484  | 23.9          | 297.0          |
| 16     | 15:56 | 94  | 22:00 | 59S | 3:20  | 269 | 0.90   | 15       | 53 | 370632         | -6.110        | 2.407  | 22.4          | 298.3          |
| 17     | 16:57 | 100 | 22:51 | 54S | 4:00  | 263 | 0.95   | 15       | 49 | 372688         | -5.982        | 3.242  | 19.8          | 299.8          |
| 18     | 17:58 | 105 | 23:43 | 49S | 4:41  | 257 | 0.99   | 15       | 43 | 375593         | -5.474        | 3.913  | 16.1          | 305.7          |
| 19     | 18:58 | 110 |       |     | 5:23  | 252 | 1.00   | 15       | 36 | 379256         | -4.634        | 4.347  | 11.5          | 25.6           |
| 20     | 19:57 | 113 | 0:35  | 46S | 6:09  | 249 | 0.99   | 15       | 28 | 383485         | -3.526        | 4.493  | 6.3           | 86.5           |
| 21     | 20:54 | 114 | 1:28  | 43S | 6:57  | 246 | 0.95   | 15       | 20 | 388011         | -2.230        | 4.324  | 0.8           | 88.8           |
| 22     | 21:47 | 115 | 2:21  | 42S | 7:48  | 245 | 0.90   | 15       | 12 | 392512         | -0.823        | 3.845  | 355.2         | 86.0           |
| 23     | 22:36 | 114 | 3:13  | 42S | 8:41  | 246 | 0.83   | 15       | 5  | 396648         | 0.618         | 3.086  | 349.9         | 82.0           |
| 24     | 23:20 | 112 | 4:04  | 43S | 9:34  | 247 | 0.75   | 15       | 0  | 400099         | 2.029         | 2.100  | 345.3         | 77.8           |
| 25     |       |     | 4:52  | 45S | 10:27 | 250 | 0.67   | 14       | 57 | 402594         | 3.353         | 0.957  | 341.5         | 73.8           |
| 26     | 0:00  | 108 | 5:38  | 48S | 11:19 | 253 | 0.57   | 14       | 56 | 403935         | 4.542         | -0.264 | 338.6         | 70.4           |
| 27     | 0:37  | 105 | 6:22  | 52S | 12:10 | 257 | 0.48   | 14       | 57 | 404013         | 5.552         | -1.478 | 336.7         | 67.5           |
| 28     | 1:12  | 100 | 7:05  | 56S | 13:01 | 262 | 0.38   | 15       | 1  | 402814         | 6.344         | -2.602 | 335.9         | 65.4           |
| 29     | 1:46  | 95  | 7:47  | 61S | 13:52 | 267 | 0.29   | 15       | 8  | 400423         | 6.882         | -3.561 | 336.1         | 64.0           |
| 30     | 2:19  | 90  | 8:29  | 66S | 14:44 | 273 | 0.20   | 15       | 16 | 397021         | 7.130         | -4.290 | 337.3         | 63.3           |
| 31     | 2:53  | 85  | 9:13  | 71S | 15:38 | 278 | 0.13   | 15       | 26 | 392866         | 7.059         | -4.742 | 339.5         | 63.1           |

# 月 球 位 置 表

## 六 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 地心黃道座標 |      |    |      | 地心赤道座標 |      |     |      | 地表赤道座標 |      |     |      | 地心地表 |      | 地平座標  |       |
|----|--------|------|----|------|--------|------|-----|------|--------|------|-----|------|------|------|-------|-------|
|    | 黃經     |      | 黃緯 |      | 赤經     |      | 赤緯  |      | 赤經     |      | 赤緯  |      | 視差   |      | 方位    | 仰角    |
|    | °      | '    | °  | '    | h      | m    | °   | '    | h      | m    | °   | '    | '    | "    | °     | °     |
| 1  | 40     | 18.9 | -4 | 47.5 | 2      | 37.7 | +10 | 21.4 | 2      | 39.4 | +10 | 5.8  | 29   | 15.3 | 113.5 | 58.7  |
| 2  | 53     | 26.2 | -4 | 13.5 | 3      | 28.6 | +14 | 32.2 | 3      | 30.9 | +14 | 18.5 | 36   | 30.3 | 97.9  | 50.3  |
| 3  | 66     | 51.9 | -3 | 24.8 | 4      | 22.5 | +18 | 5.2  | 4      | 25.5 | +17 | 51.6 | 44   | 15.4 | 87.2  | 40.0  |
| 4  | 80     | 34.2 | -2 | 23.4 | 5      | 19.7 | +20 | 42.9 | 5      | 23.1 | +20 | 27.2 | 51   | 11.6 | 79.5  | 28.8  |
| 5  | 94     | 30.1 | -1 | 12.4 | 6      | 19.4 | +22 | 9.2  | 6      | 23.2 | +21 | 49.4 | 56   | 20.6 | 73.3  | 16.9  |
| 6  | 108    | 36.1 | +0 | 4.0  | 7      | 20.6 | +22 | 12.6 | 7      | 24.5 | +21 | 47.7 | 59   | 1.3  | 68.1  | 4.6   |
| 7  | 122    | 48.7 | +1 | 20.8 | 8      | 21.7 | +20 | 50.3 | 8      | 25.3 | +20 | 20.7 | 58   | 51.0 | 63.1  | -7.8  |
| 8  | 137    | 4.3  | +2 | 33.0 | 9      | 21.3 | +18 | 8.7  | 9      | 24.5 | +17 | 35.9 | 55   | 46.9 | 58.1  | -20.2 |
| 9  | 151    | 20.2 | +3 | 35.7 | 10     | 18.7 | +14 | 21.3 | 10     | 21.3 | +13 | 47.7 | 50   | 4.9  | 52.4  | -32.4 |
| 10 | 165    | 33.8 | +4 | 25.0 | 11     | 13.8 | +9  | 45.6 | 11     | 15.6 | +9  | 13.5 | 42   | 18.4 | 45.1  | -44.3 |
| 11 | 179    | 43.0 | +4 | 57.9 | 12     | 6.9  | +4  | 40.0 | 12     | 8.0  | +4  | 11.5 | 33   | 20.7 | 34.5  | -55.5 |
| 12 | 193    | 45.8 | +5 | 12.7 | 12     | 58.7 | -0  | 37.5 | 12     | 59.2 | -1  | 1.3  | 24   | 42.5 | 16.7  | -65.0 |
| 13 | 207    | 40.4 | +5 | 8.9  | 13     | 50.2 | -5  | 50.0 | 13     | 49.9 | -6  | 8.8  | 19   | 21.1 | 345.8 | -70.5 |
| 14 | 221    | 24.9 | +4 | 47.5 | 14     | 42.0 | -10 | 41.5 | 14     | 40.9 | -10 | 56.0 | 20   | 46.7 | 309.3 | -68.9 |
| 15 | 234    | 57.2 | +4 | 10.2 | 15     | 34.6 | -14 | 57.2 | 15     | 32.9 | -15 | 8.7  | 27   | 21.9 | 285.1 | -61.5 |
| 16 | 248    | 15.7 | +3 | 19.8 | 16     | 28.3 | -18 | 23.5 | 16     | 25.9 | -18 | 33.9 | 35   | 16.2 | 271.5 | -51.7 |
| 17 | 261    | 19.2 | +2 | 19.8 | 17     | 22.9 | -20 | 49.6 | 17     | 19.9 | -21 | 1.0  | 42   | 32.2 | 263.3 | -41.1 |
| 18 | 274    | 7.2  | +1 | 13.7 | 18     | 17.8 | -22 | 8.6  | 18     | 14.5 | -22 | 22.7 | 48   | 20.1 | 257.7 | -30.2 |
| 19 | 286    | 40.0 | +0 | 5.3  | 19     | 12.2 | -22 | 18.6 | 19     | 8.7  | -22 | 36.5 | 52   | 18.9 | 253.4 | -19.3 |
| 20 | 298    | 58.7 | -1 | 2.3  | 20     | 5.4  | -21 | 22.6 | 20     | 1.8  | -21 | 44.5 | 54   | 21.9 | 249.8 | -8.4  |
| 21 | 311    | 5.6  | -2 | 6.0  | 20     | 56.6 | -19 | 27.7 | 20     | 53.2 | -19 | 53.1 | 54   | 31.0 | 246.7 | 2.4   |
| 22 | 323    | 3.4  | -3 | 3.4  | 21     | 45.8 | -16 | 43.0 | 21     | 42.6 | -17 | 10.9 | 52   | 52.6 | 243.6 | 13.1  |
| 23 | 334    | 55.8 | -3 | 52.5 | 22     | 32.9 | -13 | 18.4 | 22     | 30.1 | -13 | 47.4 | 49   | 34.6 | 240.4 | 23.7  |
| 24 | 346    | 46.9 | -4 | 31.6 | 23     | 18.5 | -9  | 23.1 | 23     | 16.2 | -9  | 51.7 | 44   | 45.8 | 236.8 | 34.2  |
| 25 | 358    | 41.4 | -4 | 59.2 | 0      | 3.1  | -5  | 5.7  | 0      | 1.3  | -5  | 32.5 | 38   | 35.4 | 232.1 | 44.7  |
| 26 | 10     | 43.8 | -5 | 14.1 | 0      | 47.6 | -0  | 34.3 | 0      | 46.3 | -0  | 58.2 | 31   | 16.8 | 225.2 | 55.1  |
| 27 | 22     | 58.6 | -5 | 15.1 | 1      | 32.8 | +4  | 3.0  | 1      | 32.0 | +3  | 42.9 | 23   | 19.0 | 213.5 | 64.9  |
| 28 | 35     | 30.2 | -5 | 1.3  | 2      | 19.6 | +8  | 36.8 | 2      | 19.4 | +8  | 20.8 | 16   | 12.3 | 189.2 | 73.0  |
| 29 | 48     | 21.7 | -4 | 32.3 | 3      | 8.8  | +12 | 55.6 | 3      | 9.3  | +12 | 43.4 | 14   | 29.9 | 144.6 | 75.1  |
| 30 | 61     | 35.6 | -3 | 48.2 | 4      | 1.1  | +16 | 45.0 | 4      | 2.4  | +16 | 35.6 | 20   | 59.8 | 109.4 | 68.6  |

# 月 球 升 沒 相 位 表

## 六 月

東經：121°31'05" · 北緯：25°05'44"

世界時 0 時

| 日<br>期 | 月 出   |     | 中 天   |     | 月 沒   |     | 相<br>位 | 視<br>半 徑<br>' " | 月地<br>距離<br>km | 月面中心   |        | 轉軸<br>傾角<br>° | 亮緣<br>方位角<br>° |
|--------|-------|-----|-------|-----|-------|-----|--------|-----------------|----------------|--------|--------|---------------|----------------|
|        | 時間    | 方位  | 時間    | 仰角  | 時間    | 方位  |        |                 |                | 經度     | 緯度     |               |                |
|        | h     | m ° | h     | m ° | h     | m ° |        |                 |                | °      | °      |               |                |
| 1      | 3:29  | 80  | 9:59  | 75S | 16:33 | 283 | 0.07   | 15 36           | 388277         | 6.651  | -4.894 | 342.7         | 63.2           |
| 2      | 4:08  | 75  | 10:47 | 80S | 17:32 | 288 | 0.02   | 15 46           | 383605         | 5.900  | -4.746 | 346.9         | 61.6           |
| 3      | 4:51  | 70  | 11:40 | 83S | 18:32 | 291 | 0.00   | 15 55           | 379194         | 4.826  | -4.323 | 351.9         | 42.0           |
| 4      | 5:40  | 67  | 12:36 | 86S | 19:34 | 294 | 0.01   | 16 3            | 375343         | 3.475  | -3.670 | 357.7         | 284.4          |
| 5      | 6:34  | 66  | 13:34 | 87S | 20:34 | 295 | 0.04   | 16 8            | 372275         | 1.919  | -2.845 | 3.8           | 276.2          |
| 6      | 7:34  | 65  | 14:34 | 87S | 21:32 | 294 | 0.09   | 16 10           | 370113         | 0.256  | -1.907 | 9.8           | 278.6          |
| 7      | 8:36  | 67  | 15:33 | 85S | 22:26 | 291 | 0.17   | 16 9            | 368877         | -1.408 | -0.913 | 15.1          | 282.7          |
| 8      | 9:41  | 70  | 16:30 | 82S | 23:15 | 287 | 0.26   | 16 7            | 368504         | -2.961 | 0.089  | 19.4          | 286.8          |
| 9      | 10:44 | 75  | 17:25 | 77S | 0:00  | 282 | 0.37   | 16 3            | 368880         | -4.304 | 1.061  | 22.3          | 290.3          |
| 10     | 11:47 | 80  | 18:17 | 72S |       |     | 0.48   | 15 57           | 369874         | -5.356 | 1.972  | 23.9          | 292.8          |
| 11     | 12:48 | 86  | 19:07 | 67S | 0:41  | 277 | 0.59   | 15 52           | 371373         | -6.059 | 2.793  | 24.0          | 294.4          |
| 12     | 13:48 | 92  | 19:56 | 61S | 1:20  | 271 | 0.70   | 15 45           | 373299         | -6.379 | 3.499  | 22.8          | 294.8          |
| 13     | 14:48 | 98  | 20:45 | 56S | 1:59  | 265 | 0.79   | 15 39           | 375609         | -6.309 | 4.060  | 20.5          | 294.2          |
| 14     | 15:47 | 104 | 21:35 | 51S | 2:38  | 259 | 0.87   | 15 33           | 378289         | -5.866 | 4.447  | 17.1          | 292.8          |
| 15     | 16:47 | 108 | 22:26 | 47S | 3:19  | 254 | 0.94   | 15 26           | 381322         | -5.089 | 4.633  | 12.9          | 290.8          |
| 16     | 17:46 | 112 | 23:19 | 44S | 4:03  | 250 | 0.98   | 15 20           | 384672         | -4.035 | 4.597  | 8.0           | 289.2          |
| 17     | 18:43 | 114 |       |     | 4:49  | 247 | 1.00   | 15 13           | 388258         | -2.771 | 4.324  | 2.6           | 297.1          |
| 18     | 19:37 | 115 | 0:11  | 42S | 5:39  | 245 | 1.00   | 15 7            | 391947         | -1.373 | 3.813  | 357.1         | 80.2           |
| 19     | 20:28 | 114 | 1:04  | 42S | 6:30  | 245 | 0.98   | 15 1            | 395553         | 0.085  | 3.076  | 351.7         | 83.6           |
| 20     | 21:15 | 113 | 1:55  | 43S | 7:24  | 246 | 0.94   | 14 57           | 398850         | 1.533  | 2.141  | 346.8         | 80.5           |
| 21     | 21:57 | 110 | 2:45  | 44S | 8:17  | 248 | 0.88   | 14 53           | 401592         | 2.908  | 1.046  | 342.7         | 76.8           |
| 22     | 22:35 | 106 | 3:32  | 47S | 9:10  | 252 | 0.81   | 14 51           | 403540         | 4.156  | -0.158 | 339.5         | 73.4           |
| 23     | 23:11 | 102 | 4:17  | 50S | 10:02 | 256 | 0.73   | 14 52           | 404485         | 5.231  | -1.408 | 337.3         | 70.5           |
| 24     | 23:45 | 97  | 5:00  | 55S | 10:53 | 260 | 0.64   | 14 54           | 404271         | 6.094  | -2.637 | 336.1         | 68.3           |
| 25     |       |     | 5:42  | 59S | 11:43 | 265 | 0.55   | 14 60           | 402819         | 6.709  | -3.772 | 335.9         | 66.9           |
| 26     | 0:17  | 92  | 6:23  | 64S | 12:34 | 270 | 0.45   | 15 8            | 400137         | 7.046  | -4.739 | 336.7         | 66.4           |
| 27     | 0:50  | 87  | 7:06  | 68S | 13:26 | 276 | 0.35   | 15 18           | 396335         | 7.078  | -5.470 | 338.5         | 66.7           |
| 28     | 1:25  | 82  | 7:50  | 73S | 14:20 | 281 | 0.26   | 15 30           | 391622         | 6.782  | -5.905 | 341.3         | 67.9           |
| 29     | 2:02  | 77  | 8:37  | 78S | 15:16 | 286 | 0.17   | 15 43           | 386307         | 6.147  | -5.998 | 345.1         | 70.1           |
| 30     | 2:43  | 72  | 9:27  | 82S | 16:16 | 290 | 0.10   | 15 56           | 380775         | 5.176  | -5.727 | 349.8         | 73.2           |

# 月 球 位 置 表

## 七 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 地心黃道座標 |      |    |      | 地心赤道座標 |      |     |      | 地表赤道座標 |      |     |      | 地心地表 |      | 地平座標  |       |
|----|--------|------|----|------|--------|------|-----|------|--------|------|-----|------|------|------|-------|-------|
|    | 黃經     | 黃緯   | 赤經 | 赤緯   | 赤經     | 赤緯   | 赤經  | 赤緯   | 視差     | 方位   | 仰角  | 方位   | 仰角   |      |       |       |
|    | °      | '    | °  | '    | h      | m    | °   | '    | h      | m    | °   | '    | '    | "    | °     | °     |
| 1  | 75     | 12.3 | -2 | 50.1 | 4      | 57.1 | +19 | 47.8 | 4      | 59.2 | +19 | 39.3 | 31   | 0.4  | 92.8  | 57.9  |
| 2  | 89     | 10.7 | -1 | 40.5 | 5      | 56.5 | +21 | 45.5 | 5      | 59.3 | +21 | 35.5 | 41   | 17.2 | 84.2  | 45.7  |
| 3  | 103    | 27.8 | -0 | 23.0 | 6      | 58.3 | +22 | 22.4 | 7      | 1.8  | +22 | 8.5  | 50   | 13.1 | 78.9  | 32.8  |
| 4  | 117    | 58.7 | +0 | 57.2 | 8      | 1.1  | +21 | 29.8 | 8      | 4.9  | +21 | 10.5 | 56   | 41.0 | 75.1  | 19.4  |
| 5  | 132    | 37.6 | +2 | 14.4 | 9      | 3.0  | +19 | 9.8  | 9      | 6.9  | +18 | 45.2 | 59   | 56.0 | 72.0  | 5.9   |
| 6  | 147    | 18.2 | +3 | 22.9 | 10     | 2.8  | +15 | 34.8 | 10     | 6.4  | +15 | 6.4  | 59   | 38.4 | 69.3  | -7.6  |
| 7  | 161    | 54.3 | +4 | 17.8 | 10     | 59.9 | +11 | 3.9  | 11     | 3.1  | +10 | 34.2 | 55   | 55.0 | 66.6  | -21.0 |
| 8  | 176    | 21.1 | +4 | 55.7 | 11     | 54.5 | +5  | 58.3 | 11     | 57.2 | +5  | 29.9 | 49   | 13.5 | 63.5  | -34.1 |
| 9  | 190    | 34.9 | +5 | 14.9 | 12     | 47.1 | +0  | 38.5 | 12     | 49.2 | +0  | 13.4 | 40   | 16.1 | 59.5  | -46.9 |
| 10 | 204    | 33.4 | +5 | 15.0 | 13     | 38.7 | -4  | 37.6 | 13     | 40.2 | -4  | 58.0 | 29   | 53.1 | 53.2  | -59.2 |
| 11 | 218    | 15.6 | +4 | 57.0 | 14     | 30.0 | -9  | 34.0 | 14     | 30.8 | -9  | 49.3 | 19   | 10.6 | 40.4  | -70.5 |
| 12 | 231    | 41.6 | +4 | 23.1 | 15     | 21.8 | -13 | 56.9 | 15     | 21.8 | -14 | 7.7  | 10   | 49.4 | 4.5   | -79.0 |
| 13 | 244    | 51.8 | +3 | 35.8 | 16     | 14.4 | -17 | 33.9 | 16     | 13.7 | -17 | 41.4 | 12   | 25.2 | 303.6 | -77.3 |
| 14 | 257    | 47.3 | +2 | 38.2 | 17     | 7.9  | -20 | 14.9 | 17     | 6.5  | -20 | 20.9 | 21   | 2.7  | 277.8 | -68.0 |
| 15 | 270    | 29.0 | +1 | 33.8 | 18     | 2.1  | -21 | 52.3 | 17     | 60.0 | -21 | 58.8 | 30   | 11.2 | 268.0 | -57.2 |
| 16 | 282    | 58.3 | +0 | 25.9 | 18     | 56.2 | -22 | 22.4 | 18     | 53.5 | -22 | 31.2 | 38   | 19.1 | 263.0 | -46.2 |
| 17 | 295    | 16.4 | -0 | 42.1 | 19     | 49.5 | -21 | 46.2 | 19     | 46.4 | -21 | 58.6 | 44   | 56.7 | 259.9 | -35.1 |
| 18 | 307    | 24.7 | -1 | 47.4 | 20     | 41.2 | -20 | 8.7  | 20     | 37.9 | -20 | 25.2 | 49   | 50.1 | 257.7 | -24.0 |
| 19 | 319    | 25.1 | -2 | 47.1 | 21     | 31.0 | -17 | 38.3 | 21     | 27.6 | -17 | 58.5 | 52   | 53.1 | 256.1 | -13.1 |
| 20 | 331    | 19.7 | -3 | 39.0 | 22     | 18.8 | -14 | 24.6 | 22     | 15.4 | -14 | 47.8 | 54   | 4.2  | 254.7 | -2.2  |
| 21 | 343    | 10.9 | -4 | 21.2 | 23     | 4.8  | -10 | 37.5 | 23     | 1.6  | -11 | 2.5  | 53   | 25.0 | 253.4 | 8.7   |
| 22 | 355    | 1.9  | -4 | 52.2 | 23     | 49.5 | -6  | 26.6 | 23     | 46.6 | -6  | 51.8 | 50   | 57.9 | 252.1 | 19.6  |
| 23 | 6      | 56.2 | -5 | 10.9 | 0      | 33.7 | -2  | 0.4  | 0      | 31.0 | -2  | 24.5 | 46   | 46.0 | 250.7 | 30.5  |
| 24 | 18     | 57.7 | -5 | 16.1 | 1      | 18.0 | +2  | 32.8 | 1      | 15.7 | +2  | 11.1 | 40   | 51.7 | 248.9 | 41.6  |
| 25 | 31     | 10.8 | -5 | 7.3  | 2      | 3.3  | +7  | 4.5  | 2      | 1.5  | +6  | 46.3 | 33   | 18.2 | 246.2 | 52.9  |
| 26 | 43     | 39.6 | -4 | 44.0 | 2      | 50.6 | +11 | 24.9 | 2      | 49.3 | +11 | 10.8 | 24   | 12.5 | 241.3 | 64.3  |
| 27 | 56     | 28.5 | -4 | 6.2  | 3      | 40.6 | +15 | 22.2 | 3      | 39.9 | +15 | 12.3 | 14   | 1.4  | 228.6 | 75.6  |
| 28 | 69     | 40.6 | -3 | 14.4 | 4      | 34.1 | +18 | 41.6 | 4      | 34.2 | +18 | 35.2 | 6    | 33.7 | 168.2 | 83.3  |
| 29 | 83     | 18.4 | -2 | 10.2 | 5      | 31.3 | +21 | 6.0  | 5      | 32.3 | +21 | 1.3  | 14   | 30.3 | 103.6 | 75.6  |
| 30 | 97     | 22.2 | -0 | 56.2 | 6      | 31.9 | +22 | 17.7 | 6      | 33.8 | +22 | 12.3 | 26   | 59.7 | 90.1  | 63.0  |
| 31 | 111    | 50.1 | +0 | 23.3 | 7      | 34.6 | +22 | 3.0  | 7      | 37.4 | +21 | 54.0 | 39   | 8.9  | 85.1  | 49.5  |



# 月 球 升 沒 相 位 表

## 七 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 月 出   |     | 中 天   |     | 月 沒   |     | 相 位  | 視 半 徑<br>' " | 月地 距離<br>km | 月面中心   |        | 轉軸 傾角<br>° | 亮緣 方位角<br>° |
|----|-------|-----|-------|-----|-------|-----|------|--------------|-------------|--------|--------|------------|-------------|
|    | 時間    | 方位  | 時間    | 仰角  | 時間    | 方位  |      |              |             | 經度     | 緯度     |            |             |
|    | h     | m ° | h     | m ° | h     | m ° |      |              |             | °      | °      |            |             |
| 1  | 3:29  | 69  | 10:21 | 85S | 17:17 | 293 | 0.04 | 16 8         | 375456      | 3.897  | -5.095 | 355.3      | 77.0        |
| 2  | 4:21  | 66  | 11:19 | 87S | 18:19 | 295 | 0.01 | 16 19        | 370779      | 2.366  | -4.134 | 1.4        | 79.6        |
| 3  | 5:19  | 65  | 12:20 | 87S | 19:20 | 295 | 0.00 | 16 26        | 367118      | 0.672  | -2.905 | 7.6        | 284.8       |
| 4  | 6:22  | 66  | 13:21 | 86S | 20:18 | 293 | 0.02 | 16 28        | 364738      | -1.071 | -1.494 | 13.4       | 279.3       |
| 5  | 7:28  | 69  | 14:21 | 83S | 21:10 | 289 | 0.07 | 16 27        | 363755      | -2.737 | 0.002  | 18.2       | 283.3       |
| 6  | 8:34  | 73  | 15:18 | 79S | 21:57 | 284 | 0.15 | 16 22        | 364135      | -4.201 | 1.481  | 21.7       | 287.2       |
| 7  | 9:39  | 78  | 16:13 | 74S | 22:41 | 279 | 0.24 | 16 14        | 365706      | -5.366 | 2.848  | 23.6       | 290.2       |
| 8  | 10:42 | 84  | 17:04 | 69S | 23:21 | 273 | 0.34 | 16 4         | 368217      | -6.161 | 4.026  | 24.0       | 291.9       |
| 9  | 11:43 | 90  | 17:54 | 63S |       |     | 0.46 | 15 53        | 371383      | -6.555 | 4.958  | 23.1       | 292.5       |
| 10 | 12:43 | 96  | 18:43 | 58S | 0:00  | 267 | 0.57 | 15 42        | 374939      | -6.546 | 5.610  | 21.0       | 291.9       |
| 11 | 13:42 | 102 | 19:32 | 53S | 0:39  | 261 | 0.67 | 15 32        | 378672      | -6.159 | 5.970  | 17.8       | 290.2       |
| 12 | 14:40 | 107 | 20:22 | 48S | 1:19  | 256 | 0.77 | 15 22        | 382430      | -5.437 | 6.043  | 13.8       | 287.4       |
| 13 | 15:38 | 111 | 21:13 | 45S | 2:01  | 251 | 0.85 | 15 13        | 386120      | -4.437 | 5.843  | 9.1        | 283.6       |
| 14 | 16:35 | 113 | 22:05 | 43S | 2:45  | 248 | 0.92 | 15 6         | 389685      | -3.222 | 5.394  | 3.9        | 279.0       |
| 15 | 17:30 | 115 | 22:57 | 42S | 3:33  | 246 | 0.96 | 14 59        | 393085      | -1.860 | 4.723  | 358.5      | 273.6       |
| 16 | 18:22 | 115 | 23:49 | 42S | 4:23  | 245 | 0.99 | 14 54        | 396274      | -0.421 | 3.861  | 353.2      | 266.5       |
| 17 | 19:10 | 114 |       |     | 5:16  | 246 | 1.00 | 14 50        | 399179      | 1.027  | 2.838  | 348.2      | 144.7       |
| 18 | 19:54 | 111 | 0:39  | 44S | 6:09  | 247 | 0.99 | 14 47        | 401697      | 2.423  | 1.687  | 343.9      | 84.4        |
| 19 | 20:33 | 108 | 1:27  | 46S | 7:02  | 250 | 0.96 | 14 45        | 403692      | 3.708  | 0.444  | 340.4      | 78.6        |
| 20 | 21:10 | 104 | 2:12  | 49S | 7:55  | 254 | 0.92 | 14 44        | 405008      | 4.832  | -0.853 | 337.9      | 74.7        |
| 21 | 21:44 | 99  | 2:56  | 53S | 8:46  | 258 | 0.86 | 14 46        | 405481      | 5.754  | -2.160 | 336.4      | 71.8        |
| 22 | 22:17 | 94  | 3:38  | 57S | 9:36  | 263 | 0.79 | 14 50        | 404961      | 6.438  | -3.426 | 335.9      | 70.0        |
| 23 | 22:50 | 89  | 4:20  | 62S | 10:27 | 268 | 0.70 | 14 56        | 403340      | 6.854  | -4.598 | 336.4      | 69.0        |
| 24 | 23:23 | 84  | 5:01  | 67S | 11:17 | 273 | 0.61 | 15 4         | 400565      | 6.979  | -5.613 | 337.8      | 69.0        |
| 25 | 23:58 | 79  | 5:44  | 71S | 12:09 | 279 | 0.51 | 15 15        | 396670      | 6.795  | -6.407 | 340.2      | 70.0        |
| 26 |       |     | 6:28  | 76S | 13:03 | 284 | 0.41 | 15 28        | 391781      | 6.289  | -6.915 | 343.5      | 71.9        |
| 27 | 0:36  | 74  | 7:16  | 80S | 14:00 | 288 | 0.31 | 15 43        | 386137      | 5.460  | -7.077 | 347.7      | 75.0        |
| 28 | 1:18  | 70  | 8:07  | 84S | 14:59 | 292 | 0.21 | 15 59        | 380080      | 4.321  | -6.845 | 352.8      | 79.3        |
| 29 | 2:06  | 67  | 9:02  | 86S | 16:00 | 294 | 0.13 | 16 14        | 374046      | 2.905  | -6.190 | 358.7      | 84.8        |
| 30 | 3:01  | 65  | 10:01 | 87S | 17:02 | 295 | 0.06 | 16 28        | 368524      | 1.278  | -5.115 | 4.9        | 91.5        |
| 31 | 4:02  | 65  | 11:03 | 87S | 18:02 | 294 | 0.02 | 16 38        | 364003      | -0.464 | -3.660 | 11.0       | 100.7       |

# 月 球 位 置 表

## 八 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 地心黃道座標 |      |    |      | 地心赤道座標 |      |     |      | 地表赤道座標 |      |     |      | 地心地表 |      | 地平座標  |       |
|----|--------|------|----|------|--------|------|-----|------|--------|------|-----|------|------|------|-------|-------|
|    | 黃經     |      | 黃緯 |      | 赤經     |      | 赤緯  |      | 赤經     |      | 赤緯  |      | 視差   |      | 方位    | 仰角    |
|    | °      | '    | °  | '    | h      | m    | °   | '    | h      | m    | °   | '    | '    | "    | °     | °     |
| 1  | 126    | 37.6 | +1 | 43.0 | 8      | 37.9 | +20 | 16.5 | 8      | 41.3 | +20 | 2.2  | 49   | 27.9 | 82.5  | 35.5  |
| 2  | 141    | 37.5 | +2 | 56.6 | 9      | 40.0 | +17 | 4.7  | 9      | 43.7 | +16 | 44.6 | 56   | 48.6 | 80.9  | 21.3  |
| 3  | 156    | 41.4 | +3 | 58.1 | 10     | 39.7 | +12 | 44.3 | 10     | 43.5 | +12 | 19.8 | 60   | 26.3 | 79.7  | 7.1   |
| 4  | 171    | 40.1 | +4 | 43.0 | 11     | 36.9 | +7  | 38.2 | 11     | 40.5 | +7  | 11.5 | 60   | 7.6  | 78.7  | -6.9  |
| 5  | 186    | 25.5 | +5 | 8.3  | 12     | 31.7 | +2  | 10.1 | 12     | 35.0 | +1  | 44.2 | 56   | 9.8  | 77.8  | -20.6 |
| 6  | 200    | 51.7 | +5 | 13.4 | 13     | 24.9 | -3  | 17.8 | 13     | 27.8 | -3  | 40.8 | 49   | 11.7 | 76.7  | -33.9 |
| 7  | 214    | 55.2 | +4 | 59.5 | 14     | 17.3 | -8  | 27.1 | 14     | 19.7 | -8  | 45.6 | 40   | 1.5  | 75.3  | -46.8 |
| 8  | 228    | 35.1 | +4 | 28.7 | 15     | 9.6  | -13 | 2.7  | 15     | 11.4 | -13 | 16.1 | 29   | 27.4 | 72.9  | -59.3 |
| 9  | 241    | 52.4 | +3 | 44.2 | 16     | 2.2  | -16 | 52.3 | 16     | 3.3  | -17 | 0.9  | 18   | 14.3 | 67.8  | -71.3 |
| 10 | 254    | 49.3 | +2 | 49.2 | 16     | 55.5 | -19 | 46.2 | 16     | 55.8 | -19 | 51.3 | 7    | 22.8 | 47.4  | -82.4 |
| 11 | 267    | 28.9 | +1 | 47.1 | 17     | 49.2 | -21 | 37.6 | 17     | 48.8 | -21 | 40.9 | 6    | 27.0 | 299.6 | -83.3 |
| 12 | 279    | 54.1 | +0 | 41.1 | 18     | 42.9 | -22 | 23.0 | 18     | 41.7 | -22 | 26.4 | 16   | 17.0 | 275.2 | -72.8 |
| 13 | 292    | 8.0  | -0 | 25.7 | 19     | 35.9 | -22 | 2.4  | 19     | 34.1 | -22 | 7.8  | 25   | 53.1 | 269.7 | -61.8 |
| 14 | 304    | 13.3 | -1 | 30.5 | 20     | 27.7 | -20 | 39.9 | 20     | 25.3 | -20 | 48.5 | 34   | 25.5 | 267.4 | -50.8 |
| 15 | 316    | 12.1 | -2 | 30.5 | 21     | 17.8 | -18 | 22.2 | 21     | 15.0 | -18 | 34.8 | 41   | 37.4 | 266.2 | -39.9 |
| 16 | 328    | 6.5  | -3 | 23.4 | 22     | 6.0  | -15 | 18.5 | 22     | 2.9  | -15 | 35.0 | 47   | 17.5 | 265.4 | -29.0 |
| 17 | 339    | 58.3 | -4 | 7.3  | 22     | 52.4 | -11 | 38.6 | 22     | 49.1 | -11 | 58.4 | 51   | 17.5 | 265.0 | -18.1 |
| 18 | 351    | 49.3 | -4 | 40.4 | 23     | 37.4 | -7  | 32.1 | 23     | 34.1 | -7  | 54.2 | 53   | 32.1 | 264.6 | -7.2  |
| 19 | 3      | 41.5 | -5 | 1.4  | 0      | 21.5 | -3  | 8.6  | 0      | 18.3 | -3  | 31.7 | 53   | 57.5 | 264.3 | 3.7   |
| 20 | 15     | 37.5 | -5 | 9.5  | 1      | 5.5  | +1  | 23.2 | 1      | 2.3  | +1  | 0.5  | 52   | 31.2 | 264.1 | 14.7  |
| 21 | 27     | 40.0 | -5 | 4.0  | 1      | 50.0 | +5  | 54.4 | 1      | 47.1 | +5  | 33.6 | 49   | 11.6 | 263.8 | 25.9  |
| 22 | 39     | 52.5 | -4 | 44.8 | 2      | 36.0 | +10 | 15.8 | 2      | 33.2 | +9  | 58.1 | 43   | 56.6 | 263.3 | 37.2  |
| 23 | 52     | 18.7 | -4 | 12.0 | 3      | 24.0 | +14 | 17.0 | 3      | 21.7 | +14 | 3.2  | 36   | 45.3 | 262.6 | 48.8  |
| 24 | 65     | 2.8  | -3 | 26.1 | 4      | 15.0 | +17 | 45.4 | 4      | 13.2 | +17 | 36.1 | 27   | 38.4 | 261.1 | 60.8  |
| 25 | 78     | 8.7  | -2 | 28.2 | 5      | 9.4  | +20 | 26.8 | 5      | 8.3  | +20 | 21.3 | 16   | 43.6 | 257.2 | 73.1  |
| 26 | 91     | 39.9 | -1 | 20.5 | 6      | 7.2  | +22 | 5.1  | 6      | 6.9  | +22 | 2.0  | 4    | 46.3 | 230.4 | 85.2  |
| 27 | 105    | 38.4 | -0 | 5.8  | 7      | 7.8  | +22 | 25.4 | 7      | 8.5  | +22 | 22.4 | 10   | 13.9 | 103.9 | 80.1  |
| 28 | 120    | 4.0  | +1 | 11.5 | 8      | 10.1 | +21 | 17.8 | 8      | 11.8 | +21 | 12.0 | 24   | 2.4  | 94.4  | 66.5  |
| 29 | 134    | 53.9 | +2 | 25.9 | 9      | 12.5 | +18 | 41.3 | 9      | 15.0 | +18 | 30.3 | 37   | 12.3 | 92.0  | 52.3  |
| 30 | 150    | 1.7  | +3 | 31.5 | 10     | 13.6 | +14 | 45.5 | 10     | 16.7 | +14 | 28.5 | 48   | 20.0 | 90.9  | 37.9  |
| 31 | 165    | 18.3 | +4 | 22.6 | 11     | 12.7 | +9  | 49.4 | 11     | 16.2 | +9  | 27.3 | 56   | 16.1 | 90.3  | 23.5  |

# 月 球 升 沒 相 位 表

## 八 月

東經：121°31'05" · 北緯：25°05'44"

世界時 0 時

| 日<br>期 | 月 出   |     | 中 天   |     | 月 沒   |     | 相<br>位 | 視<br>半<br>徑<br>' " | 月地<br>距離<br>km | 月面中心   |        | 轉軸<br>傾角<br>° | 亮緣<br>方位角<br>° |
|--------|-------|-----|-------|-----|-------|-----|--------|--------------------|----------------|--------|--------|---------------|----------------|
|        | 時間    | 方位  | 時間    | 仰角  | 時間    | 方位  |        |                    |                | 經度     | 緯度     |               |                |
|        | h     | m ° | h     | m ° | h     | m ° |        |                    |                | °      | °      |               |                |
| 1      | 5:08  | 67  | 12:05 | 85S | 18:58 | 291 | 0.00   | 16 43              | 360897         | -2.197 | -1.909 | 16.3          | 163.3          |
| 2      | 6:16  | 71  | 13:05 | 81S | 19:49 | 287 | 0.01   | 16 44              | 359477         | -3.784 | 0.016  | 20.5          | 277.0          |
| 3      | 7:23  | 76  | 14:02 | 76S | 20:35 | 281 | 0.06   | 16 38              | 359825         | -5.095 | 1.964  | 23.1          | 284.6          |
| 4      | 8:29  | 82  | 14:57 | 71S | 21:18 | 275 | 0.13   | 16 29              | 361818         | -6.033 | 3.780  | 24.0          | 288.1          |
| 5      | 9:33  | 88  | 15:49 | 65S | 21:59 | 269 | 0.22   | 16 15              | 365172         | -6.546 | 5.330  | 23.5          | 289.7          |
| 6      | 10:35 | 94  | 16:39 | 59S | 22:39 | 263 | 0.32   | 16 1               | 369498         | -6.624 | 6.512  | 21.6          | 289.7          |
| 7      | 11:36 | 100 | 17:29 | 54S | 23:19 | 257 | 0.43   | 15 46              | 374385         | -6.298 | 7.275  | 18.6          | 288.4          |
| 8      | 12:35 | 105 | 18:20 | 50S |       |     | 0.54   | 15 31              | 379453         | -5.622 | 7.607  | 14.7          | 285.8          |
| 9      | 13:33 | 110 | 19:10 | 46S | 0:00  | 253 | 0.64   | 15 18              | 384397         | -4.661 | 7.535  | 10.1          | 282.2          |
| 10     | 14:31 | 113 | 20:02 | 43S | 0:44  | 249 | 0.73   | 15 7               | 389003         | -3.484 | 7.104  | 5.0           | 277.8          |
| 11     | 15:26 | 114 | 20:53 | 42S | 1:30  | 246 | 0.82   | 14 57              | 393138         | -2.160 | 6.376  | 359.6         | 272.5          |
| 12     | 16:18 | 115 | 21:44 | 42S | 2:20  | 245 | 0.89   | 14 50              | 396737         | -0.756 | 5.411  | 354.3         | 266.7          |
| 13     | 17:07 | 114 | 22:35 | 43S | 3:11  | 245 | 0.94   | 14 44              | 399778         | 0.667  | 4.271  | 349.3         | 260.0          |
| 14     | 17:52 | 112 | 23:23 | 45S | 4:04  | 247 | 0.98   | 14 40              | 402258         | 2.048  | 3.007  | 344.9         | 251.5          |
| 15     | 18:32 | 109 |       |     | 4:57  | 249 | 1.00   | 14 38              | 404171         | 3.334  | 1.667  | 341.2         | 231.3          |
| 16     | 19:10 | 105 | 0:09  | 48S | 5:49  | 253 | 1.00   | 14 37              | 405492         | 4.474  | 0.290  | 338.5         | 106.9          |
| 17     | 19:45 | 101 | 0:54  | 52S | 6:41  | 257 | 0.98   | 14 38              | 406169         | 5.424  | -1.089 | 336.7         | 82.4           |
| 18     | 20:18 | 96  | 1:36  | 56S | 7:31  | 262 | 0.95   | 14 41              | 406128         | 6.148  | -2.439 | 336.0         | 76.1           |
| 19     | 20:50 | 91  | 2:18  | 60S | 8:22  | 267 | 0.90   | 14 45              | 405278         | 6.614  | -3.726 | 336.2         | 73.2           |
| 20     | 21:23 | 86  | 2:59  | 65S | 9:12  | 272 | 0.83   | 14 52              | 403529         | 6.800  | -4.914 | 337.3         | 72.0           |
| 21     | 21:56 | 81  | 3:40  | 70S | 10:03 | 277 | 0.76   | 15 0               | 400814         | 6.692  | -5.959 | 339.4         | 72.2           |
| 22     | 22:32 | 76  | 4:23  | 74S | 10:55 | 282 | 0.67   | 15 11              | 397111         | 6.281  | -6.810 | 342.4         | 73.5           |
| 23     | 23:12 | 72  | 5:09  | 79S | 11:49 | 286 | 0.57   | 15 24              | 392469         | 5.567  | -7.409 | 346.2         | 75.9           |
| 24     | 23:56 | 68  | 5:57  | 82S | 12:46 | 290 | 0.47   | 15 39              | 387027         | 4.562  | -7.692 | 350.8         | 79.4           |
| 25     |       |     | 6:49  | 85S | 13:45 | 293 | 0.36   | 15 56              | 381034         | 3.291  | -7.598 | 356.2         | 84.1           |
| 26     | 0:46  | 66  | 7:45  | 87S | 14:45 | 295 | 0.26   | 16 13              | 374845         | 1.797  | -7.072 | 2.2           | 89.9           |
| 27     | 1:43  | 65  | 8:44  | 87S | 15:44 | 295 | 0.16   | 16 28              | 368912         | 0.152  | -6.082 | 8.3           | 96.6           |
| 28     | 2:45  | 66  | 9:45  | 86S | 16:41 | 293 | 0.09   | 16 41              | 363744         | -1.547 | -4.635 | 14.0          | 104.2          |
| 29     | 3:52  | 69  | 10:45 | 83S | 17:34 | 289 | 0.03   | 16 50              | 359839         | -3.174 | -2.788 | 18.7          | 114.1          |
| 30     | 5:00  | 73  | 11:45 | 79S | 18:24 | 284 | 0.00   | 16 53              | 357607         | -4.595 | -0.657 | 22.1          | 143.5          |
| 31     | 6:08  | 79  | 12:42 | 73S | 19:09 | 278 | 0.01   | 16 50              | 357289         | -5.682 | 1.590  | 23.8          | 267.2          |

# 月 球 位 置 表

## 九 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 地心黃道座標 |      |    |      | 地心赤道座標 |      |     |      | 地表赤道座標 |      |     |      | 地心地表 |      | 地平座標  |       |
|----|--------|------|----|------|--------|------|-----|------|--------|------|-----|------|------|------|-------|-------|
|    | 黃經     | 黃緯   | 赤經 | 赤緯   | 赤經     | 赤緯   | 赤經  | 赤緯   | 赤經     | 赤緯   | 視差  | 方位   | 仰角   |      |       |       |
|    | °      | '    | °  | '    | h      | m    | °   | '    | h      | m    | °   | '    | "    | °    | °     |       |
| 1  | 180    | 32.8 | +4 | 54.8 | 12     | 9.8  | +4  | 17.4 | 12     | 13.5 | +3  | 52.3 | 60   | 17.5 | 90.0  | 9.1   |
| 2  | 195    | 34.6 | +5 | 6.2  | 13     | 5.2  | -1  | 25.1 | 13     | 8.9  | -1  | 50.5 | 60   | 16.1 | 89.7  | -5.0  |
| 3  | 210    | 15.2 | +4 | 57.1 | 13     | 59.6 | -6  | 55.1 | 14     | 3.1  | -7  | 18.1 | 56   | 35.6 | 89.4  | -18.6 |
| 4  | 224    | 29.1 | +4 | 29.6 | 14     | 53.5 | -11 | 53.2 | 14     | 56.7 | -12 | 11.9 | 50   | 0.0  | 89.1  | -31.8 |
| 5  | 238    | 14.3 | +3 | 47.2 | 15     | 47.5 | -16 | 4.3  | 15     | 50.2 | -16 | 18.0 | 41   | 19.1 | 88.5  | -44.5 |
| 6  | 251    | 31.9 | +2 | 53.7 | 16     | 41.7 | -19 | 17.7 | 16     | 43.8 | -19 | 26.5 | 31   | 19.0 | 87.5  | -56.7 |
| 7  | 264    | 24.9 | +1 | 52.9 | 17     | 36.0 | -21 | 26.3 | 17     | 37.4 | -21 | 31.3 | 20   | 38.0 | 85.1  | -68.5 |
| 8  | 276    | 57.2 | +0 | 48.1 | 18     | 30.1 | -22 | 27.1 | 18     | 30.8 | -22 | 29.9 | 9    | 50.0 | 77.3  | -79.8 |
| 9  | 289    | 13.5 | -0 | 17.4 | 19     | 23.4 | -22 | 20.7 | 19     | 23.3 | -22 | 23.2 | 2    | 45.3 | 335.7 | -87.0 |
| 10 | 301    | 18.2 | -1 | 21.0 | 20     | 15.4 | -21 | 11.0 | 20     | 14.6 | -21 | 15.0 | 11   | 57.9 | 285.1 | -77.3 |
| 11 | 313    | 15.2 | -2 | 20.2 | 21     | 5.7  | -19 | 4.6  | 21     | 4.2  | -19 | 11.6 | 21   | 36.5 | 279.7 | -66.5 |
| 12 | 325    | 7.9  | -3 | 12.8 | 21     | 54.1 | -16 | 10.1 | 21     | 52.1 | -16 | 20.8 | 30   | 26.4 | 277.8 | -55.7 |
| 13 | 336    | 58.8 | -3 | 56.7 | 22     | 40.8 | -12 | 36.5 | 22     | 38.4 | -12 | 51.3 | 38   | 11.9 | 276.9 | -44.9 |
| 14 | 348    | 50.1 | -4 | 30.4 | 23     | 26.1 | -8  | 33.6 | 23     | 23.3 | -8  | 52.0 | 44   | 39.7 | 276.4 | -34.1 |
| 15 | 0      | 43.5 | -4 | 52.3 | 0      | 10.4 | -4  | 10.8 | 0      | 7.4  | -4  | 32.0 | 49   | 38.2 | 276.1 | -23.2 |
| 16 | 12     | 40.2 | -5 | 1.5  | 0      | 54.4 | +0  | 22.5 | 0      | 51.3 | -0  | 0.4  | 52   | 56.7 | 275.9 | -12.3 |
| 17 | 24     | 41.9 | -4 | 57.4 | 1      | 38.8 | +4  | 57.1 | 1      | 35.5 | +4  | 33.9 | 54   | 26.1 | 275.6 | -1.2  |
| 18 | 36     | 50.1 | -4 | 39.8 | 2      | 24.2 | +9  | 23.0 | 2      | 20.9 | +9  | 1.2  | 53   | 58.9 | 275.4 | 10.0  |
| 19 | 49     | 7.1  | -4 | 9.2  | 3      | 11.3 | +13 | 30.1 | 3      | 8.0  | +13 | 10.9 | 51   | 28.9 | 275.0 | 21.4  |
| 20 | 61     | 35.5 | -3 | 26.3 | 4      | 0.8  | +17 | 6.5  | 3      | 57.7 | +16 | 51.1 | 46   | 51.1 | 274.4 | 33.0  |
| 21 | 74     | 18.7 | -2 | 32.4 | 4      | 53.2 | +19 | 59.5 | 4      | 50.4 | +19 | 48.6 | 40   | 2.9  | 273.5 | 44.9  |
| 22 | 87     | 20.1 | -1 | 29.3 | 5      | 48.5 | +21 | 55.3 | 5      | 46.3 | +21 | 48.6 | 31   | 5.5  | 271.7 | 57.2  |
| 23 | 100    | 43.4 | -0 | 19.6 | 6      | 46.5 | +22 | 40.7 | 6      | 45.1 | +22 | 36.8 | 20   | 8.7  | 267.5 | 69.7  |
| 24 | 114    | 31.4 | +0 | 53.3 | 7      | 46.4 | +22 | 5.3  | 7      | 45.9 | +22 | 2.1  | 7    | 56.9 | 248.2 | 82.2  |
| 25 | 128    | 45.4 | +2 | 5.0  | 8      | 47.1 | +20 | 4.7  | 8      | 47.5 | +19 | 59.4 | 8    | 13.1 | 128.8 | 82.0  |
| 26 | 143    | 24.4 | +3 | 10.6 | 9      | 47.3 | +16 | 42.8 | 9      | 48.7 | +16 | 32.9 | 21   | 58.0 | 109.7 | 68.7  |
| 27 | 158    | 24.0 | +4 | 4.5  | 10     | 46.4 | +12 | 11.7 | 10     | 48.5 | +11 | 55.9 | 35   | 24.2 | 105.4 | 54.5  |
| 28 | 173    | 36.5 | +4 | 41.9 | 11     | 44.0 | +6  | 51.0 | 11     | 46.8 | +6  | 29.5 | 46   | 48.9 | 103.4 | 40.1  |
| 29 | 188    | 51.8 | +4 | 59.4 | 12     | 40.4 | +1  | 4.5  | 12     | 43.7 | +0  | 38.9 | 55   | 2.9  | 102.2 | 25.7  |
| 30 | 203    | 58.5 | +4 | 55.7 | 13     | 36.1 | -4  | 42.9 | 13     | 39.6 | -5  | 9.7  | 59   | 26.6 | 101.4 | 11.5  |

# 月 球 升 沒 相 位 表

## 九 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 月 出   |     | 中 天   |     | 月 沒   |     | 相 位  | 視 半 徑 |    | 月地 距離<br>km | 月面中心 經度 緯度 |        | 轉軸 傾角 | 亮緣 方位角 |
|----|-------|-----|-------|-----|-------|-----|------|-------|----|-------------|------------|--------|-------|--------|
|    | 時間    | 方位  | 時間    | 仰角  | 時間    | 方位  |      | '     | "  |             | °          | °      |       |        |
| 1  | 7:15  | 85  | 13:36 | 67S | 19:52 | 272 | 0.04 | 16    | 41 | 358903      | -6.347     | 3.755  | 23.8  | 282.3  |
| 2  | 8:20  | 92  | 14:29 | 62S | 20:33 | 265 | 0.10 | 16    | 28 | 362247      | -6.553     | 5.649  | 22.4  | 285.8  |
| 3  | 9:23  | 98  | 15:21 | 56S | 21:15 | 259 | 0.19 | 16    | 11 | 366940      | -6.315     | 7.124  | 19.6  | 286.1  |
| 4  | 10:25 | 104 | 16:13 | 51S | 21:57 | 254 | 0.28 | 15    | 54 | 372505      | -5.688     | 8.094  | 15.8  | 284.5  |
| 5  | 11:26 | 108 | 17:05 | 47S | 22:41 | 250 | 0.39 | 15    | 36 | 378449      | -4.751     | 8.536  | 11.3  | 281.5  |
| 6  | 12:25 | 112 | 17:57 | 44S | 23:27 | 247 | 0.49 | 15    | 20 | 384330      | -3.587     | 8.478  | 6.2   | 277.4  |
| 7  | 13:22 | 114 | 18:49 | 42S |       |     | 0.59 | 15    | 6  | 389795      | -2.274     | 7.983  | 0.8   | 272.6  |
| 8  | 14:15 | 115 | 19:41 | 42S | 0:16  | 245 | 0.69 | 14    | 54 | 394600      | -0.884     | 7.133  | 355.4 | 267.3  |
| 9  | 15:05 | 115 | 20:32 | 42S | 1:07  | 245 | 0.77 | 14    | 45 | 398603      | 0.519      | 6.016  | 350.3 | 261.7  |
| 10 | 15:51 | 113 | 21:20 | 44S | 1:59  | 246 | 0.85 | 14    | 38 | 401749      | 1.880      | 4.713  | 345.8 | 255.9  |
| 11 | 16:32 | 110 | 22:07 | 47S | 2:52  | 248 | 0.91 | 14    | 34 | 404042      | 3.150      | 3.301  | 342.0 | 250.0  |
| 12 | 17:11 | 107 | 22:52 | 50S | 3:45  | 251 | 0.96 | 14    | 32 | 405530      | 4.281      | 1.841  | 339.1 | 243.2  |
| 13 | 17:46 | 102 | 23:35 | 54S | 4:36  | 255 | 0.99 | 14    | 32 | 406269      | 5.232      | 0.383  | 337.1 | 232.1  |
| 14 | 18:20 | 97  |       |     | 5:28  | 260 | 1.00 | 14    | 34 | 406314      | 5.965      | -1.034 | 336.1 | 188.7  |
| 15 | 18:52 | 92  | 0:17  | 59S | 6:18  | 265 | 0.99 | 14    | 38 | 405696      | 6.451      | -2.381 | 336.1 | 97.7   |
| 16 | 19:24 | 87  | 0:58  | 64S | 7:08  | 270 | 0.97 | 14    | 43 | 404423      | 6.665      | -3.636 | 337.0 | 81.5   |
| 17 | 19:58 | 82  | 1:39  | 68S | 7:59  | 275 | 0.93 | 14    | 50 | 402477      | 6.592      | -4.777 | 338.8 | 77.2   |
| 18 | 20:32 | 77  | 2:22  | 73S | 8:51  | 280 | 0.88 | 14    | 59 | 399829      | 6.225      | -5.779 | 341.5 | 76.4   |
| 19 | 21:10 | 73  | 3:06  | 77S | 9:44  | 285 | 0.80 | 15    | 9  | 396454      | 5.571      | -6.610 | 345.1 | 77.5   |
| 20 | 21:52 | 69  | 3:52  | 81S | 10:39 | 289 | 0.72 | 15    | 22 | 392354      | 4.642      | -7.227 | 349.4 | 80.0   |
| 21 | 22:38 | 66  | 4:42  | 84S | 11:36 | 293 | 0.62 | 15    | 36 | 387588      | 3.466      | -7.579 | 354.5 | 83.8   |
| 22 | 23:31 | 65  | 5:35  | 87S | 12:34 | 295 | 0.52 | 15    | 51 | 382288      | 2.083      | -7.603 | 0.1   | 88.7   |
| 23 |       |     | 6:31  | 88S | 13:31 | 295 | 0.41 | 16    | 7  | 376687      | 0.549      | -7.240 | 6.0   | 94.4   |
| 24 | 0:29  | 65  | 7:29  | 87S | 14:28 | 294 | 0.30 | 16    | 22 | 371115      | -1.058     | -6.440 | 11.7  | 100.6  |
| 25 | 1:31  | 67  | 8:28  | 85S | 15:21 | 291 | 0.20 | 16    | 36 | 365991      | -2.641     | -5.179 | 16.8  | 107.0  |
| 26 | 2:37  | 71  | 9:27  | 81S | 16:11 | 287 | 0.11 | 16    | 47 | 361783      | -4.081     | -3.483 | 20.7  | 113.4  |
| 27 | 3:44  | 76  | 10:24 | 76S | 16:57 | 281 | 0.05 | 16    | 53 | 358939      | -5.256     | -1.435 | 23.2  | 121.0  |
| 28 | 4:52  | 82  | 11:19 | 71S | 17:41 | 275 | 0.01 | 16    | 53 | 357812      | -6.056     | 0.815  | 24.0  | 137.7  |
| 29 | 5:58  | 88  | 12:14 | 65S | 18:23 | 268 | 0.00 | 16    | 47 | 358581      | -6.408     | 3.069  | 23.2  | 243.8  |
| 30 | 7:03  | 95  | 13:07 | 58S | 19:05 | 262 | 0.03 | 16    | 36 | 361206      | -6.292     | 5.117  | 20.9  | 277.0  |

# 月 球 位 置 表

## 十 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 地心黃道座標 |      |    |      | 地心赤道座標 |      |     |      | 地表赤道座標 |      |     |      | 地心地表 |      | 地平座標  |       |
|----|--------|------|----|------|--------|------|-----|------|--------|------|-----|------|------|------|-------|-------|
|    | 黃經     |      | 黃緯 |      | 赤經     |      | 赤緯  |      | 赤經     |      | 赤緯  |      | 視差   |      | 方位    | 仰角    |
|    | °      | '    | °  | '    | h      | m    | °   | '    | h      | m    | °   | '    | '    | "    | °     | °     |
| 1  | 218    | 46.6 | +4 | 32.1 | 14     | 31.5 | -10 | 7.4  | 14     | 35.1 | -10 | 32.8 | 59   | 55.2 | 100.6 | -2.3  |
| 2  | 233    | 8.9  | +3 | 51.8 | 15     | 27.0 | -14 | 49.0 | 15     | 30.7 | -15 | 10.7 | 56   | 53.8 | 99.7  | -15.7 |
| 3  | 247    | 1.7  | +2 | 58.7 | 16     | 22.9 | -18 | 32.6 | 16     | 26.3 | -18 | 49.2 | 51   | 5.2  | 98.7  | -28.5 |
| 4  | 260    | 24.8 | +1 | 57.4 | 17     | 18.9 | -21 | 8.3  | 17     | 21.9 | -21 | 19.7 | 43   | 16.2 | 97.2  | -40.8 |
| 5  | 273    | 20.6 | +0 | 52.0 | 18     | 14.5 | -22 | 31.7 | 18     | 16.9 | -22 | 38.8 | 34   | 9.8  | 95.0  | -52.7 |
| 6  | 285    | 53.3 | -0 | 14.2 | 19     | 9.1  | -22 | 43.5 | 19     | 10.8 | -22 | 48.0 | 24   | 22.1 | 90.8  | -64.0 |
| 7  | 298    | 8.0  | -1 | 18.1 | 20     | 2.1  | -21 | 48.4 | 20     | 3.1  | -21 | 52.2 | 14   | 29.4 | 81.1  | -74.7 |
| 8  | 310    | 9.8  | -2 | 17.3 | 20     | 53.1 | -19 | 53.9 | 20     | 53.3 | -19 | 58.7 | 6    | 18.6 | 41.3  | -83.2 |
| 9  | 322    | 3.7  | -3 | 9.8  | 21     | 42.0 | -17 | 8.6  | 21     | 41.6 | -17 | 16.0 | 9    | 8.8  | 321.9 | -80.2 |
| 10 | 333    | 54.1 | -3 | 53.7 | 22     | 29.0 | -13 | 42.1 | 22     | 28.0 | -13 | 53.1 | 17   | 58.5 | 302.0 | -70.5 |
| 11 | 345    | 44.6 | -4 | 27.4 | 23     | 14.5 | -9  | 43.6 | 23     | 13.0 | -9  | 58.5 | 26   | 53.9 | 295.5 | -60.1 |
| 12 | 357    | 37.9 | -4 | 49.6 | 23     | 59.0 | -5  | 22.2 | 23     | 57.0 | -5  | 41.1 | 35   | 8.8  | 292.3 | -49.4 |
| 13 | 9      | 36.2 | -4 | 59.2 | 0      | 43.1 | -0  | 47.0 | 0      | 40.7 | -1  | 9.2  | 42   | 21.9 | 290.2 | -38.6 |
| 14 | 21     | 40.8 | -4 | 55.6 | 1      | 27.5 | +3  | 52.6 | 1      | 24.8 | +3  | 28.0 | 48   | 15.5 | 288.7 | -27.6 |
| 15 | 33     | 52.7 | -4 | 38.3 | 2      | 12.9 | +8  | 26.4 | 2      | 9.8  | +8  | 0.9  | 52   | 32.8 | 287.4 | -16.5 |
| 16 | 46     | 12.6 | -4 | 7.9  | 2      | 59.8 | +12 | 43.4 | 2      | 56.5 | +12 | 18.5 | 54   | 58.3 | 286.2 | -5.2  |
| 17 | 58     | 41.4 | -3 | 25.3 | 3      | 49.0 | +16 | 31.5 | 3      | 45.5 | +16 | 8.9  | 55   | 19.2 | 284.9 | 6.3   |
| 18 | 71     | 20.5 | -2 | 31.9 | 4      | 40.7 | +19 | 37.8 | 4      | 37.1 | +19 | 18.8 | 53   | 25.5 | 283.4 | 18.0  |
| 19 | 84     | 11.5 | -1 | 29.9 | 5      | 35.0 | +21 | 48.8 | 5      | 31.6 | +21 | 34.3 | 49   | 11.4 | 281.5 | 29.9  |
| 20 | 97     | 16.6 | -0 | 21.9 | 6      | 31.6 | +22 | 52.3 | 6      | 28.6 | +22 | 42.2 | 42   | 36.7 | 278.7 | 42.0  |
| 21 | 110    | 38.6 | +0 | 48.8 | 7      | 29.8 | +22 | 39.3 | 7      | 27.4 | +22 | 32.4 | 33   | 50.3 | 274.2 | 54.3  |
| 22 | 124    | 19.6 | +1 | 58.4 | 8      | 28.6 | +21 | 5.5  | 8      | 27.0 | +20 | 59.6 | 23   | 20.3 | 265.0 | 66.6  |
| 23 | 138    | 21.2 | +3 | 2.6  | 9      | 27.1 | +18 | 13.1 | 9      | 26.4 | +18 | 5.7  | 12   | 52.9 | 238.3 | 77.4  |
| 24 | 152    | 43.4 | +3 | 56.9 | 10     | 24.6 | +14 | 10.9 | 10     | 24.7 | +13 | 59.5 | 11   | 39.2 | 168.4 | 78.6  |
| 25 | 167    | 23.8 | +4 | 36.8 | 11     | 20.9 | +9  | 13.5 | 11     | 21.9 | +8  | 56.5 | 22   | 30.9 | 134.7 | 68.0  |
| 26 | 182    | 17.2 | +4 | 58.7 | 12     | 16.3 | +3  | 39.5 | 12     | 18.1 | +3  | 16.7 | 34   | 52.8 | 123.7 | 54.8  |
| 27 | 197    | 15.8 | +5 | 0.4  | 13     | 11.3 | -2  | 9.0  | 13     | 13.7 | -2  | 36.4 | 45   | 39.8 | 118.4 | 41.0  |
| 28 | 212    | 10.3 | +4 | 41.6 | 14     | 6.5  | -7  | 48.9 | 14     | 9.5  | -8  | 18.7 | 53   | 36.1 | 114.9 | 27.2  |
| 29 | 226    | 51.5 | +4 | 4.4  | 15     | 2.3  | -12 | 57.7 | 15     | 5.7  | -13 | 27.1 | 58   | 5.0  | 112.2 | 13.6  |
| 30 | 241    | 11.7 | +3 | 12.4 | 15     | 59.0 | -17 | 15.4 | 16     | 2.7  | -17 | 41.9 | 59   | 2.8  | 109.8 | 0.4   |
| 31 | 255    | 6.2  | +2 | 10.1 | 16     | 56.3 | -20 | 26.9 | 17     | 0.1  | -20 | 48.6 | 56   | 51.1 | 107.4 | -12.4 |

# 月 球 升 沒 相 位 表

## 十 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 月出    |     | 中天    |     | 月沒    |     | 相位   | 視半徑 |    | 月地距離<br>km | 月面中心   |        | 轉軸傾角<br>° | 亮緣方位角<br>° |
|----|-------|-----|-------|-----|-------|-----|------|-----|----|------------|--------|--------|-----------|------------|
|    | 時間    | 方位  | 時間    | 仰角  | 時間    | 方位  |      | '   | "  |            | 經度     | 緯度     |           |            |
|    | h     | m ° | h     | m ° | h     | m ° |      |     |    | °          | °      |        |           |            |
| 1  | 8:08  | 101 | 14:01 | 53S | 19:48 | 256 | 0.08 | 16  | 20 | 365433     | -5.743 | 6.779  | 17.4      | 281.2      |
| 2  | 9:11  | 107 | 14:54 | 48S | 20:33 | 251 | 0.15 | 16  | 2  | 370843     | -4.837 | 7.935  | 13.0      | 280.3      |
| 3  | 10:13 | 111 | 15:48 | 45S | 21:20 | 248 | 0.24 | 15  | 43 | 376930     | -3.668 | 8.535  | 7.8       | 277.4      |
| 4  | 11:13 | 114 | 16:42 | 42S | 22:09 | 245 | 0.34 | 15  | 25 | 383181     | -2.332 | 8.590  | 2.3       | 273.1      |
| 5  | 12:09 | 115 | 17:35 | 41S | 23:01 | 245 | 0.44 | 15  | 9  | 389138     | -0.916 | 8.160  | 356.8     | 268.2      |
| 6  | 13:01 | 115 | 18:27 | 42S | 23:54 | 245 | 0.54 | 14  | 56 | 394438     | 0.509  | 7.329  | 351.5     | 263.0      |
| 7  | 13:49 | 114 | 19:17 | 43S |       |     | 0.63 | 14  | 45 | 398830     | 1.882  | 6.194  | 346.8     | 257.9      |
| 8  | 14:32 | 111 | 20:04 | 46S | 0:47  | 247 | 0.72 | 14  | 37 | 402174     | 3.154  | 4.852  | 342.8     | 253.0      |
| 9  | 15:11 | 108 | 20:50 | 49S | 1:40  | 250 | 0.80 | 14  | 33 | 404429     | 4.284  | 3.391  | 339.7     | 248.5      |
| 10 | 15:47 | 104 | 21:33 | 53S | 2:32  | 254 | 0.87 | 14  | 31 | 405632     | 5.234  | 1.891  | 337.5     | 244.2      |
| 11 | 16:21 | 99  | 22:15 | 57S | 3:23  | 258 | 0.92 | 14  | 31 | 405876     | 5.971  | 0.414  | 336.3     | 239.8      |
| 12 | 16:54 | 94  | 22:57 | 62S | 4:14  | 263 | 0.96 | 14  | 34 | 405285     | 6.464  | -0.989 | 336.1     | 234.1      |
| 13 | 17:26 | 89  | 23:38 | 67S | 5:04  | 268 | 0.99 | 14  | 38 | 403991     | 6.690  | -2.284 | 336.8     | 221.2      |
| 14 | 17:59 | 84  |       |     | 5:55  | 274 | 1.00 | 14  | 45 | 402115     | 6.633  | -3.449 | 338.4     | 152.1      |
| 15 | 18:33 | 79  | 0:20  | 72S | 6:47  | 279 | 0.99 | 14  | 53 | 399752     | 6.284  | -4.468 | 340.9     | 92.3       |
| 16 | 19:10 | 74  | 1:04  | 76S | 7:40  | 284 | 0.96 | 15  | 2  | 396966     | 5.647  | -5.330 | 344.2     | 83.4       |
| 17 | 19:50 | 70  | 1:50  | 80S | 8:35  | 288 | 0.91 | 15  | 12 | 393791     | 4.740  | -6.021 | 348.3     | 82.5       |
| 18 | 20:35 | 67  | 2:39  | 84S | 9:31  | 292 | 0.85 | 15  | 23 | 390248     | 3.593  | -6.519 | 353.2     | 84.5       |
| 19 | 21:25 | 65  | 3:31  | 86S | 10:28 | 294 | 0.77 | 15  | 35 | 386355     | 2.250  | -6.793 | 358.6     | 88.2       |
| 20 | 22:20 | 65  | 4:25  | 88S | 11:26 | 295 | 0.67 | 15  | 48 | 382164     | 0.767  | -6.801 | 4.4       | 93.0       |
| 21 | 23:20 | 66  | 5:21  | 88S | 12:21 | 295 | 0.56 | 16  | 2  | 377777     | -0.783 | -6.497 | 10.0      | 98.4       |
| 22 |       |     | 6:18  | 86S | 13:14 | 293 | 0.45 | 16  | 15 | 373368     | -2.316 | -5.835 | 15.2      | 104.0      |
| 23 | 0:22  | 69  | 7:15  | 83S | 14:03 | 289 | 0.34 | 16  | 27 | 369195     | -3.734 | -4.789 | 19.4      | 109.2      |
| 24 | 1:27  | 73  | 8:10  | 79S | 14:49 | 284 | 0.23 | 16  | 37 | 365582     | -4.932 | -3.364 | 22.3      | 113.8      |
| 25 | 2:32  | 79  | 9:05  | 74S | 15:32 | 278 | 0.14 | 16  | 44 | 362892     | -5.809 | -1.615 | 23.8      | 117.8      |
| 26 | 3:36  | 85  | 9:58  | 68S | 16:14 | 272 | 0.07 | 16  | 46 | 361467     | -6.279 | 0.351  | 23.7      | 121.9      |
| 27 | 4:41  | 92  | 10:51 | 62S | 16:55 | 265 | 0.02 | 16  | 43 | 361562     | -6.297 | 2.373  | 22.1      | 129.3      |
| 28 | 5:46  | 98  | 11:44 | 56S | 17:37 | 259 | 0.00 | 16  | 35 | 363284     | -5.862 | 4.271  | 19.1      | 184.4      |
| 29 | 6:51  | 104 | 12:38 | 50S | 18:21 | 253 | 0.01 | 16  | 22 | 366557     | -5.025 | 5.872  | 15.0      | 269.2      |
| 30 | 7:55  | 109 | 13:33 | 46S | 19:08 | 249 | 0.05 | 16  | 6  | 371125     | -3.873 | 7.045  | 10.1      | 275.2      |
| 31 | 8:57  | 113 | 14:29 | 43S | 19:58 | 246 | 0.11 | 15  | 48 | 376594     | -2.510 | 7.718  | 4.5       | 273.5      |

# 月 球 位 置 表

## 十 一 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 地心黃道座標 |      |    |      | 地心赤道座標 |      |     |      | 地表赤道座標 |      |     |      | 地心地表 |      | 地平座標  |       |
|----|--------|------|----|------|--------|------|-----|------|--------|------|-----|------|------|------|-------|-------|
|    | 黃經     |      | 黃緯 |      | 赤經     |      | 赤緯  |      | 赤經     |      | 赤緯  |      | 視差   |      | 方位    | 仰角    |
|    | °      | '    | °  | '    | h      | m    | °   | '    | h      | m    | °   | '    | '    | "    | °     | °     |
| 1  | 268    | 33.0 | +1 | 23   | 17     | 53.7 | -22 | 23.4 | 17     | 57.3 | -22 | 39.8 | 52   | 6.7  | 104.7 | -24.6 |
| 2  | 281    | 33.3 | -0 | 6.7  | 18     | 50.3 | -23 | 2.7  | 18     | 53.5 | -23 | 14.4 | 45   | 30.5 | 101.3 | -36.3 |
| 3  | 294    | 9.9  | -1 | 13.5 | 19     | 45.2 | -22 | 28.9 | 19     | 47.8 | -22 | 37.4 | 37   | 41.7 | 96.8  | -47.4 |
| 4  | 306    | 27.5 | -2 | 15.2 | 20     | 37.8 | -20 | 50.2 | 20     | 39.8 | -20 | 57.3 | 29   | 16.8 | 89.8  | -57.8 |
| 5  | 318    | 31.0 | -3 | 9.6  | 21     | 27.9 | -18 | 16.7 | 21     | 29.3 | -18 | 24.3 | 20   | 59.8 | 77.4  | -67.3 |
| 6  | 330    | 25.7 | -3 | 55.1 | 22     | 15.7 | -14 | 59.0 | 22     | 16.4 | -15 | 8.6  | 14   | 20.8 | 52.0  | -74.6 |
| 7  | 342    | 16.6 | -4 | 30.3 | 23     | 1.6  | -11 | 6.8  | 23     | 1.8  | -11 | 19.6 | 12   | 55.3 | 9.0   | -76.0 |
| 8  | 354    | 8.3  | -4 | 53.8 | 23     | 46.3 | -6  | 49.3 | 23     | 45.8 | -7  | 6.0  | 17   | 58.1 | 336.2 | -70.5 |
| 9  | 6      | 4.5  | -5 | 4.7  | 0      | 30.4 | -2  | 15.1 | 0      | 29.4 | -2  | 35.9 | 25   | 37.0 | 320.1 | -61.7 |
| 10 | 18     | 8.3  | -5 | 2.3  | 1      | 14.6 | +2  | 27.1 | 1      | 13.1 | +2  | 2.5  | 33   | 38.8 | 311.3 | -51.8 |
| 11 | 30     | 21.6 | -4 | 46.0 | 1      | 59.7 | +7  | 7.7  | 1      | 57.7 | +6  | 40.1 | 41   | 10.4 | 305.7 | -41.4 |
| 12 | 42     | 45.8 | -4 | 16.1 | 2      | 46.5 | +11 | 35.7 | 2      | 44.0 | +11 | 6.4  | 47   | 39.4 | 301.6 | -30.5 |
| 13 | 55     | 21.3 | -3 | 33.3 | 3      | 35.6 | +15 | 38.7 | 3      | 32.6 | +15 | 9.3  | 52   | 39.2 | 298.1 | -19.4 |
| 14 | 68     | 8.3  | -2 | 39.1 | 4      | 27.3 | +19 | 2.6  | 4      | 23.9 | +18 | 34.9 | 55   | 46.1 | 294.9 | -7.9  |
| 15 | 81     | 6.6  | -1 | 35.8 | 5      | 21.8 | +21 | 32.7 | 5      | 18.1 | +21 | 8.5  | 56   | 41.2 | 291.6 | 3.7   |
| 16 | 94     | 16.2 | -0 | 26.4 | 6      | 18.5 | +22 | 55.7 | 6      | 14.8 | +22 | 36.0 | 55   | 12.2 | 288.1 | 15.5  |
| 17 | 107    | 37.1 | +0 | 45.7 | 7      | 16.8 | +23 | 1.9  | 7      | 13.3 | +22 | 46.7 | 51   | 15.9 | 283.8 | 27.4  |
| 18 | 121    | 9.9  | +1 | 56.3 | 8      | 15.4 | +21 | 47.3 | 8      | 12.3 | +21 | 35.6 | 45   | 1.3  | 278.1 | 39.3  |
| 19 | 134    | 55.1 | +3 | 1.4  | 9      | 13.3 | +19 | 14.8 | 9      | 10.8 | +19 | 4.4  | 36   | 55.3 | 269.7 | 51.0  |
| 20 | 148    | 52.9 | +3 | 56.8 | 10     | 9.8  | +15 | 33.4 | 10     | 8.0  | +15 | 21.9 | 28   | 0.1  | 255.3 | 61.6  |
| 21 | 163    | 3.1  | +4 | 38.6 | 11     | 4.8  | +10 | 56.6 | 11     | 3.8  | +10 | 41.6 | 20   | 47.7 | 228.3 | 69.4  |
| 22 | 177    | 23.9 | +5 | 3.6  | 11     | 58.5 | +5  | 40.6 | 11     | 58.3 | +5  | 20.5 | 20   | 13.5 | 188.3 | 70.0  |
| 23 | 191    | 52.3 | +5 | 9.7  | 12     | 51.7 | +0  | 3.6  | 12     | 52.3 | -0  | 22.0 | 27   | 8.7  | 158.4 | 62.8  |
| 24 | 206    | 23.5 | +4 | 56.0 | 13     | 45.1 | -5  | 34.8 | 13     | 46.5 | -6  | 5.2  | 36   | 38.4 | 142.3 | 52.0  |
| 25 | 220    | 51.7 | +4 | 23.4 | 14     | 39.3 | -10 | 54.4 | 14     | 41.4 | -11 | 27.8 | 45   | 31.2 | 132.9 | 40.0  |
| 26 | 235    | 10.4 | +3 | 34.6 | 15     | 34.9 | -15 | 34.9 | 15     | 37.6 | -16 | 8.9  | 52   | 20.2 | 126.3 | 27.6  |
| 27 | 249    | 14.0 | +2 | 33.5 | 16     | 31.8 | -19 | 18.2 | 16     | 35.1 | -19 | 50.2 | 56   | 27.5 | 121.1 | 15.3  |
| 28 | 262    | 58.1 | +1 | 24.6 | 17     | 29.7 | -21 | 50.5 | 17     | 33.3 | -22 | 18.4 | 57   | 45.9 | 116.5 | 3.2   |
| 29 | 276    | 20.1 | +0 | 12.6 | 18     | 27.6 | -23 | 4.5  | 18     | 31.3 | -23 | 27.3 | 56   | 29.6 | 112.0 | -8.5  |
| 30 | 289    | 19.6 | -0 | 58.2 | 19     | 24.3 | -23 | 0.2  | 19     | 27.9 | -23 | 18.1 | 53   | 5.4  | 107.3 | -19.6 |



# 月 球 升 沒 相 位 表

## 十 一 月

東經：121°31'05" · 北緯：25°05'44"

世界時 0 時

| 日<br>期 | 月 出   |     | 中 天   |     | 月 沒   |     | 相<br>位 | 視<br>半 徑<br>' " | 月地<br>距離<br>km | 月面中心   |        | 轉軸<br>傾角<br>° | 亮緣<br>方位角<br>° |
|--------|-------|-----|-------|-----|-------|-----|--------|-----------------|----------------|--------|--------|---------------|----------------|
|        | 時間    | 方位  | 時間    | 仰角  | 時間    | 方位  |        |                 |                | 經度     | 緯度     |               |                |
|        | h     | m ° | h     | m ° | h     | m ° |        |                 |                | °      | °      |               |                |
| 1      | 9:57  | 115 | 15:24 | 42S | 20:50 | 244 | 0.19   | 15 31           | 382492         | -1.038 | 7.876  | 358.8         | 269.7          |
| 2      | 10:53 | 116 | 16:18 | 41S | 21:44 | 245 | 0.27   | 15 14           | 388341         | 0.452  | 7.555  | 353.2         | 264.9          |
| 3      | 11:44 | 115 | 17:10 | 42S | 22:38 | 246 | 0.37   | 14 60           | 393708         | 1.887  | 6.821  | 348.1         | 260.0          |
| 4      | 12:29 | 113 | 17:59 | 44S | 23:32 | 249 | 0.46   | 14 48           | 398245         | 3.212  | 5.762  | 343.8         | 255.4          |
| 5      | 13:10 | 110 | 18:46 | 47S |       |     | 0.56   | 14 39           | 401709         | 4.381  | 4.472  | 340.4         | 251.2          |
| 6      | 13:48 | 106 | 19:30 | 51S | 0:25  | 252 | 0.65   | 14 34           | 403964         | 5.361  | 3.044  | 338.0         | 247.7          |
| 7      | 14:22 | 101 | 20:13 | 55S | 1:17  | 256 | 0.74   | 14 32           | 404984         | 6.123  | 1.566  | 336.5         | 244.8          |
| 8      | 14:55 | 96  | 20:54 | 60S | 2:07  | 261 | 0.81   | 14 32           | 404830         | 6.640  | 0.113  | 336.1         | 242.4          |
| 9      | 15:27 | 91  | 21:35 | 65S | 2:58  | 266 | 0.88   | 14 36           | 403639         | 6.893  | -1.250 | 336.5         | 240.5          |
| 10     | 16:00 | 86  | 22:17 | 70S | 3:49  | 272 | 0.93   | 14 41           | 401599         | 6.862  | -2.475 | 337.9         | 238.5          |
| 11     | 16:33 | 80  | 23:01 | 75S | 4:40  | 277 | 0.97   | 14 49           | 398924         | 6.539  | -3.527 | 340.1         | 235.0          |
| 12     | 17:09 | 75  | 23:46 | 79S | 5:33  | 282 | 0.99   | 14 58           | 395831         | 5.924  | -4.385 | 343.3         | 220.6          |
| 13     | 17:49 | 71  |       |     | 6:28  | 287 | 1.00   | 15 8            | 392516         | 5.029  | -5.040 | 347.2         | 118.5          |
| 14     | 18:33 | 68  | 0:35  | 83S | 7:25  | 291 | 0.98   | 15 19           | 389134         | 3.883  | -5.486 | 351.9         | 91.0           |
| 15     | 19:21 | 65  | 1:26  | 86S | 8:23  | 294 | 0.94   | 15 30           | 385793         | 2.532  | -5.721 | 357.3         | 89.5           |
| 16     | 20:15 | 64  | 2:21  | 88S | 9:22  | 295 | 0.88   | 15 41           | 382556         | 1.038  | -5.739 | 3.0           | 92.4           |
| 17     | 21:14 | 65  | 3:17  | 88S | 10:18 | 295 | 0.81   | 15 52           | 379452         | -0.523 | -5.531 | 8.7           | 96.9           |
| 18     | 22:15 | 67  | 4:14  | 87S | 11:11 | 294 | 0.71   | 16 2            | 376499         | -2.064 | -5.081 | 14.0          | 101.8          |
| 19     | 23:18 | 71  | 5:10  | 84S | 12:01 | 291 | 0.61   | 16 12           | 373732         | -3.493 | -4.376 | 18.4          | 106.6          |
| 20     |       |     | 6:05  | 81S | 12:47 | 286 | 0.49   | 16 20           | 371224         | -4.714 | -3.411 | 21.6          | 110.7          |
| 21     | 0:21  | 76  | 6:58  | 76S | 13:29 | 281 | 0.38   | 16 27           | 369103         | -5.638 | -2.198 | 23.5          | 113.9          |
| 22     | 1:23  | 82  | 7:49  | 70S | 14:10 | 275 | 0.27   | 16 31           | 367548         | -6.189 | -0.780 | 23.9          | 116.1          |
| 23     | 2:26  | 89  | 8:40  | 64S | 14:49 | 268 | 0.17   | 16 32           | 366768         | -6.318 | 0.769  | 22.8          | 117.2          |
| 24     | 3:28  | 95  | 9:32  | 58S | 15:29 | 262 | 0.09   | 16 30           | 366964         | -6.007 | 2.344  | 20.4          | 117.5          |
| 25     | 4:31  | 101 | 10:24 | 53S | 16:11 | 256 | 0.03   | 16 24           | 368280         | -5.281 | 3.822  | 16.9          | 118.1          |
| 26     | 5:35  | 107 | 11:17 | 48S | 16:56 | 251 | 0.01   | 16 14           | 370762         | -4.202 | 5.081  | 12.3          | 126.4          |
| 27     | 6:38  | 111 | 12:13 | 44S | 17:44 | 247 | 0.00   | 16 2            | 374325         | -2.860 | 6.020  | 6.9           | 257.6          |
| 28     | 7:40  | 114 | 13:09 | 42S | 18:36 | 245 | 0.03   | 15 47           | 378756         | -1.360 | 6.568  | 1.2           | 269.7          |
| 29     | 8:39  | 116 | 14:05 | 41S | 19:30 | 244 | 0.07   | 15 32           | 383734         | 0.196  | 6.698  | 355.4         | 267.3          |
| 30     | 9:34  | 116 | 14:59 | 41S | 20:25 | 245 | 0.13   | 15 17           | 388870         | 1.717  | 6.418  | 349.9         | 262.9          |

# 月 球 位 置 表

## 十 二 月

東經：121°31'05"，北緯：25°05'44"

世界時 0 時

| 日期 | 地心黃道座標 |      |    |      | 地心赤道座標 |      |     |      | 地表赤道座標 |      |     |      | 地心地表 |      | 地平座標  |       |
|----|--------|------|----|------|--------|------|-----|------|--------|------|-----|------|------|------|-------|-------|
|    | 黃經     |      | 黃緯 |      | 赤經     |      | 赤緯  |      | 赤經     |      | 赤緯  |      | 視差   |      | 方位    | 仰角    |
|    | °      | '    | °  | '    | h      | m    | °   | '    | h      | m    | °   | '    | '    | "    | °     | °     |
| 1  | 301    | 58.1 | -2 | 4.3  | 20     | 18.9 | -21 | 44.2 | 20     | 22.2 | -21 | 58.4 | 48   | 5.5  | 101.8 | -30.2 |
| 2  | 314    | 18.6 | -3 | 3.0  | 21     | 10.8 | -19 | 27.2 | 21     | 13.7 | -19 | 39.2 | 42   | 3.1  | 95.2  | -40.2 |
| 3  | 326    | 24.9 | -3 | 52.5 | 22     | 0.1  | -16 | 21.0 | 22     | 2.4  | -16 | 32.8 | 35   | 32.3 | 86.3  | -49.4 |
| 4  | 338    | 21.8 | -4 | 31.1 | 22     | 46.9 | -12 | 37.2 | 22     | 48.7 | -12 | 50.3 | 29   | 14.4 | 73.9  | -57.4 |
| 5  | 350    | 14.1 | -4 | 57.8 | 23     | 32.0 | -8  | 25.8 | 23     | 33.2 | -8  | 41.5 | 24   | 10.4 | 55.6  | -63.4 |
| 6  | 2      | 6.7  | -5 | 11.9 | 0      | 16.0 | -3  | 55.8 | 0      | 16.7 | -4  | 15.1 | 21   | 50.7 | 31.0  | -66.1 |
| 7  | 14     | 4.3  | -5 | 12.6 | 0      | 59.9 | +0  | 44.7 | 1      | 0.0  | +0  | 21.4 | 23   | 23.2 | 5.1   | -64.4 |
| 8  | 26     | 10.9 | -4 | 59.5 | 1      | 44.4 | +5  | 27.1 | 1      | 43.9 | +4  | 59.7 | 28   | 10.5 | 344.9 | -58.9 |
| 9  | 38     | 29.9 | -4 | 32.4 | 2      | 30.4 | +10 | 1.8  | 2      | 29.3 | +9  | 30.9 | 34   | 38.5 | 330.7 | -51.1 |
| 10 | 51     | 3.5  | -3 | 51.9 | 3      | 18.7 | +14 | 17.3 | 3      | 17.0 | +13 | 43.9 | 41   | 31.7 | 320.6 | -41.9 |
| 11 | 63     | 53.2 | -2 | 58.9 | 4      | 9.9  | +17 | 59.7 | 4      | 7.6  | +17 | 25.4 | 47   | 57.1 | 312.9 | -31.8 |
| 12 | 76     | 59.2 | -1 | 55.4 | 5      | 4.2  | +20 | 53.2 | 5      | 1.3  | +20 | 19.9 | 53   | 13.3 | 306.4 | -21.2 |
| 13 | 90     | 20.7 | -0 | 44.3 | 6      | 1.5  | +22 | 41.9 | 5      | 58.0 | +22 | 11.6 | 56   | 46.1 | 300.5 | -10.1 |
| 14 | 103    | 56.2 | +0 | 30.6 | 7      | 0.8  | +23 | 12.9 | 6      | 57.0 | +22 | 46.9 | 58   | 9.3  | 294.7 | 1.2   |
| 15 | 117    | 43.4 | +1 | 44.9 | 8      | 0.7  | +22 | 19.6 | 7      | 56.9 | +21 | 58.3 | 57   | 9.0  | 288.6 | 12.7  |
| 16 | 131    | 40.0 | +2 | 53.8 | 8      | 59.9 | +20 | 3.9  | 8      | 56.3 | +19 | 46.2 | 53   | 46.7 | 281.5 | 24.0  |
| 17 | 145    | 43.6 | +3 | 52.8 | 9      | 57.4 | +16 | 35.5 | 9      | 54.2 | +16 | 19.5 | 48   | 23.7 | 272.9 | 35.0  |
| 18 | 159    | 51.9 | +4 | 38.1 | 10     | 52.8 | +12 | 9.5  | 10     | 50.2 | +11 | 52.8 | 41   | 45.0 | 261.5 | 45.1  |
| 19 | 174    | 2.7  | +5 | 6.6  | 11     | 46.3 | +7  | 3.3  | 11     | 44.3 | +6  | 43.8 | 35   | 7.9  | 245.4 | 53.5  |
| 20 | 188    | 13.8 | +5 | 16.5 | 12     | 38.6 | +1  | 35.1 | 12     | 37.3 | +1  | 11.2 | 30   | 31.8 | 223.1 | 58.8  |
| 21 | 202    | 23.2 | +5 | 7.3  | 13     | 30.4 | -3  | 57.3 | 13     | 29.9 | -4  | 26.2 | 30   | 0.9  | 196.9 | 59.3  |
| 22 | 216    | 28.3 | +4 | 39.6 | 14     | 22.8 | -9  | 16.2 | 14     | 23.0 | -9  | 49.8 | 33   | 44.5 | 173.6 | 54.8  |
| 23 | 230    | 26.6 | +3 | 55.5 | 15     | 16.3 | -14 | 4.3  | 15     | 17.3 | -14 | 41.1 | 39   | 44.1 | 156.4 | 47.1  |
| 24 | 244    | 15.4 | +2 | 58.1 | 16     | 11.4 | -18 | 4.5  | 16     | 13.2 | -18 | 42.5 | 45   | 57.1 | 144.1 | 37.7  |
| 25 | 257    | 52.1 | +1 | 51.3 | 17     | 8.0  | -21 | 2.1  | 17     | 10.5 | -21 | 39.0 | 51   | 7.2  | 134.7 | 27.5  |
| 26 | 271    | 14.5 | +0 | 39.5 | 18     | 5.4  | -22 | 46.3 | 18     | 8.5  | -23 | 20.0 | 54   | 35.9 | 127.0 | 17.1  |
| 27 | 284    | 20.9 | -0 | 33.0 | 19     | 2.6  | -23 | 12.7 | 19     | 6.1  | -23 | 41.9 | 56   | 10.1 | 120.2 | 6.8   |
| 28 | 297    | 10.9 | -1 | 42.4 | 19     | 58.4 | -22 | 23.7 | 20     | 2.0  | -22 | 48.2 | 55   | 53.4 | 113.7 | -3.3  |
| 29 | 309    | 44.6 | -2 | 45.4 | 20     | 51.9 | -20 | 27.7 | 20     | 55.4 | -20 | 48.2 | 54   | 0.7  | 107.1 | -12.9 |
| 30 | 322    | 3.7  | -3 | 39.3 | 21     | 42.7 | -17 | 36.6 | 21     | 46.0 | -17 | 54.4 | 50   | 52.2 | 100.1 | -22.1 |
| 31 | 334    | 10.5 | -4 | 22.5 | 22     | 30.8 | -14 | 2.9  | 22     | 33.8 | -14 | 19.6 | 46   | 51.6 | 92.2  | -30.7 |

# 月 球 升 沒 相 位 表

## 十 二 月

東經：121°31'05" · 北緯：25°05'44"

世界時 0 時

| 日<br>期 | 月 出   |     | 中 天   |     | 月 沒   |     | 相<br>位 | 視<br>半 徑 | 月地<br>距離<br>km | 月面中心   |        | 轉軸<br>傾角<br>° | 亮緣<br>方位角<br>° |       |
|--------|-------|-----|-------|-----|-------|-----|--------|----------|----------------|--------|--------|---------------|----------------|-------|
|        | 時間    | 方位  | 時間    | 仰角  | 時間    | 方位  |        |          |                | 經度     | 緯度     |               |                |       |
|        | h     | m   | °     | h   | m     | °   |        | '        | "              | °      | °      |               | °              |       |
| 1      | 10:23 | 114 | 15:51 | 43S | 21:21 | 247 | 0.21   | 15       | 3              | 393762 | 3.132  | 5.766         | 345.2          | 258.4 |
| 2      | 11:06 | 111 | 16:39 | 46S | 22:15 | 250 | 0.29   | 14       | 51             | 398032 | 4.386  | 4.803         | 341.4          | 254.2 |
| 3      | 11:46 | 108 | 17:25 | 49S | 23:08 | 254 | 0.38   | 14       | 42             | 401367 | 5.441  | 3.604         | 338.6          | 250.7 |
| 4      | 12:21 | 103 | 18:08 | 54S | 23:59 | 259 | 0.48   | 14       | 36             | 403540 | 6.266  | 2.249         | 336.9          | 247.9 |
| 5      | 12:55 | 98  | 18:50 | 58S |       |     | 0.57   | 14       | 34             | 404426 | 6.841  | 0.822         | 336.1          | 245.9 |
| 6      | 13:27 | 93  | 19:31 | 63S | 0:50  | 264 | 0.66   | 14       | 34             | 404004 | 7.149  | -0.594        | 336.3          | 244.6 |
| 7      | 13:59 | 88  | 20:12 | 68S | 1:40  | 269 | 0.75   | 14       | 38             | 402352 | 7.176  | -1.927        | 337.4          | 244.2 |
| 8      | 14:32 | 83  | 20:55 | 73S | 2:31  | 275 | 0.82   | 14       | 45             | 399644 | 6.913  | -3.109        | 339.4          | 244.4 |
| 9      | 15:06 | 78  | 21:39 | 77S | 3:23  | 280 | 0.89   | 14       | 54             | 396123 | 6.356  | -4.087        | 342.2          | 245.3 |
| 10     | 15:44 | 73  | 22:27 | 81S | 4:17  | 285 | 0.94   | 15       | 4              | 392086 | 5.513  | -4.820        | 345.9          | 246.6 |
| 11     | 16:27 | 69  | 23:18 | 85S | 5:14  | 289 | 0.98   | 15       | 16             | 387849 | 4.402  | -5.284        | 350.4          | 246.9 |
| 12     | 17:14 | 66  |       |     | 6:13  | 293 | 1.00   | 15       | 28             | 383719 | 3.063  | -5.466        | 355.6          | 229.0 |
| 13     | 18:08 | 64  | 0:12  | 87S | 7:12  | 295 | 0.99   | 15       | 41             | 379955 | 1.554  | -5.371        | 1.3            | 97.7  |
| 14     | 19:06 | 65  | 1:09  | 88S | 8:11  | 296 | 0.97   | 15       | 52             | 376746 | -0.046 | -5.013        | 7.1            | 95.6  |
| 15     | 20:08 | 66  | 2:07  | 88S | 9:07  | 295 | 0.91   | 16       | 1              | 374195 | -1.645 | -4.416        | 12.7           | 99.4  |
| 16     | 21:11 | 70  | 3:05  | 85S | 9:59  | 292 | 0.84   | 16       | 9              | 372326 | -3.140 | -3.609        | 17.4           | 103.9 |
| 17     | 22:15 | 75  | 4:01  | 82S | 10:46 | 288 | 0.75   | 16       | 15             | 371096 | -4.430 | -2.630        | 20.9           | 108.0 |
| 18     | 23:17 | 80  | 4:55  | 77S | 11:30 | 283 | 0.64   | 16       | 19             | 370434 | -5.425 | -1.518        | 23.1           | 111.2 |
| 19     |       |     | 5:46  | 72S | 12:10 | 277 | 0.53   | 16       | 22             | 370270 | -6.055 | -0.321        | 23.9           | 113.2 |
| 20     | 0:18  | 86  | 6:37  | 66S | 12:49 | 270 | 0.41   | 16       | 22             | 370563 | -6.275 | 0.909         | 23.2           | 114.1 |
| 21     | 1:19  | 93  | 7:26  | 61S | 13:28 | 264 | 0.30   | 16       | 20             | 371316 | -6.070 | 2.113         | 21.3           | 113.7 |
| 22     | 2:20  | 99  | 8:16  | 55S | 14:07 | 258 | 0.20   | 16       | 16             | 372568 | -5.458 | 3.231         | 18.2           | 112.0 |
| 23     | 3:21  | 105 | 9:08  | 50S | 14:50 | 253 | 0.12   | 16       | 9              | 374380 | -4.485 | 4.201         | 14.0           | 109.1 |
| 24     | 4:23  | 109 | 10:01 | 46S | 15:35 | 249 | 0.06   | 16       | 1              | 376798 | -3.225 | 4.967         | 9.0            | 105.0 |
| 25     | 5:25  | 113 | 10:55 | 43S | 16:24 | 246 | 0.02   | 15       | 51             | 379825 | -1.767 | 5.481         | 3.4            | 99.9  |
| 26     | 6:25  | 115 | 11:51 | 41S | 17:16 | 244 | 0.00   | 15       | 39             | 383392 | -0.207 | 5.710         | 357.6          | 91.8  |
| 27     | 7:21  | 116 | 12:46 | 41S | 18:12 | 244 | 0.01   | 15       | 27             | 387351 | 1.358  | 5.636         | 352.0          | 269.7 |
| 28     | 8:13  | 115 | 13:39 | 42S | 19:08 | 246 | 0.04   | 15       | 15             | 391478 | 2.847  | 5.257         | 346.9          | 264.0 |
| 29     | 9:00  | 113 | 14:30 | 45S | 20:03 | 249 | 0.08   | 15       | 3              | 395492 | 4.190  | 4.591         | 342.7          | 259.0 |
| 30     | 9:41  | 109 | 15:18 | 48S | 20:57 | 253 | 0.15   | 14       | 53             | 399088 | 5.336  | 3.669         | 339.5          | 254.8 |
| 31     | 10:19 | 105 | 16:02 | 52S | 21:50 | 257 | 0.22   | 14       | 44             | 401965 | 6.249  | 2.537         | 337.4          | 251.5 |

# 行 星 表

行星表包含太陽系 8 大行星的赤經、赤緯、距離、視亮度、視直徑、出沒時間、方位、光程、相位、日地離角等資料；以及冥王星、穀神星、智神星、婚神星、灶神星的赤經、赤緯、升沒時間、與視亮度。

## 一、視赤經、視赤緯

行星雖然都在黃道面附近繞日運行，但其位置一般皆使用赤道座標來標示。由於赤道儀也具備視赤經與視赤緯的刻度，所以本表行星的位置也採用地表視赤經與視赤緯。

## 二、距離、光程

距離與光程都是標示行星至地球的距離，前者以地球至太陽的平均距離，即天文單位（AU）作為單位，後者則以光速作單位，表示光線到達地球所須的時間。

## 三、視亮度

視亮度是以裸眼直接觀測所得的光度。因此，使用望遠鏡觀測時，行星若可看出大小而不再呈現點光源，將會覺得光度不如表列的明亮。當行星位置不適合觀測而難以見到時，則以虛線(---)表示。

## 四、出沒與中天

行星出沒與中天的時刻，均以東經 120° 平太陽時顯示，並標示出方位或高度。行星出沒時高度均為 0°，故僅標示方位。中天時方位恆在子午線上，故只標示高度，並以 N 與 S 表示北方還是南方。另外在時間上標示日期，以方便辨識實際出現的時間。

## 五、視直徑

由於行星的視大小只有數角秒至一角分左右，因此採用視直徑。這是與太陽表和月亮表不同的地方。

## 六、相位、日地離角

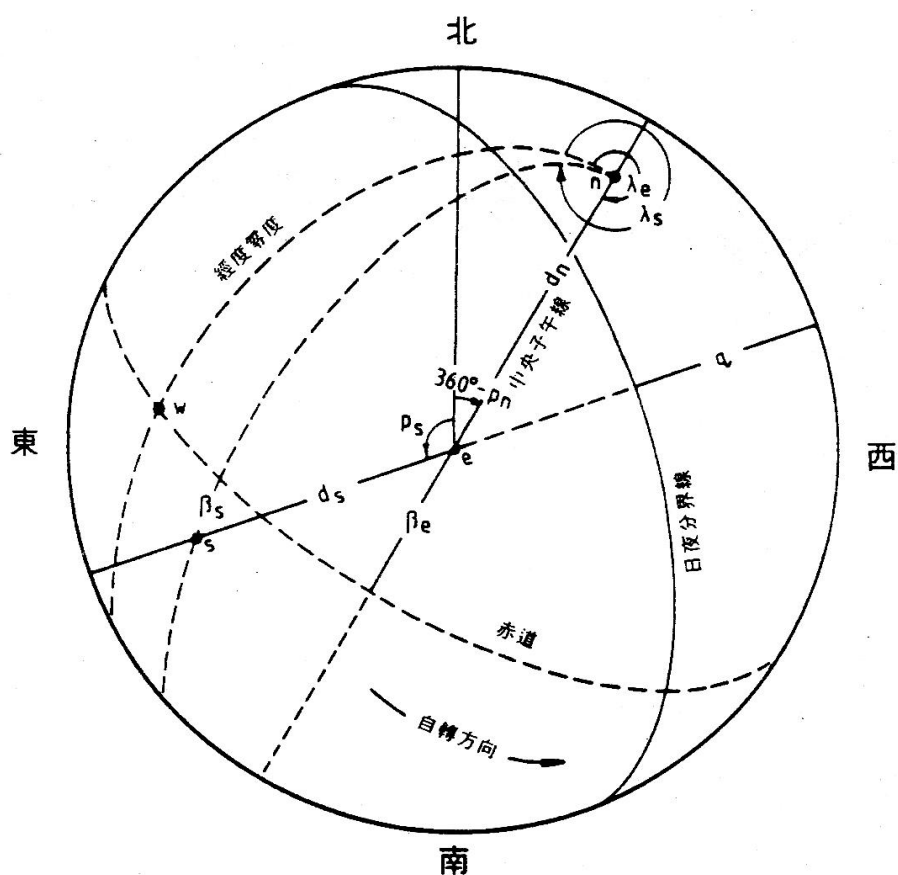
相位是地球所見行星亮面與實際受陽光照射面積的比值。  
日地離角則是由行星觀察太陽與地球間所夾的角度。

## 七、行星表面的座標

火星、木星與土星這 3 顆行星，使用小口徑的望遠鏡就能看清楚表面的特徵，是業餘觀測者的理想目標，因此這三顆行星與太陽和月球一樣，有各自的表面座標系統，用來確定表面的位置。參考附圖，並說明如下：

※ 中心點座標：由地球觀察，正對著地球的中心點以  $e$  代表，正對著太陽的點稱為「日下點」，以  $s$  代表。標示的值為行星表面的座標。此兩點的距離  $d_s$  以秒角表示。 $s$  點的方位角  $P_s$ ，是以  $e$  為中心，北點為基準向東方旋轉來量度。

※ 北極點位置：以  $e$  點為中心，北點為基準，表示北極點的距離和方位，正號表示在朝向地球的一面，負號表示在背向地球的一面，此時在相反方位的對應點即為南極點。



## 水 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分     | °    |
| 1  | 1  | 17  | 33 | 15.41 | -23 | 10 | 13.73 | 1.296130 | 10.78 | 38.2 |
| 1  | 2  | 17  | 39 | 36.76 | -23 | 21 | 18.46 | 1.307637 | 10.87 | 36.7 |
| 1  | 3  | 17  | 46 | 1.52  | -23 | 31 | 18.46 | 1.318555 | 10.97 | 35.3 |
| 1  | 4  | 17  | 52 | 29.47 | -23 | 40 | 11.70 | 1.328892 | 11.05 | 33.9 |
| 1  | 5  | 17  | 59 | 0.40  | -23 | 47 | 56.26 | 1.338660 | 11.13 | 32.6 |
| 1  | 6  | 18  | 5  | 34.10 | -23 | 54 | 30.42 | 1.347865 | 11.21 | 31.3 |
| 1  | 7  | 18  | 12 | 10.41 | -23 | 59 | 52.53 | 1.356516 | 11.28 | 30.0 |
| 1  | 8  | 18  | 18 | 49.14 | -24 | 4  | 1.10  | 1.364619 | 11.35 | 28.7 |
| 1  | 9  | 18  | 25 | 30.13 | -24 | 6  | 54.72 | 1.372183 | 11.41 | 27.5 |
| 1  | 10 | 18  | 32 | 13.24 | -24 | 8  | 32.06 | 1.379211 | 11.47 | 26.3 |
| 1  | 11 | 18  | 38 | 58.32 | -24 | 8  | 51.89 | 1.385710 | 11.52 | 25.1 |
| 1  | 12 | 18  | 45 | 45.24 | -24 | 7  | 53.05 | 1.391682 | 11.57 | 23.9 |
| 1  | 13 | 18  | 52 | 33.86 | -24 | 5  | 34.43 | 1.397131 | 11.62 | 22.8 |
| 1  | 14 | 18  | 59 | 24.06 | -24 | 1  | 55.02 | 1.402060 | 11.66 | 21.6 |
| 1  | 15 | 19  | 6  | 15.73 | -23 | 56 | 53.84 | 1.406469 | 11.70 | 20.4 |
| 1  | 16 | 19  | 13 | 8.75  | -23 | 50 | 29.96 | 1.410359 | 11.73 | 19.3 |
| 1  | 17 | 19  | 20 | 3.01  | -23 | 42 | 42.52 | 1.413729 | 11.76 | 18.1 |
| 1  | 18 | 19  | 26 | 58.40 | -23 | 33 | 30.71 | 1.416576 | 11.78 | 17.0 |
| 1  | 19 | 19  | 33 | 54.82 | -23 | 22 | 53.76 | 1.418898 | 11.80 | 15.8 |
| 1  | 20 | 19  | 40 | 52.17 | -23 | 10 | 50.94 | 1.420691 | 11.82 | 14.7 |
| 1  | 21 | 19  | 47 | 50.35 | -22 | 57 | 21.57 | 1.421948 | 11.83 | 13.5 |
| 1  | 22 | 19  | 54 | 49.28 | -22 | 42 | 25.00 | 1.422662 | 11.83 | 12.3 |
| 1  | 23 | 20  | 1  | 48.85 | -22 | 26 | 0.62  | 1.422825 | 11.83 | 11.2 |
| 1  | 24 | 20  | 8  | 48.98 | -22 | 8  | 7.86  | 1.422428 | 11.83 | 10.0 |
| 1  | 25 | 20  | 15 | 49.58 | -21 | 48 | 46.22 | 1.421457 | 11.82 | 8.8  |
| 1  | 26 | 20  | 22 | 50.56 | -21 | 27 | 55.24 | 1.419900 | 11.81 | 7.7  |
| 1  | 27 | 20  | 29 | 51.85 | -21 | 5  | 34.53 | 1.417742 | 11.79 | 6.7  |
| 1  | 28 | 20  | 36 | 53.33 | -20 | 41 | 43.78 | 1.414965 | 11.77 | 5.8  |
| 1  | 29 | 20  | 43 | 54.94 | -20 | 16 | 22.79 | 1.411553 | 11.74 | 5.1  |
| 1  | 30 | 20  | 50 | 56.55 | -19 | 49 | 31.40 | 1.407483 | 11.71 | 4.8  |
| 1  | 31 | 20  | 57 | 58.07 | -19 | 21 | 9.61  | 1.402734 | 11.67 | 5.1  |

## 水星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |     | 中 天   |     | 沒     |     | 視 直徑 | 相位   | 視 亮度 |      |
|----|----|-------|-----|-------|-----|-------|-----|------|------|------|------|
| 月  | 日  | 時間    | 方位  | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   | 星等   |      |
|    |    | h m   | °   | h m   | °   | h m   | °   | "    | "    |      |      |
| 1  | 1  | 05:29 | 115 | 10:46 | 42S | 16:03 | 244 | 5.19 | 5.19 | 0.89 | -0.4 |
| 1  | 2  | 05:32 | 116 | 10:48 | 42S | 16:05 | 244 | 5.15 | 5.15 | 0.90 | -0.4 |
| 1  | 3  | 05:35 | 116 | 10:51 | 41S | 16:07 | 244 | 5.10 | 5.10 | 0.91 | -0.4 |
| 1  | 4  | 05:37 | 116 | 10:53 | 41S | 16:09 | 244 | 5.06 | 5.06 | 0.92 | -0.4 |
| 1  | 5  | 05:40 | 116 | 10:56 | 41S | 16:12 | 244 | 5.03 | 5.03 | 0.92 | -0.4 |
| 1  | 6  | 05:43 | 116 | 10:59 | 41S | 16:14 | 244 | 4.99 | 4.99 | 0.93 | -0.5 |
| 1  | 7  | 05:46 | 116 | 11:01 | 41S | 16:17 | 244 | 4.96 | 4.96 | 0.93 | -0.5 |
| 1  | 8  | 05:49 | 116 | 11:04 | 41S | 16:19 | 244 | 4.93 | 4.93 | 0.94 | -0.5 |
| 1  | 9  | 05:52 | 117 | 11:07 | 41S | 16:22 | 243 | 4.90 | 4.90 | 0.94 | -0.5 |
| 1  | 10 | 05:55 | 117 | 11:10 | 41S | 16:25 | 243 | 4.88 | 4.88 | 0.95 | -0.5 |
| 1  | 11 | 05:57 | 117 | 11:12 | 41S | 16:27 | 243 | 4.86 | 4.86 | 0.95 | -0.6 |
| 1  | 12 | 06:00 | 117 | 11:15 | 41S | 16:30 | 243 | 4.83 | 4.83 | 0.96 | -0.6 |
| 1  | 13 | 06:03 | 116 | 11:18 | 41S | 16:33 | 244 | 4.82 | 4.82 | 0.96 | -0.6 |
| 1  | 14 | 06:06 | 116 | 11:21 | 41S | 16:36 | 244 | 4.80 | 4.80 | 0.97 | -0.6 |
| 1  | 15 | 06:09 | 116 | 11:24 | 41S | 16:39 | 244 | 4.78 | 4.78 | 0.97 | -0.7 |
| 1  | 16 | 06:11 | 116 | 11:27 | 41S | 16:43 | 244 | 4.77 | 4.77 | 0.97 | -0.7 |
| 1  | 17 | 06:14 | 116 | 11:30 | 41S | 16:46 | 244 | 4.76 | 4.76 | 0.98 | -0.8 |
| 1  | 18 | 06:17 | 116 | 11:33 | 41S | 16:49 | 244 | 4.75 | 4.75 | 0.98 | -0.8 |
| 1  | 19 | 06:19 | 116 | 11:36 | 42S | 16:53 | 244 | 4.74 | 4.74 | 0.98 | -0.8 |
| 1  | 20 | 06:22 | 115 | 11:39 | 42S | 16:56 | 245 | 4.74 | 4.74 | 0.98 | -0.9 |
| 1  | 21 | 06:24 | 115 | 11:42 | 42S | 17:00 | 245 | 4.73 | 4.73 | 0.99 | -0.9 |
| 1  | 22 | 06:27 | 115 | 11:45 | 42S | 17:03 | 245 | 4.73 | 4.73 | 0.99 | -1.0 |
| 1  | 23 | 06:29 | 115 | 11:48 | 43S | 17:07 | 245 | 4.73 | 4.73 | 0.99 | -1.1 |
| 1  | 24 | 06:32 | 114 | 11:51 | 43S | 17:11 | 246 | 4.73 | 4.73 | 0.99 | -1.1 |
| 1  | 25 | 06:34 | 114 | 11:54 | 43S | 17:15 | 246 | 4.73 | 4.73 | 0.99 | -1.2 |
| 1  | 26 | 06:36 | 114 | 11:57 | 44S | 17:19 | 247 | 4.74 | 4.74 | 1.00 | -1.3 |
| 1  | 27 | 06:39 | 113 | 12:00 | 44S | 17:22 | 247 | 4.75 | 4.75 | 1.00 | -1.3 |
| 1  | 28 | 06:41 | 113 | 12:03 | 44S | 17:26 | 248 | 4.75 | 4.75 | 1.00 | -1.4 |
| 1  | 29 | 06:43 | 112 | 12:07 | 45S | 17:30 | 248 | 4.77 | 4.77 | 1.00 | -1.4 |
| 1  | 30 | 06:45 | 112 | 12:10 | 45S | 17:35 | 249 | 4.78 | 4.78 | 1.00 | -1.5 |
| 1  | 31 | 06:47 | 111 | 12:13 | 46S | 17:39 | 249 | 4.80 | 4.80 | 1.00 | -1.5 |

## 水 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分     | °    |
| 2  | 1  | 21  | 4  | 59.37 | -18 | 51 | 17.54 | 1.397282 | 11.62 | 5.9  |
| 2  | 2  | 21  | 12 | 0.34  | -18 | 19 | 55.48 | 1.391101 | 11.57 | 7.0  |
| 2  | 3  | 21  | 19 | 0.83  | -17 | 47 | 3.88  | 1.384163 | 11.51 | 8.5  |
| 2  | 4  | 21  | 26 | 0.68  | -17 | 12 | 43.42 | 1.376437 | 11.45 | 10.1 |
| 2  | 5  | 21  | 32 | 59.72 | -16 | 36 | 55.03 | 1.367893 | 11.38 | 11.9 |
| 2  | 6  | 21  | 39 | 57.72 | -15 | 59 | 39.94 | 1.358496 | 11.30 | 13.9 |
| 2  | 7  | 21  | 46 | 54.45 | -15 | 20 | 59.77 | 1.348213 | 11.21 | 16.0 |
| 2  | 8  | 21  | 53 | 49.63 | -14 | 40 | 56.54 | 1.337008 | 11.12 | 18.3 |
| 2  | 9  | 22  | 0  | 42.91 | -13 | 59 | 32.80 | 1.324845 | 11.02 | 20.7 |
| 2  | 10 | 22  | 7  | 33.92 | -13 | 16 | 51.70 | 1.311689 | 10.91 | 23.2 |
| 2  | 11 | 22  | 14 | 22.18 | -12 | 32 | 57.09 | 1.297504 | 10.79 | 25.9 |
| 2  | 12 | 22  | 21 | 7.16  | -11 | 47 | 53.63 | 1.282258 | 10.67 | 28.8 |
| 2  | 13 | 22  | 27 | 48.23 | -11 | 1  | 46.92 | 1.265923 | 10.53 | 31.8 |
| 2  | 14 | 22  | 34 | 24.65 | -10 | 14 | 43.61 | 1.248474 | 10.38 | 35.0 |
| 2  | 15 | 22  | 40 | 55.56 | -9  | 26 | 51.55 | 1.229894 | 10.23 | 38.3 |
| 2  | 16 | 22  | 47 | 19.98 | -8  | 38 | 19.93 | 1.210175 | 10.07 | 41.8 |
| 2  | 17 | 22  | 53 | 36.78 | -7  | 49 | 19.37 | 1.189322 | 9.89  | 45.5 |
| 2  | 18 | 22  | 59 | 44.68 | -7  | 0  | 2.01  | 1.167350 | 9.71  | 49.4 |
| 2  | 19 | 23  | 5  | 42.26 | -6  | 10 | 41.64 | 1.144292 | 9.52  | 53.5 |
| 2  | 20 | 23  | 11 | 27.93 | -5  | 21 | 33.62 | 1.120202 | 9.32  | 57.8 |
| 2  | 21 | 23  | 16 | 59.98 | -4  | 32 | 54.96 | 1.095149 | 9.11  | 62.2 |
| 2  | 22 | 23  | 22 | 16.54 | -3  | 45 | 4.16  | 1.069227 | 8.89  | 66.8 |
| 2  | 23 | 23  | 27 | 15.66 | -2  | 58 | 21.08 | 1.042552 | 8.67  | 71.5 |
| 2  | 24 | 23  | 31 | 55.29 | -2  | 13 | 6.73  | 1.015260 | 8.45  | 76.4 |
| 2  | 25 | 23  | 36 | 13.34 | -1  | 29 | 42.97 | 0.987510 | 8.21  | 81.4 |
| 2  | 26 | 23  | 40 | 7.74  | -0  | 48 | 32.19 | 0.959475 | 7.98  | 86.5 |
| 2  | 27 | 23  | 43 | 36.49 | -0  | 9  | 56.90 | 0.931347 | 7.75  | 91.8 |
| 2  | 28 | 23  | 46 | 37.68 | +0  | 25 | 40.67 | 0.903327 | 7.51  | 97.0 |



## 水星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |     | 中 天   |     | 沒     |     | 視 直徑 | 相位   | 視 亮度 |      |
|----|----|-------|-----|-------|-----|-------|-----|------|------|------|------|
| 月  | 日  | 時間    | 方位  | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   | 星等   |      |
|    |    | h m   | °   | h m   | °   | h m   | °   | "    | "    |      |      |
| 2  | 1  | 06:49 | 111 | 12:16 | 46S | 17:43 | 250 | 4.81 | 4.81 | 1.00 | -1.5 |
| 2  | 2  | 06:51 | 110 | 12:19 | 47S | 17:47 | 250 | 4.84 | 4.84 | 1.00 | -1.5 |
| 2  | 3  | 06:53 | 109 | 12:22 | 47S | 17:51 | 251 | 4.86 | 4.86 | 1.00 | -1.5 |
| 2  | 4  | 06:55 | 109 | 12:25 | 48S | 17:55 | 251 | 4.89 | 4.89 | 0.99 | -1.4 |
| 2  | 5  | 06:57 | 108 | 12:28 | 48S | 18:00 | 252 | 4.92 | 4.92 | 0.99 | -1.4 |
| 2  | 6  | 06:59 | 107 | 12:31 | 49S | 18:04 | 253 | 4.95 | 4.95 | 0.99 | -1.4 |
| 2  | 7  | 07:00 | 107 | 12:34 | 50S | 18:08 | 254 | 4.99 | 4.99 | 0.98 | -1.4 |
| 2  | 8  | 07:02 | 106 | 12:37 | 50S | 18:13 | 254 | 5.03 | 5.03 | 0.98 | -1.3 |
| 2  | 9  | 07:04 | 105 | 12:40 | 51S | 18:17 | 255 | 5.08 | 5.08 | 0.97 | -1.3 |
| 2  | 10 | 07:05 | 104 | 12:43 | 52S | 18:21 | 256 | 5.13 | 5.13 | 0.96 | -1.3 |
| 2  | 11 | 07:06 | 104 | 12:46 | 53S | 18:26 | 257 | 5.18 | 5.18 | 0.95 | -1.2 |
| 2  | 12 | 07:08 | 103 | 12:49 | 53S | 18:30 | 258 | 5.25 | 5.25 | 0.94 | -1.2 |
| 2  | 13 | 07:09 | 102 | 12:51 | 54S | 18:34 | 258 | 5.31 | 5.31 | 0.93 | -1.2 |
| 2  | 14 | 07:10 | 101 | 12:54 | 55S | 18:38 | 259 | 5.39 | 5.39 | 0.91 | -1.2 |
| 2  | 15 | 07:11 | 100 | 12:56 | 56S | 18:42 | 260 | 5.47 | 5.47 | 0.89 | -1.1 |
| 2  | 16 | 07:12 | 99  | 12:59 | 56S | 18:46 | 261 | 5.56 | 5.56 | 0.87 | -1.1 |
| 2  | 17 | 07:13 | 98  | 13:01 | 57S | 18:50 | 262 | 5.66 | 5.66 | 0.85 | -1.1 |
| 2  | 18 | 07:14 | 97  | 13:03 | 58S | 18:54 | 263 | 5.76 | 5.76 | 0.83 | -1.1 |
| 2  | 19 | 07:14 | 97  | 13:05 | 59S | 18:57 | 264 | 5.88 | 5.88 | 0.80 | -1.1 |
| 2  | 20 | 07:14 | 96  | 13:07 | 60S | 19:01 | 265 | 6.00 | 6.00 | 0.77 | -1.0 |
| 2  | 21 | 07:14 | 95  | 13:09 | 61S | 19:04 | 266 | 6.14 | 6.14 | 0.73 | -1.0 |
| 2  | 22 | 07:14 | 94  | 13:10 | 61S | 19:06 | 267 | 6.29 | 6.29 | 0.70 | -0.9 |
| 2  | 23 | 07:14 | 93  | 13:11 | 62S | 19:09 | 267 | 6.45 | 6.45 | 0.66 | -0.9 |
| 2  | 24 | 07:13 | 92  | 13:12 | 63S | 19:11 | 268 | 6.63 | 6.63 | 0.62 | -0.8 |
| 2  | 25 | 07:12 | 91  | 13:12 | 64S | 19:12 | 269 | 6.81 | 6.81 | 0.58 | -0.7 |
| 2  | 26 | 07:11 | 91  | 13:12 | 64S | 19:13 | 270 | 7.01 | 7.01 | 0.53 | -0.6 |
| 2  | 27 | 07:09 | 90  | 13:11 | 65S | 19:14 | 270 | 7.22 | 7.22 | 0.49 | -0.5 |
| 2  | 28 | 07:07 | 89  | 13:10 | 65S | 19:14 | 271 | 7.45 | 7.45 | 0.44 | -0.4 |

## 水 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程  | 日地離角  |
|----|----|-----|----|-------|-----|----|-------|----------|------|-------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分    | °     |
| 3  | 1  | 23  | 49 | 9.61  | +0  | 57 | 58.99 | 0.875621 | 7.28 | 102.4 |
| 3  | 2  | 23  | 51 | 10.82 | +1  | 26 | 37.64 | 0.848438 | 7.06 | 107.8 |
| 3  | 3  | 23  | 52 | 40.19 | +1  | 51 | 17.81 | 0.821985 | 6.84 | 113.2 |
| 3  | 4  | 23  | 53 | 36.96 | +2  | 11 | 42.74 | 0.796461 | 6.63 | 118.7 |
| 3  | 5  | 23  | 54 | 0.82  | +2  | 27 | 38.22 | 0.772054 | 6.42 | 124.1 |
| 3  | 6  | 23  | 53 | 51.99 | +2  | 38 | 53.15 | 0.748939 | 6.23 | 129.6 |
| 3  | 7  | 23  | 53 | 11.23 | +2  | 45 | 20.10 | 0.727276 | 6.05 | 135.0 |
| 3  | 8  | 23  | 51 | 59.91 | +2  | 46 | 55.89 | 0.707205 | 5.88 | 140.4 |
| 3  | 9  | 23  | 50 | 20.02 | +2  | 43 | 42.19 | 0.688845 | 5.73 | 145.7 |
| 3  | 10 | 23  | 48 | 14.17 | +2  | 35 | 46.01 | 0.672296 | 5.59 | 150.9 |
| 3  | 11 | 23  | 45 | 45.55 | +2  | 23 | 19.98 | 0.657632 | 5.47 | 156.0 |
| 3  | 12 | 23  | 42 | 57.89 | +2  | 6  | 42.50 | 0.644904 | 5.36 | 160.9 |
| 3  | 13 | 23  | 39 | 55.30 | +1  | 46 | 17.49 | 0.634141 | 5.27 | 165.3 |
| 3  | 14 | 23  | 36 | 42.24 | +1  | 22 | 33.85 | 0.625347 | 5.20 | 168.9 |
| 3  | 15 | 23  | 33 | 23.28 | +0  | 56 | 4.56  | 0.618500 | 5.14 | 170.8 |
| 3  | 16 | 23  | 30 | 2.99  | +0  | 27 | 25.49 | 0.613560 | 5.10 | 170.0 |
| 3  | 17 | 23  | 26 | 45.79 | -0  | 2  | 45.93 | 0.610466 | 5.08 | 167.2 |
| 3  | 18 | 23  | 23 | 35.78 | -0  | 33 | 52.18 | 0.609140 | 5.07 | 163.5 |
| 3  | 19 | 23  | 20 | 36.66 | -1  | 5  | 16.98 | 0.609489 | 5.07 | 159.5 |
| 3  | 20 | 23  | 17 | 51.62 | -1  | 36 | 26.44 | 0.611413 | 5.09 | 155.4 |
| 3  | 21 | 23  | 15 | 23.31 | -2  | 6  | 50.01 | 0.614800 | 5.11 | 151.4 |
| 3  | 22 | 23  | 13 | 13.83 | -2  | 36 | 1.02  | 0.619537 | 5.15 | 147.4 |
| 3  | 23 | 23  | 11 | 24.72 | -3  | 3  | 37.04 | 0.625509 | 5.20 | 143.5 |
| 3  | 24 | 23  | 9  | 57.03 | -3  | 29 | 19.85 | 0.632602 | 5.26 | 139.8 |
| 3  | 25 | 23  | 8  | 51.33 | -3  | 52 | 55.28 | 0.640706 | 5.33 | 136.2 |
| 3  | 26 | 23  | 8  | 7.82  | -4  | 14 | 12.83 | 0.649717 | 5.40 | 132.8 |
| 3  | 27 | 23  | 7  | 46.37 | -4  | 33 | 5.26  | 0.659536 | 5.48 | 129.5 |
| 3  | 28 | 23  | 7  | 46.58 | -4  | 49 | 28.10 | 0.670070 | 5.57 | 126.3 |
| 3  | 29 | 23  | 8  | 7.85  | -5  | 3  | 19.17 | 0.681236 | 5.67 | 123.3 |
| 3  | 30 | 23  | 8  | 49.44 | -5  | 14 | 38.11 | 0.692956 | 5.76 | 120.4 |
| 3  | 31 | 23  | 9  | 50.50 | -5  | 23 | 26.05 | 0.705161 | 5.86 | 117.7 |

## 水星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |    | 中 天   |     | 沒     |     | 視     | 直徑    | 相位   | 視    |
|----|----|-------|----|-------|-----|-------|-----|-------|-------|------|------|
| 月  | 日  | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道    | 兩極    |      | 亮度   |
|    |    | h m   | °  | h m   | °   | h m   | °   | "     | "     |      | 星等   |
| 3  | 1  | 07:05 | 89 | 13:09 | 66S | 19:13 | 272 | 7.68  | 7.68  | 0.39 | -0.2 |
| 3  | 2  | 07:02 | 88 | 13:07 | 66S | 19:12 | 272 | 7.93  | 7.93  | 0.35 | 0.0  |
| 3  | 3  | 06:59 | 88 | 13:04 | 67S | 19:10 | 272 | 8.18  | 8.18  | 0.30 | 0.2  |
| 3  | 4  | 06:55 | 87 | 13:01 | 67S | 19:07 | 273 | 8.45  | 8.45  | 0.26 | 0.5  |
| 3  | 5  | 06:51 | 87 | 12:57 | 67S | 19:04 | 273 | 8.71  | 8.71  | 0.22 | 0.8  |
| 3  | 6  | 06:47 | 87 | 12:53 | 68S | 19:00 | 273 | 8.98  | 8.98  | 0.18 | 1.2  |
| 3  | 7  | 06:42 | 87 | 12:48 | 68S | 18:55 | 273 | 9.25  | 9.25  | 0.15 | 1.6  |
| 3  | 8  | 06:37 | 87 | 12:43 | 68S | 18:49 | 273 | 9.51  | 9.51  | 0.12 | 2.0  |
| 3  | 9  | 06:31 | 87 | 12:38 | 68S | 18:44 | 273 | 9.77  | 9.77  | 0.09 | 2.5  |
| 3  | 10 | 06:26 | 87 | 12:31 | 67S | 18:37 | 273 | 10.01 | 10.01 | 0.06 | 3.0  |
| 3  | 11 | 06:20 | 87 | 12:25 | 67S | 18:30 | 273 | 10.23 | 10.23 | 0.04 | 3.6  |
| 3  | 12 | 06:13 | 87 | 12:18 | 67S | 18:23 | 272 | 10.43 | 10.43 | 0.03 | 4.2  |
| 3  | 13 | 06:07 | 88 | 12:11 | 67S | 18:15 | 272 | 10.61 | 10.61 | 0.02 | 4.8  |
| 3  | 14 | 06:01 | 88 | 12:04 | 66S | 18:07 | 272 | 10.76 | 10.76 | 0.01 | 5.3  |
| 3  | 15 | 05:54 | 89 | 11:57 | 66S | 17:59 | 271 | 10.88 | 10.88 | 0.01 | ---- |
| 3  | 16 | 05:48 | 89 | 11:50 | 65S | 17:51 | 271 | 10.96 | 10.96 | 0.01 | ---- |
| 3  | 17 | 05:42 | 90 | 11:42 | 65S | 17:43 | 270 | 11.02 | 11.02 | 0.01 | 5.1  |
| 3  | 18 | 05:36 | 90 | 11:35 | 64S | 17:35 | 269 | 11.04 | 11.04 | 0.02 | 4.6  |
| 3  | 19 | 05:30 | 91 | 11:29 | 64S | 17:27 | 269 | 11.04 | 11.04 | 0.03 | 4.1  |
| 3  | 20 | 05:24 | 91 | 11:22 | 63S | 17:19 | 268 | 11.00 | 11.00 | 0.05 | 3.7  |
| 3  | 21 | 05:18 | 92 | 11:16 | 63S | 17:12 | 268 | 10.94 | 10.94 | 0.06 | 3.2  |
| 3  | 22 | 05:13 | 93 | 11:10 | 62S | 17:05 | 267 | 10.86 | 10.86 | 0.08 | 2.9  |
| 3  | 23 | 05:08 | 93 | 11:04 | 62S | 16:59 | 267 | 10.76 | 10.76 | 0.10 | 2.5  |
| 3  | 24 | 05:04 | 94 | 10:58 | 61S | 16:53 | 266 | 10.64 | 10.64 | 0.12 | 2.2  |
| 3  | 25 | 04:59 | 94 | 10:54 | 61S | 16:47 | 266 | 10.50 | 10.50 | 0.14 | 2.0  |
| 3  | 26 | 04:55 | 94 | 10:49 | 61S | 16:42 | 265 | 10.36 | 10.36 | 0.16 | 1.7  |
| 3  | 27 | 04:52 | 95 | 10:45 | 60S | 16:37 | 265 | 10.20 | 10.20 | 0.18 | 1.5  |
| 3  | 28 | 04:48 | 95 | 10:41 | 60S | 16:33 | 265 | 10.04 | 10.04 | 0.20 | 1.4  |
| 3  | 29 | 04:45 | 95 | 10:37 | 60S | 16:29 | 265 | 9.88  | 9.88  | 0.23 | 1.2  |
| 3  | 30 | 04:42 | 95 | 10:34 | 60S | 16:26 | 264 | 9.71  | 9.71  | 0.25 | 1.1  |
| 3  | 31 | 04:39 | 96 | 10:31 | 60S | 16:23 | 264 | 9.54  | 9.54  | 0.27 | 0.9  |

## 水 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程  | 日地離角  |
|----|----|-----|----|-------|-----|----|-------|----------|------|-------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分    | °     |
| 4  | 1  | 23  | 11 | 10.12 | -5  | 29 | 45.17 | 0.717788 | 5.97 | 115.0 |
| 4  | 2  | 23  | 12 | 47.36 | -5  | 33 | 38.50 | 0.730781 | 6.08 | 112.5 |
| 4  | 3  | 23  | 14 | 41.26 | -5  | 35 | 9.62  | 0.744090 | 6.19 | 110.1 |
| 4  | 4  | 23  | 16 | 50.89 | -5  | 34 | 22.49 | 0.757670 | 6.30 | 107.8 |
| 4  | 5  | 23  | 19 | 15.33 | -5  | 31 | 21.31 | 0.771483 | 6.42 | 105.5 |
| 4  | 6  | 23  | 21 | 53.70 | -5  | 26 | 10.37 | 0.785494 | 6.53 | 103.4 |
| 4  | 7  | 23  | 24 | 45.17 | -5  | 18 | 54.00 | 0.799672 | 6.65 | 101.3 |
| 4  | 8  | 23  | 27 | 48.96 | -5  | 9  | 36.50 | 0.813992 | 6.77 | 99.3  |
| 4  | 9  | 23  | 31 | 4.33  | -4  | 58 | 22.06 | 0.828431 | 6.89 | 97.4  |
| 4  | 10 | 23  | 34 | 30.61 | -4  | 45 | 14.78 | 0.842967 | 7.01 | 95.5  |
| 4  | 11 | 23  | 38 | 7.17  | -4  | 30 | 18.59 | 0.857583 | 7.13 | 93.6  |
| 4  | 12 | 23  | 41 | 53.45 | -4  | 13 | 37.30 | 0.872264 | 7.25 | 91.9  |
| 4  | 13 | 23  | 45 | 48.91 | -3  | 55 | 14.54 | 0.886996 | 7.38 | 90.1  |
| 4  | 14 | 23  | 49 | 53.09 | -3  | 35 | 13.81 | 0.901767 | 7.50 | 88.4  |
| 4  | 15 | 23  | 54 | 5.58  | -3  | 13 | 38.42 | 0.916567 | 7.62 | 86.7  |
| 4  | 16 | 23  | 58 | 26.01 | -2  | 50 | 31.55 | 0.931384 | 7.75 | 85.1  |
| 4  | 17 | 0   | 2  | 54.06 | -2  | 25 | 56.23 | 0.946210 | 7.87 | 83.4  |
| 4  | 18 | 0   | 7  | 29.43 | -1  | 59 | 55.36 | 0.961037 | 7.99 | 81.8  |
| 4  | 19 | 0   | 12 | 11.91 | -1  | 32 | 31.73 | 0.975855 | 8.12 | 80.2  |
| 4  | 20 | 0   | 17 | 1.29  | -1  | 3  | 48.03 | 0.990657 | 8.24 | 78.6  |
| 4  | 21 | 0   | 21 | 57.41 | -0  | 33 | 46.86 | 1.005433 | 8.36 | 77.0  |
| 4  | 22 | 0   | 27 | 0.14  | -0  | 2  | 30.77 | 1.020175 | 8.48 | 75.3  |
| 4  | 23 | 0   | 32 | 9.39  | +0  | 29 | 57.73 | 1.034874 | 8.61 | 73.7  |
| 4  | 24 | 0   | 37 | 25.10 | +1  | 3  | 36.19 | 1.049518 | 8.73 | 72.1  |
| 4  | 25 | 0   | 42 | 47.24 | +1  | 38 | 22.18 | 1.064096 | 8.85 | 70.4  |
| 4  | 26 | 0   | 48 | 15.82 | +2  | 14 | 13.25 | 1.078596 | 8.97 | 68.8  |
| 4  | 27 | 0   | 53 | 50.86 | +2  | 51 | 6.98  | 1.093005 | 9.09 | 67.0  |
| 4  | 28 | 0   | 59 | 32.42 | +3  | 29 | 0.89  | 1.107306 | 9.21 | 65.3  |
| 4  | 29 | 1   | 5  | 20.61 | +4  | 7  | 52.46 | 1.121482 | 9.33 | 63.5  |
| 4  | 30 | 1   | 11 | 15.53 | +4  | 47 | 39.10 | 1.135513 | 9.44 | 61.7  |

## 水星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 4 1       | 04:37     | 96      | 10:29     | 59S     | 16:20     | 264     | 9.37         | 9.37          | 0.29 | 0.8           |
| 4 2       | 04:35     | 96      | 10:26     | 59S     | 16:18     | 264     | 9.21         | 9.21          | 0.31 | 0.7           |
| 4 3       | 04:33     | 96      | 10:24     | 59S     | 16:16     | 264     | 9.04         | 9.04          | 0.33 | 0.7           |
| 4 4       | 04:31     | 96      | 10:22     | 59S     | 16:14     | 264     | 8.88         | 8.88          | 0.35 | 0.6           |
| 4 5       | 04:29     | 96      | 10:21     | 59S     | 16:13     | 264     | 8.72         | 8.72          | 0.37 | 0.5           |
| 4 6       | 04:28     | 96      | 10:20     | 60S     | 16:12     | 264     | 8.57         | 8.57          | 0.38 | 0.5           |
| 4 7       | 04:26     | 96      | 10:19     | 60S     | 16:11     | 264     | 8.41         | 8.41          | 0.40 | 0.4           |
| 4 8       | 04:25     | 95      | 10:18     | 60S     | 16:11     | 265     | 8.27         | 8.27          | 0.42 | 0.4           |
| 4 9       | 04:24     | 95      | 10:17     | 60S     | 16:10     | 265     | 8.12         | 8.12          | 0.44 | 0.3           |
| 4 10      | 04:23     | 95      | 10:17     | 60S     | 16:10     | 265     | 7.98         | 7.98          | 0.45 | 0.3           |
| 4 11      | 04:22     | 95      | 10:16     | 60S     | 16:10     | 265     | 7.85         | 7.85          | 0.47 | 0.3           |
| 4 12      | 04:22     | 94      | 10:16     | 61S     | 16:11     | 266     | 7.71         | 7.71          | 0.48 | 0.2           |
| 4 13      | 04:21     | 94      | 10:16     | 61S     | 16:12     | 266     | 7.59         | 7.59          | 0.50 | 0.2           |
| 4 14      | 04:21     | 94      | 10:16     | 61S     | 16:12     | 266     | 7.46         | 7.46          | 0.51 | 0.2           |
| 4 15      | 04:20     | 93      | 10:17     | 62S     | 16:13     | 267     | 7.34         | 7.34          | 0.53 | 0.2           |
| 4 16      | 04:20     | 93      | 10:17     | 62S     | 16:15     | 267     | 7.22         | 7.22          | 0.54 | 0.1           |
| 4 17      | 04:20     | 92      | 10:18     | 63S     | 16:16     | 268     | 7.11         | 7.11          | 0.56 | 0.1           |
| 4 18      | 04:19     | 92      | 10:18     | 63S     | 16:17     | 268     | 7.00         | 7.00          | 0.57 | 0.1           |
| 4 19      | 04:19     | 92      | 10:19     | 63S     | 16:19     | 269     | 6.89         | 6.89          | 0.59 | 0.1           |
| 4 20      | 04:19     | 91      | 10:20     | 64S     | 16:21     | 269     | 6.79         | 6.79          | 0.60 | 0.0           |
| 4 21      | 04:19     | 90      | 10:21     | 64S     | 16:23     | 270     | 6.69         | 6.69          | 0.61 | 0.0           |
| 4 22      | 04:19     | 90      | 10:22     | 65S     | 16:25     | 270     | 6.60         | 6.60          | 0.63 | 0.0           |
| 4 23      | 04:20     | 89      | 10:23     | 65S     | 16:27     | 271     | 6.50         | 6.50          | 0.64 | -0.1          |
| 4 24      | 04:20     | 89      | 10:25     | 66S     | 16:30     | 272     | 6.41         | 6.41          | 0.65 | -0.1          |
| 4 25      | 04:20     | 88      | 10:26     | 67S     | 16:32     | 272     | 6.32         | 6.32          | 0.67 | -0.1          |
| 4 26      | 04:21     | 87      | 10:28     | 67S     | 16:35     | 273     | 6.24         | 6.24          | 0.68 | -0.2          |
| 4 27      | 04:21     | 87      | 10:29     | 68S     | 16:38     | 274     | 6.16         | 6.16          | 0.70 | -0.2          |
| 4 28      | 04:22     | 86      | 10:31     | 68S     | 16:41     | 274     | 6.08         | 6.08          | 0.71 | -0.2          |
| 4 29      | 04:22     | 85      | 10:33     | 69S     | 16:44     | 275     | 6.00         | 6.00          | 0.72 | -0.3          |
| 4 30      | 04:23     | 85      | 10:35     | 70S     | 16:47     | 276     | 5.93         | 5.93          | 0.74 | -0.3          |

## 水 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分     | °    |
| 5  | 1  | 1   | 17 | 17.33 | +5  | 28 | 18.10 | 1.149376 | 9.56  | 59.8 |
| 5  | 2  | 1   | 23 | 26.17 | +6  | 9  | 46.62 | 1.163047 | 9.67  | 57.9 |
| 5  | 3  | 1   | 29 | 42.26 | +6  | 52 | 1.66  | 1.176496 | 9.78  | 55.9 |
| 5  | 4  | 1   | 36 | 5.79  | +7  | 35 | 0.01  | 1.189692 | 9.89  | 53.8 |
| 5  | 5  | 1   | 42 | 36.99 | +8  | 18 | 38.19 | 1.202598 | 10.00 | 51.6 |
| 5  | 6  | 1   | 49 | 16.12 | +9  | 2  | 52.42 | 1.215173 | 10.11 | 49.4 |
| 5  | 7  | 1   | 56 | 3.41  | +9  | 47 | 38.60 | 1.227374 | 10.21 | 47.0 |
| 5  | 8  | 2   | 2  | 59.13 | +10 | 32 | 52.18 | 1.239149 | 10.31 | 44.6 |
| 5  | 9  | 2   | 10 | 3.52  | +11 | 18 | 28.17 | 1.250444 | 10.40 | 42.1 |
| 5  | 10 | 2   | 17 | 16.82 | +12 | 4  | 21.02 | 1.261198 | 10.49 | 39.4 |
| 5  | 11 | 2   | 24 | 39.27 | +12 | 50 | 24.61 | 1.271346 | 10.57 | 36.7 |
| 5  | 12 | 2   | 32 | 11.06 | +13 | 36 | 32.17 | 1.280817 | 10.65 | 33.8 |
| 5  | 13 | 2   | 39 | 52.33 | +14 | 22 | 36.20 | 1.289537 | 10.72 | 30.7 |
| 5  | 14 | 2   | 47 | 43.20 | +15 | 8  | 28.49 | 1.297426 | 10.79 | 27.6 |
| 5  | 15 | 2   | 55 | 43.67 | +15 | 54 | 0.04  | 1.304401 | 10.85 | 24.3 |
| 5  | 16 | 3   | 3  | 53.71 | +16 | 39 | 1.08  | 1.310380 | 10.90 | 20.9 |
| 5  | 17 | 3   | 12 | 13.12 | +17 | 23 | 21.10 | 1.315279 | 10.94 | 17.4 |
| 5  | 18 | 3   | 20 | 41.62 | +18 | 6  | 48.93 | 1.319017 | 10.97 | 13.7 |
| 5  | 19 | 3   | 29 | 18.78 | +18 | 49 | 12.82 | 1.321519 | 10.99 | 10.0 |
| 5  | 20 | 3   | 38 | 4.02  | +19 | 30 | 20.64 | 1.322717 | 11.00 | 6.1  |
| 5  | 21 | 3   | 46 | 56.60 | +20 | 10 | 0.10  | 1.322554 | 11.00 | 2.3  |
| 5  | 22 | 3   | 55 | 55.66 | +20 | 47 | 59.02 | 1.320986 | 10.99 | 2.3  |
| 5  | 23 | 4   | 5  | 0.12  | +21 | 24 | 5.26  | 1.317986 | 10.96 | 6.2  |
| 5  | 24 | 4   | 14 | 8.84  | +21 | 58 | 7.92  | 1.313544 | 10.93 | 10.3 |
| 5  | 25 | 4   | 23 | 20.53 | +22 | 29 | 56.70 | 1.307668 | 10.88 | 14.4 |
| 5  | 26 | 4   | 32 | 33.85 | +22 | 59 | 22.66 | 1.300386 | 10.82 | 18.6 |
| 5  | 27 | 4   | 41 | 47.38 | +23 | 26 | 18.30 | 1.291744 | 10.74 | 22.7 |
| 5  | 28 | 4   | 50 | 59.71 | +23 | 50 | 37.79 | 1.281805 | 10.66 | 26.8 |
| 5  | 29 | 5   | 0  | 9.44  | +24 | 12 | 16.98 | 1.270644 | 10.57 | 30.8 |
| 5  | 30 | 5   | 9  | 15.19 | +24 | 31 | 13.48 | 1.258350 | 10.47 | 34.7 |
| 5  | 31 | 5   | 18 | 15.70 | +24 | 47 | 26.55 | 1.245017 | 10.36 | 38.5 |

## 水星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 5 1       | 04:24     | 84      | 10:37     | 70S     | 16:51     | 277     | 5.85         | 5.85          | 0.75 | -0.4          |
| 5 2       | 04:25     | 83      | 10:39     | 71S     | 16:54     | 277     | 5.79         | 5.79          | 0.77 | -0.4          |
| 5 3       | 04:26     | 82      | 10:41     | 72S     | 16:58     | 278     | 5.72         | 5.72          | 0.78 | -0.5          |
| 5 4       | 04:27     | 81      | 10:44     | 73S     | 17:02     | 279     | 5.66         | 5.66          | 0.80 | -0.5          |
| 5 5       | 04:28     | 81      | 10:47     | 73S     | 17:06     | 280     | 5.59         | 5.59          | 0.81 | -0.6          |
| 5 6       | 04:29     | 80      | 10:49     | 74S     | 17:10     | 281     | 5.54         | 5.54          | 0.83 | -0.6          |
| 5 7       | 04:30     | 79      | 10:52     | 75S     | 17:15     | 281     | 5.48         | 5.48          | 0.84 | -0.7          |
| 5 8       | 04:32     | 78      | 10:55     | 76S     | 17:19     | 282     | 5.43         | 5.43          | 0.86 | -0.8          |
| 5 9       | 04:34     | 77      | 10:58     | 76S     | 17:24     | 283     | 5.38         | 5.38          | 0.87 | -0.8          |
| 5 10      | 04:35     | 76      | 11:02     | 77S     | 17:29     | 284     | 5.33         | 5.33          | 0.89 | -0.9          |
| 5 11      | 04:37     | 76      | 11:05     | 78S     | 17:34     | 285     | 5.29         | 5.29          | 0.90 | -1.0          |
| 5 12      | 04:39     | 75      | 11:09     | 79S     | 17:39     | 286     | 5.25         | 5.25          | 0.92 | -1.1          |
| 5 13      | 04:41     | 74      | 11:12     | 79S     | 17:44     | 287     | 5.22         | 5.22          | 0.93 | -1.2          |
| 5 14      | 04:44     | 73      | 11:16     | 80S     | 17:50     | 287     | 5.19         | 5.19          | 0.94 | -1.3          |
| 5 15      | 04:46     | 72      | 11:20     | 81S     | 17:56     | 288     | 5.16         | 5.16          | 0.96 | -1.4          |
| 5 16      | 04:49     | 71      | 11:25     | 82S     | 18:01     | 289     | 5.13         | 5.13          | 0.97 | -1.6          |
| 5 17      | 04:52     | 71      | 11:29     | 82S     | 18:07     | 290     | 5.12         | 5.12          | 0.98 | -1.7          |
| 5 18      | 04:55     | 70      | 11:34     | 83S     | 18:14     | 291     | 5.10         | 5.10          | 0.99 | -1.9          |
| 5 19      | 04:58     | 69      | 11:38     | 84S     | 18:20     | 291     | 5.09         | 5.09          | 0.99 | -2.0          |
| 5 20      | 05:01     | 68      | 11:43     | 85S     | 18:26     | 292     | 5.09         | 5.09          | 1.00 | -2.2          |
| 5 21      | 05:05     | 67      | 11:48     | 85S     | 18:33     | 293     | 5.09         | 5.09          | 1.00 | -2.4          |
| 5 22      | 05:08     | 67      | 11:53     | 86S     | 18:39     | 294     | 5.09         | 5.09          | 1.00 | -2.4          |
| 5 23      | 05:12     | 66      | 11:58     | 86S     | 18:46     | 294     | 5.10         | 5.10          | 1.00 | -2.3          |
| 5 24      | 05:16     | 65      | 12:04     | 87S     | 18:52     | 295     | 5.12         | 5.12          | 0.99 | -2.1          |
| 5 25      | 05:20     | 65      | 12:09     | 88S     | 18:58     | 296     | 5.14         | 5.14          | 0.98 | -2.0          |
| 5 26      | 05:24     | 64      | 12:14     | 88S     | 19:05     | 296     | 5.17         | 5.17          | 0.97 | -1.8          |
| 5 27      | 05:29     | 64      | 12:20     | 88S     | 19:11     | 297     | 5.21         | 5.21          | 0.96 | -1.7          |
| 5 28      | 05:33     | 63      | 12:25     | 89S     | 19:17     | 297     | 5.25         | 5.25          | 0.95 | -1.6          |
| 5 29      | 05:37     | 63      | 12:30     | 89S     | 19:23     | 297     | 5.29         | 5.29          | 0.93 | -1.4          |
| 5 30      | 05:42     | 62      | 12:35     | 89S     | 19:29     | 298     | 5.35         | 5.35          | 0.91 | -1.3          |
| 5 31      | 05:46     | 62      | 12:40     | 90S     | 19:35     | 298     | 5.40         | 5.40          | 0.89 | -1.2          |

## 水 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程   | 日地離角  |
|----|----|-----|----|-------|-----|----|-------|----------|-------|-------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分     | °     |
| 6  | 1  | 5   | 27 | 9.77  | +25 | 0  | 57.00 | 1.230746 | 10.24 | 42.2  |
| 6  | 2  | 5   | 35 | 56.29 | +25 | 11 | 47.07 | 1.215640 | 10.11 | 45.8  |
| 6  | 3  | 5   | 44 | 34.28 | +25 | 20 | 0.19  | 1.199801 | 9.98  | 49.3  |
| 6  | 4  | 5   | 53 | 2.87  | +25 | 25 | 40.82 | 1.183327 | 9.84  | 52.7  |
| 6  | 5  | 6   | 1  | 21.28 | +25 | 28 | 54.27 | 1.166315 | 9.70  | 56.0  |
| 6  | 6  | 6   | 9  | 28.85 | +25 | 29 | 46.49 | 1.148853 | 9.56  | 59.1  |
| 6  | 7  | 6   | 17 | 24.99 | +25 | 28 | 23.93 | 1.131025 | 9.41  | 62.1  |
| 6  | 8  | 6   | 25 | 9.22  | +25 | 24 | 53.37 | 1.112909 | 9.26  | 65.0  |
| 6  | 9  | 6   | 32 | 41.11 | +25 | 19 | 21.85 | 1.094573 | 9.10  | 67.9  |
| 6  | 10 | 6   | 40 | 0.32  | +25 | 11 | 56.52 | 1.076083 | 8.95  | 70.6  |
| 6  | 11 | 6   | 47 | 6.54  | +25 | 2  | 44.61 | 1.057495 | 8.80  | 73.2  |
| 6  | 12 | 6   | 53 | 59.52 | +24 | 51 | 53.33 | 1.038861 | 8.64  | 75.8  |
| 6  | 13 | 7   | 0  | 39.04 | +24 | 39 | 29.87 | 1.020226 | 8.49  | 78.2  |
| 6  | 14 | 7   | 7  | 4.91  | +24 | 25 | 41.33 | 1.001633 | 8.33  | 80.6  |
| 6  | 15 | 7   | 13 | 16.95 | +24 | 10 | 34.73 | 0.983117 | 8.18  | 83.0  |
| 6  | 16 | 7   | 19 | 15.00 | +23 | 54 | 16.96 | 0.964711 | 8.02  | 85.3  |
| 6  | 17 | 7   | 24 | 58.90 | +23 | 36 | 54.81 | 0.946445 | 7.87  | 87.5  |
| 6  | 18 | 7   | 30 | 28.50 | +23 | 18 | 34.95 | 0.928345 | 7.72  | 89.7  |
| 6  | 19 | 7   | 35 | 43.63 | +22 | 59 | 23.96 | 0.910435 | 7.57  | 91.9  |
| 6  | 20 | 7   | 40 | 44.12 | +22 | 39 | 28.28 | 0.892736 | 7.43  | 94.0  |
| 6  | 21 | 7   | 45 | 29.79 | +22 | 18 | 54.32 | 0.875270 | 7.28  | 96.2  |
| 6  | 22 | 7   | 50 | 0.45  | +21 | 57 | 48.38 | 0.858056 | 7.14  | 98.3  |
| 6  | 23 | 7   | 54 | 15.89 | +21 | 36 | 16.72 | 0.841111 | 7.00  | 100.4 |
| 6  | 24 | 7   | 58 | 15.87 | +21 | 14 | 25.57 | 0.824454 | 6.86  | 102.5 |
| 6  | 25 | 8   | 2  | 0.16  | +20 | 52 | 21.14 | 0.808103 | 6.72  | 104.6 |
| 6  | 26 | 8   | 5  | 28.48 | +20 | 30 | 9.63  | 0.792076 | 6.59  | 106.7 |
| 6  | 27 | 8   | 8  | 40.56 | +20 | 7  | 57.27 | 0.776391 | 6.46  | 108.8 |
| 6  | 28 | 8   | 11 | 36.09 | +19 | 45 | 50.32 | 0.761067 | 6.33  | 110.9 |
| 6  | 29 | 8   | 14 | 14.76 | +19 | 23 | 55.06 | 0.746126 | 6.21  | 113.1 |
| 6  | 30 | 8   | 16 | 36.25 | +19 | 2  | 17.84 | 0.731588 | 6.09  | 115.3 |



## 水星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |    | 中 天   |     | 沒     |     | 視 直徑 | 相位   | 視 亮度 |      |
|----|----|-------|----|-------|-----|-------|-----|------|------|------|------|
| 月  | 日  | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   | 星等   |      |
|    |    | h m   | °  | h m   | °   | h m   | °   | "    | "    |      |      |
| 6  | 1  | 05:51 | 62 | 12:45 | 90S | 19:40 | 298 | 5.47 | 5.47 | 0.87 | -1.1 |
| 6  | 2  | 05:55 | 62 | 12:50 | 90N | 19:45 | 298 | 5.53 | 5.53 | 0.85 | -1.0 |
| 6  | 3  | 05:59 | 62 | 12:55 | 90N | 19:50 | 299 | 5.61 | 5.61 | 0.83 | -1.0 |
| 6  | 4  | 06:04 | 61 | 12:59 | 90N | 19:55 | 299 | 5.68 | 5.68 | 0.80 | -0.9 |
| 6  | 5  | 06:08 | 61 | 13:04 | 90N | 19:59 | 299 | 5.77 | 5.77 | 0.78 | -0.8 |
| 6  | 6  | 06:12 | 61 | 13:08 | 90N | 20:03 | 299 | 5.86 | 5.86 | 0.76 | -0.7 |
| 6  | 7  | 06:16 | 61 | 13:12 | 90N | 20:07 | 299 | 5.95 | 5.95 | 0.73 | -0.6 |
| 6  | 8  | 06:20 | 61 | 13:15 | 90N | 20:11 | 299 | 6.04 | 6.04 | 0.71 | -0.6 |
| 6  | 9  | 06:24 | 62 | 13:19 | 90N | 20:14 | 298 | 6.15 | 6.15 | 0.69 | -0.5 |
| 6  | 10 | 06:28 | 62 | 13:22 | 90N | 20:17 | 298 | 6.25 | 6.25 | 0.67 | -0.4 |
| 6  | 11 | 06:31 | 62 | 13:26 | 90S | 20:19 | 298 | 6.36 | 6.36 | 0.64 | -0.4 |
| 6  | 12 | 06:35 | 62 | 13:28 | 90S | 20:22 | 298 | 6.48 | 6.48 | 0.62 | -0.3 |
| 6  | 13 | 06:38 | 62 | 13:31 | 90S | 20:24 | 298 | 6.59 | 6.59 | 0.60 | -0.2 |
| 6  | 14 | 06:41 | 63 | 13:34 | 89S | 20:26 | 297 | 6.72 | 6.72 | 0.58 | -0.2 |
| 6  | 15 | 06:44 | 63 | 13:36 | 89S | 20:27 | 297 | 6.84 | 6.84 | 0.56 | -0.1 |
| 6  | 16 | 06:46 | 63 | 13:38 | 89S | 20:29 | 297 | 6.97 | 6.97 | 0.54 | -0.1 |
| 6  | 17 | 06:49 | 63 | 13:39 | 88S | 20:30 | 296 | 7.11 | 7.11 | 0.52 | 0.0  |
| 6  | 18 | 06:51 | 64 | 13:41 | 88S | 20:30 | 296 | 7.25 | 7.25 | 0.50 | 0.1  |
| 6  | 19 | 06:53 | 64 | 13:42 | 88S | 20:31 | 296 | 7.39 | 7.39 | 0.48 | 0.1  |
| 6  | 20 | 06:55 | 65 | 13:43 | 88S | 20:31 | 295 | 7.53 | 7.53 | 0.47 | 0.2  |
| 6  | 21 | 06:57 | 65 | 13:44 | 87S | 20:31 | 295 | 7.69 | 7.69 | 0.45 | 0.2  |
| 6  | 22 | 06:58 | 65 | 13:44 | 87S | 20:30 | 294 | 7.84 | 7.84 | 0.43 | 0.3  |
| 6  | 23 | 06:59 | 66 | 13:45 | 86S | 20:30 | 294 | 8.00 | 8.00 | 0.41 | 0.4  |
| 6  | 24 | 07:00 | 66 | 13:45 | 86S | 20:29 | 294 | 8.16 | 8.16 | 0.39 | 0.4  |
| 6  | 25 | 07:01 | 67 | 13:44 | 86S | 20:28 | 293 | 8.32 | 8.32 | 0.37 | 0.5  |
| 6  | 26 | 07:01 | 67 | 13:44 | 85S | 20:26 | 293 | 8.49 | 8.49 | 0.36 | 0.6  |
| 6  | 27 | 07:01 | 67 | 13:43 | 85S | 20:25 | 292 | 8.66 | 8.66 | 0.34 | 0.7  |
| 6  | 28 | 07:01 | 68 | 13:42 | 85S | 20:23 | 292 | 8.84 | 8.84 | 0.32 | 0.7  |
| 6  | 29 | 07:00 | 68 | 13:41 | 84S | 20:20 | 292 | 9.02 | 9.02 | 0.30 | 0.8  |
| 6  | 30 | 07:00 | 69 | 13:39 | 84S | 20:18 | 291 | 9.19 | 9.19 | 0.29 | 0.9  |

## 水 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程  | 日地離角  |
|----|----|-----|----|-------|-----|----|-------|----------|------|-------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分    | °     |
| 7  | 1  | 8   | 18 | 40.24 | +18 | 41 | 5.06  | 0.717478 | 5.97 | 117.5 |
| 7  | 2  | 8   | 20 | 26.39 | +18 | 20 | 23.17 | 0.703819 | 5.85 | 119.8 |
| 7  | 3  | 8   | 21 | 54.40 | +18 | 0  | 18.69 | 0.690641 | 5.74 | 122.2 |
| 7  | 4  | 8   | 23 | 3.98  | +17 | 40 | 58.13 | 0.677971 | 5.64 | 124.5 |
| 7  | 5  | 8   | 23 | 54.88 | +17 | 22 | 28.03 | 0.665842 | 5.54 | 127.0 |
| 7  | 6  | 8   | 24 | 26.90 | +17 | 4  | 54.88 | 0.654289 | 5.44 | 129.5 |
| 7  | 7  | 8   | 24 | 39.93 | +16 | 48 | 25.08 | 0.643349 | 5.35 | 132.0 |
| 7  | 8  | 8   | 24 | 33.94 | +16 | 33 | 4.91  | 0.633062 | 5.27 | 134.6 |
| 7  | 9  | 8   | 24 | 9.04  | +16 | 19 | 0.40  | 0.623470 | 5.19 | 137.3 |
| 7  | 10 | 8   | 23 | 25.49 | +16 | 6  | 17.32 | 0.614620 | 5.11 | 140.1 |
| 7  | 11 | 8   | 22 | 23.70 | +15 | 55 | 1.01  | 0.606559 | 5.05 | 142.9 |
| 7  | 12 | 8   | 21 | 4.30  | +15 | 45 | 16.29 | 0.599335 | 4.98 | 145.7 |
| 7  | 13 | 8   | 19 | 28.14 | +15 | 37 | 7.36  | 0.593000 | 4.93 | 148.6 |
| 7  | 14 | 8   | 17 | 36.31 | +15 | 30 | 37.65 | 0.587605 | 4.89 | 151.6 |
| 7  | 15 | 8   | 15 | 30.16 | +15 | 25 | 49.68 | 0.583203 | 4.85 | 154.6 |
| 7  | 16 | 8   | 13 | 11.32 | +15 | 22 | 45.00 | 0.579843 | 4.82 | 157.5 |
| 7  | 17 | 8   | 10 | 41.66 | +15 | 21 | 24.02 | 0.577576 | 4.80 | 160.4 |
| 7  | 18 | 8   | 8  | 3.35  | +15 | 21 | 46.02 | 0.576449 | 4.79 | 163.1 |
| 7  | 19 | 8   | 5  | 18.76 | +15 | 23 | 49.03 | 0.576507 | 4.79 | 165.5 |
| 7  | 20 | 8   | 2  | 30.49 | +15 | 27 | 29.90 | 0.577788 | 4.81 | 167.4 |
| 7  | 21 | 7   | 59 | 41.27 | +15 | 32 | 44.26 | 0.580329 | 4.83 | 168.4 |
| 7  | 22 | 7   | 56 | 53.96 | +15 | 39 | 26.65 | 0.584159 | 4.86 | 168.2 |
| 7  | 23 | 7   | 54 | 11.47 | +15 | 47 | 30.58 | 0.589300 | 4.90 | 167.0 |
| 7  | 24 | 7   | 51 | 36.68 | +15 | 56 | 48.66 | 0.595770 | 4.95 | 164.8 |
| 7  | 25 | 7   | 49 | 12.41 | +16 | 7  | 12.73 | 0.603577 | 5.02 | 162.1 |
| 7  | 26 | 7   | 47 | 1.34  | +16 | 18 | 34.02 | 0.612725 | 5.10 | 159.0 |
| 7  | 27 | 7   | 45 | 6.01  | +16 | 30 | 43.27 | 0.623210 | 5.18 | 155.7 |
| 7  | 28 | 7   | 43 | 28.70 | +16 | 43 | 30.82 | 0.635019 | 5.28 | 152.2 |
| 7  | 29 | 7   | 42 | 11.49 | +16 | 56 | 46.78 | 0.648137 | 5.39 | 148.6 |
| 7  | 30 | 7   | 41 | 16.16 | +17 | 10 | 21.06 | 0.662538 | 5.51 | 144.9 |
| 7  | 31 | 7   | 40 | 44.25 | +17 | 24 | 3.43  | 0.678193 | 5.64 | 141.2 |

## 水星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 7 1       | 06:58     | 69      | 13:37     | 84S     | 20:15     | 291     | 9.38         | 9.38          | 0.27 | 1.0           |
| 7 2       | 06:57     | 69      | 13:35     | 83S     | 20:12     | 290     | 9.56         | 9.56          | 0.25 | 1.1           |
| 7 3       | 06:55     | 70      | 13:32     | 83S     | 20:09     | 290     | 9.74         | 9.74          | 0.23 | 1.2           |
| 7 4       | 06:53     | 70      | 13:29     | 83S     | 20:05     | 290     | 9.92         | 9.92          | 0.22 | 1.4           |
| 7 5       | 06:51     | 70      | 13:26     | 82S     | 20:01     | 289     | 10.10        | 10.10         | 0.20 | 1.5           |
| 7 6       | 06:48     | 71      | 13:23     | 82S     | 19:57     | 289     | 10.28        | 10.28         | 0.18 | 1.6           |
| 7 7       | 06:45     | 71      | 13:19     | 82S     | 19:53     | 289     | 10.46        | 10.46         | 0.17 | 1.8           |
| 7 8       | 06:41     | 71      | 13:15     | 81S     | 19:48     | 288     | 10.63        | 10.63         | 0.15 | 2.0           |
| 7 9       | 06:38     | 72      | 13:10     | 81S     | 19:43     | 288     | 10.79        | 10.79         | 0.13 | 2.2           |
| 7 10      | 06:33     | 72      | 13:06     | 81S     | 19:38     | 288     | 10.95        | 10.95         | 0.12 | 2.4           |
| 7 11      | 06:29     | 72      | 13:01     | 81S     | 19:32     | 288     | 11.09        | 11.09         | 0.10 | 2.6           |
| 7 12      | 06:24     | 72      | 12:55     | 81S     | 19:27     | 288     | 11.22        | 11.22         | 0.09 | 2.9           |
| 7 13      | 06:19     | 72      | 12:50     | 81S     | 19:21     | 288     | 11.34        | 11.34         | 0.07 | 3.1           |
| 7 14      | 06:13     | 73      | 12:44     | 80S     | 19:15     | 287     | 11.45        | 11.45         | 0.06 | 3.4           |
| 7 15      | 06:07     | 73      | 12:38     | 80S     | 19:09     | 287     | 11.53        | 11.53         | 0.05 | 3.7           |
| 7 16      | 06:01     | 73      | 12:32     | 80S     | 19:02     | 287     | 11.60        | 11.60         | 0.04 | 4.0           |
| 7 17      | 05:55     | 73      | 12:25     | 80S     | 18:56     | 287     | 11.65        | 11.65         | 0.03 | 4.4           |
| 7 18      | 05:48     | 73      | 12:19     | 80S     | 18:49     | 287     | 11.67        | 11.67         | 0.02 | 4.7           |
| 7 19      | 05:42     | 73      | 12:12     | 80S     | 18:42     | 287     | 11.67        | 11.67         | 0.02 | 5.0           |
| 7 20      | 05:35     | 73      | 12:05     | 80S     | 18:36     | 287     | 11.64        | 11.64         | 0.01 | 5.3           |
| 7 21      | 05:28     | 73      | 11:59     | 80S     | 18:29     | 288     | 11.59        | 11.59         | 0.01 | 5.4           |
| 7 22      | 05:21     | 72      | 11:52     | 81S     | 18:23     | 288     | 11.52        | 11.52         | 0.01 | 5.4           |
| 7 23      | 05:14     | 72      | 11:45     | 81S     | 18:17     | 288     | 11.42        | 11.42         | 0.01 | 5.2           |
| 7 24      | 05:07     | 72      | 11:39     | 81S     | 18:11     | 288     | 11.29        | 11.29         | 0.02 | 4.9           |
| 7 25      | 05:01     | 72      | 11:33     | 81S     | 18:05     | 288     | 11.15        | 11.15         | 0.02 | 4.6           |
| 7 26      | 04:54     | 72      | 11:26     | 81S     | 17:59     | 288     | 10.98        | 10.98         | 0.03 | 4.2           |
| 7 27      | 04:48     | 71      | 11:21     | 81S     | 17:54     | 289     | 10.80        | 10.80         | 0.04 | 3.8           |
| 7 28      | 04:42     | 71      | 11:15     | 82S     | 17:49     | 289     | 10.59        | 10.59         | 0.06 | 3.4           |
| 7 29      | 04:36     | 71      | 11:10     | 82S     | 17:44     | 289     | 10.38        | 10.38         | 0.07 | 3.0           |
| 7 30      | 04:31     | 71      | 11:05     | 82S     | 17:40     | 289     | 10.16        | 10.16         | 0.09 | 2.7           |
| 7 31      | 04:26     | 70      | 11:01     | 82S     | 17:36     | 290     | 9.92         | 9.92          | 0.11 | 2.3           |

## 水 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程   | 日地離角  |
|----|----|-----|----|-------|-----|----|-------|----------|-------|-------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分     | °     |
| 8  | 1  | 7   | 40 | 37.04 | +17 | 37 | 43.57 | 0.695067 | 5.78  | 137.4 |
| 8  | 2  | 7   | 40 | 55.55 | +17 | 51 | 11.06 | 0.713118 | 5.93  | 133.5 |
| 8  | 3  | 7   | 41 | 40.54 | +18 | 4  | 15.41 | 0.732298 | 6.09  | 129.7 |
| 8  | 4  | 7   | 42 | 52.59 | +18 | 16 | 46.04 | 0.752556 | 6.26  | 125.8 |
| 8  | 5  | 7   | 44 | 32.03 | +18 | 28 | 32.28 | 0.773831 | 6.44  | 121.8 |
| 8  | 6  | 7   | 46 | 39.03 | +18 | 39 | 23.38 | 0.796056 | 6.62  | 117.8 |
| 8  | 7  | 7   | 49 | 13.56 | +18 | 49 | 8.53  | 0.819159 | 6.81  | 113.7 |
| 8  | 8  | 7   | 52 | 15.43 | +18 | 57 | 36.84 | 0.843056 | 7.01  | 109.6 |
| 8  | 9  | 7   | 55 | 44.28 | +19 | 4  | 37.44 | 0.867658 | 7.22  | 105.4 |
| 8  | 10 | 7   | 59 | 39.57 | +19 | 9  | 59.51 | 0.892864 | 7.42  | 101.2 |
| 8  | 11 | 8   | 4  | 0.63  | +19 | 13 | 32.40 | 0.918564 | 7.64  | 96.9  |
| 8  | 12 | 8   | 8  | 46.60 | +19 | 15 | 5.77  | 0.944640 | 7.86  | 92.6  |
| 8  | 13 | 8   | 13 | 56.46 | +19 | 14 | 29.77 | 0.970961 | 8.07  | 88.2  |
| 8  | 14 | 8   | 19 | 29.00 | +19 | 11 | 35.22 | 0.997391 | 8.29  | 83.7  |
| 8  | 15 | 8   | 25 | 22.87 | +19 | 6  | 13.87 | 1.023784 | 8.51  | 79.2  |
| 8  | 16 | 8   | 31 | 36.54 | +18 | 58 | 18.66 | 1.049991 | 8.73  | 74.6  |
| 8  | 17 | 8   | 38 | 8.32  | +18 | 47 | 43.89 | 1.075858 | 8.95  | 70.0  |
| 8  | 18 | 8   | 44 | 56.38 | +18 | 34 | 25.53 | 1.101234 | 9.16  | 65.4  |
| 8  | 19 | 8   | 51 | 58.79 | +18 | 18 | 21.37 | 1.125969 | 9.36  | 60.9  |
| 8  | 20 | 8   | 59 | 13.54 | +17 | 59 | 31.10 | 1.149925 | 9.56  | 56.3  |
| 8  | 21 | 9   | 6  | 38.58 | +17 | 37 | 56.43 | 1.172972 | 9.75  | 51.8  |
| 8  | 22 | 9   | 14 | 11.87 | +17 | 13 | 40.97 | 1.194996 | 9.94  | 47.4  |
| 8  | 23 | 9   | 21 | 51.41 | +16 | 46 | 50.15 | 1.215901 | 10.11 | 43.0  |
| 8  | 24 | 9   | 29 | 35.30 | +16 | 17 | 31.03 | 1.235609 | 10.28 | 38.7  |
| 8  | 25 | 9   | 37 | 21.75 | +15 | 45 | 52.01 | 1.254062 | 10.43 | 34.6  |
| 8  | 26 | 9   | 45 | 9.14  | +15 | 12 | 2.51  | 1.271222 | 10.57 | 30.6  |
| 8  | 27 | 9   | 52 | 56.03 | +14 | 36 | 12.75 | 1.287069 | 10.70 | 26.8  |
| 8  | 28 | 10  | 0  | 41.13 | +13 | 58 | 33.35 | 1.301600 | 10.82 | 23.1  |
| 8  | 29 | 10  | 8  | 23.38 | +13 | 19 | 15.12 | 1.314828 | 10.93 | 19.6  |
| 8  | 30 | 10  | 16 | 1.88  | +12 | 38 | 28.76 | 1.326776 | 11.03 | 16.2  |
| 8  | 31 | 10  | 23 | 35.90 | +11 | 56 | 24.73 | 1.337479 | 11.12 | 13.1  |

## 水星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |    | 中 天   |     | 沒     |     | 視 直徑 | 相位   | 視 亮度 |      |
|----|----|-------|----|-------|-----|-------|-----|------|------|------|------|
| 月  | 日  | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   | 星等   |      |
|    |    | h m   | °  | h m   | °   | h m   | °   | "    | "    |      |      |
| 8  | 1  | 04:21 | 70 | 10:57 | 83S | 17:33 | 290 | 9.68 | 9.68 | 0.13 | 2.0  |
| 8  | 2  | 04:17 | 70 | 10:53 | 83S | 17:30 | 290 | 9.44 | 9.44 | 0.16 | 1.7  |
| 8  | 3  | 04:13 | 70 | 10:50 | 83S | 17:27 | 290 | 9.19 | 9.19 | 0.18 | 1.4  |
| 8  | 4  | 04:10 | 69 | 10:47 | 83S | 17:25 | 291 | 8.94 | 8.94 | 0.21 | 1.2  |
| 8  | 5  | 04:07 | 69 | 10:45 | 83S | 17:23 | 291 | 8.69 | 8.69 | 0.24 | 0.9  |
| 8  | 6  | 04:05 | 69 | 10:43 | 84S | 17:22 | 291 | 8.45 | 8.45 | 0.27 | 0.7  |
| 8  | 7  | 04:03 | 69 | 10:42 | 84S | 17:21 | 291 | 8.21 | 8.21 | 0.30 | 0.5  |
| 8  | 8  | 04:02 | 69 | 10:41 | 84S | 17:21 | 291 | 7.98 | 7.98 | 0.33 | 0.3  |
| 8  | 9  | 04:01 | 69 | 10:41 | 84S | 17:21 | 291 | 7.75 | 7.75 | 0.37 | 0.1  |
| 8  | 10 | 04:01 | 68 | 10:41 | 84S | 17:21 | 292 | 7.54 | 7.54 | 0.40 | 0.0  |
| 8  | 11 | 04:01 | 68 | 10:41 | 84S | 17:22 | 292 | 7.33 | 7.33 | 0.44 | -0.2 |
| 8  | 12 | 04:02 | 68 | 10:42 | 84S | 17:23 | 292 | 7.12 | 7.12 | 0.48 | -0.3 |
| 8  | 13 | 04:03 | 68 | 10:43 | 84S | 17:24 | 292 | 6.93 | 6.93 | 0.52 | -0.4 |
| 8  | 14 | 04:04 | 68 | 10:45 | 84S | 17:26 | 292 | 6.75 | 6.75 | 0.56 | -0.6 |
| 8  | 15 | 04:06 | 69 | 10:47 | 84S | 17:28 | 291 | 6.57 | 6.57 | 0.59 | -0.7 |
| 8  | 16 | 04:09 | 69 | 10:49 | 84S | 17:30 | 291 | 6.41 | 6.41 | 0.63 | -0.8 |
| 8  | 17 | 04:12 | 69 | 10:52 | 84S | 17:32 | 291 | 6.25 | 6.25 | 0.67 | -0.8 |
| 8  | 18 | 04:15 | 69 | 10:55 | 83S | 17:34 | 291 | 6.11 | 6.11 | 0.71 | -0.9 |
| 8  | 19 | 04:19 | 69 | 10:58 | 83S | 17:37 | 290 | 5.98 | 5.98 | 0.74 | -1.0 |
| 8  | 20 | 04:23 | 70 | 11:01 | 83S | 17:40 | 290 | 5.85 | 5.85 | 0.78 | -1.1 |
| 8  | 21 | 04:27 | 70 | 11:05 | 83S | 17:42 | 290 | 5.74 | 5.74 | 0.81 | -1.1 |
| 8  | 22 | 04:31 | 71 | 11:09 | 82S | 17:45 | 289 | 5.63 | 5.63 | 0.84 | -1.2 |
| 8  | 23 | 04:36 | 71 | 11:12 | 82S | 17:48 | 289 | 5.53 | 5.53 | 0.87 | -1.2 |
| 8  | 24 | 04:41 | 72 | 11:16 | 81S | 17:51 | 288 | 5.45 | 5.45 | 0.89 | -1.3 |
| 8  | 25 | 04:46 | 72 | 11:20 | 81S | 17:53 | 287 | 5.37 | 5.37 | 0.91 | -1.4 |
| 8  | 26 | 04:51 | 73 | 11:24 | 80S | 17:56 | 287 | 5.29 | 5.29 | 0.93 | -1.4 |
| 8  | 27 | 04:56 | 73 | 11:28 | 79S | 17:59 | 286 | 5.23 | 5.23 | 0.95 | -1.5 |
| 8  | 28 | 05:01 | 74 | 11:31 | 79S | 18:01 | 285 | 5.17 | 5.17 | 0.96 | -1.5 |
| 8  | 29 | 05:06 | 75 | 11:35 | 78S | 18:04 | 285 | 5.12 | 5.12 | 0.97 | -1.6 |
| 8  | 30 | 05:11 | 76 | 11:39 | 77S | 18:06 | 284 | 5.07 | 5.07 | 0.98 | -1.7 |
| 8  | 31 | 05:16 | 76 | 11:43 | 77S | 18:08 | 283 | 5.03 | 5.03 | 0.99 | -1.7 |

## 水 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分     | °    |
| 9  | 1  | 10  | 31 | 4.89  | +11 | 13 | 13.04 | 1.346978 | 11.20 | 10.3 |
| 9  | 2  | 10  | 38 | 28.44 | +10 | 29 | 3.17  | 1.355322 | 11.27 | 7.7  |
| 9  | 3  | 10  | 45 | 46.24 | +9  | 44 | 4.01  | 1.362559 | 11.33 | 5.7  |
| 9  | 4  | 10  | 52 | 58.14 | +8  | 58 | 23.80 | 1.368742 | 11.38 | 4.8  |
| 9  | 5  | 11  | 0  | 4.02  | +8  | 12 | 10.13 | 1.373924 | 11.43 | 5.2  |
| 9  | 6  | 11  | 7  | 3.89  | +7  | 25 | 30.00 | 1.378157 | 11.46 | 6.6  |
| 9  | 7  | 11  | 13 | 57.77 | +6  | 38 | 29.79 | 1.381491 | 11.49 | 8.4  |
| 9  | 8  | 11  | 20 | 45.78 | +5  | 51 | 15.28 | 1.383975 | 11.51 | 10.3 |
| 9  | 9  | 11  | 27 | 28.05 | +5  | 3  | 51.70 | 1.385654 | 11.52 | 12.2 |
| 9  | 10 | 11  | 34 | 4.74  | +4  | 16 | 23.80 | 1.386571 | 11.53 | 14.1 |
| 9  | 11 | 11  | 40 | 36.04 | +3  | 28 | 55.86 | 1.386766 | 11.53 | 16.0 |
| 9  | 12 | 11  | 47 | 2.15  | +2  | 41 | 31.76 | 1.386276 | 11.53 | 17.8 |
| 9  | 13 | 11  | 53 | 23.29 | +1  | 54 | 15.02 | 1.385135 | 11.52 | 19.5 |
| 9  | 14 | 11  | 59 | 39.67 | +1  | 7  | 8.82  | 1.383374 | 11.51 | 21.2 |
| 9  | 15 | 12  | 5  | 51.52 | +0  | 20 | 16.04 | 1.381021 | 11.49 | 22.9 |
| 9  | 16 | 12  | 11 | 59.04 | -0  | 26 | 20.68 | 1.378102 | 11.46 | 24.4 |
| 9  | 17 | 12  | 18 | 2.47  | -1  | 12 | 38.94 | 1.374640 | 11.43 | 26.0 |
| 9  | 18 | 12  | 24 | 2.01  | -1  | 58 | 36.52 | 1.370655 | 11.40 | 27.5 |
| 9  | 19 | 12  | 29 | 57.87 | -2  | 44 | 11.39 | 1.366165 | 11.36 | 28.9 |
| 9  | 20 | 12  | 35 | 50.23 | -3  | 29 | 21.65 | 1.361188 | 11.32 | 30.3 |
| 9  | 21 | 12  | 41 | 39.29 | -4  | 14 | 5.53  | 1.355736 | 11.28 | 31.7 |
| 9  | 22 | 12  | 47 | 25.21 | -4  | 58 | 21.36 | 1.349822 | 11.23 | 33.1 |
| 9  | 23 | 12  | 53 | 8.16  | -5  | 42 | 7.55  | 1.343457 | 11.17 | 34.4 |
| 9  | 24 | 12  | 58 | 48.29 | -6  | 25 | 22.60 | 1.336650 | 11.12 | 35.7 |
| 9  | 25 | 13  | 4  | 25.73 | -7  | 8  | 5.03  | 1.329407 | 11.06 | 37.0 |
| 9  | 26 | 13  | 10 | 0.60  | -7  | 50 | 13.42 | 1.321736 | 10.99 | 38.3 |
| 9  | 27 | 13  | 15 | 33.00 | -8  | 31 | 46.39 | 1.313642 | 10.93 | 39.6 |
| 9  | 28 | 13  | 21 | 3.04  | -9  | 12 | 42.54 | 1.305127 | 10.86 | 40.9 |
| 9  | 29 | 13  | 26 | 30.77 | -9  | 53 | 0.51  | 1.296196 | 10.78 | 42.2 |
| 9  | 30 | 13  | 31 | 56.27 | -10 | 32 | 38.94 | 1.286849 | 10.70 | 43.5 |

## 水星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |     | 中 天   |     | 沒     |     | 視 直徑 | 相位   | 視 亮度 |      |
|----|----|-------|-----|-------|-----|-------|-----|------|------|------|------|
| 月  | 日  | 時間    | 方位  | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   | 星等   |      |
|    |    | h m   | °   | h m   | °   | h m   | °   | "    | "    |      |      |
| 9  | 1  | 05:21 | 77  | 11:46 | 76S | 18:10 | 282 | 4.99 | 4.99 | 0.99 | -1.8 |
| 9  | 2  | 05:26 | 78  | 11:49 | 75S | 18:12 | 282 | 4.96 | 4.96 | 1.00 | -1.9 |
| 9  | 3  | 05:31 | 79  | 11:53 | 75S | 18:14 | 281 | 4.94 | 4.94 | 1.00 | -1.9 |
| 9  | 4  | 05:36 | 80  | 11:56 | 74S | 18:16 | 280 | 4.92 | 4.92 | 1.00 | -1.9 |
| 9  | 5  | 05:40 | 81  | 11:59 | 73S | 18:17 | 279 | 4.90 | 4.90 | 1.00 | -1.8 |
| 9  | 6  | 05:45 | 81  | 12:02 | 72S | 18:19 | 278 | 4.88 | 4.88 | 1.00 | -1.7 |
| 9  | 7  | 05:49 | 82  | 12:05 | 71S | 18:20 | 277 | 4.87 | 4.87 | 1.00 | -1.6 |
| 9  | 8  | 05:54 | 83  | 12:08 | 71S | 18:22 | 276 | 4.86 | 4.86 | 0.99 | -1.5 |
| 9  | 9  | 05:58 | 84  | 12:11 | 70S | 18:23 | 275 | 4.86 | 4.86 | 0.99 | -1.4 |
| 9  | 10 | 06:02 | 85  | 12:13 | 69S | 18:24 | 275 | 4.85 | 4.85 | 0.99 | -1.3 |
| 9  | 11 | 06:06 | 86  | 12:16 | 68S | 18:25 | 274 | 4.85 | 4.85 | 0.98 | -1.2 |
| 9  | 12 | 06:10 | 87  | 12:19 | 67S | 18:26 | 273 | 4.85 | 4.85 | 0.98 | -1.1 |
| 9  | 13 | 06:14 | 88  | 12:21 | 67S | 18:27 | 272 | 4.86 | 4.86 | 0.97 | -1.0 |
| 9  | 14 | 06:18 | 88  | 12:23 | 66S | 18:28 | 271 | 4.86 | 4.86 | 0.97 | -0.9 |
| 9  | 15 | 06:22 | 89  | 12:25 | 65S | 18:29 | 270 | 4.87 | 4.87 | 0.96 | -0.9 |
| 9  | 16 | 06:25 | 90  | 12:28 | 64S | 18:29 | 269 | 4.88 | 4.88 | 0.96 | -0.8 |
| 9  | 17 | 06:29 | 91  | 12:30 | 64S | 18:30 | 269 | 4.89 | 4.89 | 0.95 | -0.7 |
| 9  | 18 | 06:32 | 92  | 12:32 | 63S | 18:30 | 268 | 4.91 | 4.91 | 0.94 | -0.7 |
| 9  | 19 | 06:36 | 93  | 12:34 | 62S | 18:31 | 267 | 4.92 | 4.92 | 0.94 | -0.6 |
| 9  | 20 | 06:39 | 94  | 12:36 | 61S | 18:32 | 266 | 4.94 | 4.94 | 0.93 | -0.6 |
| 9  | 21 | 06:42 | 94  | 12:38 | 61S | 18:32 | 265 | 4.96 | 4.96 | 0.93 | -0.5 |
| 9  | 22 | 06:46 | 95  | 12:39 | 60S | 18:32 | 264 | 4.98 | 4.98 | 0.92 | -0.5 |
| 9  | 23 | 06:49 | 96  | 12:41 | 59S | 18:33 | 264 | 5.01 | 5.01 | 0.91 | -0.4 |
| 9  | 24 | 06:52 | 97  | 12:43 | 58S | 18:33 | 263 | 5.03 | 5.03 | 0.91 | -0.4 |
| 9  | 25 | 06:55 | 98  | 12:45 | 58S | 18:33 | 262 | 5.06 | 5.06 | 0.90 | -0.4 |
| 9  | 26 | 06:58 | 98  | 12:46 | 57S | 18:34 | 261 | 5.09 | 5.09 | 0.89 | -0.3 |
| 9  | 27 | 07:01 | 99  | 12:48 | 56S | 18:34 | 261 | 5.12 | 5.12 | 0.89 | -0.3 |
| 9  | 28 | 07:04 | 100 | 12:49 | 56S | 18:34 | 260 | 5.15 | 5.15 | 0.88 | -0.3 |
| 9  | 29 | 07:07 | 101 | 12:51 | 55S | 18:34 | 259 | 5.19 | 5.19 | 0.87 | -0.2 |
| 9  | 30 | 07:09 | 101 | 12:52 | 54S | 18:35 | 258 | 5.23 | 5.23 | 0.86 | -0.2 |

## 水 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程   | 日地離角  |
|----|----|-----|----|-------|-----|----|-------|----------|-------|-------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分     | °     |
| 10 | 1  | 13  | 37 | 19.57 | -11 | 11 | 36.44 | 1.277090 | 10.62 | 44.7  |
| 10 | 2  | 13  | 42 | 40.68 | -11 | 49 | 51.61 | 1.266917 | 10.54 | 46.0  |
| 10 | 3  | 13  | 47 | 59.60 | -12 | 27 | 23.00 | 1.256332 | 10.45 | 47.3  |
| 10 | 4  | 13  | 53 | 16.30 | -13 | 4  | 9.12  | 1.245333 | 10.36 | 48.7  |
| 10 | 5  | 13  | 58 | 30.73 | -13 | 40 | 8.45  | 1.233921 | 10.26 | 50.0  |
| 10 | 6  | 14  | 3  | 42.81 | -14 | 15 | 19.37 | 1.222094 | 10.16 | 51.4  |
| 10 | 7  | 14  | 8  | 52.43 | -14 | 49 | 40.24 | 1.209850 | 10.06 | 52.8  |
| 10 | 8  | 14  | 13 | 59.44 | -15 | 23 | 9.29  | 1.197188 | 9.96  | 54.2  |
| 10 | 9  | 14  | 19 | 3.67  | -15 | 55 | 44.70 | 1.184106 | 9.85  | 55.6  |
| 10 | 10 | 14  | 24 | 4.89  | -16 | 27 | 24.53 | 1.170602 | 9.74  | 57.1  |
| 10 | 11 | 14  | 29 | 2.85  | -16 | 58 | 6.72  | 1.156676 | 9.62  | 58.7  |
| 10 | 12 | 14  | 33 | 57.23 | -17 | 27 | 49.07 | 1.142326 | 9.50  | 60.3  |
| 10 | 13 | 14  | 38 | 47.67 | -17 | 56 | 29.25 | 1.127552 | 9.38  | 61.9  |
| 10 | 14 | 14  | 43 | 33.74 | -18 | 24 | 4.75  | 1.112354 | 9.25  | 63.6  |
| 10 | 15 | 14  | 48 | 14.95 | -18 | 50 | 32.86 | 1.096734 | 9.12  | 65.4  |
| 10 | 16 | 14  | 52 | 50.71 | -19 | 15 | 50.66 | 1.080695 | 8.99  | 67.2  |
| 10 | 17 | 14  | 57 | 20.38 | -19 | 39 | 54.97 | 1.064243 | 8.85  | 69.2  |
| 10 | 18 | 15  | 1  | 43.21 | -20 | 2  | 42.34 | 1.047383 | 8.71  | 71.2  |
| 10 | 19 | 15  | 5  | 58.33 | -20 | 24 | 8.98  | 1.030125 | 8.57  | 73.3  |
| 10 | 20 | 15  | 10 | 4.77  | -20 | 44 | 10.74 | 1.012484 | 8.42  | 75.5  |
| 10 | 21 | 15  | 14 | 1.45  | -21 | 2  | 43.04 | 0.994476 | 8.27  | 77.8  |
| 10 | 22 | 15  | 17 | 47.10 | -21 | 19 | 40.81 | 0.976124 | 8.12  | 80.3  |
| 10 | 23 | 15  | 21 | 20.35 | -21 | 34 | 58.40 | 0.957455 | 7.96  | 82.9  |
| 10 | 24 | 15  | 24 | 39.63 | -21 | 48 | 29.56 | 0.938506 | 7.81  | 85.6  |
| 10 | 25 | 15  | 27 | 43.21 | -22 | 0  | 7.30  | 0.919319 | 7.65  | 88.5  |
| 10 | 26 | 15  | 30 | 29.20 | -22 | 9  | 43.80 | 0.899948 | 7.49  | 91.5  |
| 10 | 27 | 15  | 32 | 55.51 | -22 | 17 | 10.35 | 0.880460 | 7.32  | 94.8  |
| 10 | 28 | 15  | 34 | 59.88 | -22 | 22 | 17.26 | 0.860932 | 7.16  | 98.2  |
| 10 | 29 | 15  | 36 | 39.91 | -22 | 24 | 53.78 | 0.841462 | 7.00  | 101.9 |
| 10 | 30 | 15  | 37 | 53.08 | -22 | 24 | 48.08 | 0.822161 | 6.84  | 105.8 |
| 10 | 31 | 15  | 38 | 36.84 | -22 | 21 | 47.36 | 0.803165 | 6.68  | 110.0 |



## 水星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 10 1      | 07:12     | 102     | 12:54     | 54S     | 18:35     | 258     | 5.27         | 5.27          | 0.86 | -0.2          |
| 10 2      | 07:15     | 103     | 12:55     | 53S     | 18:35     | 257     | 5.31         | 5.31          | 0.85 | -0.2          |
| 10 3      | 07:17     | 103     | 12:57     | 52S     | 18:35     | 256     | 5.35         | 5.35          | 0.84 | -0.2          |
| 10 4      | 07:20     | 104     | 12:58     | 52S     | 18:35     | 256     | 5.40         | 5.40          | 0.83 | -0.2          |
| 10 5      | 07:22     | 105     | 12:59     | 51S     | 18:35     | 255     | 5.45         | 5.45          | 0.82 | -0.2          |
| 10 6      | 07:25     | 105     | 13:00     | 51S     | 18:35     | 254     | 5.50         | 5.50          | 0.81 | -0.1          |
| 10 7      | 07:27     | 106     | 13:02     | 50S     | 18:36     | 254     | 5.56         | 5.56          | 0.80 | -0.1          |
| 10 8      | 07:29     | 107     | 13:03     | 49S     | 18:36     | 253     | 5.62         | 5.62          | 0.79 | -0.1          |
| 10 9      | 07:32     | 107     | 13:04     | 49S     | 18:36     | 252     | 5.68         | 5.68          | 0.78 | -0.1          |
| 10 10     | 07:34     | 108     | 13:05     | 48S     | 18:36     | 252     | 5.75         | 5.75          | 0.77 | -0.1          |
| 10 11     | 07:36     | 109     | 13:06     | 48S     | 18:36     | 251     | 5.82         | 5.82          | 0.76 | -0.1          |
| 10 12     | 07:38     | 109     | 13:07     | 47S     | 18:35     | 251     | 5.89         | 5.89          | 0.75 | -0.1          |
| 10 13     | 07:40     | 110     | 13:08     | 47S     | 18:35     | 250     | 5.97         | 5.97          | 0.74 | -0.1          |
| 10 14     | 07:42     | 110     | 13:09     | 46S     | 18:35     | 250     | 6.05         | 6.05          | 0.72 | -0.1          |
| 10 15     | 07:43     | 111     | 13:09     | 46S     | 18:35     | 249     | 6.13         | 6.13          | 0.71 | -0.1          |
| 10 16     | 07:45     | 111     | 13:10     | 46S     | 18:35     | 249     | 6.22         | 6.22          | 0.69 | -0.1          |
| 10 17     | 07:46     | 112     | 13:11     | 45S     | 18:34     | 248     | 6.32         | 6.32          | 0.68 | -0.1          |
| 10 18     | 07:47     | 112     | 13:11     | 45S     | 18:34     | 248     | 6.42         | 6.42          | 0.66 | -0.1          |
| 10 19     | 07:49     | 112     | 13:11     | 44S     | 18:34     | 247     | 6.53         | 6.53          | 0.64 | -0.1          |
| 10 20     | 07:49     | 113     | 13:11     | 44S     | 18:33     | 247     | 6.64         | 6.64          | 0.63 | -0.1          |
| 10 21     | 07:50     | 113     | 13:11     | 44S     | 18:32     | 247     | 6.76         | 6.76          | 0.61 | -0.1          |
| 10 22     | 07:51     | 113     | 13:11     | 44S     | 18:31     | 246     | 6.89         | 6.89          | 0.58 | -0.1          |
| 10 23     | 07:51     | 114     | 13:11     | 43S     | 18:30     | 246     | 7.03         | 7.03          | 0.56 | -0.1          |
| 10 24     | 07:51     | 114     | 13:10     | 43S     | 18:29     | 246     | 7.17         | 7.17          | 0.54 | -0.1          |
| 10 25     | 07:50     | 114     | 13:09     | 43S     | 18:28     | 246     | 7.32         | 7.32          | 0.51 | -0.1          |
| 10 26     | 07:49     | 114     | 13:08     | 43S     | 18:26     | 246     | 7.47         | 7.47          | 0.49 | 0.0           |
| 10 27     | 07:48     | 114     | 13:06     | 43S     | 18:24     | 245     | 7.64         | 7.64          | 0.46 | 0.0           |
| 10 28     | 07:46     | 115     | 13:04     | 43S     | 18:22     | 245     | 7.81         | 7.81          | 0.43 | 0.1           |
| 10 29     | 07:44     | 115     | 13:02     | 43S     | 18:20     | 245     | 7.99         | 7.99          | 0.40 | 0.1           |
| 10 30     | 07:42     | 115     | 12:59     | 43S     | 18:17     | 245     | 8.18         | 8.18          | 0.36 | 0.2           |
| 10 31     | 07:38     | 115     | 12:56     | 43S     | 18:13     | 245     | 8.38         | 8.38          | 0.33 | 0.4           |

## 水 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程  | 日地離角  |
|----|----|-----|----|-------|-----|----|-------|----------|------|-------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分    | °     |
| 11 | 1  | 15  | 38 | 48.68 | -22 | 15 | 38.01 | 0.784629 | 6.53 | 114.4 |
| 11 | 2  | 15  | 38 | 26.27 | -22 | 6  | 6.05  | 0.766736 | 6.38 | 119.1 |
| 11 | 3  | 15  | 37 | 27.64 | -21 | 52 | 57.80 | 0.749691 | 6.24 | 124.2 |
| 11 | 4  | 15  | 35 | 51.40 | -21 | 36 | 0.93  | 0.733728 | 6.10 | 129.5 |
| 11 | 5  | 15  | 33 | 37.00 | -21 | 15 | 6.01  | 0.719100 | 5.98 | 135.1 |
| 11 | 6  | 15  | 30 | 45.00 | -20 | 50 | 8.38  | 0.706082 | 5.87 | 141.1 |
| 11 | 7  | 15  | 27 | 17.38 | -20 | 21 | 10.61 | 0.694959 | 5.78 | 147.4 |
| 11 | 8  | 15  | 23 | 17.73 | -19 | 48 | 24.92 | 0.686020 | 5.71 | 154.0 |
| 11 | 9  | 15  | 18 | 51.39 | -19 | 12 | 15.54 | 0.679537 | 5.65 | 160.9 |
| 11 | 10 | 15  | 14 | 5.38  | -18 | 33 | 20.12 | 0.675757 | 5.62 | 168.0 |
| 11 | 11 | 15  | 9  | 8.17  | -17 | 52 | 29.82 | 0.674876 | 5.61 | 175.3 |
| 11 | 12 | 15  | 4  | 9.20  | -17 | 10 | 47.48 | 0.677030 | 5.63 | 177.3 |
| 11 | 13 | 14  | 59 | 18.31 | -16 | 29 | 23.82 | 0.682279 | 5.67 | 169.8 |
| 11 | 14 | 14  | 54 | 44.99 | -15 | 49 | 32.17 | 0.690597 | 5.74 | 162.3 |
| 11 | 15 | 14  | 50 | 37.79 | -15 | 12 | 22.56 | 0.701878 | 5.84 | 154.8 |
| 11 | 16 | 14  | 47 | 3.75  | -14 | 38 | 56.24 | 0.715937 | 5.95 | 147.5 |
| 11 | 17 | 14  | 44 | 8.16  | -14 | 10 | 1.63  | 0.732527 | 6.09 | 140.3 |
| 11 | 18 | 14  | 41 | 54.41 | -13 | 46 | 12.13 | 0.751353 | 6.25 | 133.3 |
| 11 | 19 | 14  | 40 | 24.11 | -13 | 27 | 45.85 | 0.772089 | 6.42 | 126.6 |
| 11 | 20 | 14  | 39 | 37.33 | -13 | 14 | 46.94 | 0.794399 | 6.61 | 120.1 |
| 11 | 21 | 14  | 39 | 32.90 | -13 | 7  | 7.89  | 0.817952 | 6.80 | 113.9 |
| 11 | 22 | 14  | 40 | 8.76  | -13 | 4  | 32.22 | 0.842428 | 7.01 | 108.0 |
| 11 | 23 | 14  | 41 | 22.23 | -13 | 6  | 37.30 | 0.867534 | 7.21 | 102.4 |
| 11 | 24 | 14  | 43 | 10.29 | -13 | 12 | 56.71 | 0.893005 | 7.43 | 97.1  |
| 11 | 25 | 14  | 45 | 29.81 | -13 | 23 | 2.23  | 0.918610 | 7.64 | 92.1  |
| 11 | 26 | 14  | 48 | 17.66 | -13 | 36 | 25.42 | 0.944149 | 7.85 | 87.4  |
| 11 | 27 | 14  | 51 | 30.84 | -13 | 52 | 38.62 | 0.969453 | 8.06 | 82.9  |
| 11 | 28 | 14  | 55 | 6.58  | -14 | 11 | 15.69 | 0.994384 | 8.27 | 78.7  |
| 11 | 29 | 14  | 59 | 2.31  | -14 | 31 | 52.44 | 1.018830 | 8.47 | 74.8  |
| 11 | 30 | 15  | 3  | 15.73 | -14 | 54 | 6.79  | 1.042701 | 8.67 | 71.1  |

## 水星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 11 1      | 07:34     | 114     | 12:52     | 43S     | 18:10     | 246     | 8.57         | 8.57          | 0.29 | 0.5           |
| 11 2      | 07:30     | 114     | 12:47     | 43S     | 18:06     | 246     | 8.77         | 8.77          | 0.26 | 0.7           |
| 11 3      | 07:24     | 114     | 12:42     | 43S     | 18:01     | 246     | 8.97         | 8.97          | 0.22 | 1.0           |
| 11 4      | 07:18     | 114     | 12:37     | 43S     | 17:56     | 246     | 9.17         | 9.17          | 0.18 | 1.3           |
| 11 5      | 07:11     | 113     | 12:31     | 44S     | 17:50     | 247     | 9.35         | 9.35          | 0.15 | 1.6           |
| 11 6      | 07:04     | 113     | 12:24     | 44S     | 17:44     | 247     | 9.53         | 9.53          | 0.11 | 2.1           |
| 11 7      | 06:55     | 112     | 12:16     | 45S     | 17:38     | 248     | 9.68         | 9.68          | 0.08 | 2.6           |
| 11 8      | 06:46     | 112     | 12:08     | 45S     | 17:31     | 249     | 9.81         | 9.81          | 0.05 | 3.3           |
| 11 9      | 06:37     | 111     | 12:00     | 46S     | 17:24     | 249     | 9.90         | 9.90          | 0.03 | 4.1           |
| 11 10     | 06:27     | 110     | 11:51     | 46S     | 17:16     | 250     | 9.96         | 9.96          | 0.01 | 5.0           |
| 11 11     | 06:16     | 110     | 11:42     | 47S     | 17:09     | 251     | 9.97         | 9.97          | 0.00 | ----          |
| 11 12     | 06:06     | 109     | 11:33     | 48S     | 17:01     | 252     | 9.94         | 9.94          | 0.00 | ----          |
| 11 13     | 05:56     | 108     | 11:25     | 49S     | 16:54     | 252     | 9.86         | 9.86          | 0.01 | ----          |
| 11 14     | 05:46     | 107     | 11:16     | 49S     | 16:47     | 253     | 9.74         | 9.74          | 0.02 | 4.2           |
| 11 15     | 05:37     | 107     | 11:08     | 50S     | 16:40     | 254     | 9.59         | 9.59          | 0.05 | 3.3           |
| 11 16     | 05:28     | 106     | 11:01     | 50S     | 16:34     | 254     | 9.40         | 9.40          | 0.08 | 2.5           |
| 11 17     | 05:20     | 105     | 10:54     | 51S     | 16:28     | 255     | 9.19         | 9.19          | 0.12 | 1.9           |
| 11 18     | 05:13     | 105     | 10:48     | 51S     | 16:23     | 255     | 8.96         | 8.96          | 0.16 | 1.3           |
| 11 19     | 05:07     | 105     | 10:43     | 52S     | 16:19     | 255     | 8.71         | 8.71          | 0.20 | 0.9           |
| 11 20     | 05:02     | 104     | 10:38     | 52S     | 16:15     | 256     | 8.47         | 8.47          | 0.25 | 0.5           |
| 11 21     | 04:58     | 104     | 10:34     | 52S     | 16:11     | 256     | 8.23         | 8.23          | 0.30 | 0.3           |
| 11 22     | 04:54     | 104     | 10:31     | 52S     | 16:08     | 256     | 7.99         | 7.99          | 0.35 | 0.0           |
| 11 23     | 04:51     | 104     | 10:28     | 52S     | 16:05     | 256     | 7.76         | 7.76          | 0.39 | -0.1          |
| 11 24     | 04:49     | 104     | 10:26     | 52S     | 16:03     | 256     | 7.53         | 7.53          | 0.44 | -0.3          |
| 11 25     | 04:48     | 105     | 10:25     | 52S     | 16:01     | 255     | 7.32         | 7.32          | 0.48 | -0.4          |
| 11 26     | 04:47     | 105     | 10:24     | 51S     | 16:00     | 255     | 7.13         | 7.13          | 0.52 | -0.5          |
| 11 27     | 04:47     | 105     | 10:23     | 51S     | 15:59     | 255     | 6.94         | 6.94          | 0.56 | -0.5          |
| 11 28     | 04:47     | 105     | 10:23     | 51S     | 15:58     | 254     | 6.77         | 6.77          | 0.60 | -0.6          |
| 11 29     | 04:48     | 106     | 10:23     | 50S     | 15:57     | 254     | 6.60         | 6.60          | 0.63 | -0.6          |
| 11 30     | 04:49     | 106     | 10:23     | 50S     | 15:57     | 254     | 6.45         | 6.45          | 0.66 | -0.6          |

## 水 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分     | °    |
| 12 | 1  | 15  | 7  | 44.79 | -15 | 17 | 38.86 | 1.065928 | 8.86  | 67.6 |
| 12 | 2  | 15  | 12 | 27.67 | -15 | 42 | 10.86 | 1.088460 | 9.05  | 64.3 |
| 12 | 3  | 15  | 17 | 22.80 | -16 | 7  | 27.00 | 1.110259 | 9.23  | 61.2 |
| 12 | 4  | 15  | 22 | 28.80 | -16 | 33 | 13.32 | 1.131301 | 9.41  | 58.2 |
| 12 | 5  | 15  | 27 | 44.45 | -16 | 59 | 17.54 | 1.151568 | 9.58  | 55.5 |
| 12 | 6  | 15  | 33 | 8.72  | -17 | 25 | 28.82 | 1.171054 | 9.74  | 52.8 |
| 12 | 7  | 15  | 38 | 40.73 | -17 | 51 | 37.66 | 1.189757 | 9.89  | 50.4 |
| 12 | 8  | 15  | 44 | 19.69 | -18 | 17 | 35.70 | 1.207679 | 10.04 | 48.0 |
| 12 | 9  | 15  | 50 | 4.95  | -18 | 43 | 15.57 | 1.224829 | 10.19 | 45.8 |
| 12 | 10 | 15  | 55 | 55.94 | -19 | 8  | 30.80 | 1.241214 | 10.32 | 43.7 |
| 12 | 11 | 16  | 1  | 52.16 | -19 | 33 | 15.64 | 1.256847 | 10.45 | 41.6 |
| 12 | 12 | 16  | 7  | 53.19 | -19 | 57 | 25.03 | 1.271742 | 10.58 | 39.7 |
| 12 | 13 | 16  | 13 | 58.66 | -20 | 20 | 54.44 | 1.285911 | 10.69 | 37.9 |
| 12 | 14 | 16  | 20 | 8.27  | -20 | 43 | 39.83 | 1.299369 | 10.81 | 36.1 |
| 12 | 15 | 16  | 26 | 21.72 | -21 | 5  | 37.57 | 1.312131 | 10.91 | 34.4 |
| 12 | 16 | 16  | 32 | 38.78 | -21 | 26 | 44.39 | 1.324211 | 11.01 | 32.8 |
| 12 | 17 | 16  | 38 | 59.24 | -21 | 46 | 57.30 | 1.335622 | 11.11 | 31.2 |
| 12 | 18 | 16  | 45 | 22.91 | -22 | 6  | 13.59 | 1.346379 | 11.20 | 29.7 |
| 12 | 19 | 16  | 51 | 49.63 | -22 | 24 | 30.78 | 1.356494 | 11.28 | 28.3 |
| 12 | 20 | 16  | 58 | 19.24 | -22 | 41 | 46.57 | 1.365979 | 11.36 | 26.8 |
| 12 | 21 | 17  | 4  | 51.61 | -22 | 57 | 58.84 | 1.374846 | 11.43 | 25.5 |
| 12 | 22 | 17  | 11 | 26.62 | -23 | 13 | 5.63  | 1.383105 | 11.50 | 24.2 |
| 12 | 23 | 17  | 18 | 4.14  | -23 | 27 | 5.10  | 1.390767 | 11.57 | 22.9 |
| 12 | 24 | 17  | 24 | 44.06 | -23 | 39 | 55.52 | 1.397840 | 11.62 | 21.6 |
| 12 | 25 | 17  | 31 | 26.29 | -23 | 51 | 35.25 | 1.404332 | 11.68 | 20.4 |
| 12 | 26 | 17  | 38 | 10.70 | -24 | 2  | 2.74  | 1.410250 | 11.73 | 19.1 |
| 12 | 27 | 17  | 44 | 57.21 | -24 | 11 | 16.53 | 1.415602 | 11.77 | 17.9 |
| 12 | 28 | 17  | 51 | 45.71 | -24 | 19 | 15.18 | 1.420392 | 11.81 | 16.8 |
| 12 | 29 | 17  | 58 | 36.09 | -24 | 25 | 57.36 | 1.424625 | 11.85 | 15.6 |
| 12 | 30 | 18  | 5  | 28.28 | -24 | 31 | 21.75 | 1.428305 | 11.88 | 14.5 |
| 12 | 31 | 18  | 12 | 22.16 | -24 | 35 | 27.11 | 1.431433 | 11.90 | 13.4 |

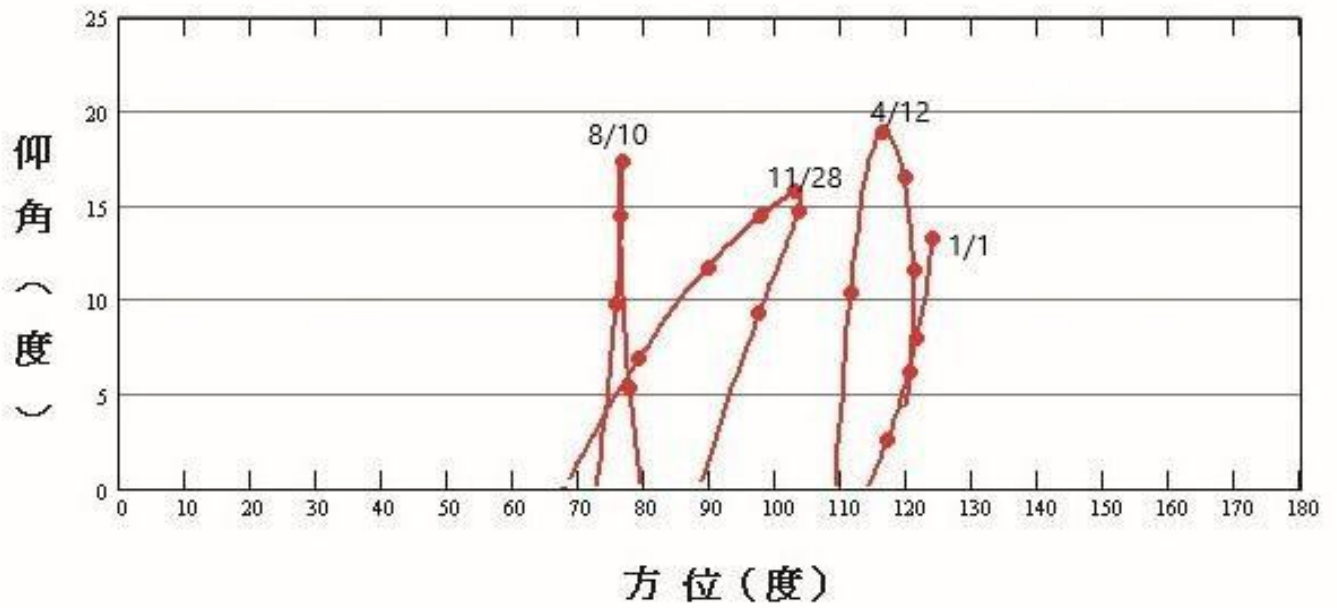
## 水星出沒時間表

東經：121.52° · 北緯：25.10°

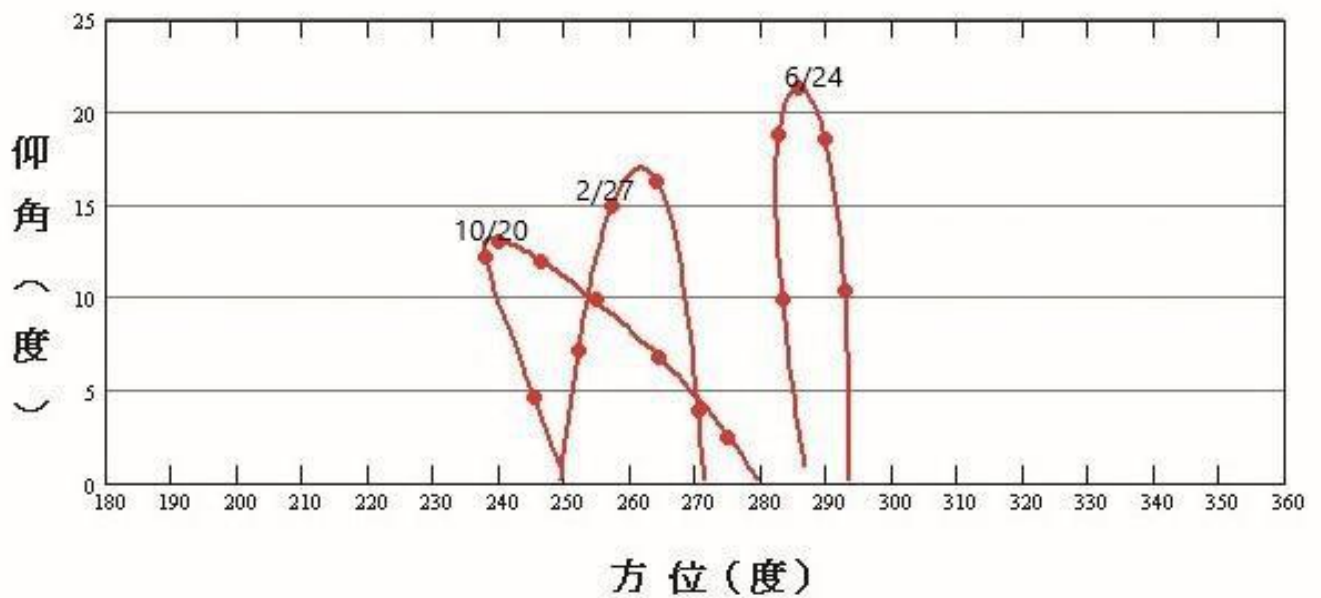
東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 12 1      | 04:50     | 107     | 10:23     | 50S     | 15:57     | 253     | 6.31         | 6.31          | 0.69 | -0.6          |
| 12 2      | 04:52     | 107     | 10:24     | 49S     | 15:57     | 253     | 6.18         | 6.18          | 0.72 | -0.6          |
| 12 3      | 04:53     | 108     | 10:25     | 49S     | 15:57     | 252     | 6.06         | 6.06          | 0.74 | -0.6          |
| 12 4      | 04:55     | 108     | 10:26     | 48S     | 15:57     | 252     | 5.95         | 5.95          | 0.76 | -0.6          |
| 12 5      | 04:58     | 108     | 10:28     | 48S     | 15:58     | 251     | 5.84         | 5.84          | 0.78 | -0.6          |
| 12 6      | 05:00     | 109     | 10:29     | 47S     | 15:58     | 251     | 5.75         | 5.75          | 0.80 | -0.6          |
| 12 7      | 05:02     | 109     | 10:31     | 47S     | 15:59     | 250     | 5.66         | 5.66          | 0.82 | -0.6          |
| 12 8      | 05:05     | 110     | 10:33     | 47S     | 16:00     | 250     | 5.57         | 5.57          | 0.84 | -0.6          |
| 12 9      | 05:08     | 110     | 10:34     | 46S     | 16:01     | 249     | 5.49         | 5.49          | 0.85 | -0.6          |
| 12 10     | 05:10     | 111     | 10:36     | 46S     | 16:02     | 249     | 5.42         | 5.42          | 0.86 | -0.6          |
| 12 11     | 05:13     | 111     | 10:38     | 45S     | 16:03     | 248     | 5.35         | 5.35          | 0.87 | -0.6          |
| 12 12     | 05:16     | 112     | 10:40     | 45S     | 16:04     | 248     | 5.29         | 5.29          | 0.89 | -0.6          |
| 12 13     | 05:19     | 112     | 10:43     | 45S     | 16:05     | 248     | 5.23         | 5.23          | 0.90 | -0.6          |
| 12 14     | 05:22     | 113     | 10:45     | 44S     | 16:07     | 247     | 5.18         | 5.18          | 0.90 | -0.6          |
| 12 15     | 05:25     | 113     | 10:47     | 44S     | 16:08     | 247     | 5.13         | 5.13          | 0.91 | -0.6          |
| 12 16     | 05:28     | 113     | 10:49     | 43S     | 16:10     | 246     | 5.08         | 5.08          | 0.92 | -0.6          |
| 12 17     | 05:32     | 114     | 10:52     | 43S     | 16:12     | 246     | 5.04         | 5.04          | 0.93 | -0.6          |
| 12 18     | 05:35     | 114     | 10:54     | 43S     | 16:14     | 246     | 5.00         | 5.00          | 0.93 | -0.6          |
| 12 19     | 05:38     | 115     | 10:57     | 42S     | 16:15     | 245     | 4.96         | 4.96          | 0.94 | -0.6          |
| 12 20     | 05:41     | 115     | 10:59     | 42S     | 16:17     | 245     | 4.93         | 4.93          | 0.95 | -0.6          |
| 12 21     | 05:44     | 115     | 11:02     | 42S     | 16:19     | 245     | 4.89         | 4.89          | 0.95 | -0.6          |
| 12 22     | 05:48     | 115     | 11:05     | 42S     | 16:21     | 244     | 4.86         | 4.86          | 0.96 | -0.6          |
| 12 23     | 05:51     | 116     | 11:07     | 41S     | 16:24     | 244     | 4.84         | 4.84          | 0.96 | -0.7          |
| 12 24     | 05:54     | 116     | 11:10     | 41S     | 16:26     | 244     | 4.81         | 4.81          | 0.97 | -0.7          |
| 12 25     | 05:57     | 116     | 11:13     | 41S     | 16:28     | 244     | 4.79         | 4.79          | 0.97 | -0.7          |
| 12 26     | 06:00     | 116     | 11:16     | 41S     | 16:31     | 244     | 4.77         | 4.77          | 0.97 | -0.7          |
| 12 27     | 06:04     | 117     | 11:18     | 41S     | 16:33     | 243     | 4.75         | 4.75          | 0.98 | -0.8          |
| 12 28     | 06:07     | 117     | 11:21     | 41S     | 16:36     | 243     | 4.74         | 4.74          | 0.98 | -0.8          |
| 12 29     | 06:10     | 117     | 11:24     | 40S     | 16:39     | 243     | 4.72         | 4.72          | 0.98 | -0.8          |
| 12 30     | 06:13     | 117     | 11:27     | 40S     | 16:41     | 243     | 4.71         | 4.71          | 0.98 | -0.9          |
| 12 31     | 06:16     | 117     | 11:30     | 40S     | 16:44     | 243     | 4.70         | 4.70          | 0.99 | -0.9          |

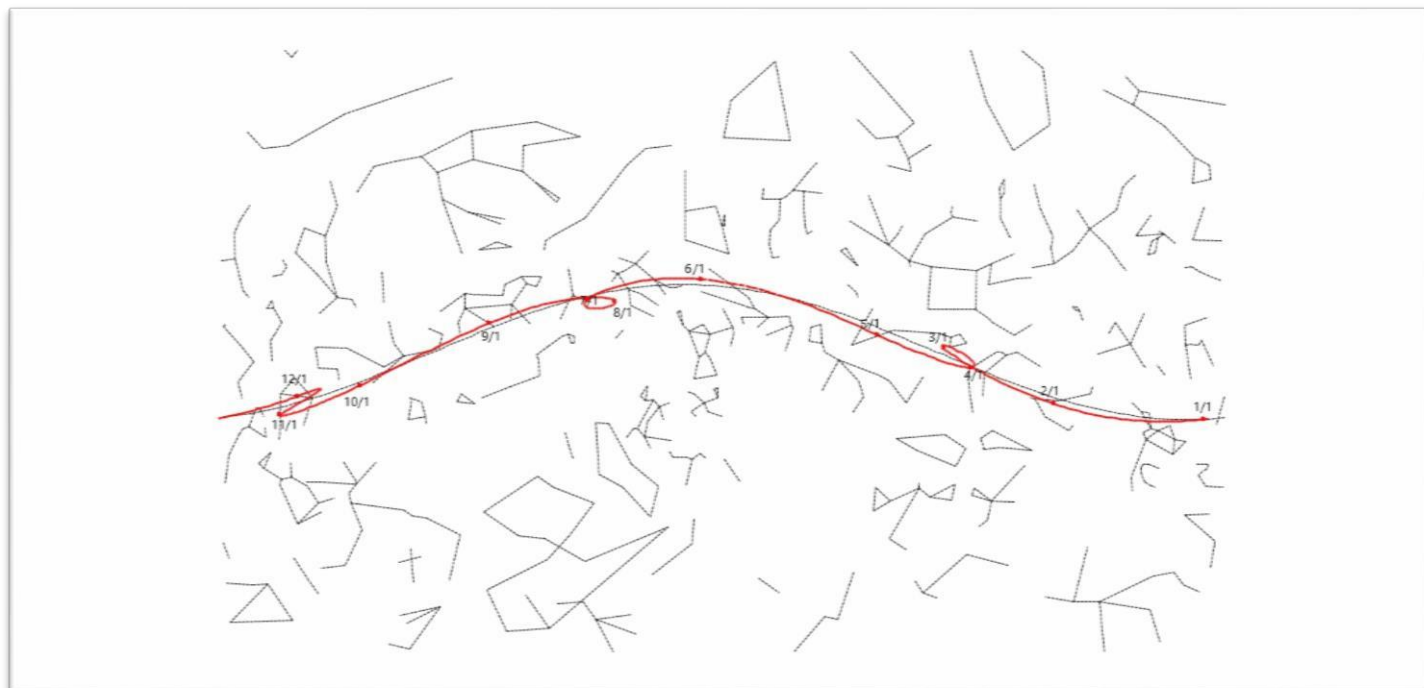
### 日出時水星方位與仰角



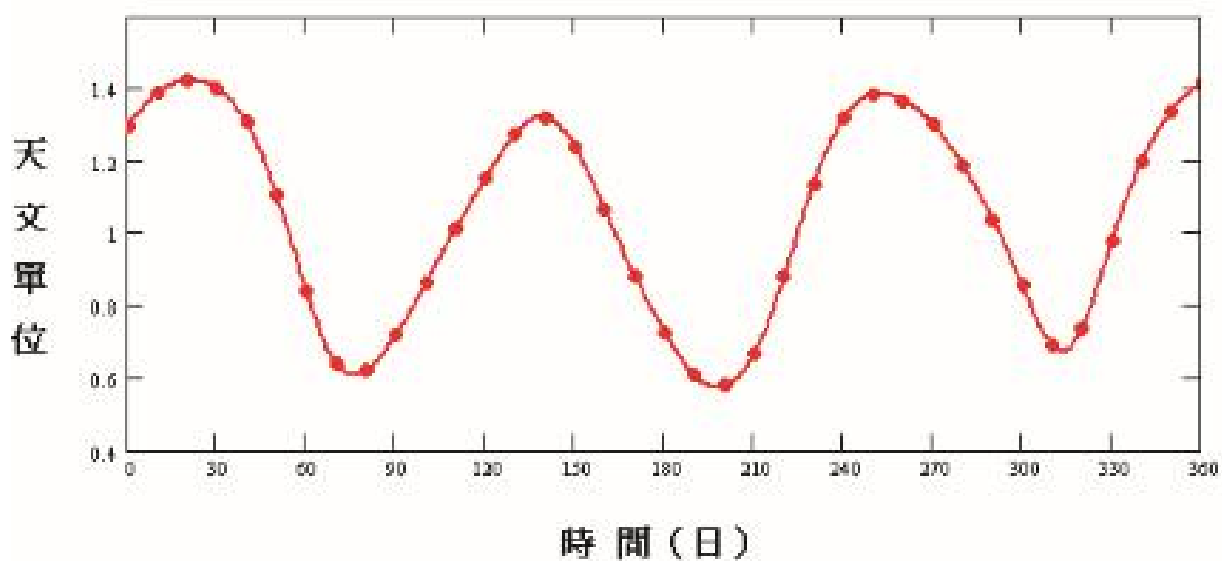
### 日沒時水星方位與仰角



### 水星在天球上運行的軌跡圖



### 水星與地球距離變化圖



## 金星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距離      | 光程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分    | °    |
| 1  | 1  | 15  | 27 | 59.89 | -15 | 18 | 48.14 | 0.63464 | 5.28 | 93.0 |
| 1  | 2  | 15  | 31 | 57.79 | -15 | 32 | 45.56 | 0.64223 | 5.34 | 92.4 |
| 1  | 3  | 15  | 35 | 58.00 | -15 | 46 | 40.13 | 0.64982 | 5.40 | 91.7 |
| 1  | 4  | 15  | 40 | 0.47  | -16 | 0  | 30.60 | 0.65742 | 5.47 | 91.1 |
| 1  | 5  | 15  | 44 | 5.15  | -16 | 14 | 15.77 | 0.66502 | 5.53 | 90.5 |
| 1  | 6  | 15  | 48 | 11.99 | -16 | 27 | 54.44 | 0.67262 | 5.59 | 89.9 |
| 1  | 7  | 15  | 52 | 20.95 | -16 | 41 | 25.44 | 0.68022 | 5.66 | 89.3 |
| 1  | 8  | 15  | 56 | 31.98 | -16 | 54 | 47.64 | 0.68783 | 5.72 | 88.7 |
| 1  | 9  | 16  | 0  | 45.06 | -17 | 7  | 59.92 | 0.69543 | 5.78 | 88.1 |
| 1  | 10 | 16  | 5  | 0.13  | -17 | 21 | 1.18  | 0.70303 | 5.85 | 87.5 |
| 1  | 11 | 16  | 9  | 17.16 | -17 | 33 | 50.36 | 0.71062 | 5.91 | 86.9 |
| 1  | 12 | 16  | 13 | 36.11 | -17 | 46 | 26.41 | 0.71822 | 5.97 | 86.4 |
| 1  | 13 | 16  | 17 | 56.96 | -17 | 58 | 48.31 | 0.72581 | 6.04 | 85.8 |
| 1  | 14 | 16  | 22 | 19.65 | -18 | 10 | 55.06 | 0.73340 | 6.10 | 85.2 |
| 1  | 15 | 16  | 26 | 44.17 | -18 | 22 | 45.71 | 0.74098 | 6.16 | 84.7 |
| 1  | 16 | 16  | 31 | 10.48 | -18 | 34 | 19.29 | 0.74856 | 6.22 | 84.1 |
| 1  | 17 | 16  | 35 | 38.53 | -18 | 45 | 34.89 | 0.75614 | 6.29 | 83.6 |
| 1  | 18 | 16  | 40 | 8.31  | -18 | 56 | 31.61 | 0.76371 | 6.35 | 83.1 |
| 1  | 19 | 16  | 44 | 39.77 | -19 | 7  | 8.58  | 0.77127 | 6.41 | 82.5 |
| 1  | 20 | 16  | 49 | 12.89 | -19 | 17 | 24.93 | 0.77883 | 6.48 | 82.0 |
| 1  | 21 | 16  | 53 | 47.61 | -19 | 27 | 19.82 | 0.78639 | 6.54 | 81.5 |
| 1  | 22 | 16  | 58 | 23.91 | -19 | 36 | 52.43 | 0.79393 | 6.60 | 80.9 |
| 1  | 23 | 17  | 3  | 1.75  | -19 | 46 | 1.92  | 0.80147 | 6.66 | 80.4 |
| 1  | 24 | 17  | 7  | 41.08 | -19 | 54 | 47.50 | 0.80899 | 6.73 | 79.9 |
| 1  | 25 | 17  | 12 | 21.86 | -20 | 3  | 8.38  | 0.81651 | 6.79 | 79.4 |
| 1  | 26 | 17  | 17 | 4.05  | -20 | 11 | 3.81  | 0.82402 | 6.85 | 78.9 |
| 1  | 27 | 17  | 21 | 47.60 | -20 | 18 | 33.08 | 0.83151 | 6.91 | 78.4 |
| 1  | 28 | 17  | 26 | 32.46 | -20 | 25 | 35.46 | 0.83899 | 6.98 | 77.9 |
| 1  | 29 | 17  | 31 | 18.58 | -20 | 32 | 10.31 | 0.84646 | 7.04 | 77.4 |
| 1  | 30 | 17  | 36 | 5.90  | -20 | 38 | 16.98 | 0.85392 | 7.10 | 76.9 |
| 1  | 31 | 17  | 40 | 54.38 | -20 | 43 | 54.84 | 0.86136 | 7.16 | 76.5 |



## 金星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |               |
| 1 1       | 03:07     | 107     | 08:40     | 50S     | 14:14     | 253     | 26.30 26.30          | 0.47 | -4.6          |
| 1 2       | 03:08     | 107     | 08:40     | 49S     | 14:13     | 253     | 25.99 25.99          | 0.48 | -4.6          |
| 1 3       | 03:08     | 107     | 08:41     | 49S     | 14:13     | 253     | 25.68 25.68          | 0.49 | -4.6          |
| 1 4       | 03:09     | 107     | 08:41     | 49S     | 14:12     | 252     | 25.39 25.39          | 0.49 | -4.6          |
| 1 5       | 03:09     | 108     | 08:41     | 49S     | 14:12     | 252     | 25.10 25.10          | 0.50 | -4.6          |
| 1 6       | 03:10     | 108     | 08:41     | 48S     | 14:12     | 252     | 24.81 24.81          | 0.50 | -4.6          |
| 1 7       | 03:11     | 108     | 08:41     | 48S     | 14:11     | 252     | 24.54 24.54          | 0.51 | -4.6          |
| 1 8       | 03:11     | 108     | 08:41     | 48S     | 14:11     | 251     | 24.27 24.27          | 0.51 | -4.5          |
| 1 9       | 03:12     | 109     | 08:42     | 48S     | 14:11     | 251     | 24.00 24.00          | 0.52 | -4.5          |
| 1 10      | 03:13     | 109     | 08:42     | 48S     | 14:11     | 251     | 23.74 23.74          | 0.52 | -4.5          |
| 1 11      | 03:14     | 109     | 08:42     | 47S     | 14:11     | 251     | 23.49 23.49          | 0.53 | -4.5          |
| 1 12      | 03:14     | 109     | 08:43     | 47S     | 14:11     | 251     | 23.24 23.24          | 0.53 | -4.5          |
| 1 13      | 03:15     | 110     | 08:43     | 47S     | 14:11     | 250     | 23.00 23.00          | 0.54 | -4.5          |
| 1 14      | 03:16     | 110     | 08:44     | 47S     | 14:11     | 250     | 22.76 22.76          | 0.54 | -4.5          |
| 1 15      | 03:17     | 110     | 08:44     | 47S     | 14:11     | 250     | 22.52 22.52          | 0.55 | -4.5          |
| 1 16      | 03:18     | 110     | 08:45     | 46S     | 14:11     | 250     | 22.30 22.30          | 0.55 | -4.5          |
| 1 17      | 03:19     | 110     | 08:45     | 46S     | 14:11     | 249     | 22.07 22.07          | 0.56 | -4.5          |
| 1 18      | 03:20     | 111     | 08:46     | 46S     | 14:11     | 249     | 21.85 21.85          | 0.56 | -4.4          |
| 1 19      | 03:21     | 111     | 08:46     | 46S     | 14:12     | 249     | 21.64 21.64          | 0.57 | -4.4          |
| 1 20      | 03:22     | 111     | 08:47     | 46S     | 14:12     | 249     | 21.43 21.43          | 0.57 | -4.4          |
| 1 21      | 03:23     | 111     | 08:47     | 45S     | 14:12     | 249     | 21.22 21.22          | 0.57 | -4.4          |
| 1 22      | 03:24     | 111     | 08:48     | 45S     | 14:12     | 248     | 21.02 21.02          | 0.58 | -4.4          |
| 1 23      | 03:25     | 112     | 08:49     | 45S     | 14:13     | 248     | 20.82 20.82          | 0.58 | -4.4          |
| 1 24      | 03:26     | 112     | 08:50     | 45S     | 14:13     | 248     | 20.63 20.63          | 0.59 | -4.4          |
| 1 25      | 03:27     | 112     | 08:50     | 45S     | 14:14     | 248     | 20.44 20.44          | 0.59 | -4.4          |
| 1 26      | 03:28     | 112     | 08:51     | 45S     | 14:14     | 248     | 20.25 20.25          | 0.60 | -4.4          |
| 1 27      | 03:29     | 112     | 08:52     | 45S     | 14:15     | 248     | 20.07 20.07          | 0.60 | -4.4          |
| 1 28      | 03:30     | 112     | 08:53     | 45S     | 14:15     | 248     | 19.89 19.89          | 0.61 | -4.4          |
| 1 29      | 03:31     | 112     | 08:53     | 44S     | 14:16     | 247     | 19.72 19.72          | 0.61 | -4.3          |
| 1 30      | 03:32     | 113     | 08:54     | 44S     | 14:17     | 247     | 19.55 19.55          | 0.61 | -4.3          |
| 1 31      | 03:33     | 113     | 08:55     | 44S     | 14:17     | 247     | 19.38 19.38          | 0.62 | -4.3          |

## 金星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 2  | 1  | 17  | 45 | 43.95 | -20 | 49 | 3.31  | 0.86879 | 7.22  | 76.0 |
| 2  | 2  | 17  | 50 | 34.55 | -20 | 53 | 41.84 | 0.87620 | 7.29  | 75.5 |
| 2  | 3  | 17  | 55 | 26.14 | -20 | 57 | 49.88 | 0.88360 | 7.35  | 75.0 |
| 2  | 4  | 18  | 0  | 18.65 | -21 | 1  | 26.94 | 0.89098 | 7.41  | 74.6 |
| 2  | 5  | 18  | 5  | 12.03 | -21 | 4  | 32.55 | 0.89835 | 7.47  | 74.1 |
| 2  | 6  | 18  | 10 | 6.21  | -21 | 7  | 6.26  | 0.90570 | 7.53  | 73.6 |
| 2  | 7  | 18  | 15 | 1.15  | -21 | 9  | 7.65  | 0.91303 | 7.59  | 73.2 |
| 2  | 8  | 18  | 19 | 56.79 | -21 | 10 | 36.36 | 0.92035 | 7.65  | 72.7 |
| 2  | 9  | 18  | 24 | 53.07 | -21 | 11 | 32.04 | 0.92766 | 7.71  | 72.3 |
| 2  | 10 | 18  | 29 | 49.93 | -21 | 11 | 54.37 | 0.93494 | 7.77  | 71.8 |
| 2  | 11 | 18  | 34 | 47.33 | -21 | 11 | 43.08 | 0.94221 | 7.84  | 71.4 |
| 2  | 12 | 18  | 39 | 45.21 | -21 | 10 | 57.91 | 0.94947 | 7.90  | 70.9 |
| 2  | 13 | 18  | 44 | 43.51 | -21 | 9  | 38.66 | 0.95671 | 7.96  | 70.5 |
| 2  | 14 | 18  | 49 | 42.19 | -21 | 7  | 45.13 | 0.96393 | 8.02  | 70.0 |
| 2  | 15 | 18  | 54 | 41.18 | -21 | 5  | 17.19 | 0.97113 | 8.08  | 69.6 |
| 2  | 16 | 18  | 59 | 40.44 | -21 | 2  | 14.72 | 0.97832 | 8.14  | 69.1 |
| 2  | 17 | 19  | 4  | 39.92 | -20 | 58 | 37.62 | 0.98550 | 8.20  | 68.7 |
| 2  | 18 | 19  | 9  | 39.57 | -20 | 54 | 25.82 | 0.99265 | 8.25  | 68.3 |
| 2  | 19 | 19  | 14 | 39.33 | -20 | 49 | 39.27 | 0.99979 | 8.31  | 67.8 |
| 2  | 20 | 19  | 19 | 39.16 | -20 | 44 | 17.96 | 1.00692 | 8.37  | 67.4 |
| 2  | 21 | 19  | 24 | 39.00 | -20 | 38 | 21.88 | 1.01402 | 8.43  | 67.0 |
| 2  | 22 | 19  | 29 | 38.82 | -20 | 31 | 51.05 | 1.02111 | 8.49  | 66.6 |
| 2  | 23 | 19  | 34 | 38.57 | -20 | 24 | 45.55 | 1.02817 | 8.55  | 66.1 |
| 2  | 24 | 19  | 39 | 38.20 | -20 | 17 | 5.47  | 1.03522 | 8.61  | 65.7 |
| 2  | 25 | 19  | 44 | 37.66 | -20 | 8  | 50.95 | 1.04225 | 8.67  | 65.3 |
| 2  | 26 | 19  | 49 | 36.91 | -20 | 0  | 2.15  | 1.04925 | 8.73  | 64.9 |
| 2  | 27 | 19  | 54 | 35.89 | -19 | 50 | 39.28 | 1.05624 | 8.78  | 64.5 |
| 2  | 28 | 23  | 30 | 11.54 | -4  | 43 | 25.40 | 1.66476 | 13.85 | 16.5 |

## 金星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |     | 中 天   |     | 沒     |     | 視 直徑  | 相位    | 視 亮度 |      |
|----|----|-------|-----|-------|-----|-------|-----|-------|-------|------|------|
| 月  | 日  | 時間    | 方位  | 時間    | 仰角  | 時間    | 方位  | 赤道    | 兩極    | 星等   |      |
|    |    | h m   | °   | h m   | °   | h m   | °   | "     | "     |      |      |
| 2  | 1  | 03:34 | 113 | 08:56 | 44S | 14:18 | 247 | 19.21 | 19.21 | 0.62 | -4.3 |
| 2  | 2  | 03:35 | 113 | 08:57 | 44S | 14:19 | 247 | 19.05 | 19.05 | 0.63 | -4.3 |
| 2  | 3  | 03:36 | 113 | 08:58 | 44S | 14:19 | 247 | 18.89 | 18.89 | 0.63 | -4.3 |
| 2  | 4  | 03:37 | 113 | 08:59 | 44S | 14:20 | 247 | 18.73 | 18.73 | 0.63 | -4.3 |
| 2  | 5  | 03:38 | 113 | 09:00 | 44S | 14:21 | 247 | 18.58 | 18.58 | 0.64 | -4.3 |
| 2  | 6  | 03:39 | 113 | 09:01 | 44S | 14:22 | 247 | 18.43 | 18.43 | 0.64 | -4.3 |
| 2  | 7  | 03:40 | 113 | 09:02 | 44S | 14:23 | 247 | 18.28 | 18.28 | 0.65 | -4.3 |
| 2  | 8  | 03:41 | 113 | 09:03 | 44S | 14:24 | 247 | 18.13 | 18.13 | 0.65 | -4.3 |
| 2  | 9  | 03:43 | 113 | 09:04 | 44S | 14:25 | 247 | 17.99 | 17.99 | 0.65 | -4.3 |
| 2  | 10 | 03:44 | 113 | 09:05 | 44S | 14:26 | 247 | 17.85 | 17.85 | 0.66 | -4.2 |
| 2  | 11 | 03:45 | 113 | 09:06 | 44S | 14:27 | 247 | 17.71 | 17.71 | 0.66 | -4.2 |
| 2  | 12 | 03:46 | 113 | 09:07 | 44S | 14:28 | 247 | 17.58 | 17.58 | 0.66 | -4.2 |
| 2  | 13 | 03:47 | 113 | 09:08 | 44S | 14:29 | 247 | 17.45 | 17.45 | 0.67 | -4.2 |
| 2  | 14 | 03:47 | 113 | 09:09 | 44S | 14:30 | 247 | 17.31 | 17.31 | 0.67 | -4.2 |
| 2  | 15 | 03:48 | 113 | 09:10 | 44S | 14:31 | 247 | 17.19 | 17.19 | 0.67 | -4.2 |
| 2  | 16 | 03:49 | 113 | 09:11 | 44S | 14:32 | 247 | 17.06 | 17.06 | 0.68 | -4.2 |
| 2  | 17 | 03:50 | 113 | 09:12 | 44S | 14:34 | 247 | 16.94 | 16.94 | 0.68 | -4.2 |
| 2  | 18 | 03:51 | 113 | 09:13 | 44S | 14:35 | 247 | 16.81 | 16.81 | 0.69 | -4.2 |
| 2  | 19 | 03:52 | 113 | 09:14 | 44S | 14:36 | 247 | 16.69 | 16.69 | 0.69 | -4.2 |
| 2  | 20 | 03:53 | 113 | 09:15 | 44S | 14:37 | 247 | 16.58 | 16.58 | 0.69 | -4.2 |
| 2  | 21 | 03:54 | 113 | 09:16 | 44S | 14:39 | 247 | 16.46 | 16.46 | 0.70 | -4.2 |
| 2  | 22 | 03:55 | 113 | 09:17 | 44S | 14:40 | 248 | 16.35 | 16.35 | 0.70 | -4.2 |
| 2  | 23 | 03:55 | 112 | 09:18 | 45S | 14:41 | 248 | 16.23 | 16.23 | 0.70 | -4.1 |
| 2  | 24 | 03:56 | 112 | 09:19 | 45S | 14:42 | 248 | 16.12 | 16.12 | 0.71 | -4.1 |
| 2  | 25 | 03:57 | 112 | 09:20 | 45S | 14:44 | 248 | 16.01 | 16.01 | 0.71 | -4.1 |
| 2  | 26 | 03:58 | 112 | 09:21 | 45S | 14:45 | 248 | 15.91 | 15.91 | 0.71 | -4.1 |
| 2  | 27 | 03:58 | 112 | 09:22 | 45S | 14:47 | 248 | 15.80 | 15.80 | 0.72 | -4.1 |
| 2  | 28 | 03:59 | 112 | 09:23 | 45S | 14:48 | 249 | 15.70 | 15.70 | 0.72 | -4.1 |

## 金星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 3  | 1  | 20  | 4  | 32.88 | -19 | 30 | 12.18 | 1.07014 | 8.90  | 63.6 |
| 3  | 2  | 20  | 9  | 30.80 | -19 | 19 | 8.48  | 1.07706 | 8.96  | 63.2 |
| 3  | 3  | 20  | 14 | 28.27 | -19 | 7  | 31.72 | 1.08396 | 9.01  | 62.8 |
| 3  | 4  | 20  | 19 | 25.27 | -18 | 55 | 22.23 | 1.09083 | 9.07  | 62.4 |
| 3  | 5  | 20  | 24 | 21.74 | -18 | 42 | 40.34 | 1.09768 | 9.13  | 62.0 |
| 3  | 6  | 20  | 29 | 17.67 | -18 | 29 | 26.41 | 1.10451 | 9.19  | 61.6 |
| 3  | 7  | 20  | 34 | 13.01 | -18 | 15 | 40.83 | 1.11132 | 9.24  | 61.2 |
| 3  | 8  | 20  | 39 | 7.74  | -18 | 1  | 23.98 | 1.11810 | 9.30  | 60.8 |
| 3  | 9  | 20  | 44 | 1.82  | -17 | 46 | 36.30 | 1.12486 | 9.35  | 60.4 |
| 3  | 10 | 20  | 48 | 55.24 | -17 | 31 | 18.21 | 1.13160 | 9.41  | 60.0 |
| 3  | 11 | 20  | 53 | 47.97 | -17 | 15 | 30.19 | 1.13831 | 9.47  | 59.6 |
| 3  | 12 | 20  | 58 | 40.00 | -16 | 59 | 12.70 | 1.14500 | 9.52  | 59.2 |
| 3  | 13 | 21  | 3  | 31.30 | -16 | 42 | 26.23 | 1.15167 | 9.58  | 58.8 |
| 3  | 14 | 21  | 8  | 21.86 | -16 | 25 | 11.30 | 1.15831 | 9.63  | 58.4 |
| 3  | 15 | 21  | 13 | 11.67 | -16 | 7  | 28.43 | 1.16493 | 9.69  | 58.0 |
| 3  | 16 | 21  | 18 | 0.72  | -15 | 49 | 18.14 | 1.17153 | 9.74  | 57.6 |
| 3  | 17 | 21  | 22 | 49.00 | -15 | 30 | 40.98 | 1.17811 | 9.80  | 57.3 |
| 3  | 18 | 21  | 27 | 36.50 | -15 | 11 | 37.49 | 1.18466 | 9.85  | 56.9 |
| 3  | 19 | 21  | 32 | 23.22 | -14 | 52 | 8.23  | 1.19119 | 9.91  | 56.5 |
| 3  | 20 | 21  | 37 | 9.16  | -14 | 32 | 13.73 | 1.19770 | 9.96  | 56.1 |
| 3  | 21 | 21  | 41 | 54.32 | -14 | 11 | 54.55 | 1.20418 | 10.01 | 55.7 |
| 3  | 22 | 21  | 46 | 38.72 | -13 | 51 | 11.24 | 1.21064 | 10.07 | 55.3 |
| 3  | 23 | 21  | 51 | 22.35 | -13 | 30 | 4.39  | 1.21707 | 10.12 | 54.9 |
| 3  | 24 | 21  | 56 | 5.22  | -13 | 8  | 34.58 | 1.22348 | 10.17 | 54.6 |
| 3  | 25 | 22  | 0  | 47.34 | -12 | 46 | 42.42 | 1.22987 | 10.23 | 54.2 |
| 3  | 26 | 22  | 5  | 28.72 | -12 | 24 | 28.53 | 1.23623 | 10.28 | 53.8 |
| 3  | 27 | 22  | 10 | 9.35  | -12 | 1  | 53.53 | 1.24256 | 10.33 | 53.4 |
| 3  | 28 | 22  | 14 | 49.26 | -11 | 38 | 58.07 | 1.24886 | 10.39 | 53.0 |
| 3  | 29 | 22  | 19 | 28.45 | -11 | 15 | 42.79 | 1.25514 | 10.44 | 52.6 |
| 3  | 30 | 22  | 24 | 6.92  | -10 | 52 | 8.32  | 1.26139 | 10.49 | 52.3 |
| 3  | 31 | 22  | 28 | 44.70 | -10 | 28 | 15.33 | 1.26761 | 10.54 | 51.9 |

## 金星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑    |         | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|---------|---------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° | 赤道<br>" | 兩極<br>" |      |               |
| 3 1       | 04:00     | 111     | 09:24     | 45S     | 14:49     | 249     | 15.60   | 15.60   | 0.72 | -4.1          |
| 3 2       | 04:00     | 111     | 09:25     | 46S     | 14:51     | 249     | 15.50   | 15.50   | 0.73 | -4.1          |
| 3 3       | 04:01     | 111     | 09:27     | 46S     | 14:52     | 249     | 15.40   | 15.40   | 0.73 | -4.1          |
| 3 4       | 04:02     | 111     | 09:28     | 46S     | 14:54     | 249     | 15.30   | 15.30   | 0.73 | -4.1          |
| 3 5       | 04:02     | 110     | 09:29     | 46S     | 14:55     | 250     | 15.20   | 15.20   | 0.74 | -4.1          |
| 3 6       | 04:03     | 110     | 09:30     | 46S     | 14:57     | 250     | 15.11   | 15.11   | 0.74 | -4.1          |
| 3 7       | 04:03     | 110     | 09:30     | 47S     | 14:58     | 250     | 15.02   | 15.02   | 0.74 | -4.1          |
| 3 8       | 04:04     | 110     | 09:31     | 47S     | 14:59     | 250     | 14.93   | 14.93   | 0.74 | -4.1          |
| 3 9       | 04:04     | 109     | 09:32     | 47S     | 15:01     | 251     | 14.84   | 14.84   | 0.75 | -4.1          |
| 3 10      | 04:05     | 109     | 09:33     | 47S     | 15:02     | 251     | 14.75   | 14.75   | 0.75 | -4.0          |
| 3 11      | 04:05     | 109     | 09:34     | 48S     | 15:04     | 251     | 14.66   | 14.66   | 0.75 | -4.0          |
| 3 12      | 04:05     | 109     | 09:35     | 48S     | 15:05     | 252     | 14.58   | 14.58   | 0.76 | -4.0          |
| 3 13      | 04:06     | 108     | 09:36     | 48S     | 15:07     | 252     | 14.49   | 14.49   | 0.76 | -4.0          |
| 3 14      | 04:06     | 108     | 09:37     | 49S     | 15:08     | 252     | 14.41   | 14.41   | 0.76 | -4.0          |
| 3 15      | 04:06     | 108     | 09:38     | 49S     | 15:10     | 253     | 14.33   | 14.33   | 0.77 | -4.0          |
| 3 16      | 04:07     | 107     | 09:39     | 49S     | 15:11     | 253     | 14.25   | 14.25   | 0.77 | -4.0          |
| 3 17      | 04:07     | 107     | 09:40     | 49S     | 15:13     | 253     | 14.17   | 14.17   | 0.77 | -4.0          |
| 3 18      | 04:07     | 107     | 09:41     | 50S     | 15:14     | 254     | 14.09   | 14.09   | 0.77 | -4.0          |
| 3 19      | 04:07     | 106     | 09:41     | 50S     | 15:16     | 254     | 14.01   | 14.01   | 0.78 | -4.0          |
| 3 20      | 04:07     | 106     | 09:42     | 50S     | 15:17     | 254     | 13.94   | 13.94   | 0.78 | -4.0          |
| 3 21      | 04:07     | 105     | 09:43     | 51S     | 15:19     | 255     | 13.86   | 13.86   | 0.78 | -4.0          |
| 3 22      | 04:08     | 105     | 09:44     | 51S     | 15:20     | 255     | 13.79   | 13.79   | 0.79 | -4.0          |
| 3 23      | 04:08     | 105     | 09:45     | 51S     | 15:22     | 255     | 13.71   | 13.71   | 0.79 | -4.0          |
| 3 24      | 04:08     | 104     | 09:45     | 52S     | 15:23     | 256     | 13.64   | 13.64   | 0.79 | -4.0          |
| 3 25      | 04:08     | 104     | 09:46     | 52S     | 15:25     | 256     | 13.57   | 13.57   | 0.79 | -4.0          |
| 3 26      | 04:08     | 104     | 09:47     | 53S     | 15:26     | 257     | 13.50   | 13.50   | 0.80 | -4.0          |
| 3 27      | 04:08     | 103     | 09:48     | 53S     | 15:28     | 257     | 13.43   | 13.43   | 0.80 | -4.0          |
| 3 28      | 04:08     | 103     | 09:48     | 53S     | 15:29     | 258     | 13.36   | 13.36   | 0.80 | -4.0          |
| 3 29      | 04:08     | 102     | 09:49     | 54S     | 15:31     | 258     | 13.30   | 13.30   | 0.80 | -3.9          |
| 3 30      | 04:08     | 102     | 09:50     | 54S     | 15:32     | 258     | 13.23   | 13.23   | 0.81 | -3.9          |
| 3 31      | 04:08     | 101     | 09:50     | 54S     | 15:33     | 259     | 13.17   | 13.17   | 0.81 | -3.9          |

## 金星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 4  | 1  | 22  | 33 | 21.79 | -10 | 4  | 4.46  | 1.27380 | 10.59 | 51.5 |
| 4  | 2  | 22  | 37 | 58.21 | -9  | 39 | 36.37 | 1.27997 | 10.64 | 51.1 |
| 4  | 3  | 22  | 42 | 33.98 | -9  | 14 | 51.71 | 1.28610 | 10.70 | 50.8 |
| 4  | 4  | 22  | 47 | 9.11  | -8  | 49 | 51.15 | 1.29221 | 10.75 | 50.4 |
| 4  | 5  | 22  | 51 | 43.63 | -8  | 24 | 35.35 | 1.29828 | 10.80 | 50.0 |
| 4  | 6  | 22  | 56 | 17.55 | -7  | 59 | 4.97  | 1.30433 | 10.85 | 49.6 |
| 4  | 7  | 23  | 0  | 50.91 | -7  | 33 | 20.68 | 1.31035 | 10.90 | 49.3 |
| 4  | 8  | 23  | 5  | 23.71 | -7  | 7  | 23.15 | 1.31633 | 10.95 | 48.9 |
| 4  | 9  | 23  | 9  | 56.00 | -6  | 41 | 13.03 | 1.32229 | 11.00 | 48.5 |
| 4  | 10 | 23  | 14 | 27.79 | -6  | 14 | 51.02 | 1.32821 | 11.05 | 48.1 |
| 4  | 11 | 23  | 18 | 59.11 | -5  | 48 | 17.78 | 1.33411 | 11.09 | 47.8 |
| 4  | 12 | 23  | 23 | 29.99 | -5  | 21 | 33.98 | 1.33997 | 11.14 | 47.4 |
| 4  | 13 | 23  | 28 | 0.46  | -4  | 54 | 40.30 | 1.34581 | 11.19 | 47.0 |
| 4  | 14 | 23  | 32 | 30.54 | -4  | 27 | 37.40 | 1.35161 | 11.24 | 46.6 |
| 4  | 15 | 23  | 37 | 0.27  | -4  | 0  | 25.95 | 1.35739 | 11.29 | 46.3 |
| 4  | 16 | 23  | 41 | 29.68 | -3  | 33 | 6.60  | 1.36313 | 11.34 | 45.9 |
| 4  | 17 | 23  | 45 | 58.81 | -3  | 5  | 39.99 | 1.36885 | 11.38 | 45.5 |
| 4  | 18 | 23  | 50 | 27.69 | -2  | 38 | 6.76  | 1.37453 | 11.43 | 45.2 |
| 4  | 19 | 23  | 54 | 56.37 | -2  | 10 | 27.55 | 1.38018 | 11.48 | 44.8 |
| 4  | 20 | 23  | 59 | 24.88 | -1  | 42 | 42.99 | 1.38580 | 11.52 | 44.4 |
| 4  | 21 | 0   | 3  | 53.25 | -1  | 14 | 53.73 | 1.39139 | 11.57 | 44.0 |
| 4  | 22 | 0   | 8  | 21.53 | -0  | 47 | 0.42  | 1.39695 | 11.62 | 43.7 |
| 4  | 23 | 0   | 12 | 49.75 | -0  | 19 | 3.72  | 1.40247 | 11.66 | 43.3 |
| 4  | 24 | 0   | 17 | 17.95 | +0  | 8  | 55.69 | 1.40796 | 11.71 | 42.9 |
| 4  | 25 | 0   | 21 | 46.15 | +0  | 36 | 57.16 | 1.41342 | 11.75 | 42.6 |
| 4  | 26 | 0   | 26 | 14.39 | +1  | 4  | 59.99 | 1.41884 | 11.80 | 42.2 |
| 4  | 27 | 0   | 30 | 42.70 | +1  | 33 | 3.52  | 1.42423 | 11.84 | 41.8 |
| 4  | 28 | 0   | 35 | 11.13 | +2  | 1  | 7.07  | 1.42958 | 11.89 | 41.4 |
| 4  | 29 | 0   | 39 | 39.70 | +2  | 29 | 9.95  | 1.43489 | 11.93 | 41.1 |
| 4  | 30 | 0   | 44 | 8.45  | +2  | 57 | 11.48 | 1.44017 | 11.98 | 40.7 |

## 金星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 4 1       | 04:08     | 101     | 09:51     | 55S     | 15:35     | 259     | 13.10        | 13.10         | 0.81 | -3.9          |
| 4 2       | 04:07     | 100     | 09:52     | 55S     | 15:36     | 260     | 13.04        | 13.04         | 0.81 | -3.9          |
| 4 3       | 04:07     | 100     | 09:52     | 56S     | 15:38     | 260     | 12.98        | 12.98         | 0.82 | -3.9          |
| 4 4       | 04:07     | 100     | 09:53     | 56S     | 15:39     | 261     | 12.92        | 12.92         | 0.82 | -3.9          |
| 4 5       | 04:07     | 99      | 09:54     | 57S     | 15:41     | 261     | 12.86        | 12.86         | 0.82 | -3.9          |
| 4 6       | 04:07     | 99      | 09:54     | 57S     | 15:42     | 262     | 12.80        | 12.80         | 0.82 | -3.9          |
| 4 7       | 04:07     | 98      | 09:55     | 57S     | 15:44     | 262     | 12.74        | 12.74         | 0.83 | -3.9          |
| 4 8       | 04:06     | 98      | 09:55     | 58S     | 15:45     | 263     | 12.68        | 12.68         | 0.83 | -3.9          |
| 4 9       | 04:06     | 97      | 09:56     | 58S     | 15:46     | 263     | 12.62        | 12.62         | 0.83 | -3.9          |
| 4 10      | 04:06     | 97      | 09:57     | 59S     | 15:48     | 264     | 12.57        | 12.57         | 0.83 | -3.9          |
| 4 11      | 04:06     | 96      | 09:57     | 59S     | 15:49     | 264     | 12.51        | 12.51         | 0.84 | -3.9          |
| 4 12      | 04:05     | 96      | 09:58     | 60S     | 15:51     | 265     | 12.46        | 12.46         | 0.84 | -3.9          |
| 4 13      | 04:05     | 95      | 09:58     | 60S     | 15:52     | 265     | 12.40        | 12.40         | 0.84 | -3.9          |
| 4 14      | 04:05     | 95      | 09:59     | 61S     | 15:54     | 266     | 12.35        | 12.35         | 0.84 | -3.9          |
| 4 15      | 04:04     | 94      | 09:59     | 61S     | 15:55     | 266     | 12.30        | 12.30         | 0.85 | -3.9          |
| 4 16      | 04:04     | 94      | 10:00     | 61S     | 15:56     | 267     | 12.24        | 12.24         | 0.85 | -3.9          |
| 4 17      | 04:04     | 93      | 10:01     | 62S     | 15:58     | 267     | 12.19        | 12.19         | 0.85 | -3.9          |
| 4 18      | 04:04     | 93      | 10:01     | 62S     | 15:59     | 268     | 12.14        | 12.14         | 0.85 | -3.9          |
| 4 19      | 04:03     | 92      | 10:02     | 63S     | 16:01     | 268     | 12.09        | 12.09         | 0.86 | -3.9          |
| 4 20      | 04:03     | 92      | 10:02     | 63S     | 16:02     | 269     | 12.04        | 12.04         | 0.86 | -3.9          |
| 4 21      | 04:03     | 91      | 10:03     | 64S     | 16:03     | 269     | 11.99        | 11.99         | 0.86 | -3.9          |
| 4 22      | 04:02     | 91      | 10:03     | 64S     | 16:05     | 270     | 11.95        | 11.95         | 0.86 | -3.9          |
| 4 23      | 04:02     | 90      | 10:04     | 65S     | 16:06     | 270     | 11.90        | 11.90         | 0.86 | -3.9          |
| 4 24      | 04:02     | 90      | 10:04     | 65S     | 16:08     | 271     | 11.85        | 11.85         | 0.87 | -3.9          |
| 4 25      | 04:01     | 89      | 10:05     | 66S     | 16:09     | 271     | 11.81        | 11.81         | 0.87 | -3.9          |
| 4 26      | 04:01     | 89      | 10:05     | 66S     | 16:10     | 272     | 11.76        | 11.76         | 0.87 | -3.9          |
| 4 27      | 04:00     | 88      | 10:06     | 67S     | 16:12     | 272     | 11.72        | 11.72         | 0.87 | -3.9          |
| 4 28      | 04:00     | 88      | 10:06     | 67S     | 16:13     | 273     | 11.67        | 11.67         | 0.88 | -3.8          |
| 4 29      | 04:00     | 87      | 10:07     | 67S     | 16:15     | 273     | 11.63        | 11.63         | 0.88 | -3.8          |
| 4 30      | 03:59     | 87      | 10:07     | 68S     | 16:16     | 274     | 11.59        | 11.59         | 0.88 | -3.8          |

## 金星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 5  | 1  | 0   | 48 | 37.41 | +3  | 25 | 11.00 | 1.44541 | 12.02 | 40.3 |
| 5  | 2  | 0   | 53 | 6.63  | +3  | 53 | 7.80  | 1.45061 | 12.06 | 40.0 |
| 5  | 3  | 0   | 57 | 36.12 | +4  | 21 | 1.21  | 1.45577 | 12.11 | 39.6 |
| 5  | 4  | 1   | 2  | 5.94  | +4  | 48 | 50.54 | 1.46090 | 12.15 | 39.2 |
| 5  | 5  | 1   | 6  | 36.11 | +5  | 16 | 35.10 | 1.46599 | 12.19 | 38.9 |
| 5  | 6  | 1   | 11 | 6.66  | +5  | 44 | 14.21 | 1.47103 | 12.23 | 38.5 |
| 5  | 7  | 1   | 15 | 37.64 | +6  | 11 | 47.17 | 1.47604 | 12.27 | 38.1 |
| 5  | 8  | 1   | 20 | 9.07  | +6  | 39 | 13.28 | 1.48101 | 12.32 | 37.7 |
| 5  | 9  | 1   | 24 | 40.98 | +7  | 6  | 31.84 | 1.48594 | 12.36 | 37.4 |
| 5  | 10 | 1   | 29 | 13.41 | +7  | 33 | 42.15 | 1.49083 | 12.40 | 37.0 |
| 5  | 11 | 1   | 33 | 46.39 | +8  | 0  | 43.51 | 1.49568 | 12.44 | 36.6 |
| 5  | 12 | 1   | 38 | 19.95 | +8  | 27 | 35.21 | 1.50049 | 12.48 | 36.2 |
| 5  | 13 | 1   | 42 | 54.13 | +8  | 54 | 16.56 | 1.50526 | 12.52 | 35.9 |
| 5  | 14 | 1   | 47 | 28.95 | +9  | 20 | 46.86 | 1.50999 | 12.56 | 35.5 |
| 5  | 15 | 1   | 52 | 4.46  | +9  | 47 | 5.44  | 1.51468 | 12.60 | 35.1 |
| 5  | 16 | 1   | 56 | 40.69 | +10 | 13 | 11.61 | 1.51933 | 12.64 | 34.8 |
| 5  | 17 | 2   | 1  | 17.67 | +10 | 39 | 4.70  | 1.52394 | 12.67 | 34.4 |
| 5  | 18 | 2   | 5  | 55.43 | +11 | 4  | 44.04 | 1.52850 | 12.71 | 34.0 |
| 5  | 19 | 2   | 10 | 34.02 | +11 | 30 | 8.94  | 1.53303 | 12.75 | 33.6 |
| 5  | 20 | 2   | 15 | 13.46 | +11 | 55 | 18.71 | 1.53752 | 12.79 | 33.3 |
| 5  | 21 | 2   | 19 | 53.77 | +12 | 20 | 12.66 | 1.54196 | 12.82 | 32.9 |
| 5  | 22 | 2   | 24 | 34.99 | +12 | 44 | 50.08 | 1.54636 | 12.86 | 32.5 |
| 5  | 23 | 2   | 29 | 17.13 | +13 | 9  | 10.27 | 1.55072 | 12.90 | 32.1 |
| 5  | 24 | 2   | 34 | 0.22  | +13 | 33 | 12.52 | 1.55503 | 12.93 | 31.8 |
| 5  | 25 | 2   | 38 | 44.28 | +13 | 56 | 56.10 | 1.55930 | 12.97 | 31.4 |
| 5  | 26 | 2   | 43 | 29.33 | +14 | 20 | 20.31 | 1.56353 | 13.00 | 31.0 |
| 5  | 27 | 2   | 48 | 15.40 | +14 | 43 | 24.42 | 1.56771 | 13.04 | 30.6 |
| 5  | 28 | 2   | 53 | 2.50  | +15 | 6  | 7.73  | 1.57184 | 13.07 | 30.3 |
| 5  | 29 | 2   | 57 | 50.64 | +15 | 28 | 29.52 | 1.57592 | 13.11 | 29.9 |
| 5  | 30 | 3   | 2  | 39.84 | +15 | 50 | 29.08 | 1.57996 | 13.14 | 29.5 |
| 5  | 31 | 3   | 7  | 30.11 | +16 | 12 | 5.69  | 1.58395 | 13.17 | 29.1 |



## 金星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |    | 中 天   |     | 沒     |     | 視 直徑  | 相位    | 視 亮度 |      |
|----|----|-------|----|-------|-----|-------|-----|-------|-------|------|------|
| 月  | 日  | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道    | 兩極    | 星等   |      |
|    |    | h m   | °  | h m   | °   | h m   | °   | "     | "     |      |      |
| 5  | 1  | 03:59 | 86 | 10:08 | 68S | 16:17 | 274 | 11.55 | 11.55 | 0.88 | -3.8 |
| 5  | 2  | 03:59 | 86 | 10:09 | 69S | 16:19 | 275 | 11.51 | 11.51 | 0.88 | -3.8 |
| 5  | 3  | 03:58 | 85 | 10:09 | 69S | 16:20 | 275 | 11.46 | 11.46 | 0.89 | -3.8 |
| 5  | 4  | 03:58 | 85 | 10:10 | 70S | 16:22 | 276 | 11.42 | 11.42 | 0.89 | -3.8 |
| 5  | 5  | 03:58 | 84 | 10:10 | 70S | 16:23 | 276 | 11.38 | 11.38 | 0.89 | -3.8 |
| 5  | 6  | 03:58 | 83 | 10:11 | 71S | 16:25 | 277 | 11.35 | 11.35 | 0.89 | -3.8 |
| 5  | 7  | 03:57 | 83 | 10:11 | 71S | 16:26 | 277 | 11.31 | 11.31 | 0.89 | -3.8 |
| 5  | 8  | 03:57 | 82 | 10:12 | 72S | 16:27 | 278 | 11.27 | 11.27 | 0.90 | -3.8 |
| 5  | 9  | 03:57 | 82 | 10:13 | 72S | 16:29 | 278 | 11.23 | 11.23 | 0.90 | -3.8 |
| 5  | 10 | 03:56 | 81 | 10:13 | 73S | 16:30 | 279 | 11.19 | 11.19 | 0.90 | -3.8 |
| 5  | 11 | 03:56 | 81 | 10:14 | 73S | 16:32 | 279 | 11.16 | 11.16 | 0.90 | -3.8 |
| 5  | 12 | 03:56 | 80 | 10:14 | 73S | 16:33 | 280 | 11.12 | 11.12 | 0.90 | -3.8 |
| 5  | 13 | 03:56 | 80 | 10:15 | 74S | 16:35 | 280 | 11.09 | 11.09 | 0.91 | -3.8 |
| 5  | 14 | 03:55 | 79 | 10:16 | 74S | 16:36 | 281 | 11.05 | 11.05 | 0.91 | -3.8 |
| 5  | 15 | 03:55 | 79 | 10:16 | 75S | 16:38 | 281 | 11.02 | 11.02 | 0.91 | -3.8 |
| 5  | 16 | 03:55 | 79 | 10:17 | 75S | 16:39 | 282 | 10.98 | 10.98 | 0.91 | -3.8 |
| 5  | 17 | 03:55 | 78 | 10:18 | 76S | 16:41 | 282 | 10.95 | 10.95 | 0.91 | -3.8 |
| 5  | 18 | 03:55 | 78 | 10:18 | 76S | 16:42 | 283 | 10.92 | 10.92 | 0.91 | -3.8 |
| 5  | 19 | 03:55 | 77 | 10:19 | 76S | 16:44 | 283 | 10.89 | 10.89 | 0.92 | -3.8 |
| 5  | 20 | 03:54 | 77 | 10:20 | 77S | 16:46 | 284 | 10.85 | 10.85 | 0.92 | -3.8 |
| 5  | 21 | 03:54 | 76 | 10:20 | 77S | 16:47 | 284 | 10.82 | 10.82 | 0.92 | -3.8 |
| 5  | 22 | 03:54 | 76 | 10:21 | 78S | 16:49 | 285 | 10.79 | 10.79 | 0.92 | -3.8 |
| 5  | 23 | 03:54 | 75 | 10:22 | 78S | 16:50 | 285 | 10.76 | 10.76 | 0.92 | -3.8 |
| 5  | 24 | 03:54 | 75 | 10:23 | 79S | 16:52 | 285 | 10.73 | 10.73 | 0.93 | -3.8 |
| 5  | 25 | 03:54 | 74 | 10:24 | 79S | 16:53 | 286 | 10.70 | 10.70 | 0.93 | -3.8 |
| 5  | 26 | 03:54 | 74 | 10:24 | 79S | 16:55 | 286 | 10.67 | 10.67 | 0.93 | -3.8 |
| 5  | 27 | 03:54 | 73 | 10:25 | 80S | 16:57 | 287 | 10.65 | 10.65 | 0.93 | -3.8 |
| 5  | 28 | 03:54 | 73 | 10:26 | 80S | 16:58 | 287 | 10.62 | 10.62 | 0.93 | -3.8 |
| 5  | 29 | 03:54 | 73 | 10:27 | 80S | 17:00 | 288 | 10.59 | 10.59 | 0.93 | -3.8 |
| 5  | 30 | 03:55 | 72 | 10:28 | 81S | 17:01 | 288 | 10.56 | 10.56 | 0.94 | -3.8 |
| 5  | 31 | 03:55 | 72 | 10:29 | 81S | 17:03 | 288 | 10.54 | 10.54 | 0.94 | -3.8 |

## 金星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 6  | 1  | 3   | 12 | 21.47 | +16 | 33 | 18.65 | 1.58789 | 13.21 | 28.7 |
| 6  | 2  | 3   | 17 | 13.93 | +16 | 54 | 7.25  | 1.59179 | 13.24 | 28.4 |
| 6  | 3  | 3   | 22 | 7.48  | +17 | 14 | 30.79 | 1.59563 | 13.27 | 28.0 |
| 6  | 4  | 3   | 27 | 2.14  | +17 | 34 | 28.58 | 1.59942 | 13.30 | 27.6 |
| 6  | 5  | 3   | 31 | 57.90 | +17 | 53 | 59.90 | 1.60317 | 13.33 | 27.2 |
| 6  | 6  | 3   | 36 | 54.76 | +18 | 13 | 4.06  | 1.60686 | 13.36 | 26.8 |
| 6  | 7  | 3   | 41 | 52.72 | +18 | 31 | 40.38 | 1.61051 | 13.39 | 26.5 |
| 6  | 8  | 3   | 46 | 51.77 | +18 | 49 | 48.15 | 1.61410 | 13.42 | 26.1 |
| 6  | 9  | 3   | 51 | 51.91 | +19 | 7  | 26.71 | 1.61765 | 13.45 | 25.7 |
| 6  | 10 | 3   | 56 | 53.13 | +19 | 24 | 35.38 | 1.62114 | 13.48 | 25.3 |
| 6  | 11 | 4   | 1  | 55.42 | +19 | 41 | 13.53 | 1.62459 | 13.51 | 24.9 |
| 6  | 12 | 4   | 6  | 58.78 | +19 | 57 | 20.51 | 1.62798 | 13.54 | 24.6 |
| 6  | 13 | 4   | 12 | 3.20  | +20 | 12 | 55.71 | 1.63133 | 13.57 | 24.2 |
| 6  | 14 | 4   | 17 | 8.66  | +20 | 27 | 58.54 | 1.63462 | 13.59 | 23.8 |
| 6  | 15 | 4   | 22 | 15.16 | +20 | 42 | 28.41 | 1.63786 | 13.62 | 23.4 |
| 6  | 16 | 4   | 27 | 22.66 | +20 | 56 | 24.75 | 1.64106 | 13.65 | 23.0 |
| 6  | 17 | 4   | 32 | 31.17 | +21 | 9  | 46.99 | 1.64420 | 13.67 | 22.6 |
| 6  | 18 | 4   | 37 | 40.64 | +21 | 22 | 34.59 | 1.64729 | 13.70 | 22.3 |
| 6  | 19 | 4   | 42 | 51.05 | +21 | 34 | 47.00 | 1.65033 | 13.72 | 21.9 |
| 6  | 20 | 4   | 48 | 2.38  | +21 | 46 | 23.71 | 1.65332 | 13.75 | 21.5 |
| 6  | 21 | 4   | 53 | 14.59 | +21 | 57 | 24.18 | 1.65626 | 13.77 | 21.1 |
| 6  | 22 | 4   | 58 | 27.66 | +22 | 7  | 47.95 | 1.65914 | 13.80 | 20.7 |
| 6  | 23 | 5   | 3  | 41.54 | +22 | 17 | 34.52 | 1.66197 | 13.82 | 20.3 |
| 6  | 24 | 5   | 8  | 56.21 | +22 | 26 | 43.44 | 1.66475 | 13.84 | 19.9 |
| 6  | 25 | 5   | 14 | 11.61 | +22 | 35 | 14.28 | 1.66747 | 13.87 | 19.6 |
| 6  | 26 | 5   | 19 | 27.72 | +22 | 43 | 6.63  | 1.67013 | 13.89 | 19.2 |
| 6  | 27 | 5   | 24 | 44.49 | +22 | 50 | 20.11 | 1.67275 | 13.91 | 18.8 |
| 6  | 28 | 5   | 30 | 1.87  | +22 | 56 | 54.35 | 1.67530 | 13.93 | 18.4 |
| 6  | 29 | 5   | 35 | 19.82 | +23 | 2  | 49.01 | 1.67780 | 13.95 | 18.0 |
| 6  | 30 | 5   | 40 | 38.29 | +23 | 8  | 3.81  | 1.68025 | 13.97 | 17.6 |

## 金星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |    | 中 天   |     | 沒     |     | 視 直徑  |       | 相位   | 視 亮度 |
|----|----|-------|----|-------|-----|-------|-----|-------|-------|------|------|
| 月  | 日  | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道    | 兩極    |      | 星等   |
|    |    | h m   | °  | h m   | °   | h m   | °   | "     | "     |      |      |
| 6  | 1  | 03:55 | 71 | 10:30 | 82S | 17:05 | 289 | 10.51 | 10.51 | 0.94 | -3.8 |
| 6  | 2  | 03:55 | 71 | 10:31 | 82S | 17:06 | 289 | 10.48 | 10.48 | 0.94 | -3.8 |
| 6  | 3  | 03:55 | 71 | 10:31 | 82S | 17:08 | 290 | 10.46 | 10.46 | 0.94 | -3.8 |
| 6  | 4  | 03:56 | 70 | 10:32 | 83S | 17:10 | 290 | 10.43 | 10.43 | 0.94 | -3.8 |
| 6  | 5  | 03:56 | 70 | 10:33 | 83S | 17:11 | 290 | 10.41 | 10.41 | 0.95 | -3.8 |
| 6  | 6  | 03:56 | 70 | 10:34 | 83S | 17:13 | 291 | 10.39 | 10.39 | 0.95 | -3.8 |
| 6  | 7  | 03:57 | 69 | 10:35 | 83S | 17:15 | 291 | 10.36 | 10.36 | 0.95 | -3.8 |
| 6  | 8  | 03:57 | 69 | 10:37 | 84S | 17:16 | 291 | 10.34 | 10.34 | 0.95 | -3.8 |
| 6  | 9  | 03:57 | 69 | 10:38 | 84S | 17:18 | 292 | 10.32 | 10.32 | 0.95 | -3.8 |
| 6  | 10 | 03:58 | 68 | 10:39 | 84S | 17:20 | 292 | 10.29 | 10.29 | 0.95 | -3.8 |
| 6  | 11 | 03:58 | 68 | 10:40 | 85S | 17:22 | 292 | 10.27 | 10.27 | 0.95 | -3.8 |
| 6  | 12 | 03:59 | 68 | 10:41 | 85S | 17:23 | 293 | 10.25 | 10.25 | 0.96 | -3.8 |
| 6  | 13 | 03:59 | 67 | 10:42 | 85S | 17:25 | 293 | 10.23 | 10.23 | 0.96 | -3.8 |
| 6  | 14 | 04:00 | 67 | 10:43 | 85S | 17:27 | 293 | 10.21 | 10.21 | 0.96 | -3.8 |
| 6  | 15 | 04:01 | 67 | 10:44 | 86S | 17:28 | 293 | 10.19 | 10.19 | 0.96 | -3.8 |
| 6  | 16 | 04:01 | 67 | 10:46 | 86S | 17:30 | 294 | 10.17 | 10.17 | 0.96 | -3.8 |
| 6  | 17 | 04:02 | 66 | 10:47 | 86S | 17:32 | 294 | 10.15 | 10.15 | 0.96 | -3.8 |
| 6  | 18 | 04:03 | 66 | 10:48 | 86S | 17:33 | 294 | 10.13 | 10.13 | 0.96 | -3.8 |
| 6  | 19 | 04:03 | 66 | 10:49 | 87S | 17:35 | 294 | 10.11 | 10.11 | 0.96 | -3.8 |
| 6  | 20 | 04:04 | 66 | 10:50 | 87S | 17:37 | 295 | 10.09 | 10.09 | 0.97 | -3.8 |
| 6  | 21 | 04:05 | 65 | 10:52 | 87S | 17:38 | 295 | 10.08 | 10.08 | 0.97 | -3.8 |
| 6  | 22 | 04:06 | 65 | 10:53 | 87S | 17:40 | 295 | 10.06 | 10.06 | 0.97 | -3.8 |
| 6  | 23 | 04:07 | 65 | 10:54 | 87S | 17:42 | 295 | 10.04 | 10.04 | 0.97 | -3.8 |
| 6  | 24 | 04:08 | 65 | 10:56 | 87S | 17:43 | 295 | 10.02 | 10.02 | 0.97 | -3.8 |
| 6  | 25 | 04:09 | 65 | 10:57 | 88S | 17:45 | 295 | 10.01 | 10.01 | 0.97 | -3.8 |
| 6  | 26 | 04:10 | 64 | 10:58 | 88S | 17:47 | 296 | 9.99  | 9.99  | 0.97 | -3.8 |
| 6  | 27 | 04:11 | 64 | 11:00 | 88S | 17:48 | 296 | 9.98  | 9.98  | 0.97 | -3.8 |
| 6  | 28 | 04:12 | 64 | 11:01 | 88S | 17:50 | 296 | 9.96  | 9.96  | 0.97 | -3.8 |
| 6  | 29 | 04:13 | 64 | 11:02 | 88S | 17:51 | 296 | 9.95  | 9.95  | 0.98 | -3.9 |
| 6  | 30 | 04:14 | 64 | 11:04 | 88S | 17:53 | 296 | 9.93  | 9.93  | 0.98 | -3.9 |

## 金星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 7  | 1  | 5   | 45 | 57.23 | +23 | 12 | 38.44 | 1.68263 | 13.99 | 17.2 |
| 7  | 2  | 5   | 51 | 16.57 | +23 | 16 | 32.68 | 1.68496 | 14.01 | 16.9 |
| 7  | 3  | 5   | 56 | 36.28 | +23 | 19 | 46.28 | 1.68724 | 14.03 | 16.5 |
| 7  | 4  | 6   | 1  | 56.28 | +23 | 22 | 19.05 | 1.68945 | 14.05 | 16.1 |
| 7  | 5  | 6   | 7  | 16.52 | +23 | 24 | 10.82 | 1.69161 | 14.07 | 15.7 |
| 7  | 6  | 6   | 12 | 36.95 | +23 | 25 | 21.42 | 1.69371 | 14.09 | 15.3 |
| 7  | 7  | 6   | 17 | 57.49 | +23 | 25 | 50.75 | 1.69575 | 14.10 | 14.9 |
| 7  | 8  | 6   | 23 | 18.10 | +23 | 25 | 38.70 | 1.69774 | 14.12 | 14.5 |
| 7  | 9  | 6   | 28 | 38.73 | +23 | 24 | 45.23 | 1.69967 | 14.14 | 14.1 |
| 7  | 10 | 6   | 33 | 59.31 | +23 | 23 | 10.31 | 1.70154 | 14.15 | 13.8 |
| 7  | 11 | 6   | 39 | 19.80 | +23 | 20 | 53.97 | 1.70335 | 14.17 | 13.4 |
| 7  | 12 | 6   | 44 | 40.14 | +23 | 17 | 56.26 | 1.70511 | 14.18 | 13.0 |
| 7  | 13 | 6   | 50 | 0.29  | +23 | 14 | 17.25 | 1.70682 | 14.19 | 12.6 |
| 7  | 14 | 6   | 55 | 20.17 | +23 | 9  | 57.05 | 1.70846 | 14.21 | 12.2 |
| 7  | 15 | 7   | 0  | 39.75 | +23 | 4  | 55.81 | 1.71005 | 14.22 | 11.8 |
| 7  | 16 | 7   | 5  | 58.98 | +22 | 59 | 13.68 | 1.71158 | 14.23 | 11.4 |
| 7  | 17 | 7   | 11 | 17.79 | +22 | 52 | 50.85 | 1.71306 | 14.25 | 11.1 |
| 7  | 18 | 7   | 16 | 36.15 | +22 | 45 | 47.53 | 1.71448 | 14.26 | 10.7 |
| 7  | 19 | 7   | 21 | 54.00 | +22 | 38 | 3.96  | 1.71585 | 14.27 | 10.3 |
| 7  | 20 | 7   | 27 | 11.29 | +22 | 29 | 40.39 | 1.71715 | 14.28 | 9.9  |
| 7  | 21 | 7   | 32 | 27.99 | +22 | 20 | 37.12 | 1.71840 | 14.29 | 9.5  |
| 7  | 22 | 7   | 37 | 44.05 | +22 | 10 | 54.47 | 1.71960 | 14.30 | 9.1  |
| 7  | 23 | 7   | 42 | 59.43 | +22 | 0  | 32.76 | 1.72073 | 14.31 | 8.7  |
| 7  | 24 | 7   | 48 | 14.09 | +21 | 49 | 32.36 | 1.72181 | 14.32 | 8.4  |
| 7  | 25 | 7   | 53 | 27.99 | +21 | 37 | 53.66 | 1.72283 | 14.33 | 8.0  |
| 7  | 26 | 7   | 58 | 41.10 | +21 | 25 | 37.08 | 1.72380 | 14.34 | 7.6  |
| 7  | 27 | 8   | 3  | 53.38 | +21 | 12 | 43.05 | 1.72470 | 14.34 | 7.2  |
| 7  | 28 | 8   | 9  | 4.80  | +20 | 59 | 12.03 | 1.72555 | 14.35 | 6.8  |
| 7  | 29 | 8   | 14 | 15.33 | +20 | 45 | 4.52  | 1.72633 | 14.36 | 6.5  |
| 7  | 30 | 8   | 19 | 24.94 | +20 | 30 | 21.02 | 1.72706 | 14.36 | 6.1  |
| 7  | 31 | 8   | 24 | 33.59 | +20 | 15 | 2.06  | 1.72773 | 14.37 | 5.7  |

## 金星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 7 1       | 04:16     | 64      | 11:05     | 88S     | 17:55     | 296     | 9.92         | 9.92          | 0.98 | -3.9          |
| 7 2       | 04:17     | 64      | 11:06     | 88S     | 17:56     | 296     | 9.90         | 9.90          | 0.98 | -3.9          |
| 7 3       | 04:18     | 64      | 11:08     | 88S     | 17:58     | 296     | 9.89         | 9.89          | 0.98 | -3.9          |
| 7 4       | 04:19     | 64      | 11:09     | 88S     | 17:59     | 296     | 9.88         | 9.88          | 0.98 | -3.9          |
| 7 5       | 04:21     | 64      | 11:11     | 88S     | 18:00     | 296     | 9.87         | 9.87          | 0.98 | -3.9          |
| 7 6       | 04:22     | 64      | 11:12     | 88S     | 18:02     | 296     | 9.85         | 9.85          | 0.98 | -3.9          |
| 7 7       | 04:23     | 64      | 11:13     | 88S     | 18:03     | 296     | 9.84         | 9.84          | 0.98 | -3.9          |
| 7 8       | 04:25     | 64      | 11:15     | 88S     | 18:05     | 296     | 9.83         | 9.83          | 0.98 | -3.9          |
| 7 9       | 04:26     | 64      | 11:16     | 88S     | 18:06     | 296     | 9.82         | 9.82          | 0.99 | -3.9          |
| 7 10      | 04:28     | 64      | 11:18     | 88S     | 18:07     | 296     | 9.81         | 9.81          | 0.99 | -3.9          |
| 7 11      | 04:29     | 64      | 11:19     | 88S     | 18:09     | 296     | 9.80         | 9.80          | 0.99 | -3.9          |
| 7 12      | 04:31     | 64      | 11:20     | 88S     | 18:10     | 296     | 9.79         | 9.79          | 0.99 | -3.9          |
| 7 13      | 04:32     | 64      | 11:22     | 88S     | 18:11     | 296     | 9.78         | 9.78          | 0.99 | -3.9          |
| 7 14      | 04:34     | 64      | 11:23     | 88S     | 18:12     | 296     | 9.77         | 9.77          | 0.99 | -3.9          |
| 7 15      | 04:35     | 64      | 11:25     | 88S     | 18:14     | 296     | 9.76         | 9.76          | 0.99 | -3.9          |
| 7 16      | 04:37     | 64      | 11:26     | 88S     | 18:15     | 296     | 9.75         | 9.75          | 0.99 | -3.9          |
| 7 17      | 04:39     | 64      | 11:27     | 88S     | 18:16     | 296     | 9.74         | 9.74          | 0.99 | -3.9          |
| 7 18      | 04:40     | 64      | 11:29     | 88S     | 18:17     | 296     | 9.73         | 9.73          | 0.99 | -3.9          |
| 7 19      | 04:42     | 65      | 11:30     | 88S     | 18:18     | 295     | 9.73         | 9.73          | 0.99 | -3.9          |
| 7 20      | 04:43     | 65      | 11:31     | 87S     | 18:19     | 295     | 9.72         | 9.72          | 0.99 | -3.9          |
| 7 21      | 04:45     | 65      | 11:33     | 87S     | 18:20     | 295     | 9.71         | 9.71          | 0.99 | -3.9          |
| 7 22      | 04:47     | 65      | 11:34     | 87S     | 18:21     | 295     | 9.70         | 9.70          | 0.99 | -3.9          |
| 7 23      | 04:49     | 65      | 11:35     | 87S     | 18:22     | 295     | 9.70         | 9.70          | 0.99 | -3.9          |
| 7 24      | 04:50     | 65      | 11:37     | 87S     | 18:23     | 294     | 9.69         | 9.69          | 1.00 | -3.9          |
| 7 25      | 04:52     | 66      | 11:38     | 87S     | 18:24     | 294     | 9.69         | 9.69          | 1.00 | -3.9          |
| 7 26      | 04:54     | 66      | 11:39     | 86S     | 18:24     | 294     | 9.68         | 9.68          | 1.00 | -3.9          |
| 7 27      | 04:55     | 66      | 11:40     | 86S     | 18:25     | 294     | 9.68         | 9.68          | 1.00 | -3.9          |
| 7 28      | 04:57     | 66      | 11:42     | 86S     | 18:26     | 293     | 9.67         | 9.67          | 1.00 | -3.9          |
| 7 29      | 04:59     | 67      | 11:43     | 86S     | 18:27     | 293     | 9.67         | 9.67          | 1.00 | -3.9          |
| 7 30      | 05:01     | 67      | 11:44     | 85S     | 18:27     | 293     | 9.66         | 9.66          | 1.00 | -3.9          |
| 7 31      | 05:02     | 67      | 11:45     | 85S     | 18:28     | 293     | 9.66         | 9.66          | 1.00 | -3.9          |

## 金星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 8  | 1  | 8   | 29 | 41.26 | +19 | 59 | 8.18  | 1.72834 | 14.37 | 5.3  |
| 8  | 2  | 8   | 34 | 47.93 | +19 | 42 | 39.95 | 1.72890 | 14.38 | 5.0  |
| 8  | 3  | 8   | 39 | 53.56 | +19 | 25 | 37.93 | 1.72939 | 14.38 | 4.6  |
| 8  | 4  | 8   | 44 | 58.15 | +19 | 8  | 2.71  | 1.72982 | 14.39 | 4.3  |
| 8  | 5  | 8   | 50 | 1.68  | +18 | 49 | 54.88 | 1.73020 | 14.39 | 3.9  |
| 8  | 6  | 8   | 55 | 4.13  | +18 | 31 | 15.04 | 1.73052 | 14.39 | 3.6  |
| 8  | 7  | 9   | 0  | 5.50  | +18 | 12 | 3.84  | 1.73078 | 14.39 | 3.2  |
| 8  | 8  | 9   | 5  | 5.78  | +17 | 52 | 21.91 | 1.73098 | 14.40 | 2.9  |
| 8  | 9  | 9   | 10 | 4.96  | +17 | 32 | 9.90  | 1.73112 | 14.40 | 2.6  |
| 8  | 10 | 9   | 15 | 3.05  | +17 | 11 | 28.48 | 1.73121 | 14.40 | 2.4  |
| 8  | 11 | 9   | 20 | 0.05  | +16 | 50 | 18.32 | 1.73125 | 14.40 | 2.1  |
| 8  | 12 | 9   | 24 | 55.96 | +16 | 28 | 40.09 | 1.73123 | 14.40 | 1.9  |
| 8  | 13 | 9   | 29 | 50.78 | +16 | 6  | 34.48 | 1.73115 | 14.40 | 1.8  |
| 8  | 14 | 9   | 34 | 44.52 | +15 | 44 | 2.14  | 1.73102 | 14.40 | 1.8  |
| 8  | 15 | 9   | 39 | 37.19 | +15 | 21 | 3.79  | 1.73083 | 14.39 | 1.8  |
| 8  | 16 | 9   | 44 | 28.80 | +14 | 57 | 40.09 | 1.73059 | 14.39 | 2.0  |
| 8  | 17 | 9   | 49 | 19.36 | +14 | 33 | 51.77 | 1.73030 | 14.39 | 2.1  |
| 8  | 18 | 9   | 54 | 8.89  | +14 | 9  | 39.50 | 1.72995 | 14.39 | 2.4  |
| 8  | 19 | 9   | 58 | 57.42 | +13 | 45 | 4.01  | 1.72954 | 14.38 | 2.6  |
| 8  | 20 | 10  | 3  | 44.95 | +13 | 20 | 5.98  | 1.72908 | 14.38 | 2.9  |
| 8  | 21 | 10  | 8  | 31.51 | +12 | 54 | 46.11 | 1.72857 | 14.38 | 3.2  |
| 8  | 22 | 10  | 13 | 17.12 | +12 | 29 | 5.13  | 1.72801 | 14.37 | 3.6  |
| 8  | 23 | 10  | 18 | 1.81  | +12 | 3  | 3.73  | 1.72739 | 14.37 | 3.9  |
| 8  | 24 | 10  | 22 | 45.60 | +11 | 36 | 42.63 | 1.72671 | 14.36 | 4.3  |
| 8  | 25 | 10  | 27 | 28.52 | +11 | 10 | 2.56  | 1.72599 | 14.35 | 4.6  |
| 8  | 26 | 10  | 32 | 10.59 | +10 | 43 | 4.25  | 1.72521 | 14.35 | 5.0  |
| 8  | 27 | 10  | 36 | 51.84 | +10 | 15 | 48.41 | 1.72437 | 14.34 | 5.3  |
| 8  | 28 | 10  | 41 | 32.30 | +9  | 48 | 15.80 | 1.72348 | 14.33 | 5.7  |
| 8  | 29 | 10  | 46 | 11.99 | +9  | 20 | 27.15 | 1.72254 | 14.33 | 6.0  |
| 8  | 30 | 10  | 50 | 50.94 | +8  | 52 | 23.21 | 1.72154 | 14.32 | 6.4  |
| 8  | 31 | 10  | 55 | 29.17 | +8  | 24 | 4.70  | 1.72049 | 14.31 | 6.8  |

## 金星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 8 1       | 05:04     | 68      | 11:47     | 85S     | 18:28     | 292     | 9.66         | 9.66          | 1.00 | -3.9          |
| 8 2       | 05:06     | 68      | 11:48     | 85S     | 18:29     | 292     | 9.65         | 9.65          | 1.00 | -3.9          |
| 8 3       | 05:08     | 68      | 11:49     | 84S     | 18:30     | 292     | 9.65         | 9.65          | 1.00 | -3.9          |
| 8 4       | 05:10     | 68      | 11:50     | 84S     | 18:30     | 291     | 9.65         | 9.65          | 1.00 | -4.0          |
| 8 5       | 05:11     | 69      | 11:51     | 84S     | 18:31     | 291     | 9.65         | 9.65          | 1.00 | -4.0          |
| 8 6       | 05:13     | 69      | 11:52     | 83S     | 18:31     | 291     | 9.64         | 9.64          | 1.00 | -4.0          |
| 8 7       | 05:15     | 70      | 11:53     | 83S     | 18:31     | 290     | 9.64         | 9.64          | 1.00 | -4.0          |
| 8 8       | 05:17     | 70      | 11:54     | 83S     | 18:32     | 290     | 9.64         | 9.64          | 1.00 | -4.0          |
| 8 9       | 05:18     | 70      | 11:55     | 82S     | 18:32     | 290     | 9.64         | 9.64          | 1.00 | -4.0          |
| 8 10      | 05:20     | 71      | 11:56     | 82S     | 18:32     | 289     | 9.64         | 9.64          | 1.00 | -4.0          |
| 8 11      | 05:22     | 71      | 11:57     | 82S     | 18:33     | 289     | 9.64         | 9.64          | 1.00 | ----          |
| 8 12      | 05:24     | 71      | 11:58     | 81S     | 18:33     | 288     | 9.64         | 9.64          | 1.00 | ----          |
| 8 13      | 05:25     | 72      | 11:59     | 81S     | 18:33     | 288     | 9.64         | 9.64          | 1.00 | ----          |
| 8 14      | 05:27     | 72      | 12:00     | 81S     | 18:33     | 288     | 9.64         | 9.64          | 1.00 | ----          |
| 8 15      | 05:29     | 73      | 12:01     | 80S     | 18:33     | 287     | 9.64         | 9.64          | 1.00 | ----          |
| 8 16      | 05:30     | 73      | 12:02     | 80S     | 18:33     | 287     | 9.64         | 9.64          | 1.00 | ----          |
| 8 17      | 05:32     | 74      | 12:03     | 79S     | 18:33     | 286     | 9.64         | 9.64          | 1.00 | ----          |
| 8 18      | 05:34     | 74      | 12:04     | 79S     | 18:34     | 286     | 9.65         | 9.65          | 1.00 | -4.0          |
| 8 19      | 05:36     | 74      | 12:05     | 79S     | 18:34     | 285     | 9.65         | 9.65          | 1.00 | -4.0          |
| 8 20      | 05:37     | 75      | 12:06     | 78S     | 18:34     | 285     | 9.65         | 9.65          | 1.00 | -4.0          |
| 8 21      | 05:39     | 75      | 12:06     | 78S     | 18:34     | 284     | 9.65         | 9.65          | 1.00 | -4.0          |
| 8 22      | 05:41     | 76      | 12:07     | 77S     | 18:33     | 284     | 9.66         | 9.66          | 1.00 | -4.0          |
| 8 23      | 05:42     | 76      | 12:08     | 77S     | 18:33     | 283     | 9.66         | 9.66          | 1.00 | -4.0          |
| 8 24      | 05:44     | 77      | 12:09     | 76S     | 18:33     | 283     | 9.66         | 9.66          | 1.00 | -4.0          |
| 8 25      | 05:46     | 77      | 12:10     | 76S     | 18:33     | 282     | 9.67         | 9.67          | 1.00 | -4.0          |
| 8 26      | 05:47     | 78      | 12:10     | 76S     | 18:33     | 282     | 9.67         | 9.67          | 1.00 | -3.9          |
| 8 27      | 05:49     | 78      | 12:11     | 75S     | 18:33     | 281     | 9.68         | 9.68          | 1.00 | -3.9          |
| 8 28      | 05:50     | 79      | 12:12     | 75S     | 18:33     | 281     | 9.68         | 9.68          | 1.00 | -3.9          |
| 8 29      | 05:52     | 79      | 12:13     | 74S     | 18:33     | 280     | 9.69         | 9.69          | 1.00 | -3.9          |
| 8 30      | 05:54     | 80      | 12:13     | 74S     | 18:32     | 280     | 9.69         | 9.69          | 1.00 | -3.9          |
| 8 31      | 05:55     | 80      | 12:14     | 73S     | 18:32     | 279     | 9.70         | 9.70          | 1.00 | -3.9          |

## 金星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 9  | 1  | 11  | 0  | 6.72  | +7  | 55 | 32.37 | 1.71939 | 14.30 | 7.1  |
| 9  | 2  | 11  | 4  | 43.63 | +7  | 26 | 46.95 | 1.71823 | 14.29 | 7.5  |
| 9  | 3  | 11  | 9  | 19.93 | +6  | 57 | 49.16 | 1.71702 | 14.28 | 7.9  |
| 9  | 4  | 11  | 13 | 55.64 | +6  | 28 | 39.74 | 1.71575 | 14.27 | 8.2  |
| 9  | 5  | 11  | 18 | 30.82 | +5  | 59 | 19.44 | 1.71444 | 14.26 | 8.6  |
| 9  | 6  | 11  | 23 | 5.49  | +5  | 29 | 48.98 | 1.71307 | 14.25 | 9.0  |
| 9  | 7  | 11  | 27 | 39.69 | +5  | 0  | 9.11  | 1.71166 | 14.24 | 9.3  |
| 9  | 8  | 11  | 32 | 13.47 | +4  | 30 | 20.57 | 1.71019 | 14.22 | 9.7  |
| 9  | 9  | 11  | 36 | 46.85 | +4  | 0  | 24.09 | 1.70867 | 14.21 | 10.1 |
| 9  | 10 | 11  | 41 | 19.88 | +3  | 30 | 20.39 | 1.70711 | 14.20 | 10.4 |
| 9  | 11 | 11  | 45 | 52.60 | +3  | 0  | 10.20 | 1.70550 | 14.18 | 10.8 |
| 9  | 12 | 11  | 50 | 25.05 | +2  | 29 | 54.24 | 1.70383 | 14.17 | 11.2 |
| 9  | 13 | 11  | 54 | 57.27 | +1  | 59 | 33.23 | 1.70213 | 14.16 | 11.5 |
| 9  | 14 | 11  | 59 | 29.31 | +1  | 29 | 7.90  | 1.70037 | 14.14 | 11.9 |
| 9  | 15 | 12  | 4  | 1.21  | +0  | 58 | 38.95 | 1.69857 | 14.13 | 12.3 |
| 9  | 16 | 12  | 8  | 33.01 | +0  | 28 | 7.10  | 1.69672 | 14.11 | 12.6 |
| 9  | 17 | 12  | 13 | 4.76  | -0  | 2  | 26.94 | 1.69482 | 14.10 | 13.0 |
| 9  | 18 | 12  | 17 | 36.51 | -0  | 33 | 2.45  | 1.69288 | 14.08 | 13.4 |
| 9  | 19 | 12  | 22 | 8.30  | -1  | 3  | 38.71 | 1.69089 | 14.06 | 13.7 |
| 9  | 20 | 12  | 26 | 40.16 | -1  | 34 | 15.01 | 1.68886 | 14.05 | 14.1 |
| 9  | 21 | 12  | 31 | 12.16 | -2  | 4  | 50.63 | 1.68678 | 14.03 | 14.4 |
| 9  | 22 | 12  | 35 | 44.33 | -2  | 35 | 24.83 | 1.68465 | 14.01 | 14.8 |
| 9  | 23 | 12  | 40 | 16.71 | -3  | 5  | 56.89 | 1.68249 | 13.99 | 15.2 |
| 9  | 24 | 12  | 44 | 49.34 | -3  | 36 | 26.07 | 1.68027 | 13.97 | 15.5 |
| 9  | 25 | 12  | 49 | 22.27 | -4  | 6  | 51.62 | 1.67801 | 13.96 | 15.9 |
| 9  | 26 | 12  | 53 | 55.54 | -4  | 37 | 12.78 | 1.67571 | 13.94 | 16.2 |
| 9  | 27 | 12  | 58 | 29.18 | -5  | 7  | 28.80 | 1.67336 | 13.92 | 16.6 |
| 9  | 28 | 13  | 3  | 3.24  | -5  | 37 | 38.93 | 1.67096 | 13.90 | 17.0 |
| 9  | 29 | 13  | 7  | 37.76 | -6  | 7  | 42.41 | 1.66852 | 13.88 | 17.3 |
| 9  | 30 | 13  | 12 | 12.77 | -6  | 37 | 38.47 | 1.66604 | 13.86 | 17.7 |



## 金星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 9 1       | 05:57     | 81      | 12:15     | 73S     | 18:32     | 279     | 9.71         | 9.71          | 1.00 | -3.9          |
| 9 2       | 05:59     | 81      | 12:15     | 72S     | 18:32     | 278     | 9.71         | 9.71          | 1.00 | -3.9          |
| 9 3       | 06:00     | 82      | 12:16     | 72S     | 18:31     | 278     | 9.72         | 9.72          | 1.00 | -3.9          |
| 9 4       | 06:02     | 83      | 12:17     | 71S     | 18:31     | 277     | 9.73         | 9.73          | 1.00 | -3.9          |
| 9 5       | 06:03     | 83      | 12:17     | 71S     | 18:31     | 277     | 9.73         | 9.73          | 0.99 | -3.9          |
| 9 6       | 06:05     | 84      | 12:18     | 70S     | 18:31     | 276     | 9.74         | 9.74          | 0.99 | -3.9          |
| 9 7       | 06:06     | 84      | 12:19     | 70S     | 18:30     | 276     | 9.75         | 9.75          | 0.99 | -3.9          |
| 9 8       | 06:08     | 85      | 12:19     | 69S     | 18:30     | 275     | 9.76         | 9.76          | 0.99 | -3.9          |
| 9 9       | 06:10     | 85      | 12:20     | 69S     | 18:30     | 274     | 9.77         | 9.77          | 0.99 | -3.9          |
| 9 10      | 06:11     | 86      | 12:20     | 68S     | 18:29     | 274     | 9.78         | 9.78          | 0.99 | -3.9          |
| 9 11      | 06:13     | 86      | 12:21     | 68S     | 18:29     | 273     | 9.78         | 9.78          | 0.99 | -3.9          |
| 9 12      | 06:14     | 87      | 12:22     | 67S     | 18:29     | 273     | 9.79         | 9.79          | 0.99 | -3.9          |
| 9 13      | 06:16     | 87      | 12:22     | 67S     | 18:28     | 272     | 9.80         | 9.80          | 0.99 | -3.9          |
| 9 14      | 06:17     | 88      | 12:23     | 66S     | 18:28     | 272     | 9.81         | 9.81          | 0.99 | -3.9          |
| 9 15      | 06:19     | 89      | 12:23     | 66S     | 18:27     | 271     | 9.82         | 9.82          | 0.99 | -3.9          |
| 9 16      | 06:20     | 89      | 12:24     | 65S     | 18:27     | 271     | 9.84         | 9.84          | 0.99 | -3.9          |
| 9 17      | 06:22     | 90      | 12:25     | 65S     | 18:27     | 270     | 9.85         | 9.85          | 0.99 | -3.9          |
| 9 18      | 06:23     | 90      | 12:25     | 64S     | 18:26     | 269     | 9.86         | 9.86          | 0.99 | -3.9          |
| 9 19      | 06:25     | 91      | 12:26     | 64S     | 18:26     | 269     | 9.87         | 9.87          | 0.99 | -3.9          |
| 9 20      | 06:27     | 91      | 12:26     | 63S     | 18:26     | 268     | 9.88         | 9.88          | 0.99 | -3.9          |
| 9 21      | 06:28     | 92      | 12:27     | 63S     | 18:25     | 268     | 9.89         | 9.89          | 0.98 | -3.9          |
| 9 22      | 06:30     | 93      | 12:27     | 62S     | 18:25     | 267     | 9.91         | 9.91          | 0.98 | -3.9          |
| 9 23      | 06:31     | 93      | 12:28     | 62S     | 18:25     | 267     | 9.92         | 9.92          | 0.98 | -3.9          |
| 9 24      | 06:33     | 94      | 12:29     | 61S     | 18:24     | 266     | 9.93         | 9.93          | 0.98 | -3.9          |
| 9 25      | 06:34     | 94      | 12:29     | 61S     | 18:24     | 265     | 9.95         | 9.95          | 0.98 | -3.9          |
| 9 26      | 06:36     | 95      | 12:30     | 60S     | 18:23     | 265     | 9.96         | 9.96          | 0.98 | -3.9          |
| 9 27      | 06:37     | 95      | 12:31     | 60S     | 18:23     | 264     | 9.97         | 9.97          | 0.98 | -3.9          |
| 9 28      | 06:39     | 96      | 12:31     | 59S     | 18:23     | 264     | 9.99         | 9.99          | 0.98 | -3.9          |
| 9 29      | 06:41     | 96      | 12:32     | 59S     | 18:23     | 263     | 10.00        | 10.00         | 0.98 | -3.9          |
| 9 30      | 06:42     | 97      | 12:32     | 58S     | 18:22     | 263     | 10.02        | 10.02         | 0.98 | -3.9          |

## 金星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 10 | 1  | 13  | 16 | 48.32 | -7  | 7  | 26.35 | 1.66351 | 13.84 | 18.0 |
| 10 | 2  | 13  | 21 | 24.45 | -7  | 37 | 5.30  | 1.66093 | 13.81 | 18.4 |
| 10 | 3  | 13  | 26 | 1.18  | -8  | 6  | 34.53 | 1.65831 | 13.79 | 18.7 |
| 10 | 4  | 13  | 30 | 38.57 | -8  | 35 | 53.27 | 1.65565 | 13.77 | 19.1 |
| 10 | 5  | 13  | 35 | 16.64 | -9  | 5  | 0.74  | 1.65295 | 13.75 | 19.5 |
| 10 | 6  | 13  | 39 | 55.43 | -9  | 33 | 56.15 | 1.65020 | 13.72 | 19.8 |
| 10 | 7  | 13  | 44 | 34.98 | -10 | 2  | 38.72 | 1.64742 | 13.70 | 20.2 |
| 10 | 8  | 13  | 49 | 15.32 | -10 | 31 | 7.68  | 1.64459 | 13.68 | 20.5 |
| 10 | 9  | 13  | 53 | 56.48 | -10 | 59 | 22.24 | 1.64172 | 13.65 | 20.9 |
| 10 | 10 | 13  | 58 | 38.51 | -11 | 27 | 21.62 | 1.63881 | 13.63 | 21.2 |
| 10 | 11 | 14  | 3  | 21.43 | -11 | 55 | 5.05  | 1.63587 | 13.61 | 21.6 |
| 10 | 12 | 14  | 8  | 5.28  | -12 | 22 | 31.74 | 1.63288 | 13.58 | 21.9 |
| 10 | 13 | 14  | 12 | 50.09 | -12 | 49 | 40.92 | 1.62985 | 13.56 | 22.3 |
| 10 | 14 | 14  | 17 | 35.90 | -13 | 16 | 31.81 | 1.62679 | 13.53 | 22.6 |
| 10 | 15 | 14  | 22 | 22.74 | -13 | 43 | 3.63  | 1.62369 | 13.50 | 23.0 |
| 10 | 16 | 14  | 27 | 10.63 | -14 | 9  | 15.61 | 1.62055 | 13.48 | 23.3 |
| 10 | 17 | 14  | 31 | 59.61 | -14 | 35 | 6.97  | 1.61737 | 13.45 | 23.7 |
| 10 | 18 | 14  | 36 | 49.69 | -15 | 0  | 36.93 | 1.61416 | 13.43 | 24.0 |
| 10 | 19 | 14  | 41 | 40.91 | -15 | 25 | 44.70 | 1.61091 | 13.40 | 24.4 |
| 10 | 20 | 14  | 46 | 33.29 | -15 | 50 | 29.51 | 1.60762 | 13.37 | 24.7 |
| 10 | 21 | 14  | 51 | 26.83 | -16 | 14 | 50.56 | 1.60430 | 13.34 | 25.1 |
| 10 | 22 | 14  | 56 | 21.57 | -16 | 38 | 47.07 | 1.60094 | 13.32 | 25.4 |
| 10 | 23 | 15  | 1  | 17.52 | -17 | 2  | 18.24 | 1.59754 | 13.29 | 25.7 |
| 10 | 24 | 15  | 6  | 14.68 | -17 | 25 | 23.27 | 1.59411 | 13.26 | 26.1 |
| 10 | 25 | 15  | 11 | 13.07 | -17 | 48 | 1.36  | 1.59064 | 13.23 | 26.4 |
| 10 | 26 | 15  | 16 | 12.71 | -18 | 10 | 11.73 | 1.58713 | 13.20 | 26.8 |
| 10 | 27 | 15  | 21 | 13.58 | -18 | 31 | 53.59 | 1.58359 | 13.17 | 27.1 |
| 10 | 28 | 15  | 26 | 15.71 | -18 | 53 | 6.17  | 1.58001 | 13.14 | 27.5 |
| 10 | 29 | 15  | 31 | 19.08 | -19 | 13 | 48.68 | 1.57639 | 13.11 | 27.8 |
| 10 | 30 | 15  | 36 | 23.70 | -19 | 34 | 0.37  | 1.57274 | 13.08 | 28.2 |
| 10 | 31 | 15  | 41 | 29.55 | -19 | 53 | 40.48 | 1.56905 | 13.05 | 28.5 |

## 金星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 10 1      | 06:44     | 98      | 12:33     | 58S     | 18:22     | 262     | 10.03        | 10.03         | 0.98 | -3.9          |
| 10 2      | 06:45     | 98      | 12:34     | 57S     | 18:22     | 262     | 10.05        | 10.05         | 0.97 | -3.9          |
| 10 3      | 06:47     | 99      | 12:34     | 57S     | 18:21     | 261     | 10.06        | 10.06         | 0.97 | -3.9          |
| 10 4      | 06:49     | 99      | 12:35     | 56S     | 18:21     | 261     | 10.08        | 10.08         | 0.97 | -3.9          |
| 10 5      | 06:50     | 100     | 12:36     | 56S     | 18:21     | 260     | 10.10        | 10.10         | 0.97 | -3.9          |
| 10 6      | 06:52     | 100     | 12:36     | 55S     | 18:21     | 259     | 10.11        | 10.11         | 0.97 | -3.9          |
| 10 7      | 06:53     | 101     | 12:37     | 55S     | 18:21     | 259     | 10.13        | 10.13         | 0.97 | -3.9          |
| 10 8      | 06:55     | 101     | 12:38     | 54S     | 18:20     | 258     | 10.15        | 10.15         | 0.97 | -3.9          |
| 10 9      | 06:57     | 102     | 12:39     | 54S     | 18:20     | 258     | 10.16        | 10.16         | 0.97 | -3.9          |
| 10 10     | 06:58     | 102     | 12:39     | 53S     | 18:20     | 257     | 10.18        | 10.18         | 0.97 | -3.9          |
| 10 11     | 07:00     | 103     | 12:40     | 53S     | 18:20     | 257     | 10.20        | 10.20         | 0.97 | -3.9          |
| 10 12     | 07:02     | 103     | 12:41     | 52S     | 18:20     | 256     | 10.22        | 10.22         | 0.96 | -3.9          |
| 10 13     | 07:03     | 104     | 12:42     | 52S     | 18:20     | 256     | 10.24        | 10.24         | 0.96 | -3.8          |
| 10 14     | 07:05     | 104     | 12:43     | 52S     | 18:20     | 255     | 10.26        | 10.26         | 0.96 | -3.8          |
| 10 15     | 07:07     | 105     | 12:43     | 51S     | 18:20     | 255     | 10.28        | 10.28         | 0.96 | -3.8          |
| 10 16     | 07:09     | 105     | 12:44     | 51S     | 18:20     | 254     | 10.30        | 10.30         | 0.96 | -3.8          |
| 10 17     | 07:10     | 106     | 12:45     | 50S     | 18:20     | 254     | 10.32        | 10.32         | 0.96 | -3.8          |
| 10 18     | 07:12     | 106     | 12:46     | 50S     | 18:20     | 253     | 10.34        | 10.34         | 0.96 | -3.8          |
| 10 19     | 07:14     | 107     | 12:47     | 49S     | 18:20     | 253     | 10.36        | 10.36         | 0.96 | -3.8          |
| 10 20     | 07:16     | 107     | 12:48     | 49S     | 18:20     | 253     | 10.38        | 10.38         | 0.95 | -3.8          |
| 10 21     | 07:17     | 108     | 12:49     | 49S     | 18:20     | 252     | 10.40        | 10.40         | 0.95 | -3.8          |
| 10 22     | 07:19     | 108     | 12:50     | 48S     | 18:20     | 252     | 10.42        | 10.42         | 0.95 | -3.8          |
| 10 23     | 07:21     | 109     | 12:51     | 48S     | 18:20     | 251     | 10.45        | 10.45         | 0.95 | -3.8          |
| 10 24     | 07:23     | 109     | 12:52     | 47S     | 18:21     | 251     | 10.47        | 10.47         | 0.95 | -3.8          |
| 10 25     | 07:25     | 109     | 12:53     | 47S     | 18:21     | 250     | 10.49        | 10.49         | 0.95 | -3.8          |
| 10 26     | 07:26     | 110     | 12:54     | 47S     | 18:21     | 250     | 10.51        | 10.51         | 0.95 | -3.8          |
| 10 27     | 07:28     | 110     | 12:55     | 46S     | 18:22     | 250     | 10.54        | 10.54         | 0.95 | -3.8          |
| 10 28     | 07:30     | 111     | 12:56     | 46S     | 18:22     | 249     | 10.56        | 10.56         | 0.94 | -3.8          |
| 10 29     | 07:32     | 111     | 12:57     | 46S     | 18:22     | 249     | 10.59        | 10.59         | 0.94 | -3.8          |
| 10 30     | 07:34     | 111     | 12:58     | 45S     | 18:23     | 248     | 10.61        | 10.61         | 0.94 | -3.8          |
| 10 31     | 07:36     | 112     | 13:00     | 45S     | 18:23     | 248     | 10.64        | 10.64         | 0.94 | -3.8          |

## 金星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 11 | 1  | 15  | 46 | 36.63 | -20 | 12 | 48.24 | 1.56532 | 13.02 | 28.8 |
| 11 | 2  | 15  | 51 | 44.92 | -20 | 31 | 22.90 | 1.56156 | 12.99 | 29.2 |
| 11 | 3  | 15  | 56 | 54.41 | -20 | 49 | 23.74 | 1.55776 | 12.96 | 29.5 |
| 11 | 4  | 16  | 2  | 5.08  | -21 | 6  | 50.02 | 1.55393 | 12.92 | 29.9 |
| 11 | 5  | 16  | 7  | 16.90 | -21 | 23 | 41.03 | 1.55006 | 12.89 | 30.2 |
| 11 | 6  | 16  | 12 | 29.87 | -21 | 39 | 56.09 | 1.54616 | 12.86 | 30.5 |
| 11 | 7  | 16  | 17 | 43.95 | -21 | 55 | 34.51 | 1.54222 | 12.83 | 30.9 |
| 11 | 8  | 16  | 22 | 59.12 | -22 | 10 | 35.65 | 1.53825 | 12.79 | 31.2 |
| 11 | 9  | 16  | 28 | 15.35 | -22 | 24 | 58.86 | 1.53425 | 12.76 | 31.6 |
| 11 | 10 | 16  | 33 | 32.61 | -22 | 38 | 43.54 | 1.53021 | 12.73 | 31.9 |
| 11 | 11 | 16  | 38 | 50.87 | -22 | 51 | 49.09 | 1.52615 | 12.69 | 32.2 |
| 11 | 12 | 16  | 44 | 10.09 | -23 | 4  | 14.95 | 1.52205 | 12.66 | 32.6 |
| 11 | 13 | 16  | 49 | 30.24 | -23 | 16 | 0.57  | 1.51791 | 12.62 | 32.9 |
| 11 | 14 | 16  | 54 | 51.26 | -23 | 27 | 5.44  | 1.51375 | 12.59 | 33.3 |
| 11 | 15 | 17  | 0  | 13.13 | -23 | 37 | 29.07 | 1.50956 | 12.56 | 33.6 |
| 11 | 16 | 17  | 5  | 35.78 | -23 | 47 | 10.99 | 1.50534 | 12.52 | 33.9 |
| 11 | 17 | 17  | 10 | 59.18 | -23 | 56 | 10.75 | 1.50108 | 12.48 | 34.3 |
| 11 | 18 | 17  | 16 | 23.27 | -24 | 4  | 27.93 | 1.49679 | 12.45 | 34.6 |
| 11 | 19 | 17  | 21 | 47.99 | -24 | 12 | 2.15  | 1.49248 | 12.41 | 35.0 |
| 11 | 20 | 17  | 27 | 13.29 | -24 | 18 | 53.02 | 1.48813 | 12.38 | 35.3 |
| 11 | 21 | 17  | 32 | 39.12 | -24 | 25 | 0.21  | 1.48375 | 12.34 | 35.6 |
| 11 | 22 | 17  | 38 | 5.40  | -24 | 30 | 23.40 | 1.47934 | 12.30 | 36.0 |
| 11 | 23 | 17  | 43 | 32.09 | -24 | 35 | 2.31  | 1.47490 | 12.27 | 36.3 |
| 11 | 24 | 17  | 48 | 59.12 | -24 | 38 | 56.71 | 1.47043 | 12.23 | 36.7 |
| 11 | 25 | 17  | 54 | 26.42 | -24 | 42 | 6.39  | 1.46593 | 12.19 | 37.0 |
| 11 | 26 | 17  | 59 | 53.93 | -24 | 44 | 31.19 | 1.46139 | 12.15 | 37.4 |
| 11 | 27 | 18  | 5  | 21.58 | -24 | 46 | 10.97 | 1.45682 | 12.12 | 37.7 |
| 11 | 28 | 18  | 10 | 49.29 | -24 | 47 | 5.65  | 1.45222 | 12.08 | 38.0 |
| 11 | 29 | 18  | 16 | 16.99 | -24 | 47 | 15.16 | 1.44759 | 12.04 | 38.4 |
| 11 | 30 | 18  | 21 | 44.61 | -24 | 46 | 39.47 | 1.44293 | 12.00 | 38.7 |

## 金星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視 亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |            |
| 11 1      | 07:37     | 112     | 13:01     | 45S     | 18:24     | 248     | 10.66 10.66          | 0.94 | -3.8       |
| 11 2      | 07:39     | 112     | 13:02     | 44S     | 18:24     | 247     | 10.69 10.69          | 0.94 | -3.8       |
| 11 3      | 07:41     | 113     | 13:03     | 44S     | 18:25     | 247     | 10.71 10.71          | 0.94 | -3.8       |
| 11 4      | 07:43     | 113     | 13:04     | 44S     | 18:26     | 247     | 10.74 10.74          | 0.93 | -3.8       |
| 11 5      | 07:45     | 113     | 13:06     | 43S     | 18:26     | 246     | 10.77 10.77          | 0.93 | -3.8       |
| 11 6      | 07:47     | 114     | 13:07     | 43S     | 18:27     | 246     | 10.79 10.79          | 0.93 | -3.8       |
| 11 7      | 07:49     | 114     | 13:08     | 43S     | 18:28     | 246     | 10.82 10.82          | 0.93 | -3.8       |
| 11 8      | 07:51     | 114     | 13:10     | 43S     | 18:28     | 246     | 10.85 10.85          | 0.93 | -3.8       |
| 11 9      | 07:52     | 115     | 13:11     | 42S     | 18:29     | 245     | 10.88 10.88          | 0.93 | -3.8       |
| 11 10     | 07:54     | 115     | 13:12     | 42S     | 18:30     | 245     | 10.91 10.91          | 0.92 | -3.8       |
| 11 11     | 07:56     | 115     | 13:14     | 42S     | 18:31     | 245     | 10.93 10.93          | 0.92 | -3.8       |
| 11 12     | 07:58     | 115     | 13:15     | 42S     | 18:32     | 245     | 10.96 10.96          | 0.92 | -3.8       |
| 11 13     | 08:00     | 116     | 13:16     | 42S     | 18:33     | 244     | 10.99 10.99          | 0.92 | -3.8       |
| 11 14     | 08:02     | 116     | 13:18     | 41S     | 18:34     | 244     | 11.02 11.02          | 0.92 | -3.8       |
| 11 15     | 08:03     | 116     | 13:19     | 41S     | 18:35     | 244     | 11.05 11.05          | 0.92 | -3.8       |
| 11 16     | 08:05     | 116     | 13:21     | 41S     | 18:36     | 244     | 11.09 11.09          | 0.92 | -3.9       |
| 11 17     | 08:07     | 116     | 13:22     | 41S     | 18:37     | 244     | 11.12 11.12          | 0.91 | -3.9       |
| 11 18     | 08:09     | 116     | 13:24     | 41S     | 18:38     | 243     | 11.15 11.15          | 0.91 | -3.9       |
| 11 19     | 08:11     | 117     | 13:25     | 41S     | 18:40     | 243     | 11.18 11.18          | 0.91 | -3.9       |
| 11 20     | 08:12     | 117     | 13:27     | 41S     | 18:41     | 243     | 11.21 11.21          | 0.91 | -3.9       |
| 11 21     | 08:14     | 117     | 13:28     | 41S     | 18:42     | 243     | 11.25 11.25          | 0.91 | -3.9       |
| 11 22     | 08:16     | 117     | 13:30     | 40S     | 18:43     | 243     | 11.28 11.28          | 0.91 | -3.9       |
| 11 23     | 08:17     | 117     | 13:31     | 40S     | 18:45     | 243     | 11.31 11.31          | 0.90 | -3.9       |
| 11 24     | 08:19     | 117     | 13:33     | 40S     | 18:46     | 243     | 11.35 11.35          | 0.90 | -3.9       |
| 11 25     | 08:21     | 117     | 13:34     | 40S     | 18:47     | 243     | 11.38 11.38          | 0.90 | -3.9       |
| 11 26     | 08:22     | 117     | 13:36     | 40S     | 18:49     | 243     | 11.42 11.42          | 0.90 | -3.9       |
| 11 27     | 08:24     | 117     | 13:37     | 40S     | 18:50     | 243     | 11.45 11.45          | 0.90 | -3.9       |
| 11 28     | 08:25     | 117     | 13:39     | 40S     | 18:52     | 243     | 11.49 11.49          | 0.89 | -3.9       |
| 11 29     | 08:27     | 117     | 13:40     | 40S     | 18:53     | 243     | 11.53 11.53          | 0.89 | -3.9       |
| 11 30     | 08:28     | 117     | 13:42     | 40S     | 18:55     | 243     | 11.56 11.56          | 0.89 | -3.9       |

## 金星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 12 | 1  | 18  | 27 | 12.07 | -24 | 45 | 18.58 | 1.43823 | 11.96 | 39.1 |
| 12 | 2  | 18  | 32 | 39.30 | -24 | 43 | 12.54 | 1.43350 | 11.92 | 39.4 |
| 12 | 3  | 18  | 38 | 6.23  | -24 | 40 | 21.41 | 1.42874 | 11.88 | 39.7 |
| 12 | 4  | 18  | 43 | 32.79 | -24 | 36 | 45.32 | 1.42395 | 11.84 | 40.1 |
| 12 | 5  | 18  | 48 | 58.92 | -24 | 32 | 24.40 | 1.41913 | 11.80 | 40.4 |
| 12 | 6  | 18  | 54 | 24.54 | -24 | 27 | 18.85 | 1.41428 | 11.76 | 40.8 |
| 12 | 7  | 18  | 59 | 49.59 | -24 | 21 | 28.89 | 1.40940 | 11.72 | 41.1 |
| 12 | 8  | 19  | 5  | 14.01 | -24 | 14 | 54.78 | 1.40449 | 11.68 | 41.5 |
| 12 | 9  | 19  | 10 | 37.74 | -24 | 7  | 36.79 | 1.39955 | 11.64 | 41.8 |
| 12 | 10 | 19  | 16 | 0.72  | -23 | 59 | 35.28 | 1.39458 | 11.60 | 42.2 |
| 12 | 11 | 19  | 21 | 22.88 | -23 | 50 | 50.58 | 1.38958 | 11.56 | 42.5 |
| 12 | 12 | 19  | 26 | 44.19 | -23 | 41 | 23.10 | 1.38455 | 11.52 | 42.9 |
| 12 | 13 | 19  | 32 | 4.57  | -23 | 31 | 13.25 | 1.37949 | 11.47 | 43.2 |
| 12 | 14 | 19  | 37 | 23.99 | -23 | 20 | 21.49 | 1.37441 | 11.43 | 43.5 |
| 12 | 15 | 19  | 42 | 42.38 | -23 | 8  | 48.28 | 1.36929 | 11.39 | 43.9 |
| 12 | 16 | 19  | 47 | 59.72 | -22 | 56 | 34.11 | 1.36415 | 11.35 | 44.2 |
| 12 | 17 | 19  | 53 | 15.94 | -22 | 43 | 39.50 | 1.35898 | 11.30 | 44.6 |
| 12 | 18 | 19  | 58 | 31.02 | -22 | 30 | 4.97  | 1.35378 | 11.26 | 45.0 |
| 12 | 19 | 20  | 3  | 44.92 | -22 | 15 | 51.08 | 1.34856 | 11.22 | 45.3 |
| 12 | 20 | 20  | 8  | 57.60 | -22 | 0  | 58.39 | 1.34330 | 11.17 | 45.7 |
| 12 | 21 | 20  | 14 | 9.03  | -21 | 45 | 27.49 | 1.33802 | 11.13 | 46.0 |
| 12 | 22 | 20  | 19 | 19.19 | -21 | 29 | 19.01 | 1.33271 | 11.08 | 46.4 |
| 12 | 23 | 20  | 24 | 28.05 | -21 | 12 | 33.59 | 1.32736 | 11.04 | 46.7 |
| 12 | 24 | 20  | 29 | 35.57 | -20 | 55 | 11.89 | 1.32199 | 11.00 | 47.1 |
| 12 | 25 | 20  | 34 | 41.74 | -20 | 37 | 14.60 | 1.31659 | 10.95 | 47.4 |
| 12 | 26 | 20  | 39 | 46.53 | -20 | 18 | 42.43 | 1.31116 | 10.91 | 47.8 |
| 12 | 27 | 20  | 44 | 49.92 | -19 | 59 | 36.09 | 1.30569 | 10.86 | 48.2 |
| 12 | 28 | 20  | 49 | 51.89 | -19 | 39 | 56.30 | 1.30020 | 10.81 | 48.5 |
| 12 | 29 | 20  | 54 | 52.42 | -19 | 19 | 43.81 | 1.29468 | 10.77 | 48.9 |
| 12 | 30 | 20  | 59 | 51.50 | -18 | 58 | 59.35 | 1.28912 | 10.72 | 49.2 |
| 12 | 31 | 21  | 4  | 49.11 | -18 | 37 | 43.68 | 1.28354 | 10.68 | 49.6 |

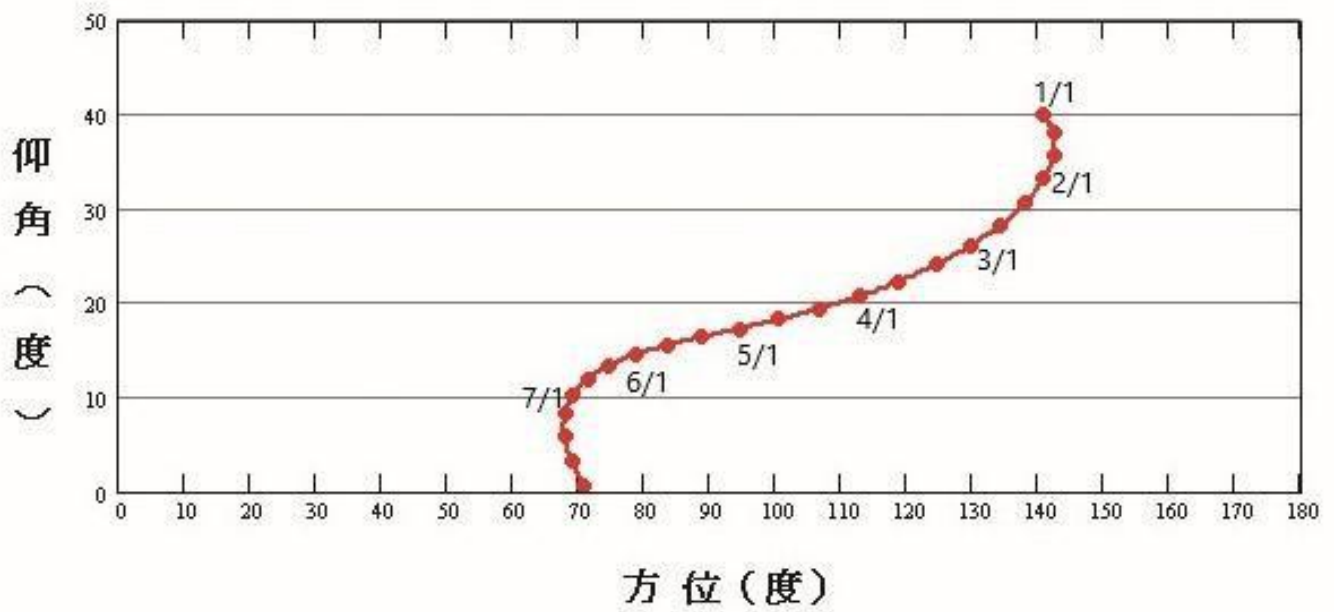
## 金星出沒時間表

東經：121.52° · 北緯：25.10°

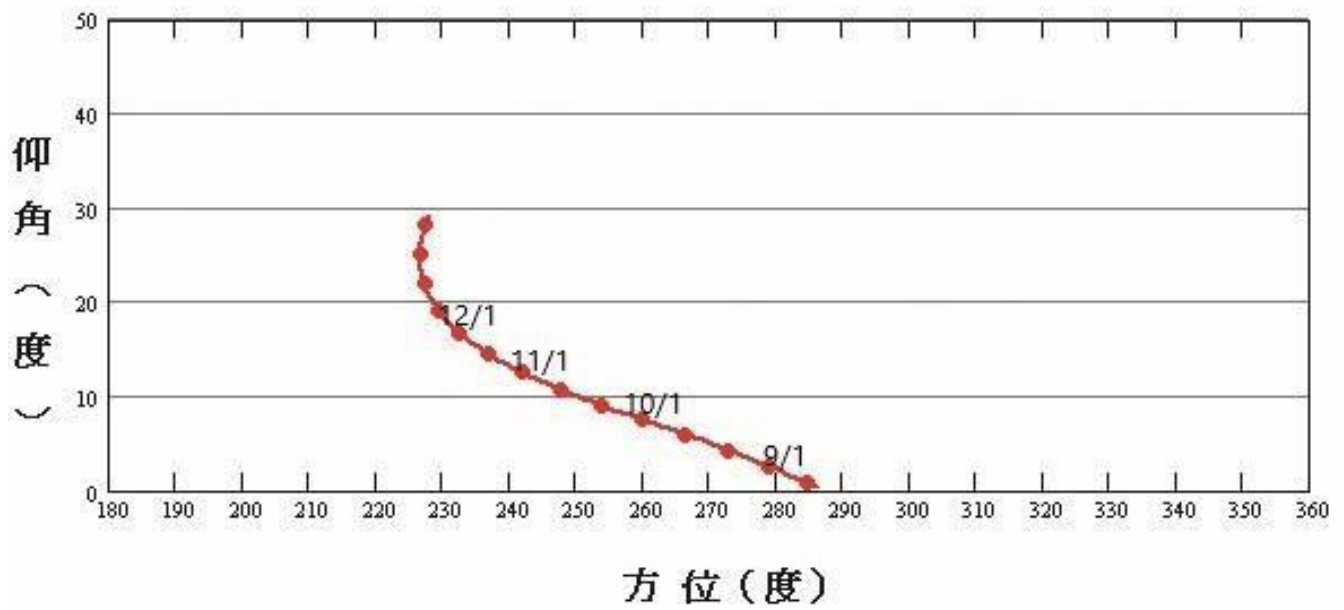
東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |               |
| 12 1      | 08:30     | 117     | 13:43     | 40S     | 18:57     | 243     | 11.60 11.60          | 0.89 | -3.9          |
| 12 2      | 08:31     | 117     | 13:45     | 40S     | 18:58     | 243     | 11.64 11.64          | 0.89 | -3.9          |
| 12 3      | 08:33     | 117     | 13:46     | 40S     | 19:00     | 243     | 11.68 11.68          | 0.88 | -3.9          |
| 12 4      | 08:34     | 117     | 13:48     | 40S     | 19:01     | 243     | 11.72 11.72          | 0.88 | -3.9          |
| 12 5      | 08:35     | 117     | 13:49     | 40S     | 19:03     | 243     | 11.76 11.76          | 0.88 | -3.9          |
| 12 6      | 08:37     | 117     | 13:51     | 41S     | 19:05     | 243     | 11.80 11.80          | 0.88 | -3.9          |
| 12 7      | 08:38     | 117     | 13:52     | 41S     | 19:06     | 243     | 11.84 11.84          | 0.88 | -3.9          |
| 12 8      | 08:39     | 117     | 13:54     | 41S     | 19:08     | 243     | 11.88 11.88          | 0.88 | -3.9          |
| 12 9      | 08:40     | 117     | 13:55     | 41S     | 19:10     | 244     | 11.92 11.92          | 0.87 | -3.9          |
| 12 10     | 08:42     | 116     | 13:57     | 41S     | 19:12     | 244     | 11.97 11.97          | 0.87 | -3.9          |
| 12 11     | 08:43     | 116     | 13:58     | 41S     | 19:13     | 244     | 12.01 12.01          | 0.87 | -3.9          |
| 12 12     | 08:44     | 116     | 13:59     | 41S     | 19:15     | 244     | 12.05 12.05          | 0.87 | -3.9          |
| 12 13     | 08:45     | 116     | 14:01     | 41S     | 19:17     | 244     | 12.10 12.10          | 0.86 | -3.9          |
| 12 14     | 08:46     | 116     | 14:02     | 42S     | 19:19     | 244     | 12.14 12.14          | 0.86 | -3.9          |
| 12 15     | 08:47     | 115     | 14:03     | 42S     | 19:21     | 245     | 12.19 12.19          | 0.86 | -3.9          |
| 12 16     | 08:47     | 115     | 14:05     | 42S     | 19:22     | 245     | 12.23 12.23          | 0.86 | -3.9          |
| 12 17     | 08:48     | 115     | 14:06     | 42S     | 19:24     | 245     | 12.28 12.28          | 0.86 | -3.9          |
| 12 18     | 08:49     | 115     | 14:07     | 42S     | 19:26     | 245     | 12.33 12.33          | 0.85 | -3.9          |
| 12 19     | 08:50     | 114     | 14:09     | 43S     | 19:28     | 246     | 12.37 12.37          | 0.85 | -3.9          |
| 12 20     | 08:51     | 114     | 14:10     | 43S     | 19:30     | 246     | 12.42 12.42          | 0.85 | -3.9          |
| 12 21     | 08:51     | 114     | 14:11     | 43S     | 19:31     | 246     | 12.47 12.47          | 0.85 | -3.9          |
| 12 22     | 08:52     | 114     | 14:12     | 44S     | 19:33     | 247     | 12.52 12.52          | 0.85 | -3.9          |
| 12 23     | 08:53     | 113     | 14:14     | 44S     | 19:35     | 247     | 12.57 12.57          | 0.84 | -3.9          |
| 12 24     | 08:53     | 113     | 14:15     | 44S     | 19:37     | 247     | 12.62 12.62          | 0.84 | -3.9          |
| 12 25     | 08:54     | 113     | 14:16     | 44S     | 19:39     | 248     | 12.67 12.67          | 0.84 | -3.9          |
| 12 26     | 08:54     | 112     | 14:17     | 45S     | 19:41     | 248     | 12.73 12.73          | 0.84 | -3.9          |
| 12 27     | 08:55     | 112     | 14:18     | 45S     | 19:42     | 248     | 12.78 12.78          | 0.83 | -3.9          |
| 12 28     | 08:55     | 112     | 14:19     | 45S     | 19:44     | 249     | 12.83 12.83          | 0.83 | -3.9          |
| 12 29     | 08:55     | 111     | 14:20     | 46S     | 19:46     | 249     | 12.89 12.89          | 0.83 | -3.9          |
| 12 30     | 08:56     | 111     | 14:21     | 46S     | 19:48     | 249     | 12.94 12.94          | 0.83 | -4.0          |
| 12 31     | 08:56     | 110     | 14:22     | 46S     | 19:49     | 250     | 13.00 13.00          | 0.82 | -4.0          |

### 日出時金星方位與仰角

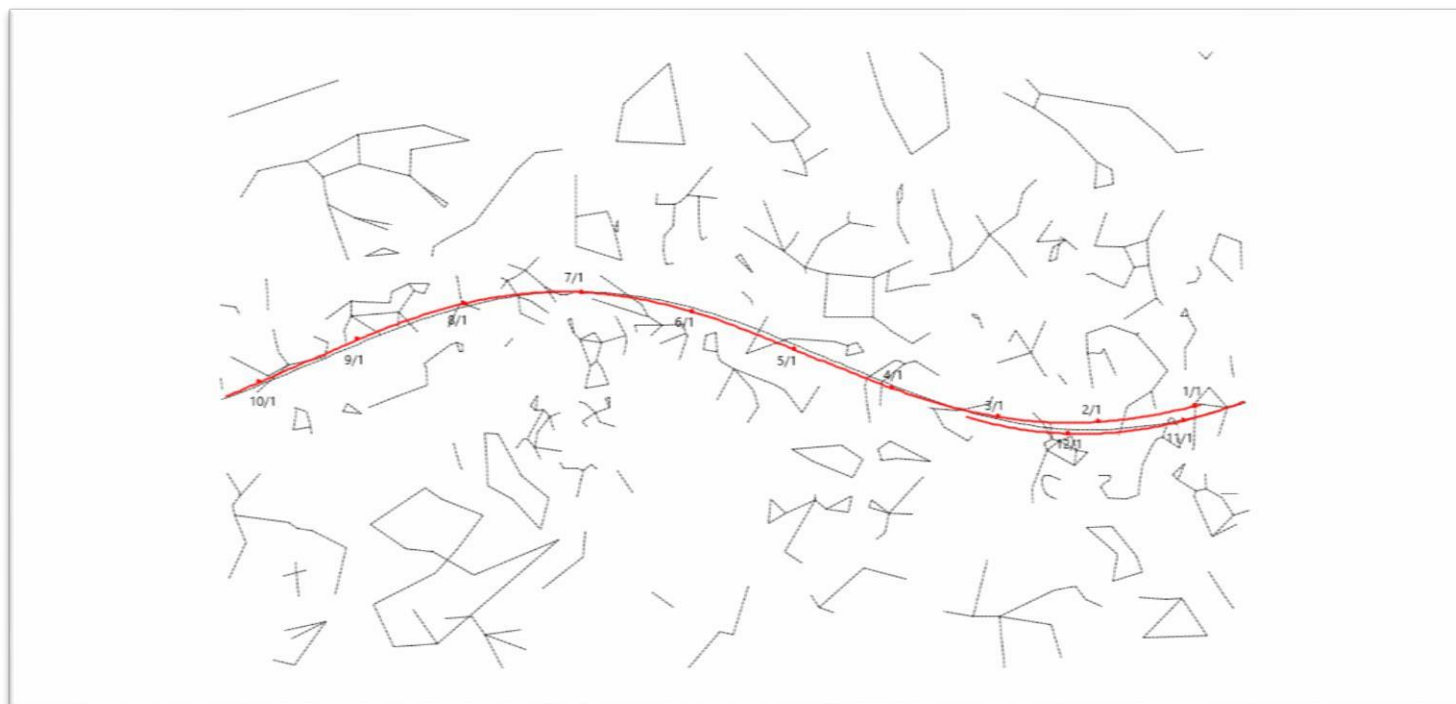


### 日沒時金星方位與仰角

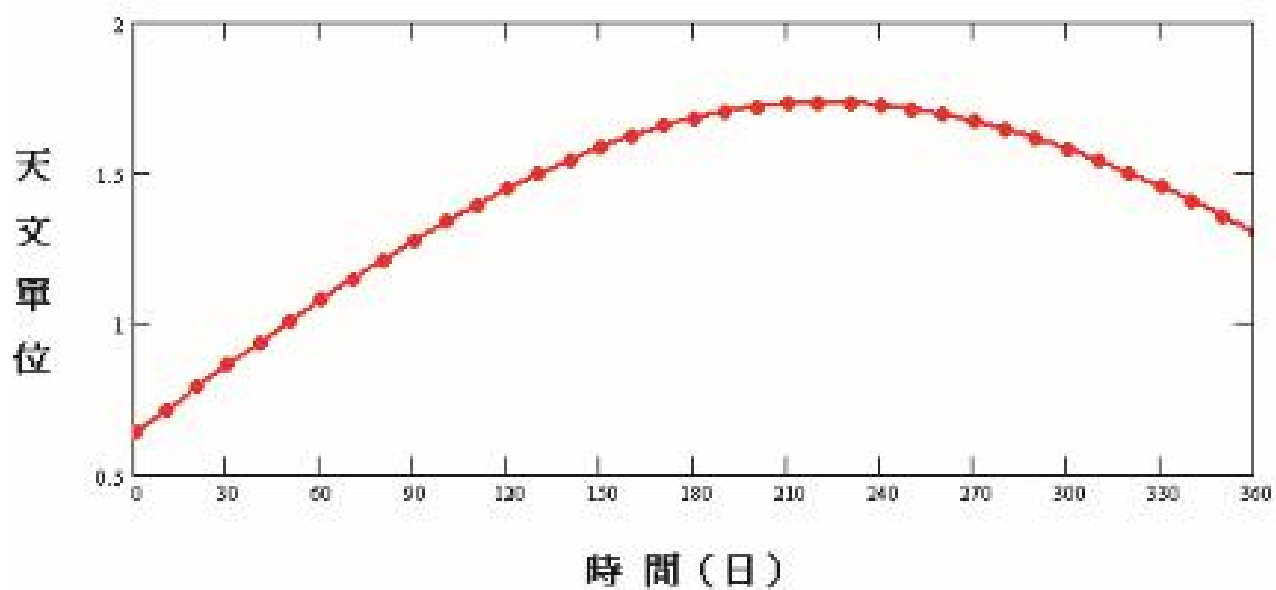




### 金星在天球上運行的軌跡圖



### 金星與地球距離變化圖



# 火 星 位 置 表

世界時 0 時

| 日期<br>月 日 | 赤 經 |    |       | 赤 緯 |    |       | 距 離<br>AU | 光 程<br>分 | 日地離角<br>° |
|-----------|-----|----|-------|-----|----|-------|-----------|----------|-----------|
|           | h   | m  | s     | °   | '  | "     |           |          |           |
| 1 1       | 0   | 0  | 14.35 | -0  | 18 | 1.06  | 1.26104   | 10.49    | 41.7      |
| 1 2       | 0   | 2  | 40.17 | -0  | 0  | 43.79 | 1.26947   | 10.56    | 41.6      |
| 1 3       | 0   | 5  | 6.14  | +0  | 16 | 33.19 | 1.27791   | 10.63    | 41.5      |
| 1 4       | 0   | 7  | 32.25 | +0  | 33 | 49.75 | 1.28637   | 10.70    | 41.4      |
| 1 5       | 0   | 9  | 58.50 | +0  | 51 | 5.75  | 1.29483   | 10.77    | 41.3      |
| 1 6       | 0   | 12 | 24.91 | +1  | 8  | 21.07 | 1.30332   | 10.84    | 41.2      |
| 1 7       | 0   | 14 | 51.46 | +1  | 25 | 35.57 | 1.31181   | 10.91    | 41.1      |
| 1 8       | 0   | 17 | 18.16 | +1  | 42 | 49.11 | 1.32031   | 10.98    | 41.0      |
| 1 9       | 0   | 19 | 45.01 | +2  | 0  | 1.54  | 1.32883   | 11.05    | 40.9      |
| 1 10      | 0   | 22 | 12.00 | +2  | 17 | 12.73 | 1.33735   | 11.12    | 40.8      |
| 1 11      | 0   | 24 | 39.15 | +2  | 34 | 22.55 | 1.34589   | 11.19    | 40.7      |
| 1 12      | 0   | 27 | 6.45  | +2  | 51 | 30.84 | 1.35443   | 11.27    | 40.6      |
| 1 13      | 0   | 29 | 33.89 | +3  | 8  | 37.47 | 1.36298   | 11.34    | 40.4      |
| 1 14      | 0   | 32 | 1.49  | +3  | 25 | 42.30 | 1.37154   | 11.41    | 40.3      |
| 1 15      | 0   | 34 | 29.25 | +3  | 42 | 45.19 | 1.38011   | 11.48    | 40.2      |
| 1 16      | 0   | 36 | 57.15 | +3  | 59 | 46.01 | 1.38868   | 11.55    | 40.1      |
| 1 17      | 0   | 39 | 25.21 | +4  | 16 | 44.61 | 1.39726   | 11.62    | 40.0      |
| 1 18      | 0   | 41 | 53.43 | +4  | 33 | 40.86 | 1.40584   | 11.69    | 39.8      |
| 1 19      | 0   | 44 | 21.81 | +4  | 50 | 34.59 | 1.41443   | 11.76    | 39.7      |
| 1 20      | 0   | 46 | 50.34 | +5  | 7  | 25.68 | 1.42303   | 11.84    | 39.6      |
| 1 21      | 0   | 49 | 19.03 | +5  | 24 | 13.96 | 1.43164   | 11.91    | 39.5      |
| 1 22      | 0   | 51 | 47.88 | +5  | 40 | 59.31 | 1.44024   | 11.98    | 39.4      |
| 1 23      | 0   | 54 | 16.89 | +5  | 57 | 41.57 | 1.44886   | 12.05    | 39.2      |
| 1 24      | 0   | 56 | 46.07 | +6  | 14 | 20.64 | 1.45748   | 12.12    | 39.1      |
| 1 25      | 0   | 59 | 15.43 | +6  | 30 | 56.41 | 1.46610   | 12.19    | 39.0      |
| 1 26      | 1   | 1  | 44.97 | +6  | 47 | 28.78 | 1.47474   | 12.27    | 38.9      |
| 1 27      | 1   | 4  | 14.71 | +7  | 3  | 57.65 | 1.48337   | 12.34    | 38.7      |
| 1 28      | 1   | 6  | 44.64 | +7  | 20 | 22.93 | 1.49201   | 12.41    | 38.6      |
| 1 29      | 1   | 9  | 14.78 | +7  | 36 | 44.52 | 1.50065   | 12.48    | 38.5      |
| 1 30      | 1   | 11 | 45.14 | +7  | 53 | 2.30  | 1.50930   | 12.55    | 38.3      |
| 1 31      | 1   | 14 | 15.71 | +8  | 9  | 16.17 | 1.51794   | 12.62    | 38.2      |

## 火星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期  |    | 出     |    | 中 天   |     | 沒     |     | 視    | 直徑   | 相位   | 視   |
|-----|----|-------|----|-------|-----|-------|-----|------|------|------|-----|
| 月 日 |    | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   |      | 亮度  |
|     |    | h m   | °  | h m   | °   | h m   | °   | "    | "    |      | 星等  |
| 1   | 1  | 11:10 | 90 | 17:12 | 65S | 23:14 | 270 | 7.43 | 7.39 | 0.87 | 0.5 |
| 1   | 2  | 11:08 | 90 | 17:11 | 65S | 23:13 | 270 | 7.38 | 7.34 | 0.87 | 0.5 |
| 1   | 3  | 11:06 | 89 | 17:09 | 65S | 23:12 | 271 | 7.33 | 7.29 | 0.87 | 0.5 |
| 1   | 4  | 11:04 | 89 | 17:08 | 66S | 23:11 | 271 | 7.28 | 7.25 | 0.88 | 0.5 |
| 1   | 5  | 11:02 | 89 | 17:06 | 66S | 23:10 | 271 | 7.23 | 7.20 | 0.88 | 0.5 |
| 1   | 6  | 11:00 | 88 | 17:05 | 66S | 23:09 | 272 | 7.19 | 7.15 | 0.88 | 0.5 |
| 1   | 7  | 10:58 | 88 | 17:03 | 66S | 23:08 | 272 | 7.14 | 7.10 | 0.88 | 0.5 |
| 1   | 8  | 10:56 | 88 | 17:02 | 67S | 23:07 | 272 | 7.09 | 7.06 | 0.88 | 0.6 |
| 1   | 9  | 10:54 | 87 | 17:00 | 67S | 23:06 | 273 | 7.05 | 7.01 | 0.88 | 0.6 |
| 1   | 10 | 10:52 | 87 | 16:59 | 67S | 23:05 | 273 | 7.00 | 6.97 | 0.88 | 0.6 |
| 1   | 11 | 10:50 | 87 | 16:57 | 68S | 23:04 | 273 | 6.96 | 6.92 | 0.88 | 0.6 |
| 1   | 12 | 10:48 | 87 | 16:56 | 68S | 23:03 | 274 | 6.91 | 6.88 | 0.88 | 0.6 |
| 1   | 13 | 10:46 | 86 | 16:54 | 68S | 23:03 | 274 | 6.87 | 6.84 | 0.88 | 0.6 |
| 1   | 14 | 10:44 | 86 | 16:53 | 68S | 23:02 | 274 | 6.83 | 6.80 | 0.88 | 0.6 |
| 1   | 15 | 10:42 | 86 | 16:51 | 69S | 23:01 | 275 | 6.79 | 6.75 | 0.88 | 0.7 |
| 1   | 16 | 10:40 | 85 | 16:50 | 69S | 23:00 | 275 | 6.74 | 6.71 | 0.88 | 0.7 |
| 1   | 17 | 10:38 | 85 | 16:48 | 69S | 22:59 | 275 | 6.70 | 6.67 | 0.88 | 0.7 |
| 1   | 18 | 10:36 | 85 | 16:47 | 70S | 22:58 | 275 | 6.66 | 6.63 | 0.88 | 0.7 |
| 1   | 19 | 10:34 | 84 | 16:45 | 70S | 22:57 | 276 | 6.62 | 6.59 | 0.89 | 0.7 |
| 1   | 20 | 10:32 | 84 | 16:44 | 70S | 22:56 | 276 | 6.58 | 6.55 | 0.89 | 0.7 |
| 1   | 21 | 10:30 | 84 | 16:42 | 70S | 22:55 | 276 | 6.54 | 6.51 | 0.89 | 0.7 |
| 1   | 22 | 10:28 | 83 | 16:41 | 71S | 22:54 | 277 | 6.50 | 6.47 | 0.89 | 0.7 |
| 1   | 23 | 10:26 | 83 | 16:39 | 71S | 22:53 | 277 | 6.46 | 6.43 | 0.89 | 0.8 |
| 1   | 24 | 10:24 | 83 | 16:38 | 71S | 22:52 | 277 | 6.43 | 6.39 | 0.89 | 0.8 |
| 1   | 25 | 10:22 | 83 | 16:37 | 72S | 22:51 | 278 | 6.39 | 6.36 | 0.89 | 0.8 |
| 1   | 26 | 10:20 | 82 | 16:35 | 72S | 22:50 | 278 | 6.35 | 6.32 | 0.89 | 0.8 |
| 1   | 27 | 10:18 | 82 | 16:34 | 72S | 22:49 | 278 | 6.31 | 6.28 | 0.89 | 0.8 |
| 1   | 28 | 10:16 | 82 | 16:32 | 72S | 22:49 | 279 | 6.28 | 6.25 | 0.89 | 0.8 |
| 1   | 29 | 10:14 | 81 | 16:31 | 73S | 22:48 | 279 | 6.24 | 6.21 | 0.89 | 0.8 |
| 1   | 30 | 10:12 | 81 | 16:29 | 73S | 22:47 | 279 | 6.20 | 6.17 | 0.89 | 0.8 |
| 1   | 31 | 10:10 | 81 | 16:28 | 73S | 22:46 | 279 | 6.17 | 6.14 | 0.89 | 0.9 |

## 火 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 2  | 1  | 1   | 16 | 46.49 | +8  | 25 | 26.00 | 1.52659 | 12.70 | 38.1 |
| 2  | 2  | 1   | 19 | 17.50 | +8  | 41 | 31.67 | 1.53524 | 12.77 | 37.9 |
| 2  | 3  | 1   | 21 | 48.74 | +8  | 57 | 33.07 | 1.54389 | 12.84 | 37.8 |
| 2  | 4  | 1   | 24 | 20.20 | +9  | 13 | 30.06 | 1.55254 | 12.91 | 37.7 |
| 2  | 5  | 1   | 26 | 51.89 | +9  | 29 | 22.53 | 1.56119 | 12.98 | 37.5 |
| 2  | 6  | 1   | 29 | 23.81 | +9  | 45 | 10.33 | 1.56983 | 13.06 | 37.4 |
| 2  | 7  | 1   | 31 | 55.96 | +10 | 0  | 53.35 | 1.57847 | 13.13 | 37.3 |
| 2  | 8  | 1   | 34 | 28.35 | +10 | 16 | 31.46 | 1.58711 | 13.20 | 37.1 |
| 2  | 9  | 1   | 37 | 0.97  | +10 | 32 | 4.53  | 1.59574 | 13.27 | 37.0 |
| 2  | 10 | 1   | 39 | 33.83 | +10 | 47 | 32.43 | 1.60437 | 13.34 | 36.8 |
| 2  | 11 | 1   | 42 | 6.93  | +11 | 2  | 55.05 | 1.61299 | 13.42 | 36.7 |
| 2  | 12 | 1   | 44 | 40.27 | +11 | 18 | 12.24 | 1.62161 | 13.49 | 36.5 |
| 2  | 13 | 1   | 47 | 13.86 | +11 | 33 | 23.90 | 1.63021 | 13.56 | 36.4 |
| 2  | 14 | 1   | 49 | 47.68 | +11 | 48 | 29.89 | 1.63882 | 13.63 | 36.3 |
| 2  | 15 | 1   | 52 | 21.75 | +12 | 3  | 30.08 | 1.64741 | 13.70 | 36.1 |
| 2  | 16 | 1   | 54 | 56.06 | +12 | 18 | 24.35 | 1.65600 | 13.77 | 36.0 |
| 2  | 17 | 1   | 57 | 30.62 | +12 | 33 | 12.54 | 1.66457 | 13.84 | 35.8 |
| 2  | 18 | 2   | 0  | 5.41  | +12 | 47 | 54.54 | 1.67314 | 13.92 | 35.7 |
| 2  | 19 | 2   | 2  | 40.44 | +13 | 2  | 30.20 | 1.68171 | 13.99 | 35.5 |
| 2  | 20 | 2   | 5  | 15.72 | +13 | 16 | 59.40 | 1.69026 | 14.06 | 35.4 |
| 2  | 21 | 2   | 7  | 51.24 | +13 | 31 | 22.03 | 1.69880 | 14.13 | 35.2 |
| 2  | 22 | 2   | 10 | 27.02 | +13 | 45 | 37.98 | 1.70734 | 14.20 | 35.1 |
| 2  | 23 | 2   | 13 | 3.06  | +13 | 59 | 47.16 | 1.71587 | 14.27 | 34.9 |
| 2  | 24 | 2   | 15 | 39.36 | +14 | 13 | 49.49 | 1.72439 | 14.34 | 34.8 |
| 2  | 25 | 2   | 18 | 15.94 | +14 | 27 | 44.89 | 1.73289 | 14.41 | 34.6 |
| 2  | 26 | 2   | 20 | 52.79 | +14 | 41 | 33.25 | 1.74139 | 14.48 | 34.5 |
| 2  | 27 | 2   | 23 | 29.92 | +14 | 55 | 14.49 | 1.74988 | 14.55 | 34.3 |
| 2  | 28 | 2   | 26 | 7.34  | +15 | 8  | 48.51 | 1.75835 | 14.62 | 34.2 |

## 火星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |    | 中 天   |     | 沒     |     | 視 直徑 | 相位   | 視 亮度 |     |
|----|----|-------|----|-------|-----|-------|-----|------|------|------|-----|
| 月  | 日  | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   | 星等   |     |
|    |    | h m   | °  | h m   | °   | h m   | °   | "    | "    |      |     |
| 2  | 1  | 10:08 | 80 | 16:27 | 73S | 22:45 | 280 | 6.13 | 6.10 | 0.89 | 0.9 |
| 2  | 2  | 10:06 | 80 | 16:25 | 74S | 22:44 | 280 | 6.10 | 6.07 | 0.89 | 0.9 |
| 2  | 3  | 10:05 | 80 | 16:24 | 74S | 22:43 | 280 | 6.07 | 6.04 | 0.90 | 0.9 |
| 2  | 4  | 10:03 | 80 | 16:22 | 74S | 22:42 | 281 | 6.03 | 6.00 | 0.90 | 0.9 |
| 2  | 5  | 10:01 | 79 | 16:21 | 75S | 22:41 | 281 | 6.00 | 5.97 | 0.90 | 0.9 |
| 2  | 6  | 09:59 | 79 | 16:19 | 75S | 22:40 | 281 | 5.97 | 5.94 | 0.90 | 0.9 |
| 2  | 7  | 09:57 | 79 | 16:18 | 75S | 22:39 | 282 | 5.93 | 5.90 | 0.90 | 0.9 |
| 2  | 8  | 09:55 | 78 | 16:17 | 75S | 22:39 | 282 | 5.90 | 5.87 | 0.90 | 1.0 |
| 2  | 9  | 09:53 | 78 | 16:15 | 76S | 22:38 | 282 | 5.87 | 5.84 | 0.90 | 1.0 |
| 2  | 10 | 09:51 | 78 | 16:14 | 76S | 22:37 | 282 | 5.84 | 5.81 | 0.90 | 1.0 |
| 2  | 11 | 09:49 | 77 | 16:12 | 76S | 22:36 | 283 | 5.81 | 5.78 | 0.90 | 1.0 |
| 2  | 12 | 09:47 | 77 | 16:11 | 76S | 22:35 | 283 | 5.78 | 5.75 | 0.90 | 1.0 |
| 2  | 13 | 09:46 | 77 | 16:10 | 77S | 22:34 | 283 | 5.74 | 5.72 | 0.90 | 1.0 |
| 2  | 14 | 09:44 | 77 | 16:08 | 77S | 22:33 | 284 | 5.71 | 5.69 | 0.90 | 1.0 |
| 2  | 15 | 09:42 | 76 | 16:07 | 77S | 22:32 | 284 | 5.68 | 5.66 | 0.90 | 1.0 |
| 2  | 16 | 09:40 | 76 | 16:06 | 77S | 22:32 | 284 | 5.66 | 5.63 | 0.91 | 1.0 |
| 2  | 17 | 09:38 | 76 | 16:04 | 78S | 22:31 | 284 | 5.63 | 5.60 | 0.91 | 1.1 |
| 2  | 18 | 09:36 | 76 | 16:03 | 78S | 22:30 | 285 | 5.60 | 5.57 | 0.91 | 1.1 |
| 2  | 19 | 09:34 | 75 | 16:02 | 78S | 22:29 | 285 | 5.57 | 5.54 | 0.91 | 1.1 |
| 2  | 20 | 09:33 | 75 | 16:00 | 78S | 22:28 | 285 | 5.54 | 5.51 | 0.91 | 1.1 |
| 2  | 21 | 09:31 | 75 | 15:59 | 79S | 22:27 | 285 | 5.51 | 5.48 | 0.91 | 1.1 |
| 2  | 22 | 09:29 | 74 | 15:57 | 79S | 22:26 | 286 | 5.49 | 5.46 | 0.91 | 1.1 |
| 2  | 23 | 09:27 | 74 | 15:56 | 79S | 22:25 | 286 | 5.46 | 5.43 | 0.91 | 1.1 |
| 2  | 24 | 09:25 | 74 | 15:55 | 79S | 22:25 | 286 | 5.43 | 5.40 | 0.91 | 1.1 |
| 2  | 25 | 09:23 | 74 | 15:53 | 79S | 22:24 | 286 | 5.40 | 5.38 | 0.91 | 1.1 |
| 2  | 26 | 09:22 | 73 | 15:52 | 80S | 22:23 | 287 | 5.38 | 5.35 | 0.91 | 1.1 |
| 2  | 27 | 09:20 | 73 | 15:51 | 80S | 22:22 | 287 | 5.35 | 5.32 | 0.91 | 1.2 |
| 2  | 28 | 09:18 | 73 | 15:49 | 80S | 22:21 | 287 | 5.33 | 5.30 | 0.91 | 1.2 |

# 火 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 3  | 1  | 2   | 28 | 45.03 | +15 | 22 | 15.20 | 1.76682 | 14.69 | 34.0 |
| 3  | 2  | 2   | 31 | 23.01 | +15 | 35 | 34.45 | 1.77527 | 14.77 | 33.9 |
| 3  | 3  | 2   | 34 | 1.27  | +15 | 48 | 46.17 | 1.78370 | 14.84 | 33.7 |
| 3  | 4  | 2   | 36 | 39.82 | +16 | 1  | 50.23 | 1.79213 | 14.91 | 33.6 |
| 3  | 5  | 2   | 39 | 18.66 | +16 | 14 | 46.53 | 1.80053 | 14.98 | 33.4 |
| 3  | 6  | 2   | 41 | 57.77 | +16 | 27 | 34.97 | 1.80892 | 15.04 | 33.2 |
| 3  | 7  | 2   | 44 | 37.18 | +16 | 40 | 15.43 | 1.81730 | 15.11 | 33.1 |
| 3  | 8  | 2   | 47 | 16.87 | +16 | 52 | 47.81 | 1.82565 | 15.18 | 32.9 |
| 3  | 9  | 2   | 49 | 56.84 | +17 | 5  | 11.99 | 1.83399 | 15.25 | 32.8 |
| 3  | 10 | 2   | 52 | 37.10 | +17 | 17 | 27.89 | 1.84231 | 15.32 | 32.6 |
| 3  | 11 | 2   | 55 | 17.64 | +17 | 29 | 35.38 | 1.85061 | 15.39 | 32.4 |
| 3  | 12 | 2   | 57 | 58.47 | +17 | 41 | 34.37 | 1.85889 | 15.46 | 32.3 |
| 3  | 13 | 3   | 0  | 39.57 | +17 | 53 | 24.76 | 1.86715 | 15.53 | 32.1 |
| 3  | 14 | 3   | 3  | 20.95 | +18 | 5  | 6.44  | 1.87539 | 15.60 | 32.0 |
| 3  | 15 | 3   | 6  | 2.60  | +18 | 16 | 39.31 | 1.88361 | 15.67 | 31.8 |
| 3  | 16 | 3   | 8  | 44.52 | +18 | 28 | 3.25  | 1.89180 | 15.73 | 31.6 |
| 3  | 17 | 3   | 11 | 26.71 | +18 | 39 | 18.16 | 1.89998 | 15.80 | 31.5 |
| 3  | 18 | 3   | 14 | 9.15  | +18 | 50 | 23.92 | 1.90813 | 15.87 | 31.3 |
| 3  | 19 | 3   | 16 | 51.85 | +19 | 1  | 20.43 | 1.91626 | 15.94 | 31.2 |
| 3  | 20 | 3   | 19 | 34.80 | +19 | 12 | 7.57  | 1.92436 | 16.00 | 31.0 |
| 3  | 21 | 3   | 22 | 18.01 | +19 | 22 | 45.26 | 1.93245 | 16.07 | 30.8 |
| 3  | 22 | 3   | 25 | 1.47  | +19 | 33 | 13.41 | 1.94051 | 16.14 | 30.7 |
| 3  | 23 | 3   | 27 | 45.19 | +19 | 43 | 31.94 | 1.94855 | 16.21 | 30.5 |
| 3  | 24 | 3   | 30 | 29.17 | +19 | 53 | 40.81 | 1.95657 | 16.27 | 30.3 |
| 3  | 25 | 3   | 33 | 13.42 | +20 | 3  | 39.93 | 1.96456 | 16.34 | 30.2 |
| 3  | 26 | 3   | 35 | 57.92 | +20 | 13 | 29.25 | 1.97253 | 16.41 | 30.0 |
| 3  | 27 | 3   | 38 | 42.68 | +20 | 23 | 8.70  | 1.98048 | 16.47 | 29.8 |
| 3  | 28 | 3   | 41 | 27.70 | +20 | 32 | 38.19 | 1.98840 | 16.54 | 29.7 |
| 3  | 29 | 3   | 44 | 12.97 | +20 | 41 | 57.66 | 1.99630 | 16.60 | 29.5 |
| 3  | 30 | 3   | 46 | 58.49 | +20 | 51 | 7.03  | 2.00417 | 16.67 | 29.3 |
| 3  | 31 | 3   | 49 | 44.26 | +21 | 0  | 6.21  | 2.01201 | 16.73 | 29.2 |

## 火星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期  |    | 出     |    | 中 天   |     | 沒     |     | 視    | 直徑   | 相位   | 視   |
|-----|----|-------|----|-------|-----|-------|-----|------|------|------|-----|
| 月 日 |    | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   |      | 亮度  |
|     |    | h m   | °  | h m   | °   | h m   | °   | "    | "    |      | 星等  |
| 3   | 1  | 09:16 | 73 | 15:48 | 80S | 22:20 | 287 | 5.30 | 5.27 | 0.91 | 1.2 |
| 3   | 2  | 09:15 | 72 | 15:47 | 81S | 22:19 | 288 | 5.28 | 5.25 | 0.92 | 1.2 |
| 3   | 3  | 09:13 | 72 | 15:46 | 81S | 22:19 | 288 | 5.25 | 5.22 | 0.92 | 1.2 |
| 3   | 4  | 09:11 | 72 | 15:44 | 81S | 22:18 | 288 | 5.23 | 5.20 | 0.92 | 1.2 |
| 3   | 5  | 09:09 | 72 | 15:43 | 81S | 22:17 | 288 | 5.20 | 5.17 | 0.92 | 1.2 |
| 3   | 6  | 09:08 | 71 | 15:42 | 81S | 22:16 | 289 | 5.18 | 5.15 | 0.92 | 1.2 |
| 3   | 7  | 09:06 | 71 | 15:40 | 82S | 22:15 | 289 | 5.15 | 5.13 | 0.92 | 1.2 |
| 3   | 8  | 09:04 | 71 | 15:39 | 82S | 22:14 | 289 | 5.13 | 5.10 | 0.92 | 1.2 |
| 3   | 9  | 09:02 | 71 | 15:38 | 82S | 22:13 | 289 | 5.11 | 5.08 | 0.92 | 1.3 |
| 3   | 10 | 09:01 | 71 | 15:37 | 82S | 22:13 | 290 | 5.08 | 5.06 | 0.92 | 1.3 |
| 3   | 11 | 08:59 | 70 | 15:35 | 82S | 22:12 | 290 | 5.06 | 5.03 | 0.92 | 1.3 |
| 3   | 12 | 08:57 | 70 | 15:34 | 83S | 22:11 | 290 | 5.04 | 5.01 | 0.92 | 1.3 |
| 3   | 13 | 08:56 | 70 | 15:33 | 83S | 22:10 | 290 | 5.02 | 4.99 | 0.92 | 1.3 |
| 3   | 14 | 08:54 | 70 | 15:32 | 83S | 22:09 | 290 | 4.99 | 4.97 | 0.92 | 1.3 |
| 3   | 15 | 08:52 | 69 | 15:30 | 83S | 22:08 | 291 | 4.97 | 4.94 | 0.93 | 1.3 |
| 3   | 16 | 08:51 | 69 | 15:29 | 83S | 22:08 | 291 | 4.95 | 4.92 | 0.93 | 1.3 |
| 3   | 17 | 08:49 | 69 | 15:28 | 84S | 22:07 | 291 | 4.93 | 4.90 | 0.93 | 1.3 |
| 3   | 18 | 08:48 | 69 | 15:27 | 84S | 22:06 | 291 | 4.91 | 4.88 | 0.93 | 1.3 |
| 3   | 19 | 08:46 | 69 | 15:25 | 84S | 22:05 | 291 | 4.89 | 4.86 | 0.93 | 1.3 |
| 3   | 20 | 08:44 | 68 | 15:24 | 84S | 22:04 | 292 | 4.87 | 4.84 | 0.93 | 1.3 |
| 3   | 21 | 08:43 | 68 | 15:23 | 84S | 22:03 | 292 | 4.85 | 4.82 | 0.93 | 1.4 |
| 3   | 22 | 08:41 | 68 | 15:22 | 85S | 22:03 | 292 | 4.83 | 4.80 | 0.93 | 1.4 |
| 3   | 23 | 08:40 | 68 | 15:21 | 85S | 22:02 | 292 | 4.81 | 4.78 | 0.93 | 1.4 |
| 3   | 24 | 08:38 | 68 | 15:19 | 85S | 22:01 | 292 | 4.79 | 4.76 | 0.93 | 1.4 |
| 3   | 25 | 08:36 | 67 | 15:18 | 85S | 22:00 | 293 | 4.77 | 4.74 | 0.93 | 1.4 |
| 3   | 26 | 08:35 | 67 | 15:17 | 85S | 21:59 | 293 | 4.75 | 4.72 | 0.93 | 1.4 |
| 3   | 27 | 08:33 | 67 | 15:16 | 85S | 21:58 | 293 | 4.73 | 4.70 | 0.93 | 1.4 |
| 3   | 28 | 08:32 | 67 | 15:15 | 86S | 21:57 | 293 | 4.71 | 4.68 | 0.93 | 1.4 |
| 3   | 29 | 08:30 | 67 | 15:13 | 86S | 21:57 | 293 | 4.69 | 4.66 | 0.94 | 1.4 |
| 3   | 30 | 08:29 | 67 | 15:12 | 86S | 21:56 | 294 | 4.67 | 4.65 | 0.94 | 1.4 |
| 3   | 31 | 08:27 | 66 | 15:11 | 86S | 21:55 | 294 | 4.65 | 4.63 | 0.94 | 1.4 |

## 火 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 4  | 1  | 3   | 52 | 30.27 | +21 | 8  | 55.14 | 2.01983 | 16.80 | 29.0 |
| 4  | 2  | 3   | 55 | 16.52 | +21 | 17 | 33.73 | 2.02761 | 16.86 | 28.8 |
| 4  | 3  | 3   | 58 | 3.01  | +21 | 26 | 1.92  | 2.03537 | 16.93 | 28.7 |
| 4  | 4  | 4   | 0  | 49.74 | +21 | 34 | 19.62 | 2.04310 | 16.99 | 28.5 |
| 4  | 5  | 4   | 3  | 36.69 | +21 | 42 | 26.76 | 2.05080 | 17.06 | 28.3 |
| 4  | 6  | 4   | 6  | 23.86 | +21 | 50 | 23.29 | 2.05847 | 17.12 | 28.1 |
| 4  | 7  | 4   | 9  | 11.25 | +21 | 58 | 9.12  | 2.06611 | 17.18 | 28.0 |
| 4  | 8  | 4   | 11 | 58.86 | +22 | 5  | 44.20 | 2.07371 | 17.25 | 27.8 |
| 4  | 9  | 4   | 14 | 46.68 | +22 | 13 | 8.47  | 2.08129 | 17.31 | 27.6 |
| 4  | 10 | 4   | 17 | 34.69 | +22 | 20 | 21.86 | 2.08882 | 17.37 | 27.5 |
| 4  | 11 | 4   | 20 | 22.90 | +22 | 27 | 24.31 | 2.09633 | 17.44 | 27.3 |
| 4  | 12 | 4   | 23 | 11.29 | +22 | 34 | 15.76 | 2.10380 | 17.50 | 27.1 |
| 4  | 13 | 4   | 25 | 59.85 | +22 | 40 | 56.14 | 2.11124 | 17.56 | 26.9 |
| 4  | 14 | 4   | 28 | 48.58 | +22 | 47 | 25.39 | 2.11864 | 17.62 | 26.8 |
| 4  | 15 | 4   | 31 | 37.46 | +22 | 53 | 43.45 | 2.12601 | 17.68 | 26.6 |
| 4  | 16 | 4   | 34 | 26.49 | +22 | 59 | 50.23 | 2.13335 | 17.74 | 26.4 |
| 4  | 17 | 4   | 37 | 15.66 | +23 | 5  | 45.69 | 2.14064 | 17.80 | 26.2 |
| 4  | 18 | 4   | 40 | 4.96  | +23 | 11 | 29.78 | 2.14791 | 17.86 | 26.1 |
| 4  | 19 | 4   | 42 | 54.40 | +23 | 17 | 2.45  | 2.15514 | 17.92 | 25.9 |
| 4  | 20 | 4   | 45 | 43.97 | +23 | 22 | 23.67 | 2.16233 | 17.98 | 25.7 |
| 4  | 21 | 4   | 48 | 33.67 | +23 | 27 | 33.43 | 2.16949 | 18.04 | 25.5 |
| 4  | 22 | 4   | 51 | 23.49 | +23 | 32 | 31.69 | 2.17662 | 18.10 | 25.4 |
| 4  | 23 | 4   | 54 | 13.43 | +23 | 37 | 18.44 | 2.18371 | 18.16 | 25.2 |
| 4  | 24 | 4   | 57 | 3.48  | +23 | 41 | 53.66 | 2.19076 | 18.22 | 25.0 |
| 4  | 25 | 4   | 59 | 53.64 | +23 | 46 | 17.31 | 2.19778 | 18.28 | 24.8 |
| 4  | 26 | 5   | 2  | 43.89 | +23 | 50 | 29.37 | 2.20476 | 18.34 | 24.7 |
| 4  | 27 | 5   | 5  | 34.23 | +23 | 54 | 29.81 | 2.21170 | 18.39 | 24.5 |
| 4  | 28 | 5   | 8  | 24.66 | +23 | 58 | 18.61 | 2.21861 | 18.45 | 24.3 |
| 4  | 29 | 5   | 11 | 15.16 | +24 | 1  | 55.73 | 2.22547 | 18.51 | 24.1 |
| 4  | 30 | 5   | 14 | 5.73  | +24 | 5  | 21.16 | 2.23230 | 18.57 | 23.9 |



## 火星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 4 1       | 08:26     | 66      | 15:10     | 86S     | 21:54     | 294     | 4.64         | 4.61          | 0.94 | 1.4           |
| 4 2       | 08:24     | 66      | 15:09     | 86S     | 21:53     | 294     | 4.62         | 4.59          | 0.94 | 1.5           |
| 4 3       | 08:23     | 66      | 15:07     | 86S     | 21:52     | 294     | 4.60         | 4.57          | 0.94 | 1.5           |
| 4 4       | 08:21     | 66      | 15:06     | 87S     | 21:52     | 294     | 4.58         | 4.56          | 0.94 | 1.5           |
| 4 5       | 08:20     | 66      | 15:05     | 87S     | 21:51     | 294     | 4.57         | 4.54          | 0.94 | 1.5           |
| 4 6       | 08:18     | 65      | 15:04     | 87S     | 21:50     | 295     | 4.55         | 4.52          | 0.94 | 1.5           |
| 4 7       | 08:17     | 65      | 15:03     | 87S     | 21:49     | 295     | 4.53         | 4.51          | 0.94 | 1.5           |
| 4 8       | 08:15     | 65      | 15:02     | 87S     | 21:48     | 295     | 4.52         | 4.49          | 0.94 | 1.5           |
| 4 9       | 08:14     | 65      | 15:01     | 87S     | 21:47     | 295     | 4.50         | 4.47          | 0.94 | 1.5           |
| 4 10      | 08:13     | 65      | 14:59     | 87S     | 21:46     | 295     | 4.48         | 4.46          | 0.94 | 1.5           |
| 4 11      | 08:11     | 65      | 14:58     | 87S     | 21:45     | 295     | 4.47         | 4.44          | 0.94 | 1.5           |
| 4 12      | 08:10     | 65      | 14:57     | 88S     | 21:45     | 295     | 4.45         | 4.43          | 0.95 | 1.5           |
| 4 13      | 08:08     | 65      | 14:56     | 88S     | 21:44     | 296     | 4.44         | 4.41          | 0.95 | 1.5           |
| 4 14      | 08:07     | 64      | 14:55     | 88S     | 21:43     | 296     | 4.42         | 4.39          | 0.95 | 1.5           |
| 4 15      | 08:06     | 64      | 14:54     | 88S     | 21:42     | 296     | 4.40         | 4.38          | 0.95 | 1.5           |
| 4 16      | 08:04     | 64      | 14:53     | 88S     | 21:41     | 296     | 4.39         | 4.36          | 0.95 | 1.5           |
| 4 17      | 08:03     | 64      | 14:51     | 88S     | 21:40     | 296     | 4.37         | 4.35          | 0.95 | 1.6           |
| 4 18      | 08:02     | 64      | 14:50     | 88S     | 21:39     | 296     | 4.36         | 4.33          | 0.95 | 1.6           |
| 4 19      | 08:00     | 64      | 14:49     | 88S     | 21:38     | 296     | 4.35         | 4.32          | 0.95 | 1.6           |
| 4 20      | 07:59     | 64      | 14:48     | 88S     | 21:37     | 296     | 4.33         | 4.31          | 0.95 | 1.6           |
| 4 21      | 07:58     | 64      | 14:47     | 88S     | 21:36     | 296     | 4.32         | 4.29          | 0.95 | 1.6           |
| 4 22      | 07:56     | 64      | 14:46     | 88S     | 21:36     | 297     | 4.30         | 4.28          | 0.95 | 1.6           |
| 4 23      | 07:55     | 63      | 14:45     | 89S     | 21:35     | 297     | 4.29         | 4.26          | 0.95 | 1.6           |
| 4 24      | 07:54     | 63      | 14:44     | 89S     | 21:34     | 297     | 4.27         | 4.25          | 0.95 | 1.6           |
| 4 25      | 07:53     | 63      | 14:43     | 89S     | 21:33     | 297     | 4.26         | 4.24          | 0.95 | 1.6           |
| 4 26      | 07:51     | 63      | 14:41     | 89S     | 21:32     | 297     | 4.25         | 4.22          | 0.95 | 1.6           |
| 4 27      | 07:50     | 63      | 14:40     | 89S     | 21:31     | 297     | 4.23         | 4.21          | 0.96 | 1.6           |
| 4 28      | 07:49     | 63      | 14:39     | 89S     | 21:30     | 297     | 4.22         | 4.20          | 0.96 | 1.6           |
| 4 29      | 07:48     | 63      | 14:38     | 89S     | 21:29     | 297     | 4.21         | 4.18          | 0.96 | 1.6           |
| 4 30      | 07:46     | 63      | 14:37     | 89S     | 21:28     | 297     | 4.20         | 4.17          | 0.96 | 1.6           |

## 火 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 5  | 1  | 5   | 16 | 56.37 | +24 | 8  | 34.86 | 2.23909 | 18.62 | 23.8 |
| 5  | 2  | 5   | 19 | 47.07 | +24 | 11 | 36.83 | 2.24583 | 18.68 | 23.6 |
| 5  | 3  | 5   | 22 | 37.81 | +24 | 14 | 27.05 | 2.25254 | 18.73 | 23.4 |
| 5  | 4  | 5   | 25 | 28.60 | +24 | 17 | 5.50  | 2.25920 | 18.79 | 23.2 |
| 5  | 5  | 5   | 28 | 19.42 | +24 | 19 | 32.18 | 2.26582 | 18.84 | 23.1 |
| 5  | 6  | 5   | 31 | 10.27 | +24 | 21 | 47.08 | 2.27240 | 18.90 | 22.9 |
| 5  | 7  | 5   | 34 | 1.14  | +24 | 23 | 50.20 | 2.27894 | 18.95 | 22.7 |
| 5  | 8  | 5   | 36 | 52.01 | +24 | 25 | 41.54 | 2.28543 | 19.01 | 22.5 |
| 5  | 9  | 5   | 39 | 42.88 | +24 | 27 | 21.11 | 2.29187 | 19.06 | 22.3 |
| 5  | 10 | 5   | 42 | 33.72 | +24 | 28 | 48.89 | 2.29828 | 19.11 | 22.1 |
| 5  | 11 | 5   | 45 | 24.54 | +24 | 30 | 4.90  | 2.30463 | 19.17 | 22.0 |
| 5  | 12 | 5   | 48 | 15.32 | +24 | 31 | 9.12  | 2.31095 | 19.22 | 21.8 |
| 5  | 13 | 5   | 51 | 6.05  | +24 | 32 | 1.54  | 2.31721 | 19.27 | 21.6 |
| 5  | 14 | 5   | 53 | 56.71 | +24 | 32 | 42.17 | 2.32343 | 19.32 | 21.4 |
| 5  | 15 | 5   | 56 | 47.31 | +24 | 33 | 11.00 | 2.32961 | 19.38 | 21.2 |
| 5  | 16 | 5   | 59 | 37.84 | +24 | 33 | 28.06 | 2.33574 | 19.43 | 21.1 |
| 5  | 17 | 6   | 2  | 28.28 | +24 | 33 | 33.34 | 2.34183 | 19.48 | 20.9 |
| 5  | 18 | 6   | 5  | 18.64 | +24 | 33 | 26.90 | 2.34787 | 19.53 | 20.7 |
| 5  | 19 | 6   | 8  | 8.91  | +24 | 33 | 8.75  | 2.35386 | 19.58 | 20.5 |
| 5  | 20 | 6   | 10 | 59.08 | +24 | 32 | 38.93 | 2.35981 | 19.63 | 20.3 |
| 5  | 21 | 6   | 13 | 49.15 | +24 | 31 | 57.48 | 2.36572 | 19.68 | 20.1 |
| 5  | 22 | 6   | 16 | 39.11 | +24 | 31 | 4.42  | 2.37157 | 19.72 | 20.0 |
| 5  | 23 | 6   | 19 | 28.95 | +24 | 29 | 59.80 | 2.37739 | 19.77 | 19.8 |
| 5  | 24 | 6   | 22 | 18.67 | +24 | 28 | 43.63 | 2.38315 | 19.82 | 19.6 |
| 5  | 25 | 6   | 25 | 8.25  | +24 | 27 | 15.95 | 2.38887 | 19.87 | 19.4 |
| 5  | 26 | 6   | 27 | 57.70 | +24 | 25 | 36.79 | 2.39454 | 19.92 | 19.2 |
| 5  | 27 | 6   | 30 | 47.00 | +24 | 23 | 46.18 | 2.40017 | 19.96 | 19.0 |
| 5  | 28 | 6   | 33 | 36.15 | +24 | 21 | 44.15 | 2.40574 | 20.01 | 18.9 |
| 5  | 29 | 6   | 36 | 25.15 | +24 | 19 | 30.74 | 2.41127 | 20.05 | 18.7 |
| 5  | 30 | 6   | 39 | 13.98 | +24 | 17 | 5.99  | 2.41675 | 20.10 | 18.5 |
| 5  | 31 | 6   | 42 | 2.65  | +24 | 14 | 29.94 | 2.42217 | 20.14 | 18.3 |

## 火星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |    | 中天    |     | 沒     |     | 視直徑  |      | 相位   | 視亮星 |
|----|----|-------|----|-------|-----|-------|-----|------|------|------|-----|
| 月  | 日  | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   |      |     |
|    |    | h m   | °  | h m   | °   | h m   | °   | "    | "    |      |     |
| 5  | 1  | 07:45 | 63 | 14:36 | 89S | 21:27 | 297 | 4.18 | 4.16 | 0.96 | 1.6 |
| 5  | 2  | 07:44 | 63 | 14:35 | 89S | 21:26 | 297 | 4.17 | 4.15 | 0.96 | 1.6 |
| 5  | 3  | 07:43 | 63 | 14:34 | 89S | 21:25 | 297 | 4.16 | 4.13 | 0.96 | 1.6 |
| 5  | 4  | 07:41 | 63 | 14:33 | 89S | 21:24 | 297 | 4.15 | 4.12 | 0.96 | 1.6 |
| 5  | 5  | 07:40 | 63 | 14:32 | 89S | 21:23 | 297 | 4.13 | 4.11 | 0.96 | 1.6 |
| 5  | 6  | 07:39 | 63 | 14:31 | 89S | 21:22 | 297 | 4.12 | 4.10 | 0.96 | 1.7 |
| 5  | 7  | 07:38 | 63 | 14:29 | 89S | 21:21 | 297 | 4.11 | 4.09 | 0.96 | 1.7 |
| 5  | 8  | 07:37 | 63 | 14:28 | 89S | 21:20 | 297 | 4.10 | 4.07 | 0.96 | 1.7 |
| 5  | 9  | 07:36 | 63 | 14:27 | 89S | 21:19 | 298 | 4.09 | 4.06 | 0.96 | 1.7 |
| 5  | 10 | 07:34 | 62 | 14:26 | 89S | 21:18 | 298 | 4.07 | 4.05 | 0.96 | 1.7 |
| 5  | 11 | 07:33 | 62 | 14:25 | 89S | 21:17 | 298 | 4.06 | 4.04 | 0.96 | 1.7 |
| 5  | 12 | 07:32 | 62 | 14:24 | 89S | 21:16 | 298 | 4.05 | 4.03 | 0.96 | 1.7 |
| 5  | 13 | 07:31 | 62 | 14:23 | 89S | 21:15 | 298 | 4.04 | 4.02 | 0.97 | 1.7 |
| 5  | 14 | 07:30 | 62 | 14:22 | 89S | 21:14 | 298 | 4.03 | 4.01 | 0.97 | 1.7 |
| 5  | 15 | 07:29 | 62 | 14:21 | 89S | 21:13 | 298 | 4.02 | 4.00 | 0.97 | 1.7 |
| 5  | 16 | 07:28 | 62 | 14:20 | 89S | 21:11 | 298 | 4.01 | 3.99 | 0.97 | 1.7 |
| 5  | 17 | 07:27 | 62 | 14:18 | 89S | 21:10 | 298 | 4.00 | 3.98 | 0.97 | 1.7 |
| 5  | 18 | 07:25 | 62 | 14:17 | 89S | 21:09 | 298 | 3.99 | 3.97 | 0.97 | 1.7 |
| 5  | 19 | 07:24 | 62 | 14:16 | 89S | 21:08 | 298 | 3.98 | 3.96 | 0.97 | 1.7 |
| 5  | 20 | 07:23 | 62 | 14:15 | 89S | 21:07 | 298 | 3.97 | 3.95 | 0.97 | 1.7 |
| 5  | 21 | 07:22 | 62 | 14:14 | 89S | 21:06 | 298 | 3.96 | 3.94 | 0.97 | 1.7 |
| 5  | 22 | 07:21 | 62 | 14:13 | 89S | 21:05 | 298 | 3.95 | 3.93 | 0.97 | 1.7 |
| 5  | 23 | 07:20 | 62 | 14:12 | 89S | 21:04 | 298 | 3.94 | 3.92 | 0.97 | 1.7 |
| 5  | 24 | 07:19 | 62 | 14:11 | 89S | 21:02 | 298 | 3.93 | 3.91 | 0.97 | 1.7 |
| 5  | 25 | 07:18 | 63 | 14:10 | 89S | 21:01 | 297 | 3.92 | 3.90 | 0.97 | 1.7 |
| 5  | 26 | 07:17 | 63 | 14:08 | 89S | 21:00 | 297 | 3.91 | 3.89 | 0.97 | 1.7 |
| 5  | 27 | 07:16 | 63 | 14:07 | 89S | 20:59 | 297 | 3.90 | 3.88 | 0.97 | 1.7 |
| 5  | 28 | 07:15 | 63 | 14:06 | 89S | 20:58 | 297 | 3.89 | 3.87 | 0.97 | 1.7 |
| 5  | 29 | 07:14 | 63 | 14:05 | 89S | 20:56 | 297 | 3.88 | 3.86 | 0.97 | 1.7 |
| 5  | 30 | 07:13 | 63 | 14:04 | 89S | 20:55 | 297 | 3.88 | 3.85 | 0.97 | 1.7 |
| 5  | 31 | 07:12 | 63 | 14:03 | 89S | 20:54 | 297 | 3.87 | 3.84 | 0.98 | 1.7 |

## 火 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 6  | 1  | 6   | 44 | 51.14 | +24 | 11 | 42.63 | 2.42755 | 20.19 | 18.1 |
| 6  | 2  | 6   | 47 | 39.46 | +24 | 8  | 44.12 | 2.43287 | 20.23 | 17.9 |
| 6  | 3  | 6   | 50 | 27.59 | +24 | 5  | 34.45 | 2.43815 | 20.28 | 17.7 |
| 6  | 4  | 6   | 53 | 15.52 | +24 | 2  | 13.70 | 2.44337 | 20.32 | 17.6 |
| 6  | 5  | 6   | 56 | 3.25  | +23 | 58 | 41.92 | 2.44854 | 20.36 | 17.4 |
| 6  | 6  | 6   | 58 | 50.77 | +23 | 54 | 59.17 | 2.45365 | 20.41 | 17.2 |
| 6  | 7  | 7   | 1  | 38.06 | +23 | 51 | 5.51  | 2.45871 | 20.45 | 17.0 |
| 6  | 8  | 7   | 4  | 25.12 | +23 | 47 | 1.00  | 2.46372 | 20.49 | 16.8 |
| 6  | 9  | 7   | 7  | 11.93 | +23 | 42 | 45.67 | 2.46867 | 20.53 | 16.6 |
| 6  | 10 | 7   | 9  | 58.50 | +23 | 38 | 19.60 | 2.47357 | 20.57 | 16.4 |
| 6  | 11 | 7   | 12 | 44.81 | +23 | 33 | 42.81 | 2.47842 | 20.61 | 16.2 |
| 6  | 12 | 7   | 15 | 30.86 | +23 | 28 | 55.39 | 2.48321 | 20.65 | 16.1 |
| 6  | 13 | 7   | 18 | 16.64 | +23 | 23 | 57.38 | 2.48795 | 20.69 | 15.9 |
| 6  | 14 | 7   | 21 | 2.16  | +23 | 18 | 48.86 | 2.49263 | 20.73 | 15.7 |
| 6  | 15 | 7   | 23 | 47.41 | +23 | 13 | 29.90 | 2.49726 | 20.77 | 15.5 |
| 6  | 16 | 7   | 26 | 32.38 | +23 | 8  | 0.59  | 2.50184 | 20.81 | 15.3 |
| 6  | 17 | 7   | 29 | 17.08 | +23 | 2  | 20.99 | 2.50636 | 20.85 | 15.1 |
| 6  | 18 | 7   | 32 | 1.50  | +22 | 56 | 31.20 | 2.51083 | 20.88 | 14.9 |
| 6  | 19 | 7   | 34 | 45.63 | +22 | 50 | 31.28 | 2.51525 | 20.92 | 14.7 |
| 6  | 20 | 7   | 37 | 29.48 | +22 | 44 | 21.31 | 2.51961 | 20.96 | 14.6 |
| 6  | 21 | 7   | 40 | 13.03 | +22 | 38 | 1.36  | 2.52392 | 20.99 | 14.4 |
| 6  | 22 | 7   | 42 | 56.29 | +22 | 31 | 31.50 | 2.52818 | 21.03 | 14.2 |
| 6  | 23 | 7   | 45 | 39.26 | +22 | 24 | 51.79 | 2.53237 | 21.06 | 14.0 |
| 6  | 24 | 7   | 48 | 21.92 | +22 | 18 | 2.32  | 2.53652 | 21.10 | 13.8 |
| 6  | 25 | 7   | 51 | 4.29  | +22 | 11 | 3.14  | 2.54061 | 21.13 | 13.6 |
| 6  | 26 | 7   | 53 | 46.36 | +22 | 3  | 54.34 | 2.54464 | 21.16 | 13.4 |
| 6  | 27 | 7   | 56 | 28.13 | +21 | 56 | 35.99 | 2.54861 | 21.20 | 13.2 |
| 6  | 28 | 7   | 59 | 9.60  | +21 | 49 | 8.16  | 2.55253 | 21.23 | 13.0 |
| 6  | 29 | 8   | 1  | 50.76 | +21 | 41 | 30.95 | 2.55639 | 21.26 | 12.8 |
| 6  | 30 | 8   | 4  | 31.63 | +21 | 33 | 44.42 | 2.56019 | 21.29 | 12.7 |

## 火星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |    | 中 天   |     | 沒     |     | 視 直徑 | 相位   | 視 亮度 |     |
|----|----|-------|----|-------|-----|-------|-----|------|------|------|-----|
| 月  | 日  | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   | 星等   |     |
|    |    | h m   | °  | h m   | °   | h m   | °   | "    | "    |      |     |
| 6  | 1  | 07:11 | 63 | 14:02 | 89S | 20:53 | 297 | 3.86 | 3.84 | 0.98 | 1.8 |
| 6  | 2  | 07:10 | 63 | 14:01 | 89S | 20:51 | 297 | 3.85 | 3.83 | 0.98 | 1.8 |
| 6  | 3  | 07:09 | 63 | 13:59 | 89S | 20:50 | 297 | 3.84 | 3.82 | 0.98 | 1.8 |
| 6  | 4  | 07:08 | 63 | 13:58 | 89S | 20:49 | 297 | 3.83 | 3.81 | 0.98 | 1.8 |
| 6  | 5  | 07:07 | 63 | 13:57 | 89S | 20:48 | 297 | 3.82 | 3.80 | 0.98 | 1.8 |
| 6  | 6  | 07:06 | 63 | 13:56 | 89S | 20:46 | 297 | 3.82 | 3.79 | 0.98 | 1.8 |
| 6  | 7  | 07:05 | 63 | 13:55 | 89S | 20:45 | 297 | 3.81 | 3.79 | 0.98 | 1.8 |
| 6  | 8  | 07:04 | 63 | 13:54 | 89S | 20:44 | 297 | 3.80 | 3.78 | 0.98 | 1.8 |
| 6  | 9  | 07:03 | 63 | 13:53 | 89S | 20:42 | 297 | 3.79 | 3.77 | 0.98 | 1.8 |
| 6  | 10 | 07:02 | 63 | 13:51 | 89S | 20:41 | 297 | 3.79 | 3.76 | 0.98 | 1.8 |
| 6  | 11 | 07:01 | 64 | 13:50 | 88S | 20:40 | 296 | 3.78 | 3.76 | 0.98 | 1.8 |
| 6  | 12 | 07:00 | 64 | 13:49 | 88S | 20:38 | 296 | 3.77 | 3.75 | 0.98 | 1.8 |
| 6  | 13 | 06:59 | 64 | 13:48 | 88S | 20:37 | 296 | 3.76 | 3.74 | 0.98 | 1.8 |
| 6  | 14 | 06:58 | 64 | 13:47 | 88S | 20:36 | 296 | 3.76 | 3.74 | 0.98 | 1.8 |
| 6  | 15 | 06:57 | 64 | 13:45 | 88S | 20:34 | 296 | 3.75 | 3.73 | 0.98 | 1.8 |
| 6  | 16 | 06:56 | 64 | 13:44 | 88S | 20:33 | 296 | 3.74 | 3.72 | 0.98 | 1.8 |
| 6  | 17 | 06:55 | 64 | 13:43 | 88S | 20:31 | 296 | 3.74 | 3.72 | 0.98 | 1.8 |
| 6  | 18 | 06:54 | 64 | 13:42 | 88S | 20:30 | 296 | 3.73 | 3.71 | 0.98 | 1.8 |
| 6  | 19 | 06:53 | 64 | 13:41 | 88S | 20:28 | 296 | 3.72 | 3.70 | 0.98 | 1.8 |
| 6  | 20 | 06:52 | 64 | 13:39 | 88S | 20:27 | 295 | 3.72 | 3.70 | 0.98 | 1.8 |
| 6  | 21 | 06:51 | 65 | 13:38 | 88S | 20:26 | 295 | 3.71 | 3.69 | 0.98 | 1.8 |
| 6  | 22 | 06:50 | 65 | 13:37 | 87S | 20:24 | 295 | 3.70 | 3.68 | 0.99 | 1.8 |
| 6  | 23 | 06:49 | 65 | 13:36 | 87S | 20:23 | 295 | 3.70 | 3.68 | 0.99 | 1.8 |
| 6  | 24 | 06:48 | 65 | 13:35 | 87S | 20:21 | 295 | 3.69 | 3.67 | 0.99 | 1.8 |
| 6  | 25 | 06:47 | 65 | 13:33 | 87S | 20:20 | 295 | 3.69 | 3.67 | 0.99 | 1.8 |
| 6  | 26 | 06:46 | 65 | 13:32 | 87S | 20:18 | 295 | 3.68 | 3.66 | 0.99 | 1.8 |
| 6  | 27 | 06:45 | 65 | 13:31 | 87S | 20:17 | 295 | 3.67 | 3.65 | 0.99 | 1.8 |
| 6  | 28 | 06:44 | 65 | 13:30 | 87S | 20:15 | 294 | 3.67 | 3.65 | 0.99 | 1.8 |
| 6  | 29 | 06:43 | 66 | 13:28 | 87S | 20:13 | 294 | 3.66 | 3.64 | 0.99 | 1.8 |
| 6  | 30 | 06:42 | 66 | 13:27 | 86S | 20:12 | 294 | 3.66 | 3.64 | 0.99 | 1.8 |

## 火 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 7  | 1  | 8   | 7  | 12.18 | +21 | 25 | 48.68 | 2.56393 | 21.32 | 12.5 |
| 7  | 2  | 8   | 9  | 52.42 | +21 | 17 | 43.82 | 2.56762 | 21.35 | 12.3 |
| 7  | 3  | 8   | 12 | 32.35 | +21 | 9  | 29.93 | 2.57124 | 21.38 | 12.1 |
| 7  | 4  | 8   | 15 | 11.96 | +21 | 1  | 7.12  | 2.57480 | 21.41 | 11.9 |
| 7  | 5  | 8   | 17 | 51.24 | +20 | 52 | 35.46 | 2.57831 | 21.44 | 11.7 |
| 7  | 6  | 8   | 20 | 30.19 | +20 | 43 | 55.06 | 2.58175 | 21.47 | 11.5 |
| 7  | 7  | 8   | 23 | 8.81  | +20 | 35 | 5.99  | 2.58513 | 21.50 | 11.3 |
| 7  | 8  | 8   | 25 | 47.09 | +20 | 26 | 8.32  | 2.58845 | 21.53 | 11.1 |
| 7  | 9  | 8   | 28 | 25.03 | +20 | 17 | 2.15  | 2.59171 | 21.55 | 10.9 |
| 7  | 10 | 8   | 31 | 2.64  | +20 | 7  | 47.56 | 2.59491 | 21.58 | 10.7 |
| 7  | 11 | 8   | 33 | 39.92 | +19 | 58 | 24.64 | 2.59805 | 21.61 | 10.5 |
| 7  | 12 | 8   | 36 | 16.86 | +19 | 48 | 53.49 | 2.60113 | 21.63 | 10.4 |
| 7  | 13 | 8   | 38 | 53.46 | +19 | 39 | 14.20 | 2.60415 | 21.66 | 10.2 |
| 7  | 14 | 8   | 41 | 29.74 | +19 | 29 | 26.87 | 2.60711 | 21.68 | 10.0 |
| 7  | 15 | 8   | 44 | 5.68  | +19 | 19 | 31.60 | 2.61001 | 21.71 | 9.8  |
| 7  | 16 | 8   | 46 | 41.30 | +19 | 9  | 28.49 | 2.61285 | 21.73 | 9.6  |
| 7  | 17 | 8   | 49 | 16.58 | +18 | 59 | 17.62 | 2.61563 | 21.75 | 9.4  |
| 7  | 18 | 8   | 51 | 51.54 | +18 | 48 | 59.09 | 2.61835 | 21.78 | 9.2  |
| 7  | 19 | 8   | 54 | 26.17 | +18 | 38 | 32.98 | 2.62101 | 21.80 | 9.0  |
| 7  | 20 | 8   | 57 | 0.47  | +18 | 27 | 59.37 | 2.62361 | 21.82 | 8.8  |
| 7  | 21 | 8   | 59 | 34.46 | +18 | 17 | 18.35 | 2.62615 | 21.84 | 8.6  |
| 7  | 22 | 9   | 2  | 8.12  | +18 | 6  | 30.01 | 2.62863 | 21.86 | 8.4  |
| 7  | 23 | 9   | 4  | 41.47 | +17 | 55 | 34.42 | 2.63104 | 21.88 | 8.2  |
| 7  | 24 | 9   | 7  | 14.52 | +17 | 44 | 31.67 | 2.63340 | 21.90 | 8.0  |
| 7  | 25 | 9   | 9  | 47.25 | +17 | 33 | 21.84 | 2.63569 | 21.92 | 7.8  |
| 7  | 26 | 9   | 12 | 19.68 | +17 | 22 | 5.02  | 2.63792 | 21.94 | 7.6  |
| 7  | 27 | 9   | 14 | 51.82 | +17 | 10 | 41.31 | 2.64009 | 21.96 | 7.4  |
| 7  | 28 | 9   | 17 | 23.65 | +16 | 59 | 10.80 | 2.64219 | 21.97 | 7.3  |
| 7  | 29 | 9   | 19 | 55.19 | +16 | 47 | 33.57 | 2.64423 | 21.99 | 7.1  |
| 7  | 30 | 9   | 22 | 26.44 | +16 | 35 | 49.75 | 2.64621 | 22.01 | 6.9  |
| 7  | 31 | 9   | 24 | 57.39 | +16 | 23 | 59.43 | 2.64812 | 22.02 | 6.7  |

## 火星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 7 1       | 06:41     | 66      | 13:26     | 86S     | 20:10     | 294     | 3.65         | 3.63          | 0.99 | 1.8           |
| 7 2       | 06:40     | 66      | 13:25     | 86S     | 20:09     | 294     | 3.65         | 3.63          | 0.99 | 1.8           |
| 7 3       | 06:39     | 66      | 13:23     | 86S     | 20:07     | 294     | 3.64         | 3.62          | 0.99 | 1.8           |
| 7 4       | 06:38     | 66      | 13:22     | 86S     | 20:06     | 294     | 3.64         | 3.62          | 0.99 | 1.8           |
| 7 5       | 06:37     | 67      | 13:21     | 86S     | 20:04     | 293     | 3.63         | 3.61          | 0.99 | 1.8           |
| 7 6       | 06:36     | 67      | 13:19     | 86S     | 20:02     | 293     | 3.63         | 3.61          | 0.99 | 1.8           |
| 7 7       | 06:35     | 67      | 13:18     | 85S     | 20:01     | 293     | 3.62         | 3.60          | 0.99 | 1.8           |
| 7 8       | 06:34     | 67      | 13:17     | 85S     | 19:59     | 293     | 3.62         | 3.60          | 0.99 | 1.8           |
| 7 9       | 06:33     | 67      | 13:15     | 85S     | 19:57     | 293     | 3.61         | 3.59          | 0.99 | 1.8           |
| 7 10      | 06:32     | 67      | 13:14     | 85S     | 19:56     | 293     | 3.61         | 3.59          | 0.99 | 1.8           |
| 7 11      | 06:31     | 68      | 13:13     | 85S     | 19:54     | 292     | 3.60         | 3.59          | 0.99 | 1.8           |
| 7 12      | 06:30     | 68      | 13:11     | 85S     | 19:52     | 292     | 3.60         | 3.58          | 0.99 | 1.8           |
| 7 13      | 06:29     | 68      | 13:10     | 85S     | 19:51     | 292     | 3.60         | 3.58          | 0.99 | 1.8           |
| 7 14      | 06:28     | 68      | 13:09     | 84S     | 19:49     | 292     | 3.59         | 3.57          | 0.99 | 1.8           |
| 7 15      | 06:27     | 68      | 13:07     | 84S     | 19:47     | 292     | 3.59         | 3.57          | 0.99 | 1.8           |
| 7 16      | 06:26     | 68      | 13:06     | 84S     | 19:46     | 291     | 3.58         | 3.57          | 0.99 | 1.8           |
| 7 17      | 06:25     | 69      | 13:05     | 84S     | 19:44     | 291     | 3.58         | 3.56          | 0.99 | 1.8           |
| 7 18      | 06:24     | 69      | 13:03     | 84S     | 19:42     | 291     | 3.58         | 3.56          | 0.99 | 1.8           |
| 7 19      | 06:23     | 69      | 13:02     | 84S     | 19:40     | 291     | 3.57         | 3.55          | 0.99 | 1.8           |
| 7 20      | 06:22     | 69      | 13:01     | 83S     | 19:39     | 291     | 3.57         | 3.55          | 0.99 | 1.8           |
| 7 21      | 06:21     | 69      | 12:59     | 83S     | 19:37     | 290     | 3.57         | 3.55          | 0.99 | 1.8           |
| 7 22      | 06:20     | 70      | 12:58     | 83S     | 19:35     | 290     | 3.56         | 3.54          | 1.00 | 1.8           |
| 7 23      | 06:19     | 70      | 12:57     | 83S     | 19:33     | 290     | 3.56         | 3.54          | 1.00 | 1.8           |
| 7 24      | 06:18     | 70      | 12:55     | 83S     | 19:32     | 290     | 3.56         | 3.54          | 1.00 | 1.8           |
| 7 25      | 06:17     | 70      | 12:54     | 82S     | 19:30     | 290     | 3.55         | 3.53          | 1.00 | 1.8           |
| 7 26      | 06:16     | 70      | 12:52     | 82S     | 19:28     | 289     | 3.55         | 3.53          | 1.00 | 1.8           |
| 7 27      | 06:15     | 71      | 12:51     | 82S     | 19:26     | 289     | 3.55         | 3.53          | 1.00 | 1.8           |
| 7 28      | 06:14     | 71      | 12:50     | 82S     | 19:24     | 289     | 3.54         | 3.53          | 1.00 | 1.8           |
| 7 29      | 06:13     | 71      | 12:48     | 82S     | 19:23     | 289     | 3.54         | 3.52          | 1.00 | 1.8           |
| 7 30      | 06:12     | 71      | 12:47     | 81S     | 19:21     | 289     | 3.54         | 3.52          | 1.00 | 1.8           |
| 7 31      | 06:11     | 72      | 12:45     | 81S     | 19:19     | 288     | 3.54         | 3.52          | 1.00 | 1.8           |

## 火 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 8  | 1  | 9   | 27 | 28.05 | +16 | 12 | 2.72  | 2.64997 | 22.04 | 6.5  |
| 8  | 2  | 9   | 29 | 58.41 | +15 | 59 | 59.72 | 2.65175 | 22.05 | 6.3  |
| 8  | 3  | 9   | 32 | 28.48 | +15 | 47 | 50.53 | 2.65347 | 22.07 | 6.1  |
| 8  | 4  | 9   | 34 | 58.25 | +15 | 35 | 35.23 | 2.65512 | 22.08 | 5.9  |
| 8  | 5  | 9   | 37 | 27.73 | +15 | 23 | 13.92 | 2.65670 | 22.10 | 5.7  |
| 8  | 6  | 9   | 39 | 56.92 | +15 | 10 | 46.68 | 2.65822 | 22.11 | 5.5  |
| 8  | 7  | 9   | 42 | 25.83 | +14 | 58 | 13.60 | 2.65967 | 22.12 | 5.3  |
| 8  | 8  | 9   | 44 | 54.45 | +14 | 45 | 34.80 | 2.66106 | 22.13 | 5.1  |
| 8  | 9  | 9   | 47 | 22.80 | +14 | 32 | 50.35 | 2.66239 | 22.14 | 4.9  |
| 8  | 10 | 9   | 49 | 50.88 | +14 | 20 | 0.38  | 2.66365 | 22.15 | 4.7  |
| 8  | 11 | 9   | 52 | 18.69 | +14 | 7  | 4.97  | 2.66484 | 22.16 | 4.5  |
| 8  | 12 | 9   | 54 | 46.24 | +13 | 54 | 4.22  | 2.66597 | 22.17 | 4.3  |
| 8  | 13 | 9   | 57 | 13.52 | +13 | 40 | 58.23 | 2.66704 | 22.18 | 4.1  |
| 8  | 14 | 9   | 59 | 40.55 | +13 | 27 | 47.09 | 2.66804 | 22.19 | 3.9  |
| 8  | 15 | 10  | 2  | 7.33  | +13 | 14 | 30.89 | 2.66898 | 22.20 | 3.7  |
| 8  | 16 | 10  | 4  | 33.86 | +13 | 1  | 9.70  | 2.66986 | 22.20 | 3.5  |
| 8  | 17 | 10  | 7  | 0.16  | +12 | 47 | 43.63 | 2.67067 | 22.21 | 3.3  |
| 8  | 18 | 10  | 9  | 26.21 | +12 | 34 | 12.73 | 2.67141 | 22.22 | 3.2  |
| 8  | 19 | 10  | 11 | 52.05 | +12 | 20 | 37.11 | 2.67210 | 22.22 | 3.0  |
| 8  | 20 | 10  | 14 | 17.66 | +12 | 6  | 56.83 | 2.67271 | 22.23 | 2.8  |
| 8  | 21 | 10  | 16 | 43.06 | +11 | 53 | 11.98 | 2.67326 | 22.23 | 2.6  |
| 8  | 22 | 10  | 19 | 8.25  | +11 | 39 | 22.64 | 2.67375 | 22.24 | 2.4  |
| 8  | 23 | 10  | 21 | 33.24 | +11 | 25 | 28.90 | 2.67417 | 22.24 | 2.2  |
| 8  | 24 | 10  | 23 | 58.03 | +11 | 11 | 30.83 | 2.67453 | 22.24 | 2.0  |
| 8  | 25 | 10  | 26 | 22.64 | +10 | 57 | 28.55 | 2.67482 | 22.25 | 1.8  |
| 8  | 26 | 10  | 28 | 47.06 | +10 | 43 | 22.12 | 2.67504 | 22.25 | 1.6  |
| 8  | 27 | 10  | 31 | 11.30 | +10 | 29 | 11.67 | 2.67520 | 22.25 | 1.5  |
| 8  | 28 | 10  | 33 | 35.36 | +10 | 14 | 57.29 | 2.67529 | 22.25 | 1.3  |
| 8  | 29 | 10  | 35 | 59.25 | +10 | 0  | 39.09 | 2.67531 | 22.25 | 1.1  |
| 8  | 30 | 10  | 38 | 22.96 | +9  | 46 | 17.17 | 2.67526 | 22.25 | 1.0  |
| 8  | 31 | 10  | 40 | 46.50 | +9  | 31 | 51.64 | 2.67515 | 22.25 | 0.8  |



## 火星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |    | 中 天   |     | 沒     |     | 視 直徑 | 相位   | 視 亮度 |     |
|----|----|-------|----|-------|-----|-------|-----|------|------|------|-----|
| 月  | 日  | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   | 星等   |     |
|    |    | h m   | °  | h m   | °   | h m   | °   | "    | "    |      |     |
| 8  | 1  | 06:10 | 72 | 12:44 | 81S | 19:17 | 288 | 3.53 | 3.52 | 1.00 | 1.8 |
| 8  | 2  | 06:09 | 72 | 12:42 | 81S | 19:15 | 288 | 3.53 | 3.51 | 1.00 | 1.8 |
| 8  | 3  | 06:08 | 72 | 12:41 | 81S | 19:13 | 288 | 3.53 | 3.51 | 1.00 | 1.8 |
| 8  | 4  | 06:07 | 72 | 12:40 | 80S | 19:12 | 287 | 3.53 | 3.51 | 1.00 | 1.8 |
| 8  | 5  | 06:06 | 73 | 12:38 | 80S | 19:10 | 287 | 3.53 | 3.51 | 1.00 | 1.8 |
| 8  | 6  | 06:05 | 73 | 12:37 | 80S | 19:08 | 287 | 3.52 | 3.51 | 1.00 | 1.8 |
| 8  | 7  | 06:04 | 73 | 12:35 | 80S | 19:06 | 287 | 3.52 | 3.50 | 1.00 | 1.8 |
| 8  | 8  | 06:03 | 73 | 12:34 | 80S | 19:04 | 287 | 3.52 | 3.50 | 1.00 | 1.8 |
| 8  | 9  | 06:02 | 74 | 12:32 | 79S | 19:02 | 286 | 3.52 | 3.50 | 1.00 | 1.8 |
| 8  | 10 | 06:01 | 74 | 12:31 | 79S | 19:00 | 286 | 3.52 | 3.50 | 1.00 | 1.8 |
| 8  | 11 | 06:00 | 74 | 12:29 | 79S | 18:58 | 286 | 3.51 | 3.50 | 1.00 | 1.8 |
| 8  | 12 | 05:59 | 74 | 12:28 | 79S | 18:56 | 286 | 3.51 | 3.50 | 1.00 | 1.8 |
| 8  | 13 | 05:58 | 75 | 12:26 | 79S | 18:54 | 285 | 3.51 | 3.49 | 1.00 | 1.8 |
| 8  | 14 | 05:57 | 75 | 12:25 | 78S | 18:53 | 285 | 3.51 | 3.49 | 1.00 | 1.8 |
| 8  | 15 | 05:56 | 75 | 12:23 | 78S | 18:51 | 285 | 3.51 | 3.49 | 1.00 | 1.8 |
| 8  | 16 | 05:55 | 75 | 12:22 | 78S | 18:49 | 285 | 3.51 | 3.49 | 1.00 | 1.8 |
| 8  | 17 | 05:54 | 76 | 12:20 | 78S | 18:47 | 284 | 3.51 | 3.49 | 1.00 | 1.8 |
| 8  | 18 | 05:53 | 76 | 12:19 | 77S | 18:45 | 284 | 3.51 | 3.49 | 1.00 | 1.8 |
| 8  | 19 | 05:52 | 76 | 12:17 | 77S | 18:43 | 284 | 3.50 | 3.49 | 1.00 | 1.8 |
| 8  | 20 | 05:50 | 76 | 12:16 | 77S | 18:41 | 284 | 3.50 | 3.49 | 1.00 | 1.8 |
| 8  | 21 | 05:49 | 77 | 12:14 | 77S | 18:39 | 283 | 3.50 | 3.49 | 1.00 | 1.8 |
| 8  | 22 | 05:48 | 77 | 12:13 | 77S | 18:37 | 283 | 3.50 | 3.49 | 1.00 | 1.8 |
| 8  | 23 | 05:47 | 77 | 12:11 | 76S | 18:35 | 283 | 3.50 | 3.48 | 1.00 | 1.8 |
| 8  | 24 | 05:46 | 77 | 12:10 | 76S | 18:33 | 283 | 3.50 | 3.48 | 1.00 | 1.8 |
| 8  | 25 | 05:45 | 78 | 12:08 | 76S | 18:31 | 282 | 3.50 | 3.48 | 1.00 | 1.8 |
| 8  | 26 | 05:44 | 78 | 12:07 | 76S | 18:29 | 282 | 3.50 | 3.48 | 1.00 | 1.7 |
| 8  | 27 | 05:43 | 78 | 12:05 | 75S | 18:27 | 282 | 3.50 | 3.48 | 1.00 | 1.7 |
| 8  | 28 | 05:42 | 78 | 12:04 | 75S | 18:25 | 281 | 3.50 | 3.48 | 1.00 | 1.7 |
| 8  | 29 | 05:41 | 79 | 12:02 | 75S | 18:23 | 281 | 3.50 | 3.48 | 1.00 | 1.7 |
| 8  | 30 | 05:40 | 79 | 12:00 | 75S | 18:21 | 281 | 3.50 | 3.48 | 1.00 | 1.7 |
| 8  | 31 | 05:39 | 79 | 11:59 | 74S | 18:19 | 281 | 3.50 | 3.48 | 1.00 | 1.7 |

# 火 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 9  | 1  | 10  | 43 | 9.87  | +9  | 17 | 22.58 | 2.67496 | 22.25 | 0.7  |
| 9  | 2  | 10  | 45 | 33.08 | +9  | 2  | 50.07 | 2.67471 | 22.24 | 0.7  |
| 9  | 3  | 10  | 47 | 56.13 | +8  | 48 | 14.16 | 2.67439 | 22.24 | 0.7  |
| 9  | 4  | 10  | 50 | 19.03 | +8  | 33 | 34.93 | 2.67401 | 22.24 | 0.7  |
| 9  | 5  | 10  | 52 | 41.78 | +8  | 18 | 52.52 | 2.67355 | 22.24 | 0.8  |
| 9  | 6  | 10  | 55 | 4.40  | +8  | 4  | 7.03  | 2.67303 | 22.23 | 1.0  |
| 9  | 7  | 10  | 57 | 26.89 | +7  | 49 | 18.57 | 2.67244 | 22.23 | 1.1  |
| 9  | 8  | 10  | 59 | 49.24 | +7  | 34 | 27.24 | 2.67179 | 22.22 | 1.3  |
| 9  | 9  | 11  | 2  | 11.47 | +7  | 19 | 33.14 | 2.67107 | 22.21 | 1.5  |
| 9  | 10 | 11  | 4  | 33.59 | +7  | 4  | 36.36 | 2.67028 | 22.21 | 1.6  |
| 9  | 11 | 11  | 6  | 55.59 | +6  | 49 | 36.97 | 2.66943 | 22.20 | 1.8  |
| 9  | 12 | 11  | 9  | 17.48 | +6  | 34 | 35.07 | 2.66851 | 22.19 | 2.0  |
| 9  | 13 | 11  | 11 | 39.28 | +6  | 19 | 30.74 | 2.66753 | 22.19 | 2.2  |
| 9  | 14 | 11  | 14 | 0.98  | +6  | 4  | 24.06 | 2.66648 | 22.18 | 2.4  |
| 9  | 15 | 11  | 16 | 22.60 | +5  | 49 | 15.10 | 2.66536 | 22.17 | 2.6  |
| 9  | 16 | 11  | 18 | 44.15 | +5  | 34 | 3.94  | 2.66418 | 22.16 | 2.8  |
| 9  | 17 | 11  | 21 | 5.63  | +5  | 18 | 50.66 | 2.66294 | 22.15 | 3.0  |
| 9  | 18 | 11  | 23 | 27.05 | +5  | 3  | 35.34 | 2.66163 | 22.14 | 3.2  |
| 9  | 19 | 11  | 25 | 48.42 | +4  | 48 | 18.06 | 2.66025 | 22.12 | 3.4  |
| 9  | 20 | 11  | 28 | 9.75  | +4  | 32 | 58.90 | 2.65881 | 22.11 | 3.6  |
| 9  | 21 | 11  | 30 | 31.04 | +4  | 17 | 37.94 | 2.65730 | 22.10 | 3.8  |
| 9  | 22 | 11  | 32 | 52.30 | +4  | 2  | 15.27 | 2.65573 | 22.09 | 4.0  |
| 9  | 23 | 11  | 35 | 13.54 | +3  | 46 | 50.99 | 2.65408 | 22.07 | 4.2  |
| 9  | 24 | 11  | 37 | 34.75 | +3  | 31 | 25.18 | 2.65238 | 22.06 | 4.4  |
| 9  | 25 | 11  | 39 | 55.95 | +3  | 15 | 57.97 | 2.65060 | 22.04 | 4.6  |
| 9  | 26 | 11  | 42 | 17.14 | +3  | 0  | 29.43 | 2.64876 | 22.03 | 4.8  |
| 9  | 27 | 11  | 44 | 38.32 | +2  | 44 | 59.69 | 2.64685 | 22.01 | 5.0  |
| 9  | 28 | 11  | 46 | 59.50 | +2  | 29 | 28.82 | 2.64487 | 22.00 | 5.2  |
| 9  | 29 | 11  | 49 | 20.68 | +2  | 13 | 56.93 | 2.64282 | 21.98 | 5.4  |
| 9  | 30 | 11  | 51 | 41.87 | +1  | 58 | 24.11 | 2.64071 | 21.96 | 5.6  |

## 火星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 9 1       | 05:38     | 79      | 11:57     | 74S     | 18:17     | 280     | 3.50         | 3.48          | 1.00 | 1.7           |
| 9 2       | 05:37     | 80      | 11:56     | 74S     | 18:15     | 280     | 3.50         | 3.48          | 1.00 | 1.7           |
| 9 3       | 05:35     | 80      | 11:54     | 74S     | 18:13     | 280     | 3.50         | 3.48          | 1.00 | 1.7           |
| 9 4       | 05:34     | 80      | 11:53     | 73S     | 18:11     | 280     | 3.50         | 3.49          | 1.00 | 1.7           |
| 9 5       | 05:33     | 81      | 11:51     | 73S     | 18:09     | 279     | 3.50         | 3.49          | 1.00 | 1.7           |
| 9 6       | 05:32     | 81      | 11:50     | 73S     | 18:07     | 279     | 3.50         | 3.49          | 1.00 | 1.7           |
| 9 7       | 05:31     | 81      | 11:48     | 73S     | 18:05     | 279     | 3.50         | 3.49          | 1.00 | 1.7           |
| 9 8       | 05:30     | 81      | 11:46     | 72S     | 18:03     | 279     | 3.51         | 3.49          | 1.00 | 1.7           |
| 9 9       | 05:29     | 82      | 11:45     | 72S     | 18:01     | 278     | 3.51         | 3.49          | 1.00 | 1.7           |
| 9 10      | 05:28     | 82      | 11:43     | 72S     | 17:58     | 278     | 3.51         | 3.49          | 1.00 | 1.8           |
| 9 11      | 05:27     | 82      | 11:42     | 72S     | 17:56     | 278     | 3.51         | 3.49          | 1.00 | 1.8           |
| 9 12      | 05:26     | 82      | 11:40     | 71S     | 17:54     | 277     | 3.51         | 3.49          | 1.00 | 1.8           |
| 9 13      | 05:24     | 83      | 11:39     | 71S     | 17:52     | 277     | 3.51         | 3.49          | 1.00 | 1.8           |
| 9 14      | 05:23     | 83      | 11:37     | 71S     | 17:50     | 277     | 3.51         | 3.50          | 1.00 | 1.8           |
| 9 15      | 05:22     | 83      | 11:35     | 71S     | 17:48     | 277     | 3.51         | 3.50          | 1.00 | 1.8           |
| 9 16      | 05:21     | 84      | 11:34     | 70S     | 17:46     | 276     | 3.52         | 3.50          | 1.00 | 1.8           |
| 9 17      | 05:20     | 84      | 11:32     | 70S     | 17:44     | 276     | 3.52         | 3.50          | 1.00 | 1.8           |
| 9 18      | 05:19     | 84      | 11:31     | 70S     | 17:42     | 276     | 3.52         | 3.50          | 1.00 | 1.8           |
| 9 19      | 05:18     | 84      | 11:29     | 70S     | 17:40     | 275     | 3.52         | 3.50          | 1.00 | 1.8           |
| 9 20      | 05:17     | 85      | 11:27     | 69S     | 17:38     | 275     | 3.52         | 3.51          | 1.00 | 1.8           |
| 9 21      | 05:16     | 85      | 11:26     | 69S     | 17:36     | 275     | 3.52         | 3.51          | 1.00 | 1.8           |
| 9 22      | 05:15     | 85      | 11:24     | 69S     | 17:34     | 275     | 3.53         | 3.51          | 1.00 | 1.8           |
| 9 23      | 05:13     | 86      | 11:23     | 69S     | 17:32     | 274     | 3.53         | 3.51          | 1.00 | 1.8           |
| 9 24      | 05:12     | 86      | 11:21     | 68S     | 17:30     | 274     | 3.53         | 3.51          | 1.00 | 1.8           |
| 9 25      | 05:11     | 86      | 11:20     | 68S     | 17:28     | 274     | 3.53         | 3.52          | 1.00 | 1.8           |
| 9 26      | 05:10     | 86      | 11:18     | 68S     | 17:25     | 273     | 3.54         | 3.52          | 1.00 | 1.8           |
| 9 27      | 05:09     | 87      | 11:16     | 68S     | 17:23     | 273     | 3.54         | 3.52          | 1.00 | 1.8           |
| 9 28      | 05:08     | 87      | 11:15     | 67S     | 17:21     | 273     | 3.54         | 3.52          | 1.00 | 1.8           |
| 9 29      | 05:07     | 87      | 11:13     | 67S     | 17:19     | 273     | 3.54         | 3.53          | 1.00 | 1.8           |
| 9 30      | 05:06     | 88      | 11:12     | 67S     | 17:17     | 272     | 3.55         | 3.53          | 1.00 | 1.8           |

## 火 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 10 | 1  | 11  | 54 | 3.08  | +1  | 42 | 50.44 | 2.63853 | 21.94 | 5.8  |
| 10 | 2  | 11  | 56 | 24.30 | +1  | 27 | 16.04 | 2.63628 | 21.93 | 6.0  |
| 10 | 3  | 11  | 58 | 45.56 | +1  | 11 | 40.99 | 2.63396 | 21.91 | 6.2  |
| 10 | 4  | 12  | 1  | 6.84  | +0  | 56 | 5.41  | 2.63158 | 21.89 | 6.4  |
| 10 | 5  | 12  | 3  | 28.16 | +0  | 40 | 29.39 | 2.62914 | 21.87 | 6.6  |
| 10 | 6  | 12  | 5  | 49.52 | +0  | 24 | 53.04 | 2.62662 | 21.84 | 6.8  |
| 10 | 7  | 12  | 8  | 10.93 | +0  | 9  | 16.45 | 2.62405 | 21.82 | 7.0  |
| 10 | 8  | 12  | 10 | 32.39 | -0  | 6  | 20.27 | 2.62141 | 21.80 | 7.2  |
| 10 | 9  | 12  | 12 | 53.91 | -0  | 21 | 57.04 | 2.61870 | 21.78 | 7.4  |
| 10 | 10 | 12  | 15 | 15.50 | -0  | 37 | 33.77 | 2.61593 | 21.76 | 7.6  |
| 10 | 11 | 12  | 17 | 37.17 | -0  | 53 | 10.37 | 2.61310 | 21.73 | 7.8  |
| 10 | 12 | 12  | 19 | 58.91 | -1  | 8  | 46.76 | 2.61020 | 21.71 | 8.0  |
| 10 | 13 | 12  | 22 | 20.75 | -1  | 24 | 22.85 | 2.60724 | 21.68 | 8.2  |
| 10 | 14 | 12  | 24 | 42.70 | -1  | 39 | 58.57 | 2.60421 | 21.66 | 8.4  |
| 10 | 15 | 12  | 27 | 4.75  | -1  | 55 | 33.83 | 2.60113 | 21.63 | 8.6  |
| 10 | 16 | 12  | 29 | 26.91 | -2  | 11 | 8.55  | 2.59798 | 21.61 | 8.8  |
| 10 | 17 | 12  | 31 | 49.20 | -2  | 26 | 42.65 | 2.59477 | 21.58 | 9.0  |
| 10 | 18 | 12  | 34 | 11.63 | -2  | 42 | 16.04 | 2.59149 | 21.55 | 9.2  |
| 10 | 19 | 12  | 36 | 34.20 | -2  | 57 | 48.63 | 2.58815 | 21.52 | 9.4  |
| 10 | 20 | 12  | 38 | 56.91 | -3  | 13 | 20.33 | 2.58475 | 21.50 | 9.6  |
| 10 | 21 | 12  | 41 | 19.77 | -3  | 28 | 51.04 | 2.58129 | 21.47 | 9.8  |
| 10 | 22 | 12  | 43 | 42.79 | -3  | 44 | 20.65 | 2.57776 | 21.44 | 10.0 |
| 10 | 23 | 12  | 46 | 5.97  | -3  | 59 | 49.06 | 2.57417 | 21.41 | 10.2 |
| 10 | 24 | 12  | 48 | 29.31 | -4  | 15 | 16.16 | 2.57052 | 21.38 | 10.4 |
| 10 | 25 | 12  | 50 | 52.83 | -4  | 30 | 41.84 | 2.56680 | 21.35 | 10.7 |
| 10 | 26 | 12  | 53 | 16.52 | -4  | 46 | 6.00  | 2.56302 | 21.32 | 10.9 |
| 10 | 27 | 12  | 55 | 40.39 | -5  | 1  | 28.55 | 2.55917 | 21.28 | 11.1 |
| 10 | 28 | 12  | 58 | 4.46  | -5  | 16 | 49.37 | 2.55527 | 21.25 | 11.3 |
| 10 | 29 | 13  | 0  | 28.71 | -5  | 32 | 8.36  | 2.55129 | 21.22 | 11.5 |
| 10 | 30 | 13  | 2  | 53.17 | -5  | 47 | 25.42 | 2.54726 | 21.18 | 11.7 |
| 10 | 31 | 13  | 5  | 17.82 | -6  | 2  | 40.44 | 2.54316 | 21.15 | 11.9 |

## 火星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 10 1      | 05:05     | 88      | 11:10     | 67S     | 17:15     | 272     | 3.55         | 3.53          | 1.00 | 1.8           |
| 10 2      | 05:04     | 88      | 11:08     | 66S     | 17:13     | 272     | 3.55         | 3.54          | 1.00 | 1.8           |
| 10 3      | 05:02     | 88      | 11:07     | 66S     | 17:11     | 271     | 3.56         | 3.54          | 1.00 | 1.8           |
| 10 4      | 05:01     | 89      | 11:05     | 66S     | 17:09     | 271     | 3.56         | 3.54          | 1.00 | 1.8           |
| 10 5      | 05:00     | 89      | 11:04     | 66S     | 17:07     | 271     | 3.56         | 3.55          | 1.00 | 1.8           |
| 10 6      | 04:59     | 89      | 11:02     | 65S     | 17:05     | 271     | 3.57         | 3.55          | 1.00 | 1.8           |
| 10 7      | 04:58     | 90      | 11:00     | 65S     | 17:03     | 270     | 3.57         | 3.55          | 1.00 | 1.8           |
| 10 8      | 04:57     | 90      | 10:59     | 65S     | 17:01     | 270     | 3.57         | 3.56          | 1.00 | 1.8           |
| 10 9      | 04:56     | 90      | 10:57     | 65S     | 16:59     | 270     | 3.58         | 3.56          | 1.00 | 1.8           |
| 10 10     | 04:55     | 90      | 10:56     | 64S     | 16:56     | 269     | 3.58         | 3.56          | 1.00 | 1.8           |
| 10 11     | 04:54     | 91      | 10:54     | 64S     | 16:54     | 269     | 3.58         | 3.57          | 1.00 | 1.8           |
| 10 12     | 04:53     | 91      | 10:53     | 64S     | 16:52     | 269     | 3.59         | 3.57          | 1.00 | 1.8           |
| 10 13     | 04:51     | 91      | 10:51     | 63S     | 16:50     | 269     | 3.59         | 3.57          | 1.00 | 1.8           |
| 10 14     | 04:50     | 92      | 10:49     | 63S     | 16:48     | 268     | 3.60         | 3.58          | 1.00 | 1.8           |
| 10 15     | 04:49     | 92      | 10:48     | 63S     | 16:46     | 268     | 3.60         | 3.58          | 0.99 | 1.8           |
| 10 16     | 04:48     | 92      | 10:46     | 63S     | 16:44     | 268     | 3.60         | 3.59          | 0.99 | 1.8           |
| 10 17     | 04:47     | 92      | 10:45     | 62S     | 16:42     | 267     | 3.61         | 3.59          | 0.99 | 1.8           |
| 10 18     | 04:46     | 93      | 10:43     | 62S     | 16:40     | 267     | 3.61         | 3.60          | 0.99 | 1.8           |
| 10 19     | 04:45     | 93      | 10:42     | 62S     | 16:38     | 267     | 3.62         | 3.60          | 0.99 | 1.8           |
| 10 20     | 04:44     | 93      | 10:40     | 62S     | 16:36     | 267     | 3.62         | 3.61          | 0.99 | 1.8           |
| 10 21     | 04:43     | 94      | 10:38     | 61S     | 16:34     | 266     | 3.63         | 3.61          | 0.99 | 1.8           |
| 10 22     | 04:42     | 94      | 10:37     | 61S     | 16:32     | 266     | 3.63         | 3.62          | 0.99 | 1.8           |
| 10 23     | 04:41     | 94      | 10:35     | 61S     | 16:30     | 266     | 3.64         | 3.62          | 0.99 | 1.8           |
| 10 24     | 04:40     | 94      | 10:34     | 61S     | 16:28     | 265     | 3.64         | 3.63          | 0.99 | 1.8           |
| 10 25     | 04:39     | 95      | 10:32     | 60S     | 16:26     | 265     | 3.65         | 3.63          | 0.99 | 1.8           |
| 10 26     | 04:37     | 95      | 10:31     | 60S     | 16:24     | 265     | 3.65         | 3.64          | 0.99 | 1.8           |
| 10 27     | 04:36     | 95      | 10:29     | 60S     | 16:22     | 265     | 3.66         | 3.64          | 0.99 | 1.8           |
| 10 28     | 04:35     | 96      | 10:28     | 60S     | 16:20     | 264     | 3.67         | 3.65          | 0.99 | 1.8           |
| 10 29     | 04:34     | 96      | 10:26     | 59S     | 16:18     | 264     | 3.67         | 3.65          | 0.99 | 1.8           |
| 10 30     | 04:33     | 96      | 10:25     | 59S     | 16:16     | 264     | 3.68         | 3.66          | 0.99 | 1.8           |
| 10 31     | 04:32     | 96      | 10:23     | 59S     | 16:14     | 263     | 3.68         | 3.66          | 0.99 | 1.8           |

## 火 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 11 | 1  | 13  | 7  | 42.69 | -6  | 17 | 53.30 | 2.53901 | 21.12 | 12.1 |
| 11 | 2  | 13  | 10 | 7.76  | -6  | 33 | 3.88  | 2.53479 | 21.08 | 12.3 |
| 11 | 3  | 13  | 12 | 33.05 | -6  | 48 | 12.07 | 2.53051 | 21.05 | 12.5 |
| 11 | 4  | 13  | 14 | 58.56 | -7  | 3  | 17.76 | 2.52617 | 21.01 | 12.7 |
| 11 | 5  | 13  | 17 | 24.29 | -7  | 18 | 20.85 | 2.52177 | 20.97 | 12.9 |
| 11 | 6  | 13  | 19 | 50.26 | -7  | 33 | 21.23 | 2.51732 | 20.94 | 13.1 |
| 11 | 7  | 13  | 22 | 16.46 | -7  | 48 | 18.80 | 2.51280 | 20.90 | 13.3 |
| 11 | 8  | 13  | 24 | 42.91 | -8  | 3  | 13.46 | 2.50823 | 20.86 | 13.5 |
| 11 | 9  | 13  | 27 | 9.62  | -8  | 18 | 5.12  | 2.50360 | 20.82 | 13.7 |
| 11 | 10 | 13  | 29 | 36.58 | -8  | 32 | 53.68 | 2.49891 | 20.78 | 13.9 |
| 11 | 11 | 13  | 32 | 3.82  | -8  | 47 | 39.05 | 2.49417 | 20.74 | 14.1 |
| 11 | 12 | 13  | 34 | 31.33 | -9  | 2  | 21.14 | 2.48937 | 20.70 | 14.3 |
| 11 | 13 | 13  | 36 | 59.13 | -9  | 16 | 59.86 | 2.48451 | 20.66 | 14.5 |
| 11 | 14 | 13  | 39 | 27.21 | -9  | 31 | 35.11 | 2.47960 | 20.62 | 14.7 |
| 11 | 15 | 13  | 41 | 55.60 | -9  | 46 | 6.79  | 2.47463 | 20.58 | 14.9 |
| 11 | 16 | 13  | 44 | 24.29 | -10 | 0  | 34.81 | 2.46961 | 20.54 | 15.1 |
| 11 | 17 | 13  | 46 | 53.29 | -10 | 14 | 59.05 | 2.46453 | 20.50 | 15.3 |
| 11 | 18 | 13  | 49 | 22.60 | -10 | 29 | 19.42 | 2.45940 | 20.45 | 15.5 |
| 11 | 19 | 13  | 51 | 52.22 | -10 | 43 | 35.78 | 2.45421 | 20.41 | 15.7 |
| 11 | 20 | 13  | 54 | 22.17 | -10 | 57 | 48.03 | 2.44897 | 20.37 | 15.9 |
| 11 | 21 | 13  | 56 | 52.44 | -11 | 11 | 56.04 | 2.44367 | 20.32 | 16.1 |
| 11 | 22 | 13  | 59 | 23.05 | -11 | 25 | 59.71 | 2.43831 | 20.28 | 16.3 |
| 11 | 23 | 14  | 1  | 53.98 | -11 | 39 | 58.90 | 2.43290 | 20.23 | 16.5 |
| 11 | 24 | 14  | 4  | 25.26 | -11 | 53 | 53.52 | 2.42744 | 20.19 | 16.7 |
| 11 | 25 | 14  | 6  | 56.88 | -12 | 7  | 43.45 | 2.42192 | 20.14 | 16.9 |
| 11 | 26 | 14  | 9  | 28.84 | -12 | 21 | 28.57 | 2.41635 | 20.10 | 17.1 |
| 11 | 27 | 14  | 12 | 1.16  | -12 | 35 | 8.77  | 2.41072 | 20.05 | 17.3 |
| 11 | 28 | 14  | 14 | 33.82 | -12 | 48 | 43.92 | 2.40504 | 20.00 | 17.5 |
| 11 | 29 | 14  | 17 | 6.84  | -13 | 2  | 13.88 | 2.39931 | 19.95 | 17.7 |
| 11 | 30 | 14  | 19 | 40.20 | -13 | 15 | 38.55 | 2.39352 | 19.91 | 17.9 |

## 火星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 11 1      | 04:31     | 97      | 10:21     | 59S     | 16:12     | 263     | 3.69         | 3.67          | 0.99 | 1.8           |
| 11 2      | 04:30     | 97      | 10:20     | 58S     | 16:10     | 263     | 3.69         | 3.68          | 0.99 | 1.8           |
| 11 3      | 04:29     | 97      | 10:18     | 58S     | 16:08     | 263     | 3.70         | 3.68          | 0.99 | 1.8           |
| 11 4      | 04:28     | 97      | 10:17     | 58S     | 16:06     | 262     | 3.71         | 3.69          | 0.99 | 1.8           |
| 11 5      | 04:27     | 98      | 10:15     | 58S     | 16:04     | 262     | 3.71         | 3.70          | 0.99 | 1.8           |
| 11 6      | 04:26     | 98      | 10:14     | 57S     | 16:02     | 262     | 3.72         | 3.70          | 0.99 | 1.8           |
| 11 7      | 04:25     | 98      | 10:12     | 57S     | 16:00     | 262     | 3.73         | 3.71          | 0.99 | 1.8           |
| 11 8      | 04:24     | 99      | 10:11     | 57S     | 15:58     | 261     | 3.73         | 3.72          | 0.99 | 1.8           |
| 11 9      | 04:23     | 99      | 10:09     | 57S     | 15:56     | 261     | 3.74         | 3.72          | 0.99 | 1.8           |
| 11 10     | 04:22     | 99      | 10:08     | 56S     | 15:54     | 261     | 3.75         | 3.73          | 0.99 | 1.8           |
| 11 11     | 04:21     | 99      | 10:06     | 56S     | 15:52     | 260     | 3.75         | 3.74          | 0.99 | 1.8           |
| 11 12     | 04:20     | 100     | 10:05     | 56S     | 15:50     | 260     | 3.76         | 3.74          | 0.98 | 1.8           |
| 11 13     | 04:19     | 100     | 10:03     | 56S     | 15:48     | 260     | 3.77         | 3.75          | 0.98 | 1.8           |
| 11 14     | 04:18     | 100     | 10:02     | 55S     | 15:46     | 260     | 3.78         | 3.76          | 0.98 | 1.8           |
| 11 15     | 04:17     | 100     | 10:01     | 55S     | 15:44     | 259     | 3.78         | 3.77          | 0.98 | 1.8           |
| 11 16     | 04:16     | 101     | 09:59     | 55S     | 15:42     | 259     | 3.79         | 3.77          | 0.98 | 1.8           |
| 11 17     | 04:15     | 101     | 09:58     | 55S     | 15:40     | 259     | 3.80         | 3.78          | 0.98 | 1.8           |
| 11 18     | 04:14     | 101     | 09:56     | 54S     | 15:38     | 259     | 3.81         | 3.79          | 0.98 | 1.8           |
| 11 19     | 04:13     | 102     | 09:55     | 54S     | 15:36     | 258     | 3.82         | 3.80          | 0.98 | 1.7           |
| 11 20     | 04:12     | 102     | 09:53     | 54S     | 15:35     | 258     | 3.82         | 3.80          | 0.98 | 1.7           |
| 11 21     | 04:11     | 102     | 09:52     | 54S     | 15:33     | 258     | 3.83         | 3.81          | 0.98 | 1.7           |
| 11 22     | 04:10     | 102     | 09:50     | 53S     | 15:31     | 258     | 3.84         | 3.82          | 0.98 | 1.7           |
| 11 23     | 04:09     | 103     | 09:49     | 53S     | 15:29     | 257     | 3.85         | 3.83          | 0.98 | 1.7           |
| 11 24     | 04:08     | 103     | 09:48     | 53S     | 15:27     | 257     | 3.86         | 3.84          | 0.98 | 1.7           |
| 11 25     | 04:07     | 103     | 09:46     | 53S     | 15:25     | 257     | 3.87         | 3.85          | 0.98 | 1.7           |
| 11 26     | 04:06     | 103     | 09:45     | 53S     | 15:23     | 257     | 3.88         | 3.86          | 0.98 | 1.7           |
| 11 27     | 04:05     | 104     | 09:43     | 52S     | 15:21     | 256     | 3.88         | 3.86          | 0.98 | 1.7           |
| 11 28     | 04:04     | 104     | 09:42     | 52S     | 15:20     | 256     | 3.89         | 3.87          | 0.98 | 1.7           |
| 11 29     | 04:03     | 104     | 09:41     | 52S     | 15:18     | 256     | 3.90         | 3.88          | 0.98 | 1.7           |
| 11 30     | 04:02     | 104     | 09:39     | 52S     | 15:16     | 256     | 3.91         | 3.89          | 0.98 | 1.7           |

# 火 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 12 | 1  | 14  | 22 | 13.92 | -13 | 28 | 57.77 | 2.38769 | 19.86 | 18.1 |
| 12 | 2  | 14  | 24 | 48.00 | -13 | 42 | 11.45 | 2.38180 | 19.81 | 18.3 |
| 12 | 3  | 14  | 27 | 22.44 | -13 | 55 | 19.44 | 2.37587 | 19.76 | 18.5 |
| 12 | 4  | 14  | 29 | 57.25 | -14 | 8  | 21.65 | 2.36989 | 19.71 | 18.7 |
| 12 | 5  | 14  | 32 | 32.43 | -14 | 21 | 17.95 | 2.36385 | 19.66 | 18.9 |
| 12 | 6  | 14  | 35 | 7.98  | -14 | 34 | 8.23  | 2.35777 | 19.61 | 19.1 |
| 12 | 7  | 14  | 37 | 43.91 | -14 | 46 | 52.39 | 2.35165 | 19.56 | 19.3 |
| 12 | 8  | 14  | 40 | 20.23 | -14 | 59 | 30.32 | 2.34548 | 19.51 | 19.5 |
| 12 | 9  | 14  | 42 | 56.93 | -15 | 12 | 1.91  | 2.33926 | 19.45 | 19.7 |
| 12 | 10 | 14  | 45 | 34.03 | -15 | 24 | 27.08 | 2.33299 | 19.40 | 19.9 |
| 12 | 11 | 14  | 48 | 11.53 | -15 | 36 | 45.70 | 2.32669 | 19.35 | 20.1 |
| 12 | 12 | 14  | 50 | 49.44 | -15 | 48 | 57.69 | 2.32033 | 19.30 | 20.3 |
| 12 | 13 | 14  | 53 | 27.75 | -16 | 1  | 2.94  | 2.31394 | 19.24 | 20.5 |
| 12 | 14 | 14  | 56 | 6.48  | -16 | 13 | 1.33  | 2.30750 | 19.19 | 20.7 |
| 12 | 15 | 14  | 58 | 45.61 | -16 | 24 | 52.77 | 2.30102 | 19.14 | 20.9 |
| 12 | 16 | 15  | 1  | 25.16 | -16 | 36 | 37.11 | 2.29449 | 19.08 | 21.1 |
| 12 | 17 | 15  | 4  | 5.12  | -16 | 48 | 14.25 | 2.28792 | 19.03 | 21.3 |
| 12 | 18 | 15  | 6  | 45.49 | -16 | 59 | 44.06 | 2.28131 | 18.97 | 21.5 |
| 12 | 19 | 15  | 9  | 26.28 | -17 | 11 | 6.42  | 2.27465 | 18.92 | 21.7 |
| 12 | 20 | 15  | 12 | 7.50  | -17 | 22 | 21.21 | 2.26796 | 18.86 | 21.9 |
| 12 | 21 | 15  | 14 | 49.13 | -17 | 33 | 28.31 | 2.26122 | 18.81 | 22.1 |
| 12 | 22 | 15  | 17 | 31.18 | -17 | 44 | 27.60 | 2.25444 | 18.75 | 22.3 |
| 12 | 23 | 15  | 20 | 13.66 | -17 | 55 | 18.97 | 2.24761 | 18.69 | 22.5 |
| 12 | 24 | 15  | 22 | 56.55 | -18 | 6  | 2.31  | 2.24075 | 18.64 | 22.7 |
| 12 | 25 | 15  | 25 | 39.86 | -18 | 16 | 37.49 | 2.23384 | 18.58 | 22.9 |
| 12 | 26 | 15  | 28 | 23.58 | -18 | 27 | 4.40  | 2.22690 | 18.52 | 23.1 |
| 12 | 27 | 15  | 31 | 7.72  | -18 | 37 | 22.89 | 2.21992 | 18.46 | 23.3 |
| 12 | 28 | 15  | 33 | 52.25 | -18 | 47 | 32.85 | 2.21289 | 18.40 | 23.5 |
| 12 | 29 | 15  | 36 | 37.19 | -18 | 57 | 34.16 | 2.20583 | 18.34 | 23.7 |
| 12 | 30 | 15  | 39 | 22.54 | -19 | 7  | 26.68 | 2.19874 | 18.29 | 23.9 |
| 12 | 31 | 15  | 42 | 8.28  | -19 | 17 | 10.31 | 2.19161 | 18.23 | 24.1 |



## 火星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 12 1      | 04:01     | 105     | 09:38     | 51S     | 15:14     | 255     | 3.92         | 3.90          | 0.98 | 1.7           |
| 12 2      | 04:00     | 105     | 09:36     | 51S     | 15:12     | 255     | 3.93         | 3.91          | 0.98 | 1.7           |
| 12 3      | 03:59     | 105     | 09:35     | 51S     | 15:11     | 255     | 3.94         | 3.92          | 0.97 | 1.7           |
| 12 4      | 03:58     | 105     | 09:34     | 51S     | 15:09     | 255     | 3.95         | 3.93          | 0.97 | 1.7           |
| 12 5      | 03:57     | 106     | 09:32     | 51S     | 15:07     | 254     | 3.96         | 3.94          | 0.97 | 1.7           |
| 12 6      | 03:57     | 106     | 09:31     | 50S     | 15:05     | 254     | 3.97         | 3.95          | 0.97 | 1.7           |
| 12 7      | 03:56     | 106     | 09:30     | 50S     | 15:03     | 254     | 3.98         | 3.96          | 0.97 | 1.7           |
| 12 8      | 03:55     | 106     | 09:28     | 50S     | 15:02     | 254     | 3.99         | 3.97          | 0.97 | 1.7           |
| 12 9      | 03:54     | 107     | 09:27     | 50S     | 15:00     | 253     | 4.00         | 3.98          | 0.97 | 1.7           |
| 12 10     | 03:53     | 107     | 09:26     | 50S     | 14:58     | 253     | 4.01         | 3.99          | 0.97 | 1.7           |
| 12 11     | 03:52     | 107     | 09:24     | 49S     | 14:56     | 253     | 4.03         | 4.00          | 0.97 | 1.7           |
| 12 12     | 03:51     | 107     | 09:23     | 49S     | 14:55     | 253     | 4.04         | 4.01          | 0.97 | 1.7           |
| 12 13     | 03:50     | 107     | 09:22     | 49S     | 14:53     | 252     | 4.05         | 4.03          | 0.97 | 1.7           |
| 12 14     | 03:49     | 108     | 09:20     | 49S     | 14:51     | 252     | 4.06         | 4.04          | 0.97 | 1.7           |
| 12 15     | 03:48     | 108     | 09:19     | 49S     | 14:50     | 252     | 4.07         | 4.05          | 0.97 | 1.7           |
| 12 16     | 03:48     | 108     | 09:18     | 48S     | 14:48     | 252     | 4.08         | 4.06          | 0.97 | 1.7           |
| 12 17     | 03:47     | 108     | 09:17     | 48S     | 14:46     | 252     | 4.09         | 4.07          | 0.97 | 1.7           |
| 12 18     | 03:46     | 109     | 09:15     | 48S     | 14:45     | 251     | 4.11         | 4.08          | 0.97 | 1.6           |
| 12 19     | 03:45     | 109     | 09:14     | 48S     | 14:43     | 251     | 4.12         | 4.09          | 0.97 | 1.6           |
| 12 20     | 03:44     | 109     | 09:13     | 48S     | 14:41     | 251     | 4.13         | 4.11          | 0.96 | 1.6           |
| 12 21     | 03:43     | 109     | 09:12     | 47S     | 14:40     | 251     | 4.14         | 4.12          | 0.96 | 1.6           |
| 12 22     | 03:42     | 109     | 09:10     | 47S     | 14:38     | 251     | 4.15         | 4.13          | 0.96 | 1.6           |
| 12 23     | 03:41     | 110     | 09:09     | 47S     | 14:37     | 250     | 4.17         | 4.14          | 0.96 | 1.6           |
| 12 24     | 03:41     | 110     | 09:08     | 47S     | 14:35     | 250     | 4.18         | 4.16          | 0.96 | 1.6           |
| 12 25     | 03:40     | 110     | 09:07     | 47S     | 14:33     | 250     | 4.19         | 4.17          | 0.96 | 1.6           |
| 12 26     | 03:39     | 110     | 09:05     | 46S     | 14:32     | 250     | 4.21         | 4.18          | 0.96 | 1.6           |
| 12 27     | 03:38     | 110     | 09:04     | 46S     | 14:30     | 250     | 4.22         | 4.20          | 0.96 | 1.6           |
| 12 28     | 03:37     | 111     | 09:03     | 46S     | 14:29     | 249     | 4.23         | 4.21          | 0.96 | 1.6           |
| 12 29     | 03:36     | 111     | 09:02     | 46S     | 14:27     | 249     | 4.25         | 4.22          | 0.96 | 1.6           |
| 12 30     | 03:36     | 111     | 09:01     | 46S     | 14:26     | 249     | 4.26         | 4.24          | 0.96 | 1.6           |
| 12 31     | 03:35     | 111     | 08:59     | 46S     | 14:24     | 249     | 4.27         | 4.25          | 0.96 | 1.6           |

# 火星表面位置座標表

世界時 0 時

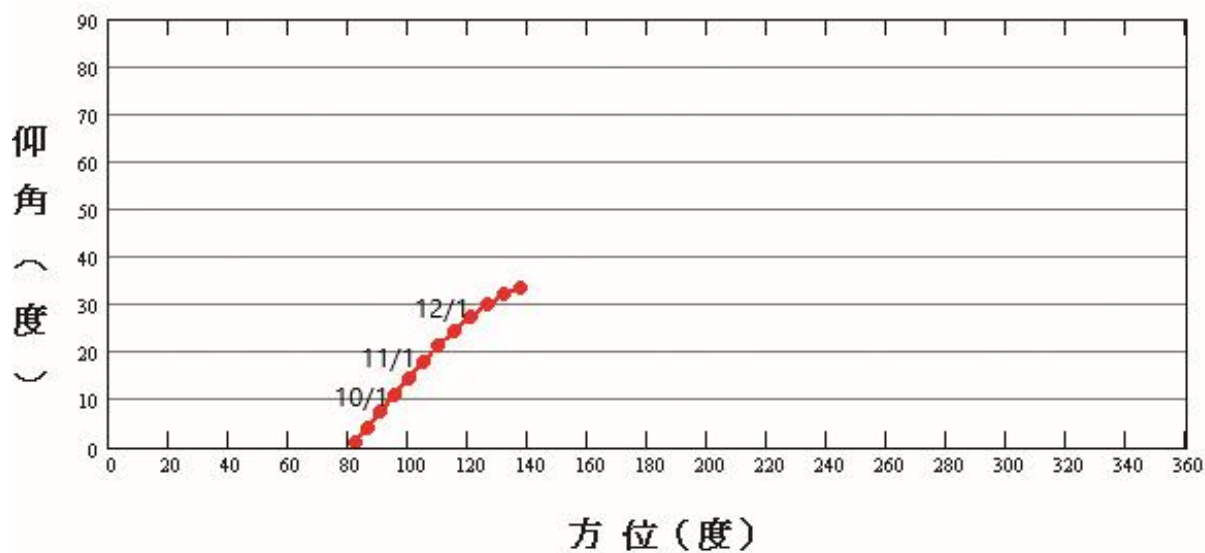
| 日期<br>月 日 |    | 中心點座標                               |                                   | 日下點座標                          |                                    |                      |                          | 北極點位置                |                          |
|-----------|----|-------------------------------------|-----------------------------------|--------------------------------|------------------------------------|----------------------|--------------------------|----------------------|--------------------------|
|           |    | 地<br>經度<br>( $\lambda_e$ ) $^\circ$ | 球<br>緯度<br>( $\beta_e$ ) $^\circ$ | 經度<br>( $\lambda_s$ ) $^\circ$ | 太陽<br>緯度<br>( $\beta_s$ ) $^\circ$ | 距離<br>( $d_s$ ) $''$ | 方位<br>( $P_s$ ) $^\circ$ | 距離<br>( $d_n$ ) $''$ | 方位<br>( $P_n$ ) $^\circ$ |
| 1         | 1  | 10.84                               | -26.49                            | 326.82                         | -17.27                             | 2.47                 | 246.62                   | -3.31                | 333.16                   |
| 1         | 6  | 321.47                              | -26.35                            | 278.38                         | -16.32                             | 2.37                 | 246.64                   | -3.21                | 331.53                   |
| 1         | 11 | 272.10                              | -26.10                            | 229.99                         | -15.34                             | 2.27                 | 246.73                   | -3.11                | 329.99                   |
| 1         | 16 | 222.73                              | -25.75                            | 181.65                         | -14.34                             | 2.17                 | 246.88                   | -3.03                | 328.55                   |
| 1         | 21 | 173.39                              | -25.30                            | 133.35                         | -13.32                             | 2.08                 | 247.10                   | -2.95                | 327.21                   |
| 1         | 26 | 124.08                              | -24.76                            | 85.10                          | -12.27                             | 1.99                 | 247.39                   | -2.87                | 326.00                   |
| 2         | 1  | 64.96                               | -23.98                            | 27.26                          | -11.00                             | 1.89                 | 247.83                   | -2.79                | 324.71                   |
| 2         | 6  | 15.73                               | -23.23                            | 339.10                         | -9.93                              | 1.81                 | 248.26                   | -2.73                | 323.78                   |
| 2         | 11 | 326.55                              | -22.39                            | 290.98                         | -8.84                              | 1.73                 | 248.77                   | -2.67                | 322.99                   |
| 2         | 16 | 277.41                              | -21.48                            | 242.89                         | -7.75                              | 1.66                 | 249.34                   | -2.62                | 322.34                   |
| 2         | 21 | 228.33                              | -20.50                            | 194.84                         | -6.66                              | 1.59                 | 249.98                   | -2.57                | 321.84                   |
| 2         | 26 | 179.30                              | -19.45                            | 146.82                         | -5.56                              | 1.52                 | 250.69                   | -2.52                | 321.48                   |
| 3         | 1  | 149.91                              | -18.79                            | 118.02                         | -4.90                              | 1.48                 | 251.14                   | -2.50                | 321.34                   |
| 3         | 6  | 100.96                              | -17.64                            | 70.05                          | -3.80                              | 1.42                 | 251.95                   | -2.45                | 321.22                   |
| 3         | 11 | 52.07                               | -16.43                            | 22.10                          | -2.71                              | 1.36                 | 252.82                   | -2.41                | 321.24                   |
| 3         | 16 | 3.22                                | -15.18                            | 334.18                         | -1.62                              | 1.30                 | 253.75                   | -2.38                | 321.41                   |
| 3         | 21 | 314.42                              | -13.89                            | 286.28                         | -0.54                              | 1.24                 | 254.74                   | -2.34                | 321.72                   |
| 3         | 26 | 265.66                              | -12.56                            | 238.40                         | 0.54                               | 1.19                 | 255.78                   | -2.30                | 322.17                   |
| 4         | 1  | 207.21                              | -10.92                            | 180.96                         | 1.82                               | 1.12                 | 257.09                   | -2.26                | 322.89                   |
| 4         | 6  | 158.54                              | -9.53                             | 133.12                         | 2.87                               | 1.07                 | 258.23                   | -2.23                | 323.62                   |
| 4         | 11 | 109.91                              | -8.11                             | 85.29                          | 3.91                               | 1.02                 | 259.42                   | -2.20                | 324.48                   |
| 4         | 16 | 61.31                               | -6.68                             | 37.47                          | 4.94                               | 0.98                 | 260.64                   | -2.17                | 325.46                   |
| 4         | 21 | 12.73                               | -5.23                             | 349.67                         | 5.95                               | 0.93                 | 261.89                   | -2.14                | 326.55                   |
| 4         | 26 | 324.18                              | -3.77                             | 301.87                         | 6.95                               | 0.89                 | 263.16                   | -2.11                | 327.74                   |
| 5         | 1  | 275.64                              | -2.31                             | 254.08                         | 7.93                               | 0.84                 | 264.45                   | -2.08                | 329.04                   |
| 5         | 6  | 227.12                              | -0.85                             | 206.30                         | 8.89                               | 0.80                 | 265.75                   | -2.05                | 330.42                   |
| 5         | 11 | 178.61                              | 0.61                              | 158.52                         | 9.84                               | 0.76                 | 267.06                   | 2.02                 | 331.88                   |
| 5         | 16 | 130.11                              | 2.07                              | 110.75                         | 10.76                              | 0.72                 | 268.36                   | 1.99                 | 333.43                   |
| 5         | 21 | 81.61                               | 3.51                              | 62.97                          | 11.67                              | 0.68                 | 269.66                   | 1.96                 | 335.04                   |
| 5         | 26 | 33.11                               | 4.94                              | 15.20                          | 12.55                              | 0.64                 | 270.93                   | 1.94                 | 336.72                   |
| 6         | 1  | 334.90                              | 6.63                              | 317.87                         | 13.58                              | 0.60                 | 272.43                   | 1.91                 | 338.80                   |
| 6         | 6  | 286.39                              | 8.01                              | 270.10                         | 14.41                              | 0.56                 | 273.64                   | 1.88                 | 340.60                   |
| 6         | 11 | 237.86                              | 9.37                              | 222.32                         | 15.22                              | 0.53                 | 274.82                   | 1.85                 | 342.44                   |
| 6         | 16 | 189.32                              | 10.70                             | 174.54                         | 16.01                              | 0.49                 | 275.94                   | 1.83                 | 344.31                   |
| 6         | 21 | 140.76                              | 12.00                             | 126.75                         | 16.76                              | 0.46                 | 277.01                   | 1.80                 | 346.22                   |
| 6         | 26 | 92.17                               | 13.26                             | 78.96                          | 17.50                              | 0.43                 | 278.01                   | 1.78                 | 348.16                   |

## 火星表面位置座標表

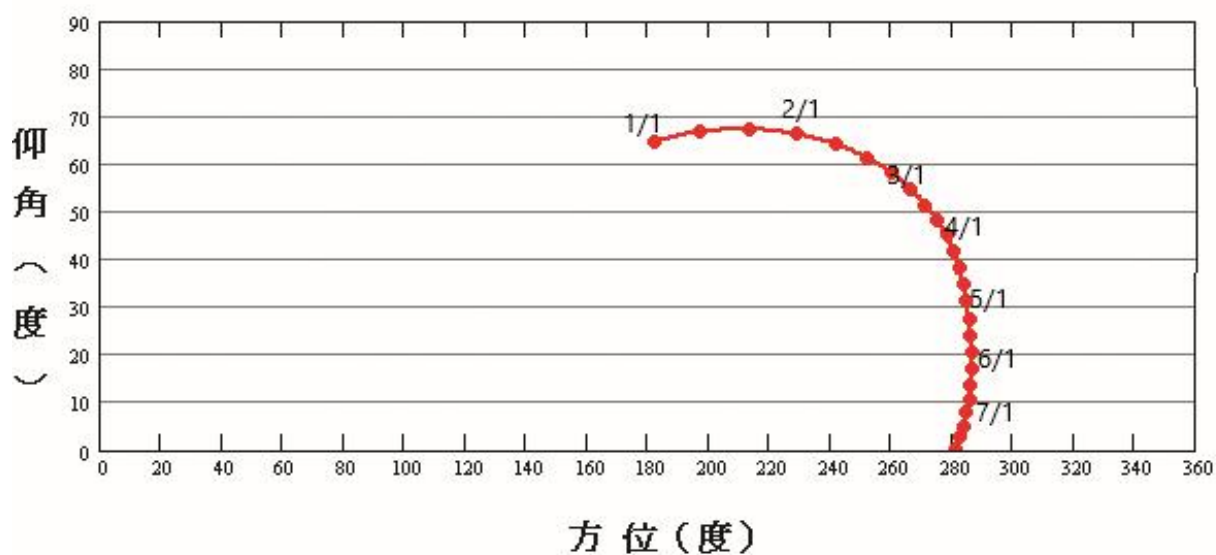
世界時 0 時

| 日期<br>月 日 |    | 中心點座標                               |                                   | 日下點座標                               |                                   |                      |                          | 北極點位置                |                          |
|-----------|----|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|----------------------|--------------------------|----------------------|--------------------------|
|           |    | 地<br>經度<br>( $\lambda_e$ ) $^\circ$ | 球<br>緯度<br>( $\beta_e$ ) $^\circ$ | 太<br>經度<br>( $\lambda_s$ ) $^\circ$ | 陽<br>緯度<br>( $\beta_s$ ) $^\circ$ | 距離<br>( $d_s$ ) $''$ | 方位<br>( $P_s$ ) $^\circ$ | 距離<br>( $d_n$ ) $''$ | 方位<br>( $P_n$ ) $^\circ$ |
| 7         | 1  | 43.56                               | 14.49                             | 31.16                               | 18.2                              | 0.39                 | 278.94                   | 1.76                 | 350.12                   |
| 7         | 6  | 354.93                              | 15.67                             | 343.36                              | 18.88                             | 0.36                 | 279.79                   | 1.74                 | 352.11                   |
| 7         | 11 | 306.26                              | 16.8                              | 295.54                              | 19.53                             | 0.33                 | 280.54                   | 1.72                 | 354.11                   |
| 7         | 16 | 257.57                              | 17.89                             | 247.72                              | 20.14                             | 0.3                  | 281.17                   | 1.7                  | 356.12                   |
| 7         | 21 | 208.84                              | 18.92                             | 199.89                              | 20.73                             | 0.27                 | 281.67                   | 1.68                 | 358.14                   |
| 7         | 26 | 160.07                              | 19.89                             | 152.06                              | 21.29                             | 0.24                 | 281.99                   | 1.66                 | 0.17                     |
| 8         | 1  | 101.51                              | 20.98                             | 94.64                               | 21.92                             | 0.2                  | 282.08                   | 1.64                 | 2.61                     |
| 8         | 6  | 52.67                               | 21.82                             | 46.78                               | 22.4                              | 0.17                 | 281.79                   | 1.63                 | 4.64                     |
| 8         | 11 | 3.8                                 | 22.59                             | 358.91                              | 22.86                             | 0.14                 | 280.98                   | 1.62                 | 6.67                     |
| 8         | 16 | 314.89                              | 23.28                             | 311.04                              | 23.27                             | 0.11                 | 279.29                   | 1.6                  | 8.68                     |
| 8         | 21 | 265.95                              | 23.91                             | 263.15                              | 23.66                             | 0.08                 | 275.77                   | 1.6                  | 10.68                    |
| 8         | 26 | 216.98                              | 24.45                             | 215.26                              | 24.01                             | 0.05                 | 267.34                   | 1.59                 | 12.66                    |
| 9         | 1  | 158.18                              | 25                                | 157.77                              | 24.38                             | 0.02                 | 225.87                   | 1.58                 | 15.01                    |
| 9         | 6  | 109.15                              | 25.37                             | 109.86                              | 24.65                             | 0.03                 | 154.79                   | 1.58                 | 16.93                    |
| 9         | 11 | 60.11                               | 25.65                             | 61.94                               | 24.88                             | 0.06                 | 133.17                   | 1.58                 | 18.81                    |
| 9         | 16 | 11.04                               | 25.84                             | 14.01                               | 25.07                             | 0.09                 | 125.99                   | 1.58                 | 20.65                    |
| 9         | 21 | 321.97                              | 25.95                             | 326.08                              | 25.22                             | 0.12                 | 122.57                   | 1.58                 | 22.44                    |
| 9         | 26 | 272.89                              | 25.97                             | 278.14                              | 25.34                             | 0.15                 | 120.57                   | 1.58                 | 24.17                    |
| 10        | 1  | 223.81                              | 25.9                              | 230.2                               | 25.42                             | 0.18                 | 119.23                   | 1.59                 | 25.83                    |
| 10        | 6  | 174.73                              | 25.74                             | 182.25                              | 25.45                             | 0.21                 | 118.24                   | 1.6                  | 27.42                    |
| 10        | 11 | 125.67                              | 25.49                             | 134.3                               | 25.45                             | 0.24                 | 117.43                   | 1.61                 | 28.94                    |
| 10        | 16 | 76.61                               | 25.16                             | 86.34                               | 25.4                              | 0.28                 | 116.71                   | 1.63                 | 30.36                    |
| 10        | 21 | 27.57                               | 24.74                             | 38.39                               | 25.32                             | 0.31                 | 116.05                   | 1.64                 | 31.69                    |
| 10        | 26 | 338.55                              | 24.23                             | 350.43                              | 25.19                             | 0.34                 | 115.4                    | 1.66                 | 32.92                    |
| 11        | 1  | 279.76                              | 23.51                             | 292.89                              | 24.99                             | 0.39                 | 114.61                   | 1.68                 | 34.25                    |
| 11        | 6  | 230.8                               | 22.82                             | 244.93                              | 24.77                             | 0.42                 | 113.93                   | 1.71                 | 35.23                    |
| 11        | 11 | 181.88                              | 22.06                             | 196.98                              | 24.52                             | 0.46                 | 113.22                   | 1.73                 | 36.09                    |
| 11        | 16 | 132.98                              | 21.22                             | 149.03                              | 24.22                             | 0.49                 | 112.47                   | 1.76                 | 36.83                    |
| 11        | 21 | 84.12                               | 20.31                             | 101.08                              | 23.88                             | 0.53                 | 111.68                   | 1.79                 | 37.44                    |
| 11        | 26 | 35.29                               | 19.33                             | 53.14                               | 23.5                              | 0.57                 | 110.84                   | 1.82                 | 37.92                    |
| 12        | 1  | 346.5                               | 18.29                             | 5.2                                 | 23.08                             | 0.61                 | 109.94                   | 1.85                 | 38.27                    |
| 12        | 6  | 297.74                              | 17.19                             | 317.27                              | 22.62                             | 0.65                 | 108.99                   | 1.89                 | 38.47                    |
| 12        | 11 | 249.01                              | 16.03                             | 269.34                              | 22.12                             | 0.69                 | 107.99                   | 1.92                 | 38.54                    |
| 12        | 16 | 200.32                              | 14.82                             | 221.42                              | 21.57                             | 0.74                 | 106.93                   | 1.96                 | 38.47                    |
| 12        | 21 | 151.65                              | 13.56                             | 173.5                               | 20.99                             | 0.78                 | 105.82                   | 2                    | 38.26                    |
| 12        | 26 | 103.01                              | 12.26                             | 125.58                              | 20.37                             | 0.82                 | 104.65                   | 2.04                 | 37.91                    |
| 12        | 31 | 54.4                                | 10.92                             | 77.68                               | 19.72                             | 0.87                 | 103.43                   | 2.09                 | 37.43                    |

### 日出時火星方位與仰角



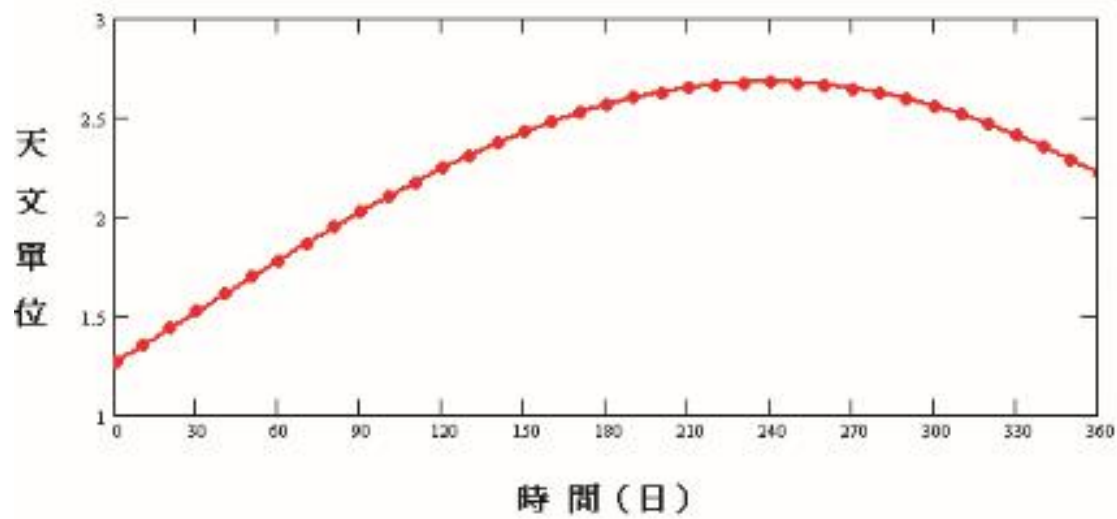
### 日沒時火星方位與仰角



### 火星在天球上運行的軌跡圖



### 火星與地球距離變化圖



## 木 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 1  | 1  | 16  | 41 | 22.42 | -21 | 34 | 19.93 | 6.19351 | 51.51 | 5.0  |
| 1  | 2  | 16  | 42 | 16.03 | -21 | 36 | 2.11  | 6.18541 | 51.44 | 5.2  |
| 1  | 3  | 16  | 43 | 9.46  | -21 | 37 | 42.76 | 6.17711 | 51.37 | 5.3  |
| 1  | 4  | 16  | 44 | 2.70  | -21 | 39 | 21.87 | 6.16862 | 51.30 | 5.4  |
| 1  | 5  | 16  | 44 | 55.73 | -21 | 40 | 59.44 | 6.15994 | 51.23 | 5.5  |
| 1  | 6  | 16  | 45 | 48.56 | -21 | 42 | 35.48 | 6.15106 | 51.16 | 5.7  |
| 1  | 7  | 16  | 46 | 41.16 | -21 | 44 | 9.97  | 6.14200 | 51.08 | 5.8  |
| 1  | 8  | 16  | 47 | 33.54 | -21 | 45 | 42.92 | 6.13274 | 51.00 | 5.9  |
| 1  | 9  | 16  | 48 | 25.68 | -21 | 47 | 14.32 | 6.12330 | 50.93 | 6.1  |
| 1  | 10 | 16  | 49 | 17.57 | -21 | 48 | 44.16 | 6.11368 | 50.85 | 6.2  |
| 1  | 11 | 16  | 50 | 9.22  | -21 | 50 | 12.45 | 6.10387 | 50.76 | 6.3  |
| 1  | 12 | 16  | 51 | 0.61  | -21 | 51 | 39.18 | 6.09388 | 50.68 | 6.4  |
| 1  | 13 | 16  | 51 | 51.74 | -21 | 53 | 4.35  | 6.08371 | 50.60 | 6.5  |
| 1  | 14 | 16  | 52 | 42.60 | -21 | 54 | 27.97 | 6.07336 | 50.51 | 6.7  |
| 1  | 15 | 16  | 53 | 33.18 | -21 | 55 | 50.05 | 6.06284 | 50.42 | 6.8  |
| 1  | 16 | 16  | 54 | 23.48 | -21 | 57 | 10.59 | 6.05215 | 50.33 | 6.9  |
| 1  | 17 | 16  | 55 | 13.50 | -21 | 58 | 29.62 | 6.04129 | 50.24 | 7.0  |
| 1  | 18 | 16  | 56 | 3.23  | -21 | 59 | 47.14 | 6.03026 | 50.15 | 7.1  |
| 1  | 19 | 16  | 56 | 52.65 | -22 | 1  | 3.19  | 6.01906 | 50.06 | 7.2  |
| 1  | 20 | 16  | 57 | 41.77 | -22 | 2  | 17.76 | 6.00770 | 49.96 | 7.4  |
| 1  | 21 | 16  | 58 | 30.58 | -22 | 3  | 30.88 | 5.99617 | 49.87 | 7.5  |
| 1  | 22 | 16  | 59 | 19.05 | -22 | 4  | 42.55 | 5.98449 | 49.77 | 7.6  |
| 1  | 23 | 17  | 0  | 7.20  | -22 | 5  | 52.76 | 5.97264 | 49.67 | 7.7  |
| 1  | 24 | 17  | 0  | 55.01 | -22 | 7  | 1.51  | 5.96064 | 49.57 | 7.8  |
| 1  | 25 | 17  | 1  | 42.47 | -22 | 8  | 8.79  | 5.94849 | 49.47 | 7.9  |
| 1  | 26 | 17  | 2  | 29.58 | -22 | 9  | 14.63 | 5.93618 | 49.37 | 8.0  |
| 1  | 27 | 17  | 3  | 16.33 | -22 | 10 | 19.03 | 5.92372 | 49.27 | 8.1  |
| 1  | 28 | 17  | 4  | 2.72  | -22 | 11 | 22.01 | 5.91111 | 49.16 | 8.2  |
| 1  | 29 | 17  | 4  | 48.74 | -22 | 12 | 23.58 | 5.89835 | 49.05 | 8.3  |
| 1  | 30 | 17  | 5  | 34.38 | -22 | 13 | 23.78 | 5.88545 | 48.95 | 8.4  |
| 1  | 31 | 17  | 6  | 19.63 | -22 | 14 | 22.61 | 5.87241 | 48.84 | 8.5  |

## 木星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 1 1       | 04:34     | 114     | 09:54     | 43S     | 15:13     | 246     | 31.83        | 29.77         | 1.00 | -1.8          |
| 1 2       | 04:31     | 114     | 09:51     | 43S     | 15:10     | 246     | 31.87        | 29.81         | 1.00 | -1.8          |
| 1 3       | 04:28     | 114     | 09:48     | 43S     | 15:07     | 246     | 31.92        | 29.85         | 1.00 | -1.8          |
| 1 4       | 04:25     | 114     | 09:44     | 43S     | 15:04     | 246     | 31.96        | 29.89         | 1.00 | -1.8          |
| 1 5       | 04:22     | 114     | 09:41     | 43S     | 15:01     | 246     | 32.00        | 29.93         | 1.00 | -1.8          |
| 1 6       | 04:19     | 114     | 09:38     | 43S     | 14:57     | 246     | 32.05        | 29.98         | 1.00 | -1.8          |
| 1 7       | 04:16     | 114     | 09:35     | 43S     | 14:54     | 246     | 32.10        | 30.02         | 1.00 | -1.8          |
| 1 8       | 04:13     | 114     | 09:32     | 43S     | 14:51     | 246     | 32.15        | 30.07         | 1.00 | -1.8          |
| 1 9       | 04:10     | 114     | 09:29     | 43S     | 14:48     | 246     | 32.20        | 30.11         | 1.00 | -1.8          |
| 1 10      | 04:07     | 114     | 09:26     | 43S     | 14:45     | 246     | 32.25        | 30.16         | 1.00 | -1.8          |
| 1 11      | 04:04     | 114     | 09:23     | 43S     | 14:42     | 246     | 32.30        | 30.21         | 1.00 | -1.8          |
| 1 12      | 04:01     | 114     | 09:20     | 43S     | 14:39     | 246     | 32.35        | 30.26         | 1.00 | -1.8          |
| 1 13      | 03:58     | 114     | 09:17     | 43S     | 14:36     | 246     | 32.41        | 30.31         | 1.00 | -1.8          |
| 1 14      | 03:55     | 114     | 09:14     | 43S     | 14:32     | 246     | 32.46        | 30.36         | 1.00 | -1.8          |
| 1 15      | 03:52     | 114     | 09:11     | 43S     | 14:29     | 246     | 32.52        | 30.41         | 1.00 | -1.8          |
| 1 16      | 03:49     | 114     | 09:08     | 43S     | 14:26     | 246     | 32.57        | 30.47         | 1.00 | -1.8          |
| 1 17      | 03:46     | 114     | 09:04     | 43S     | 14:23     | 246     | 32.63        | 30.52         | 1.00 | -1.8          |
| 1 18      | 03:43     | 114     | 09:01     | 43S     | 14:20     | 246     | 32.69        | 30.58         | 1.00 | -1.8          |
| 1 19      | 03:40     | 114     | 08:58     | 43S     | 14:17     | 246     | 32.75        | 30.63         | 1.00 | -1.8          |
| 1 20      | 03:37     | 114     | 08:55     | 43S     | 14:14     | 246     | 32.82        | 30.69         | 1.00 | -1.8          |
| 1 21      | 03:34     | 114     | 08:52     | 43S     | 14:10     | 246     | 32.88        | 30.75         | 1.00 | -1.8          |
| 1 22      | 03:31     | 114     | 08:49     | 43S     | 14:07     | 246     | 32.94        | 30.81         | 1.00 | -1.8          |
| 1 23      | 03:27     | 114     | 08:46     | 43S     | 14:04     | 246     | 33.01        | 30.87         | 1.00 | -1.8          |
| 1 24      | 03:24     | 114     | 08:43     | 43S     | 14:01     | 246     | 33.07        | 30.93         | 1.00 | -1.8          |
| 1 25      | 03:21     | 114     | 08:39     | 43S     | 13:58     | 246     | 33.14        | 31.00         | 1.00 | -1.8          |
| 1 26      | 03:18     | 114     | 08:36     | 43S     | 13:54     | 246     | 33.21        | 31.06         | 1.00 | -1.9          |
| 1 27      | 03:15     | 114     | 08:33     | 43S     | 13:51     | 246     | 33.28        | 31.13         | 1.00 | -1.9          |
| 1 28      | 03:12     | 114     | 08:30     | 43S     | 13:48     | 246     | 33.35        | 31.19         | 1.00 | -1.9          |
| 1 29      | 03:09     | 114     | 08:27     | 43S     | 13:45     | 246     | 33.42        | 31.26         | 1.00 | -1.9          |
| 1 30      | 03:06     | 114     | 08:24     | 43S     | 13:42     | 246     | 33.50        | 31.33         | 1.00 | -1.9          |
| 1 31      | 03:03     | 114     | 08:20     | 43S     | 13:38     | 246     | 33.57        | 31.40         | 1.00 | -1.9          |

## 木 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 2  | 1  | 17  | 7  | 4.49  | -22 | 15 | 20.08 | 5.85923 | 48.73 | 8.6  |
| 2  | 2  | 17  | 7  | 48.93 | -22 | 16 | 16.21 | 5.84590 | 48.62 | 8.7  |
| 2  | 3  | 17  | 8  | 32.96 | -22 | 17 | 11.01 | 5.83245 | 48.51 | 8.8  |
| 2  | 4  | 17  | 9  | 16.57 | -22 | 18 | 4.47  | 5.81886 | 48.39 | 8.9  |
| 2  | 5  | 17  | 9  | 59.74 | -22 | 18 | 56.63 | 5.80514 | 48.28 | 9.0  |
| 2  | 6  | 17  | 10 | 42.46 | -22 | 19 | 47.46 | 5.79130 | 48.16 | 9.0  |
| 2  | 7  | 17  | 11 | 24.74 | -22 | 20 | 37.00 | 5.77733 | 48.05 | 9.1  |
| 2  | 8  | 17  | 12 | 6.55  | -22 | 21 | 25.24 | 5.76325 | 47.93 | 9.2  |
| 2  | 9  | 17  | 12 | 47.91 | -22 | 22 | 12.19 | 5.74904 | 47.81 | 9.3  |
| 2  | 10 | 17  | 13 | 28.78 | -22 | 22 | 57.88 | 5.73473 | 47.69 | 9.4  |
| 2  | 11 | 17  | 14 | 9.19  | -22 | 23 | 42.31 | 5.72030 | 47.57 | 9.4  |
| 2  | 12 | 17  | 14 | 49.10 | -22 | 24 | 25.50 | 5.70576 | 47.45 | 9.5  |
| 2  | 13 | 17  | 15 | 28.53 | -22 | 25 | 7.49  | 5.69112 | 47.33 | 9.6  |
| 2  | 14 | 17  | 16 | 7.46  | -22 | 25 | 48.29 | 5.67638 | 47.21 | 9.7  |
| 2  | 15 | 17  | 16 | 45.88 | -22 | 26 | 27.93 | 5.66155 | 47.09 | 9.7  |
| 2  | 16 | 17  | 17 | 23.79 | -22 | 27 | 6.44  | 5.64661 | 46.96 | 9.8  |
| 2  | 17 | 17  | 18 | 1.18  | -22 | 27 | 43.83 | 5.63159 | 46.84 | 9.9  |
| 2  | 18 | 17  | 18 | 38.04 | -22 | 28 | 20.13 | 5.61648 | 46.71 | 9.9  |
| 2  | 19 | 17  | 19 | 14.36 | -22 | 28 | 55.34 | 5.60128 | 46.58 | 10.0 |
| 2  | 20 | 17  | 19 | 50.14 | -22 | 29 | 29.47 | 5.58600 | 46.46 | 10.0 |
| 2  | 21 | 17  | 20 | 25.36 | -22 | 30 | 2.52  | 5.57064 | 46.33 | 10.1 |
| 2  | 22 | 17  | 21 | 0.03  | -22 | 30 | 34.51 | 5.55520 | 46.20 | 10.2 |
| 2  | 23 | 17  | 21 | 34.13 | -22 | 31 | 5.45  | 5.53969 | 46.07 | 10.2 |
| 2  | 24 | 17  | 22 | 7.66  | -22 | 31 | 35.36 | 5.52411 | 45.94 | 10.3 |
| 2  | 25 | 17  | 22 | 40.62 | -22 | 32 | 4.27  | 5.50846 | 45.81 | 10.3 |
| 2  | 26 | 17  | 23 | 12.99 | -22 | 32 | 32.21 | 5.49274 | 45.68 | 10.4 |
| 2  | 27 | 17  | 23 | 44.76 | -22 | 32 | 59.20 | 5.47696 | 45.55 | 10.4 |
| 2  | 28 | 17  | 24 | 15.93 | -22 | 33 | 25.26 | 5.46113 | 45.42 | 10.4 |



## 木星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視 亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |            |
| 2 1       | 02:59     | 114     | 08:17     | 43S     | 13:35     | 246     | 33.65 31.47          | 0.99 | -1.9       |
| 2 2       | 02:56     | 114     | 08:14     | 43S     | 13:32     | 246     | 33.72 31.54          | 0.99 | -1.9       |
| 2 3       | 02:53     | 114     | 08:11     | 43S     | 13:29     | 246     | 33.80 31.61          | 0.99 | -1.9       |
| 2 4       | 02:50     | 114     | 08:08     | 43S     | 13:25     | 246     | 33.88 31.69          | 0.99 | -1.9       |
| 2 5       | 02:47     | 114     | 08:04     | 43S     | 13:22     | 246     | 33.96 31.76          | 0.99 | -1.9       |
| 2 6       | 02:44     | 115     | 08:01     | 43S     | 13:19     | 245     | 34.04 31.84          | 0.99 | -1.9       |
| 2 7       | 02:40     | 115     | 07:58     | 43S     | 13:16     | 245     | 34.12 31.92          | 0.99 | -1.9       |
| 2 8       | 02:37     | 115     | 07:55     | 43S     | 13:12     | 245     | 34.21 31.99          | 0.99 | -1.9       |
| 2 9       | 02:34     | 115     | 07:52     | 43S     | 13:09     | 245     | 34.29 32.07          | 0.99 | -1.9       |
| 2 10      | 02:31     | 115     | 07:48     | 43S     | 13:06     | 245     | 34.38 32.15          | 0.99 | -1.9       |
| 2 11      | 02:27     | 115     | 07:45     | 43S     | 13:03     | 245     | 34.46 32.23          | 0.99 | -1.9       |
| 2 12      | 02:24     | 115     | 07:42     | 43S     | 12:59     | 245     | 34.55 32.32          | 0.99 | -1.9       |
| 2 13      | 02:21     | 115     | 07:38     | 43S     | 12:56     | 245     | 34.64 32.40          | 0.99 | -1.9       |
| 2 14      | 02:18     | 115     | 07:35     | 43S     | 12:53     | 245     | 34.73 32.48          | 0.99 | -1.9       |
| 2 15      | 02:14     | 115     | 07:32     | 42S     | 12:49     | 245     | 34.82 32.57          | 0.99 | -1.9       |
| 2 16      | 02:11     | 115     | 07:29     | 42S     | 12:46     | 245     | 34.91 32.65          | 0.99 | -2.0       |
| 2 17      | 02:08     | 115     | 07:25     | 42S     | 12:43     | 245     | 35.01 32.74          | 0.99 | -2.0       |
| 2 18      | 02:05     | 115     | 07:22     | 42S     | 12:39     | 245     | 35.10 32.83          | 0.99 | -2.0       |
| 2 19      | 02:01     | 115     | 07:19     | 42S     | 12:36     | 245     | 35.20 32.92          | 0.99 | -2.0       |
| 2 20      | 01:58     | 115     | 07:15     | 42S     | 12:33     | 245     | 35.29 33.01          | 0.99 | -2.0       |
| 2 21      | 01:55     | 115     | 07:12     | 42S     | 12:29     | 245     | 35.39 33.10          | 0.99 | -2.0       |
| 2 22      | 01:51     | 115     | 07:09     | 42S     | 12:26     | 245     | 35.49 33.19          | 0.99 | -2.0       |
| 2 23      | 01:48     | 115     | 07:05     | 42S     | 12:22     | 245     | 35.59 33.28          | 0.99 | -2.0       |
| 2 24      | 01:45     | 115     | 07:02     | 42S     | 12:19     | 245     | 35.69 33.38          | 0.99 | -2.0       |
| 2 25      | 01:41     | 115     | 06:58     | 42S     | 12:16     | 245     | 35.79 33.47          | 0.99 | -2.0       |
| 2 26      | 01:38     | 115     | 06:55     | 42S     | 12:12     | 245     | 35.89 33.57          | 0.99 | -2.0       |
| 2 27      | 01:34     | 115     | 06:52     | 42S     | 12:09     | 245     | 36.00 33.67          | 0.99 | -2.0       |
| 2 28      | 01:31     | 115     | 06:48     | 42S     | 12:05     | 245     | 36.10 33.76          | 0.99 | -2.0       |

## 木 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 3  | 1  | 17  | 24 | 46.49 | -22 | 33 | 50.41 | 5.44524 | 45.29 | 10.5 |
| 3  | 2  | 17  | 25 | 16.42 | -22 | 34 | 14.66 | 5.42930 | 45.15 | 10.5 |
| 3  | 3  | 17  | 25 | 45.73 | -22 | 34 | 38.03 | 5.41331 | 45.02 | 10.6 |
| 3  | 4  | 17  | 26 | 14.39 | -22 | 35 | 0.52  | 5.39728 | 44.89 | 10.6 |
| 3  | 5  | 17  | 26 | 42.41 | -22 | 35 | 22.15 | 5.38121 | 44.75 | 10.6 |
| 3  | 6  | 17  | 27 | 9.77  | -22 | 35 | 42.93 | 5.36511 | 44.62 | 10.6 |
| 3  | 7  | 17  | 27 | 36.46 | -22 | 36 | 2.86  | 5.34898 | 44.49 | 10.7 |
| 3  | 8  | 17  | 28 | 2.49  | -22 | 36 | 21.97 | 5.33281 | 44.35 | 10.7 |
| 3  | 9  | 17  | 28 | 27.84 | -22 | 36 | 40.27 | 5.31663 | 44.22 | 10.7 |
| 3  | 10 | 17  | 28 | 52.51 | -22 | 36 | 57.77 | 5.30042 | 44.08 | 10.7 |
| 3  | 11 | 17  | 29 | 16.50 | -22 | 37 | 14.49 | 5.28421 | 43.95 | 10.7 |
| 3  | 12 | 17  | 29 | 39.79 | -22 | 37 | 30.46 | 5.26798 | 43.81 | 10.7 |
| 3  | 13 | 17  | 30 | 2.39  | -22 | 37 | 45.70 | 5.25174 | 43.68 | 10.7 |
| 3  | 14 | 17  | 30 | 24.28 | -22 | 38 | 0.24  | 5.23550 | 43.54 | 10.8 |
| 3  | 15 | 17  | 30 | 45.47 | -22 | 38 | 14.10 | 5.21927 | 43.41 | 10.8 |
| 3  | 16 | 17  | 31 | 5.94  | -22 | 38 | 27.30 | 5.20304 | 43.27 | 10.8 |
| 3  | 17 | 17  | 31 | 25.68 | -22 | 38 | 39.86 | 5.18682 | 43.14 | 10.8 |
| 3  | 18 | 17  | 31 | 44.70 | -22 | 38 | 51.79 | 5.17062 | 43.00 | 10.7 |
| 3  | 19 | 17  | 32 | 2.98  | -22 | 39 | 3.10  | 5.15443 | 42.87 | 10.7 |
| 3  | 20 | 17  | 32 | 20.52 | -22 | 39 | 13.78 | 5.13826 | 42.73 | 10.7 |
| 3  | 21 | 17  | 32 | 37.32 | -22 | 39 | 23.85 | 5.12212 | 42.60 | 10.7 |
| 3  | 22 | 17  | 32 | 53.37 | -22 | 39 | 33.31 | 5.10601 | 42.47 | 10.7 |
| 3  | 23 | 17  | 33 | 8.67  | -22 | 39 | 42.18 | 5.08994 | 42.33 | 10.7 |
| 3  | 24 | 17  | 33 | 23.21 | -22 | 39 | 50.47 | 5.07389 | 42.20 | 10.7 |
| 3  | 25 | 17  | 33 | 37.00 | -22 | 39 | 58.22 | 5.05789 | 42.06 | 10.6 |
| 3  | 26 | 17  | 33 | 50.02 | -22 | 40 | 5.44  | 5.04194 | 41.93 | 10.6 |
| 3  | 27 | 17  | 34 | 2.26  | -22 | 40 | 12.14 | 5.02603 | 41.80 | 10.6 |
| 3  | 28 | 17  | 34 | 13.72 | -22 | 40 | 18.35 | 5.01018 | 41.67 | 10.5 |
| 3  | 29 | 17  | 34 | 24.40 | -22 | 40 | 24.06 | 4.99438 | 41.54 | 10.5 |
| 3  | 30 | 17  | 34 | 34.29 | -22 | 40 | 29.28 | 4.97865 | 41.41 | 10.4 |
| 3  | 31 | 17  | 34 | 43.37 | -22 | 40 | 34.02 | 4.96298 | 41.28 | 10.4 |

## 木星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |               |
| 3 1       | 01:28     | 115     | 06:45     | 42S     | 12:02     | 245     | 36.21 33.86          | 0.99 | -2.0          |
| 3 2       | 01:24     | 115     | 06:41     | 42S     | 11:59     | 245     | 36.31 33.96          | 0.99 | -2.0          |
| 3 3       | 01:21     | 115     | 06:38     | 42S     | 11:55     | 245     | 36.42 34.06          | 0.99 | -2.0          |
| 3 4       | 01:17     | 115     | 06:34     | 42S     | 11:52     | 245     | 36.53 34.16          | 0.99 | -2.1          |
| 3 5       | 01:14     | 115     | 06:31     | 42S     | 11:48     | 245     | 36.64 34.26          | 0.99 | -2.1          |
| 3 6       | 01:10     | 115     | 06:28     | 42S     | 11:45     | 245     | 36.75 34.37          | 0.99 | -2.1          |
| 3 7       | 01:07     | 115     | 06:24     | 42S     | 11:41     | 245     | 36.86 34.47          | 0.99 | -2.1          |
| 3 8       | 01:03     | 115     | 06:21     | 42S     | 11:38     | 245     | 36.97 34.58          | 0.99 | -2.1          |
| 3 9       | 01:00     | 115     | 06:17     | 42S     | 11:34     | 245     | 37.08 34.68          | 0.99 | -2.1          |
| 3 10      | 00:56     | 115     | 06:14     | 42S     | 11:31     | 245     | 37.19 34.79          | 0.99 | -2.1          |
| 3 11      | 00:53     | 115     | 06:10     | 42S     | 11:27     | 245     | 37.31 34.89          | 0.99 | -2.1          |
| 3 12      | 00:49     | 115     | 06:06     | 42S     | 11:23     | 245     | 37.42 35.00          | 0.99 | -2.1          |
| 3 13      | 00:46     | 115     | 06:03     | 42S     | 11:20     | 245     | 37.54 35.11          | 0.99 | -2.1          |
| 3 14      | 00:42     | 115     | 05:59     | 42S     | 11:16     | 245     | 37.66 35.22          | 0.99 | -2.1          |
| 3 15      | 00:39     | 115     | 05:56     | 42S     | 11:13     | 245     | 37.77 35.33          | 0.99 | -2.1          |
| 3 16      | 00:35     | 115     | 05:52     | 42S     | 11:09     | 245     | 37.89 35.44          | 0.99 | -2.1          |
| 3 17      | 00:32     | 115     | 05:49     | 42S     | 11:05     | 245     | 38.01 35.55          | 0.99 | -2.1          |
| 3 18      | 00:28     | 115     | 05:45     | 42S     | 11:02     | 245     | 38.13 35.66          | 0.99 | -2.1          |
| 3 19      | 00:24     | 115     | 05:41     | 42S     | 10:58     | 245     | 38.25 35.77          | 0.99 | -2.2          |
| 3 20      | 00:21     | 115     | 05:38     | 42S     | 10:55     | 245     | 38.37 35.89          | 0.99 | -2.2          |
| 3 21      | 00:17     | 115     | 05:34     | 42S     | 10:51     | 245     | 38.49 36.00          | 0.99 | -2.2          |
| 3 22      | 00:13     | 115     | 05:30     | 42S     | 10:47     | 245     | 38.61 36.11          | 0.99 | -2.2          |
| 3 23      | 00:10     | 115     | 05:27     | 42S     | 10:44     | 245     | 38.73 36.23          | 0.99 | -2.2          |
| 3 24      | 00:06     | 115     | 05:23     | 42S     | 10:40     | 245     | 38.86 36.34          | 0.99 | -2.2          |
| 3 25      | 00:02     | 115     | 05:19     | 42S     | 10:36     | 245     | 38.98 36.46          | 0.99 | -2.2          |
| 3 26      | 23:55     | 115     | 05:16     | 42S     | 10:32     | 245     | 39.10 36.57          | 0.99 | -2.2          |
| 3 27      | 23:51     | 115     | 05:12     | 42S     | 10:29     | 245     | 39.23 36.69          | 0.99 | -2.2          |
| 3 28      | 23:47     | 115     | 05:08     | 42S     | 10:25     | 245     | 39.35 36.80          | 0.99 | -2.2          |
| 3 29      | 23:44     | 115     | 05:04     | 42S     | 10:21     | 245     | 39.47 36.92          | 0.99 | -2.2          |
| 3 30      | 23:40     | 115     | 05:01     | 42S     | 10:17     | 245     | 39.60 37.04          | 0.99 | -2.2          |
| 3 31      | 23:36     | 115     | 04:57     | 42S     | 10:14     | 245     | 39.72 37.15          | 0.99 | -2.2          |

## 木 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 4  | 1  | 17  | 34 | 51.66 | -22 | 40 | 38.28 | 4.94738 | 41.15 | 10.4 |
| 4  | 2  | 17  | 34 | 59.14 | -22 | 40 | 42.06 | 4.93186 | 41.02 | 10.3 |
| 4  | 3  | 17  | 35 | 5.82  | -22 | 40 | 45.35 | 4.91642 | 40.89 | 10.3 |
| 4  | 4  | 17  | 35 | 11.68 | -22 | 40 | 48.17 | 4.90107 | 40.76 | 10.2 |
| 4  | 5  | 17  | 35 | 16.73 | -22 | 40 | 50.52 | 4.88581 | 40.63 | 10.1 |
| 4  | 6  | 17  | 35 | 20.97 | -22 | 40 | 52.40 | 4.87064 | 40.51 | 10.1 |
| 4  | 7  | 17  | 35 | 24.39 | -22 | 40 | 53.81 | 4.85557 | 40.38 | 10.0 |
| 4  | 8  | 17  | 35 | 27.00 | -22 | 40 | 54.78 | 4.84060 | 40.26 | 9.9  |
| 4  | 9  | 17  | 35 | 28.80 | -22 | 40 | 55.31 | 4.82575 | 40.13 | 9.9  |
| 4  | 10 | 17  | 35 | 29.78 | -22 | 40 | 55.42 | 4.81100 | 40.01 | 9.8  |
| 4  | 11 | 17  | 35 | 29.95 | -22 | 40 | 55.12 | 4.79638 | 39.89 | 9.7  |
| 4  | 12 | 17  | 35 | 29.30 | -22 | 40 | 54.41 | 4.78188 | 39.77 | 9.6  |
| 4  | 13 | 17  | 35 | 27.85 | -22 | 40 | 53.31 | 4.76750 | 39.65 | 9.5  |
| 4  | 14 | 17  | 35 | 25.57 | -22 | 40 | 51.81 | 4.75326 | 39.53 | 9.5  |
| 4  | 15 | 17  | 35 | 22.49 | -22 | 40 | 49.91 | 4.73915 | 39.41 | 9.4  |
| 4  | 16 | 17  | 35 | 18.59 | -22 | 40 | 47.60 | 4.72519 | 39.30 | 9.3  |
| 4  | 17 | 17  | 35 | 13.88 | -22 | 40 | 44.87 | 4.71136 | 39.18 | 9.2  |
| 4  | 18 | 17  | 35 | 8.37  | -22 | 40 | 41.71 | 4.69769 | 39.07 | 9.1  |
| 4  | 19 | 17  | 35 | 2.06  | -22 | 40 | 38.11 | 4.68416 | 38.96 | 9.0  |
| 4  | 20 | 17  | 34 | 54.95 | -22 | 40 | 34.09 | 4.67079 | 38.85 | 8.9  |
| 4  | 21 | 17  | 34 | 47.05 | -22 | 40 | 29.66 | 4.65759 | 38.74 | 8.8  |
| 4  | 22 | 17  | 34 | 38.36 | -22 | 40 | 24.81 | 4.64454 | 38.63 | 8.6  |
| 4  | 23 | 17  | 34 | 28.89 | -22 | 40 | 19.55 | 4.63166 | 38.52 | 8.5  |
| 4  | 24 | 17  | 34 | 18.63 | -22 | 40 | 13.89 | 4.61896 | 38.41 | 8.4  |
| 4  | 25 | 17  | 34 | 7.59  | -22 | 40 | 7.81  | 4.60643 | 38.31 | 8.3  |
| 4  | 26 | 17  | 33 | 55.76 | -22 | 40 | 1.31  | 4.59408 | 38.21 | 8.2  |
| 4  | 27 | 17  | 33 | 43.17 | -22 | 39 | 54.38 | 4.58192 | 38.11 | 8.0  |
| 4  | 28 | 17  | 33 | 29.80 | -22 | 39 | 47.00 | 4.56995 | 38.01 | 7.9  |
| 4  | 29 | 17  | 33 | 15.67 | -22 | 39 | 39.17 | 4.55817 | 37.91 | 7.8  |
| 4  | 30 | 17  | 33 | 0.79  | -22 | 39 | 30.87 | 4.54659 | 37.81 | 7.6  |

## 木星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 4 1       | 23:32     | 115     | 04:53     | 42S     | 10:10     | 245     | 39.85        | 37.27         | 0.99 | -2.2          |
| 4 2       | 23:29     | 115     | 04:49     | 42S     | 10:06     | 245     | 39.97        | 37.39         | 0.99 | -2.3          |
| 4 3       | 23:25     | 115     | 04:45     | 42S     | 10:02     | 245     | 40.10        | 37.50         | 0.99 | -2.3          |
| 4 4       | 23:21     | 115     | 04:42     | 42S     | 09:58     | 245     | 40.23        | 37.62         | 0.99 | -2.3          |
| 4 5       | 23:17     | 115     | 04:38     | 42S     | 09:55     | 245     | 40.35        | 37.74         | 0.99 | -2.3          |
| 4 6       | 23:13     | 115     | 04:34     | 42S     | 09:51     | 245     | 40.48        | 37.86         | 0.99 | -2.3          |
| 4 7       | 23:09     | 115     | 04:30     | 42S     | 09:47     | 245     | 40.60        | 37.97         | 0.99 | -2.3          |
| 4 8       | 23:05     | 115     | 04:26     | 42S     | 09:43     | 245     | 40.73        | 38.09         | 0.99 | -2.3          |
| 4 9       | 23:01     | 115     | 04:22     | 42S     | 09:39     | 245     | 40.85        | 38.21         | 0.99 | -2.3          |
| 4 10      | 22:58     | 115     | 04:18     | 42S     | 09:35     | 245     | 40.98        | 38.33         | 0.99 | -2.3          |
| 4 11      | 22:54     | 115     | 04:14     | 42S     | 09:31     | 245     | 41.10        | 38.44         | 0.99 | -2.3          |
| 4 12      | 22:50     | 115     | 04:10     | 42S     | 09:27     | 245     | 41.23        | 38.56         | 0.99 | -2.3          |
| 4 13      | 22:46     | 115     | 04:06     | 42S     | 09:23     | 245     | 41.35        | 38.68         | 0.99 | -2.3          |
| 4 14      | 22:42     | 115     | 04:02     | 42S     | 09:19     | 245     | 41.48        | 38.79         | 0.99 | -2.3          |
| 4 15      | 22:38     | 115     | 03:58     | 42S     | 09:15     | 245     | 41.60        | 38.91         | 0.99 | -2.3          |
| 4 16      | 22:34     | 115     | 03:55     | 42S     | 09:11     | 245     | 41.72        | 39.02         | 0.99 | -2.4          |
| 4 17      | 22:30     | 115     | 03:50     | 42S     | 09:07     | 245     | 41.84        | 39.14         | 0.99 | -2.4          |
| 4 18      | 22:26     | 115     | 03:46     | 42S     | 09:03     | 245     | 41.97        | 39.25         | 0.99 | -2.4          |
| 4 19      | 22:22     | 115     | 03:42     | 42S     | 08:59     | 245     | 42.09        | 39.36         | 0.99 | -2.4          |
| 4 20      | 22:18     | 115     | 03:38     | 42S     | 08:55     | 245     | 42.21        | 39.48         | 0.99 | -2.4          |
| 4 21      | 22:13     | 115     | 03:34     | 42S     | 08:51     | 245     | 42.33        | 39.59         | 0.99 | -2.4          |
| 4 22      | 22:09     | 115     | 03:30     | 42S     | 08:47     | 245     | 42.45        | 39.70         | 0.99 | -2.4          |
| 4 23      | 22:05     | 115     | 03:26     | 42S     | 08:43     | 245     | 42.56        | 39.81         | 0.99 | -2.4          |
| 4 24      | 22:01     | 115     | 03:22     | 42S     | 08:39     | 245     | 42.68        | 39.92         | 1.00 | -2.4          |
| 4 25      | 21:57     | 115     | 03:18     | 42S     | 08:35     | 245     | 42.80        | 40.03         | 1.00 | -2.4          |
| 4 26      | 21:53     | 115     | 03:14     | 42S     | 08:31     | 245     | 42.91        | 40.14         | 1.00 | -2.4          |
| 4 27      | 21:49     | 115     | 03:10     | 42S     | 08:26     | 245     | 43.03        | 40.24         | 1.00 | -2.4          |
| 4 28      | 21:45     | 115     | 03:06     | 42S     | 08:22     | 245     | 43.14        | 40.35         | 1.00 | -2.4          |
| 4 29      | 21:40     | 115     | 03:01     | 42S     | 08:18     | 245     | 43.25        | 40.45         | 1.00 | -2.4          |
| 4 30      | 21:36     | 115     | 02:57     | 42S     | 08:14     | 245     | 43.36        | 40.55         | 1.00 | -2.4          |

## 木 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 5  | 1  | 17  | 32 | 45.16 | -22 | 39 | 22.09 | 4.53521 | 37.72 | 7.5  |
| 5  | 2  | 17  | 32 | 28.79 | -22 | 39 | 12.83 | 4.52404 | 37.63 | 7.3  |
| 5  | 3  | 17  | 32 | 11.69 | -22 | 39 | 3.06  | 4.51308 | 37.53 | 7.2  |
| 5  | 4  | 17  | 31 | 53.88 | -22 | 38 | 52.80 | 4.50233 | 37.44 | 7.1  |
| 5  | 5  | 17  | 31 | 35.36 | -22 | 38 | 42.03 | 4.49181 | 37.36 | 6.9  |
| 5  | 6  | 17  | 31 | 16.15 | -22 | 38 | 30.77 | 4.48151 | 37.27 | 6.7  |
| 5  | 7  | 17  | 30 | 56.25 | -22 | 38 | 19.01 | 4.47143 | 37.19 | 6.6  |
| 5  | 8  | 17  | 30 | 35.70 | -22 | 38 | 6.76  | 4.46159 | 37.11 | 6.4  |
| 5  | 9  | 17  | 30 | 14.48 | -22 | 37 | 54.02 | 4.45198 | 37.03 | 6.3  |
| 5  | 10 | 17  | 29 | 52.62 | -22 | 37 | 40.79 | 4.44261 | 36.95 | 6.1  |
| 5  | 11 | 17  | 29 | 30.13 | -22 | 37 | 27.07 | 4.43348 | 36.87 | 5.9  |
| 5  | 12 | 17  | 29 | 7.03  | -22 | 37 | 12.85 | 4.42460 | 36.80 | 5.8  |
| 5  | 13 | 17  | 28 | 43.32 | -22 | 36 | 58.11 | 4.41596 | 36.73 | 5.6  |
| 5  | 14 | 17  | 28 | 19.02 | -22 | 36 | 42.83 | 4.40758 | 36.66 | 5.4  |
| 5  | 15 | 17  | 27 | 54.16 | -22 | 36 | 27.01 | 4.39945 | 36.59 | 5.3  |
| 5  | 16 | 17  | 27 | 28.74 | -22 | 36 | 10.65 | 4.39157 | 36.52 | 5.1  |
| 5  | 17 | 17  | 27 | 2.79  | -22 | 35 | 53.74 | 4.38395 | 36.46 | 4.9  |
| 5  | 18 | 17  | 26 | 36.33 | -22 | 35 | 36.29 | 4.37660 | 36.40 | 4.7  |
| 5  | 19 | 17  | 26 | 9.36  | -22 | 35 | 18.31 | 4.36950 | 36.34 | 4.5  |
| 5  | 20 | 17  | 25 | 41.91 | -22 | 34 | 59.81 | 4.36268 | 36.28 | 4.3  |
| 5  | 21 | 17  | 25 | 13.99 | -22 | 34 | 40.79 | 4.35612 | 36.23 | 4.2  |
| 5  | 22 | 17  | 24 | 45.61 | -22 | 34 | 21.25 | 4.34983 | 36.18 | 4.0  |
| 5  | 23 | 17  | 24 | 16.80 | -22 | 34 | 1.19  | 4.34381 | 36.13 | 3.8  |
| 5  | 24 | 17  | 23 | 47.57 | -22 | 33 | 40.60 | 4.33808 | 36.08 | 3.6  |
| 5  | 25 | 17  | 23 | 17.94 | -22 | 33 | 19.49 | 4.33261 | 36.03 | 3.4  |
| 5  | 26 | 17  | 22 | 47.93 | -22 | 32 | 57.84 | 4.32743 | 35.99 | 3.2  |
| 5  | 27 | 17  | 22 | 17.55 | -22 | 32 | 35.66 | 4.32254 | 35.95 | 3.0  |
| 5  | 28 | 17  | 21 | 46.84 | -22 | 32 | 12.95 | 4.31792 | 35.91 | 2.8  |
| 5  | 29 | 17  | 21 | 15.80 | -22 | 31 | 49.70 | 4.31360 | 35.88 | 2.6  |
| 5  | 30 | 17  | 20 | 44.47 | -22 | 31 | 25.93 | 4.30956 | 35.84 | 2.4  |
| 5  | 31 | 17  | 20 | 12.86 | -22 | 31 | 1.65  | 4.30581 | 35.81 | 2.2  |

## 木星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期  |    | 出     |     | 中 天   |     | 沒     |     | 視 直徑  |       | 相位   | 視    |
|-----|----|-------|-----|-------|-----|-------|-----|-------|-------|------|------|
| 月 日 |    | 時間    | 方位  | 時間    | 仰角  | 時間    | 方位  | 赤道    | 兩極    |      | 亮    |
|     |    | h m   | °   | h m   | °   | h m   | °   | "     | "     |      | 星    |
| 5   | 1  | 21:32 | 115 | 02:53 | 42S | 08:10 | 245 | 43.47 | 40.66 | 1.00 | -2.5 |
| 5   | 2  | 21:28 | 115 | 02:49 | 42S | 08:06 | 245 | 43.58 | 40.76 | 1.00 | -2.5 |
| 5   | 3  | 21:24 | 115 | 02:45 | 42S | 08:01 | 245 | 43.68 | 40.86 | 1.00 | -2.5 |
| 5   | 4  | 21:19 | 115 | 02:40 | 42S | 07:57 | 245 | 43.79 | 40.95 | 1.00 | -2.5 |
| 5   | 5  | 21:15 | 115 | 02:36 | 42S | 07:53 | 245 | 43.89 | 41.05 | 1.00 | -2.5 |
| 5   | 6  | 21:11 | 115 | 02:32 | 42S | 07:49 | 245 | 43.99 | 41.14 | 1.00 | -2.5 |
| 5   | 7  | 21:07 | 115 | 02:28 | 42S | 07:44 | 245 | 44.09 | 41.24 | 1.00 | -2.5 |
| 5   | 8  | 21:02 | 115 | 02:23 | 42S | 07:40 | 245 | 44.19 | 41.33 | 1.00 | -2.5 |
| 5   | 9  | 20:58 | 115 | 02:19 | 42S | 07:36 | 245 | 44.28 | 41.42 | 1.00 | -2.5 |
| 5   | 10 | 20:54 | 115 | 02:15 | 42S | 07:32 | 245 | 44.38 | 41.50 | 1.00 | -2.5 |
| 5   | 11 | 20:49 | 115 | 02:10 | 42S | 07:27 | 245 | 44.47 | 41.59 | 1.00 | -2.5 |
| 5   | 12 | 20:45 | 115 | 02:06 | 42S | 07:23 | 245 | 44.56 | 41.67 | 1.00 | -2.5 |
| 5   | 13 | 20:41 | 115 | 02:02 | 42S | 07:19 | 245 | 44.64 | 41.75 | 1.00 | -2.5 |
| 5   | 14 | 20:36 | 115 | 01:58 | 42S | 07:14 | 245 | 44.73 | 41.83 | 1.00 | -2.5 |
| 5   | 15 | 20:32 | 115 | 01:53 | 42S | 07:10 | 245 | 44.81 | 41.91 | 1.00 | -2.5 |
| 5   | 16 | 20:28 | 115 | 01:49 | 42S | 07:06 | 245 | 44.89 | 41.99 | 1.00 | -2.5 |
| 5   | 17 | 20:23 | 115 | 01:44 | 42S | 07:01 | 245 | 44.97 | 42.06 | 1.00 | -2.5 |
| 5   | 18 | 20:19 | 115 | 01:40 | 42S | 06:57 | 245 | 45.05 | 42.13 | 1.00 | -2.5 |
| 5   | 19 | 20:14 | 115 | 01:36 | 42S | 06:53 | 245 | 45.12 | 42.20 | 1.00 | -2.5 |
| 5   | 20 | 20:10 | 115 | 01:31 | 42S | 06:48 | 245 | 45.19 | 42.26 | 1.00 | -2.6 |
| 5   | 21 | 20:06 | 115 | 01:27 | 42S | 06:44 | 245 | 45.26 | 42.33 | 1.00 | -2.6 |
| 5   | 22 | 20:01 | 115 | 01:23 | 42S | 06:40 | 245 | 45.32 | 42.39 | 1.00 | -2.6 |
| 5   | 23 | 19:57 | 115 | 01:18 | 42S | 06:35 | 245 | 45.39 | 42.45 | 1.00 | -2.6 |
| 5   | 24 | 19:52 | 115 | 01:14 | 42S | 06:31 | 245 | 45.45 | 42.50 | 1.00 | -2.6 |
| 5   | 25 | 19:48 | 115 | 01:09 | 42S | 06:26 | 245 | 45.50 | 42.56 | 1.00 | -2.6 |
| 5   | 26 | 19:43 | 115 | 01:05 | 42S | 06:22 | 245 | 45.56 | 42.61 | 1.00 | -2.6 |
| 5   | 27 | 19:39 | 115 | 01:00 | 42S | 06:17 | 245 | 45.61 | 42.66 | 1.00 | -2.6 |
| 5   | 28 | 19:35 | 115 | 00:56 | 42S | 06:13 | 245 | 45.66 | 42.70 | 1.00 | -2.6 |
| 5   | 29 | 19:30 | 115 | 00:52 | 42S | 06:09 | 245 | 45.70 | 42.75 | 1.00 | -2.6 |
| 5   | 30 | 19:26 | 115 | 00:47 | 42S | 06:04 | 245 | 45.75 | 42.79 | 1.00 | -2.6 |
| 5   | 31 | 19:21 | 115 | 00:43 | 42S | 06:00 | 245 | 45.79 | 42.82 | 1.00 | -2.6 |

## 木 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 6  | 1  | 17  | 19 | 41.01 | -22 | 30 | 36.87 | 4.30236 | 35.78 | 2.0  |
| 6  | 2  | 17  | 19 | 8.92  | -22 | 30 | 11.61 | 4.29920 | 35.76 | 1.8  |
| 6  | 3  | 17  | 18 | 36.64 | -22 | 29 | 45.89 | 4.29633 | 35.73 | 1.6  |
| 6  | 4  | 17  | 18 | 4.17  | -22 | 29 | 19.75 | 4.29376 | 35.71 | 1.4  |
| 6  | 5  | 17  | 17 | 31.55 | -22 | 28 | 53.20 | 4.29149 | 35.69 | 1.2  |
| 6  | 6  | 17  | 16 | 58.80 | -22 | 28 | 26.28 | 4.28951 | 35.67 | 1.0  |
| 6  | 7  | 17  | 16 | 25.94 | -22 | 27 | 58.99 | 4.28784 | 35.66 | 0.8  |
| 6  | 8  | 17  | 15 | 52.98 | -22 | 27 | 31.35 | 4.28646 | 35.65 | 0.6  |
| 6  | 9  | 17  | 15 | 19.97 | -22 | 27 | 3.37  | 4.28538 | 35.64 | 0.4  |
| 6  | 10 | 17  | 14 | 46.91 | -22 | 26 | 35.07 | 4.28460 | 35.63 | 0.2  |
| 6  | 11 | 17  | 14 | 13.84 | -22 | 26 | 6.46  | 4.28411 | 35.63 | 0.1  |
| 6  | 12 | 17  | 13 | 40.77 | -22 | 25 | 37.56 | 4.28393 | 35.63 | 0.3  |
| 6  | 13 | 17  | 13 | 7.75  | -22 | 25 | 8.40  | 4.28404 | 35.63 | 0.5  |
| 6  | 14 | 17  | 12 | 34.77 | -22 | 24 | 39.01 | 4.28444 | 35.63 | 0.7  |
| 6  | 15 | 17  | 12 | 1.88  | -22 | 24 | 9.43  | 4.28514 | 35.64 | 0.9  |
| 6  | 16 | 17  | 11 | 29.10 | -22 | 23 | 39.69 | 4.28614 | 35.65 | 1.1  |
| 6  | 17 | 17  | 10 | 56.43 | -22 | 23 | 9.82  | 4.28743 | 35.66 | 1.3  |
| 6  | 18 | 17  | 10 | 23.91 | -22 | 22 | 39.86 | 4.28902 | 35.67 | 1.5  |
| 6  | 19 | 17  | 9  | 51.55 | -22 | 22 | 9.83  | 4.29089 | 35.69 | 1.7  |
| 6  | 20 | 17  | 9  | 19.38 | -22 | 21 | 39.76 | 4.29306 | 35.70 | 1.9  |
| 6  | 21 | 17  | 8  | 47.41 | -22 | 21 | 9.67  | 4.29552 | 35.72 | 2.1  |
| 6  | 22 | 17  | 8  | 15.66 | -22 | 20 | 39.59 | 4.29827 | 35.75 | 2.3  |
| 6  | 23 | 17  | 7  | 44.16 | -22 | 20 | 9.53  | 4.30130 | 35.77 | 2.5  |
| 6  | 24 | 17  | 7  | 12.93 | -22 | 19 | 39.53 | 4.30462 | 35.80 | 2.7  |
| 6  | 25 | 17  | 6  | 41.99 | -22 | 19 | 9.62  | 4.30823 | 35.83 | 2.9  |
| 6  | 26 | 17  | 6  | 11.35 | -22 | 18 | 39.83 | 4.31213 | 35.86 | 3.1  |
| 6  | 27 | 17  | 5  | 41.06 | -22 | 18 | 10.19 | 4.31630 | 35.90 | 3.3  |
| 6  | 28 | 17  | 5  | 11.12 | -22 | 17 | 40.75 | 4.32076 | 35.93 | 3.5  |
| 6  | 29 | 17  | 4  | 41.55 | -22 | 17 | 11.55 | 4.32549 | 35.97 | 3.7  |
| 6  | 30 | 17  | 4  | 12.39 | -22 | 16 | 42.63 | 4.33051 | 36.02 | 3.9  |



## 木星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |               |
| 6 1       | 19:17     | 115     | 00:38     | 42S     | 05:55     | 245     | 45.82 42.86          | 1.00 | -2.6          |
| 6 2       | 19:12     | 115     | 00:34     | 42S     | 05:51     | 245     | 45.86 42.89          | 1.00 | -2.6          |
| 6 3       | 19:08     | 115     | 00:29     | 42S     | 05:46     | 245     | 45.89 42.92          | 1.00 | -2.6          |
| 6 4       | 19:03     | 115     | 00:25     | 42S     | 05:42     | 245     | 45.91 42.94          | 1.00 | -2.6          |
| 6 5       | 18:59     | 115     | 00:20     | 42S     | 05:37     | 245     | 45.94 42.97          | 1.00 | -2.6          |
| 6 6       | 18:54     | 115     | 00:16     | 42S     | 05:33     | 245     | 45.96 42.99          | 1.00 | -2.6          |
| 6 7       | 18:50     | 115     | 00:11     | 42S     | 05:29     | 245     | 45.98 43.00          | 1.00 | -2.6          |
| 6 8       | 18:45     | 115     | 00:07     | 42S     | 05:24     | 245     | 45.99 43.02          | 1.00 | -2.6          |
| 6 9       | 18:41     | 115     | 00:02     | 42S     | 05:20     | 245     | 46.00 43.03          | 1.00 | -2.6          |
| 6 10      | 18:36     | 115     | 23:53     | 43S     | 05:15     | 245     | 46.01 43.03          | 1.00 | -2.6          |
| 6 11      | 18:32     | 115     | 23:49     | 43S     | 05:11     | 245     | 46.02 43.04          | 1.00 | -2.6          |
| 6 12      | 18:27     | 115     | 23:45     | 43S     | 05:06     | 245     | 46.02 43.04          | 1.00 | -2.6          |
| 6 13      | 18:23     | 115     | 23:40     | 43S     | 05:02     | 245     | 46.02 43.04          | 1.00 | -2.6          |
| 6 14      | 18:18     | 115     | 23:36     | 43S     | 04:57     | 245     | 46.01 43.04          | 1.00 | -2.6          |
| 6 15      | 18:14     | 115     | 23:31     | 43S     | 04:53     | 245     | 46.01 43.03          | 1.00 | -2.6          |
| 6 16      | 18:09     | 115     | 23:27     | 43S     | 04:48     | 245     | 46.00 43.02          | 1.00 | -2.6          |
| 6 17      | 18:05     | 115     | 23:22     | 43S     | 04:44     | 245     | 45.98 43.01          | 1.00 | -2.6          |
| 6 18      | 18:00     | 115     | 23:18     | 43S     | 04:39     | 245     | 45.97 42.99          | 1.00 | -2.6          |
| 6 19      | 17:56     | 115     | 23:13     | 43S     | 04:35     | 245     | 45.94 42.97          | 1.00 | -2.6          |
| 6 20      | 17:51     | 115     | 23:09     | 43S     | 04:31     | 245     | 45.92 42.95          | 1.00 | -2.6          |
| 6 21      | 17:47     | 115     | 23:04     | 43S     | 04:26     | 245     | 45.90 42.92          | 1.00 | -2.6          |
| 6 22      | 17:42     | 115     | 23:00     | 43S     | 04:22     | 245     | 45.87 42.90          | 1.00 | -2.6          |
| 6 23      | 17:38     | 115     | 22:55     | 43S     | 04:17     | 245     | 45.83 42.87          | 1.00 | -2.6          |
| 6 24      | 17:33     | 115     | 22:51     | 43S     | 04:13     | 245     | 45.80 42.83          | 1.00 | -2.6          |
| 6 25      | 17:29     | 114     | 22:46     | 43S     | 04:08     | 246     | 45.76 42.80          | 1.00 | -2.6          |
| 6 26      | 17:25     | 114     | 22:42     | 43S     | 04:04     | 246     | 45.72 42.76          | 1.00 | -2.6          |
| 6 27      | 17:20     | 114     | 22:38     | 43S     | 04:00     | 246     | 45.67 42.72          | 1.00 | -2.6          |
| 6 28      | 17:16     | 114     | 22:33     | 43S     | 03:55     | 246     | 45.63 42.67          | 1.00 | -2.6          |
| 6 29      | 17:11     | 114     | 22:29     | 43S     | 03:51     | 246     | 45.58 42.63          | 1.00 | -2.6          |
| 6 30      | 17:07     | 114     | 22:24     | 43S     | 03:46     | 246     | 45.52 42.58          | 1.00 | -2.6          |

## 木 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 7  | 1  | 17  | 3  | 43.64 | -22 | 16 | 14.04 | 4.33580 | 36.06 | 4.1  |
| 7  | 2  | 17  | 3  | 15.33 | -22 | 15 | 45.83 | 4.34136 | 36.11 | 4.3  |
| 7  | 3  | 17  | 2  | 47.47 | -22 | 15 | 18.04 | 4.34719 | 36.15 | 4.5  |
| 7  | 4  | 17  | 2  | 20.09 | -22 | 14 | 50.72 | 4.35329 | 36.21 | 4.7  |
| 7  | 5  | 17  | 1  | 53.20 | -22 | 14 | 23.89 | 4.35965 | 36.26 | 4.9  |
| 7  | 6  | 17  | 1  | 26.82 | -22 | 13 | 57.59 | 4.36628 | 36.31 | 5.0  |
| 7  | 7  | 17  | 1  | 0.96  | -22 | 13 | 31.83 | 4.37316 | 36.37 | 5.2  |
| 7  | 8  | 17  | 0  | 35.64 | -22 | 13 | 6.64  | 4.38030 | 36.43 | 5.4  |
| 7  | 9  | 17  | 0  | 10.88 | -22 | 12 | 42.06 | 4.38769 | 36.49 | 5.6  |
| 7  | 10 | 16  | 59 | 46.69 | -22 | 12 | 18.13 | 4.39532 | 36.56 | 5.7  |
| 7  | 11 | 16  | 59 | 23.10 | -22 | 11 | 54.87 | 4.40320 | 36.62 | 5.9  |
| 7  | 12 | 16  | 59 | 0.10  | -22 | 11 | 32.35 | 4.41132 | 36.69 | 6.1  |
| 7  | 13 | 16  | 58 | 37.73 | -22 | 11 | 10.58 | 4.41968 | 36.76 | 6.3  |
| 7  | 14 | 16  | 58 | 15.98 | -22 | 10 | 49.62 | 4.42827 | 36.83 | 6.4  |
| 7  | 15 | 16  | 57 | 54.87 | -22 | 10 | 29.49 | 4.43710 | 36.90 | 6.6  |
| 7  | 16 | 16  | 57 | 34.41 | -22 | 10 | 10.23 | 4.44615 | 36.98 | 6.7  |
| 7  | 17 | 16  | 57 | 14.60 | -22 | 9  | 51.84 | 4.45542 | 37.05 | 6.9  |
| 7  | 18 | 16  | 56 | 55.46 | -22 | 9  | 34.37 | 4.46491 | 37.13 | 7.0  |
| 7  | 19 | 16  | 56 | 37.00 | -22 | 9  | 17.81 | 4.47462 | 37.21 | 7.2  |
| 7  | 20 | 16  | 56 | 19.22 | -22 | 9  | 2.20  | 4.48454 | 37.30 | 7.3  |
| 7  | 21 | 16  | 56 | 2.13  | -22 | 8  | 47.55 | 4.49466 | 37.38 | 7.5  |
| 7  | 22 | 16  | 55 | 45.75 | -22 | 8  | 33.89 | 4.50500 | 37.47 | 7.6  |
| 7  | 23 | 16  | 55 | 30.08 | -22 | 8  | 21.22 | 4.51554 | 37.55 | 7.8  |
| 7  | 24 | 16  | 55 | 15.13 | -22 | 8  | 9.59  | 4.52627 | 37.64 | 7.9  |
| 7  | 25 | 16  | 55 | 0.92  | -22 | 7  | 59.01 | 4.53720 | 37.74 | 8.1  |
| 7  | 26 | 16  | 54 | 47.45 | -22 | 7  | 49.50 | 4.54832 | 37.83 | 8.2  |
| 7  | 27 | 16  | 54 | 34.72 | -22 | 7  | 41.10 | 4.55963 | 37.92 | 8.3  |
| 7  | 28 | 16  | 54 | 22.76 | -22 | 7  | 33.83 | 4.57112 | 38.02 | 8.4  |
| 7  | 29 | 16  | 54 | 11.55 | -22 | 7  | 27.73 | 4.58278 | 38.11 | 8.6  |
| 7  | 30 | 16  | 54 | 1.12  | -22 | 7  | 22.81 | 4.59463 | 38.21 | 8.7  |
| 7  | 31 | 16  | 53 | 51.46 | -22 | 7  | 19.10 | 4.60664 | 38.31 | 8.8  |

## 木星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視 亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |            |
| 7 1       | 17:02     | 114     | 22:20     | 43S     | 03:42     | 246     | 45.47 42.53          | 1.00 | -2.6       |
| 7 2       | 16:58     | 114     | 22:16     | 43S     | 03:38     | 246     | 45.41 42.47          | 1.00 | -2.6       |
| 7 3       | 16:54     | 114     | 22:11     | 43S     | 03:33     | 246     | 45.35 42.41          | 1.00 | -2.6       |
| 7 4       | 16:49     | 114     | 22:07     | 43S     | 03:29     | 246     | 45.29 42.36          | 1.00 | -2.6       |
| 7 5       | 16:45     | 114     | 22:02     | 43S     | 03:24     | 246     | 45.22 42.29          | 1.00 | -2.6       |
| 7 6       | 16:40     | 114     | 21:58     | 43S     | 03:20     | 246     | 45.15 42.23          | 1.00 | -2.6       |
| 7 7       | 16:36     | 114     | 21:54     | 43S     | 03:16     | 246     | 45.08 42.16          | 1.00 | -2.6       |
| 7 8       | 16:32     | 114     | 21:49     | 43S     | 03:11     | 246     | 45.01 42.09          | 1.00 | -2.5       |
| 7 9       | 16:27     | 114     | 21:45     | 43S     | 03:07     | 246     | 44.93 42.02          | 1.00 | -2.5       |
| 7 10      | 16:23     | 114     | 21:41     | 43S     | 03:03     | 246     | 44.85 41.95          | 1.00 | -2.5       |
| 7 11      | 16:19     | 114     | 21:36     | 43S     | 02:58     | 246     | 44.77 41.87          | 1.00 | -2.5       |
| 7 12      | 16:14     | 114     | 21:32     | 43S     | 02:54     | 246     | 44.69 41.80          | 1.00 | -2.5       |
| 7 13      | 16:10     | 114     | 21:28     | 43S     | 02:50     | 246     | 44.61 41.72          | 1.00 | -2.5       |
| 7 14      | 16:06     | 114     | 21:23     | 43S     | 02:46     | 246     | 44.52 41.64          | 1.00 | -2.5       |
| 7 15      | 16:01     | 114     | 21:19     | 43S     | 02:41     | 246     | 44.43 41.55          | 1.00 | -2.5       |
| 7 16      | 15:57     | 114     | 21:15     | 43S     | 02:37     | 246     | 44.34 41.47          | 1.00 | -2.5       |
| 7 17      | 15:53     | 114     | 21:11     | 43S     | 02:33     | 246     | 44.25 41.38          | 1.00 | -2.5       |
| 7 18      | 15:49     | 114     | 21:06     | 43S     | 02:29     | 246     | 44.15 41.30          | 1.00 | -2.5       |
| 7 19      | 15:44     | 114     | 21:02     | 43S     | 02:24     | 246     | 44.06 41.21          | 1.00 | -2.5       |
| 7 20      | 15:40     | 114     | 20:58     | 43S     | 02:20     | 246     | 43.96 41.12          | 1.00 | -2.5       |
| 7 21      | 15:36     | 114     | 20:54     | 43S     | 02:16     | 246     | 43.86 41.02          | 1.00 | -2.5       |
| 7 22      | 15:32     | 114     | 20:50     | 43S     | 02:12     | 246     | 43.76 40.93          | 1.00 | -2.5       |
| 7 23      | 15:27     | 114     | 20:45     | 43S     | 02:08     | 246     | 43.66 40.83          | 1.00 | -2.5       |
| 7 24      | 15:23     | 114     | 20:41     | 43S     | 02:03     | 246     | 43.56 40.74          | 1.00 | -2.5       |
| 7 25      | 15:19     | 114     | 20:37     | 43S     | 01:59     | 246     | 43.45 40.64          | 1.00 | -2.5       |
| 7 26      | 15:15     | 114     | 20:33     | 43S     | 01:55     | 246     | 43.34 40.54          | 1.00 | -2.5       |
| 7 27      | 15:11     | 114     | 20:29     | 43S     | 01:51     | 246     | 43.24 40.44          | 1.00 | -2.5       |
| 7 28      | 15:07     | 114     | 20:25     | 43S     | 01:47     | 246     | 43.13 40.34          | 1.00 | -2.4       |
| 7 29      | 15:03     | 114     | 20:21     | 43S     | 01:43     | 246     | 43.02 40.23          | 0.99 | -2.4       |
| 7 30      | 14:58     | 114     | 20:16     | 43S     | 01:39     | 246     | 42.91 40.13          | 0.99 | -2.4       |
| 7 31      | 14:54     | 114     | 20:12     | 43S     | 01:34     | 246     | 42.80 40.03          | 0.99 | -2.4       |

## 木 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 8  | 1  | 16  | 53 | 42.57 | -22 | 7  | 16.62 | 4.61882 | 38.41 | 8.9  |
| 8  | 2  | 16  | 53 | 34.47 | -22 | 7  | 15.35 | 4.63117 | 38.52 | 9.0  |
| 8  | 3  | 16  | 53 | 27.15 | -22 | 7  | 15.31 | 4.64367 | 38.62 | 9.1  |
| 8  | 4  | 16  | 53 | 20.61 | -22 | 7  | 16.48 | 4.65632 | 38.73 | 9.2  |
| 8  | 5  | 16  | 53 | 14.87 | -22 | 7  | 18.88 | 4.66912 | 38.83 | 9.3  |
| 8  | 6  | 16  | 53 | 9.93  | -22 | 7  | 22.51 | 4.68206 | 38.94 | 9.4  |
| 8  | 7  | 16  | 53 | 5.78  | -22 | 7  | 27.38 | 4.69514 | 39.05 | 9.5  |
| 8  | 8  | 16  | 53 | 2.44  | -22 | 7  | 33.51 | 4.70835 | 39.16 | 9.6  |
| 8  | 9  | 16  | 52 | 59.90 | -22 | 7  | 40.91 | 4.72169 | 39.27 | 9.7  |
| 8  | 10 | 16  | 52 | 58.15 | -22 | 7  | 49.57 | 4.73516 | 39.38 | 9.8  |
| 8  | 11 | 16  | 52 | 57.21 | -22 | 7  | 59.51 | 4.74875 | 39.49 | 9.9  |
| 8  | 12 | 16  | 52 | 57.07 | -22 | 8  | 10.72 | 4.76245 | 39.61 | 10.0 |
| 8  | 13 | 16  | 52 | 57.71 | -22 | 8  | 23.20 | 4.77627 | 39.72 | 10.1 |
| 8  | 14 | 16  | 52 | 59.16 | -22 | 8  | 36.92 | 4.79019 | 39.84 | 10.1 |
| 8  | 15 | 16  | 53 | 1.39  | -22 | 8  | 51.89 | 4.80422 | 39.96 | 10.2 |
| 8  | 16 | 16  | 53 | 4.41  | -22 | 9  | 8.08  | 4.81835 | 40.07 | 10.3 |
| 8  | 17 | 16  | 53 | 8.22  | -22 | 9  | 25.49 | 4.83257 | 40.19 | 10.3 |
| 8  | 18 | 16  | 53 | 12.81 | -22 | 9  | 44.10 | 4.84689 | 40.31 | 10.4 |
| 8  | 19 | 16  | 53 | 18.20 | -22 | 10 | 3.90  | 4.86129 | 40.43 | 10.5 |
| 8  | 20 | 16  | 53 | 24.36 | -22 | 10 | 24.87 | 4.87578 | 40.55 | 10.5 |
| 8  | 21 | 16  | 53 | 31.31 | -22 | 10 | 47.02 | 4.89035 | 40.67 | 10.6 |
| 8  | 22 | 16  | 53 | 39.05 | -22 | 11 | 10.33 | 4.90499 | 40.79 | 10.6 |
| 8  | 23 | 16  | 53 | 47.56 | -22 | 11 | 34.80 | 4.91971 | 40.92 | 10.7 |
| 8  | 24 | 16  | 53 | 56.86 | -22 | 12 | 0.42  | 4.93449 | 41.04 | 10.7 |
| 8  | 25 | 16  | 54 | 6.93  | -22 | 12 | 27.19 | 4.94934 | 41.16 | 10.8 |
| 8  | 26 | 16  | 54 | 17.78 | -22 | 12 | 55.11 | 4.96425 | 41.29 | 10.8 |
| 8  | 27 | 16  | 54 | 29.40 | -22 | 13 | 24.16 | 4.97922 | 41.41 | 10.8 |
| 8  | 28 | 16  | 54 | 41.79 | -22 | 13 | 54.32 | 4.99423 | 41.54 | 10.9 |
| 8  | 29 | 16  | 54 | 54.94 | -22 | 14 | 25.58 | 5.00930 | 41.66 | 10.9 |
| 8  | 30 | 16  | 55 | 8.85  | -22 | 14 | 57.90 | 5.02440 | 41.79 | 10.9 |
| 8  | 31 | 16  | 55 | 23.50 | -22 | 15 | 31.26 | 5.03955 | 41.91 | 10.9 |

## 木星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |               |
| 8 1       | 14:50     | 114     | 20:08     | 43S     | 01:30     | 246     | 42.68 39.92          | 0.99 | -2.4          |
| 8 2       | 14:46     | 114     | 20:04     | 43S     | 01:26     | 246     | 42.57 39.81          | 0.99 | -2.4          |
| 8 3       | 14:42     | 114     | 20:00     | 43S     | 01:22     | 246     | 42.45 39.71          | 0.99 | -2.4          |
| 8 4       | 14:38     | 114     | 19:56     | 43S     | 01:18     | 246     | 42.34 39.60          | 0.99 | -2.4          |
| 8 5       | 14:34     | 114     | 19:52     | 43S     | 01:14     | 246     | 42.22 39.49          | 0.99 | -2.4          |
| 8 6       | 14:30     | 114     | 19:48     | 43S     | 01:10     | 246     | 42.11 39.38          | 0.99 | -2.4          |
| 8 7       | 14:26     | 114     | 19:44     | 43S     | 01:06     | 246     | 41.99 39.27          | 0.99 | -2.4          |
| 8 8       | 14:22     | 114     | 19:40     | 43S     | 01:02     | 246     | 41.87 39.16          | 0.99 | -2.4          |
| 8 9       | 14:18     | 114     | 19:36     | 43S     | 00:58     | 246     | 41.75 39.05          | 0.99 | -2.4          |
| 8 10      | 14:14     | 114     | 19:32     | 43S     | 00:54     | 246     | 41.63 38.94          | 0.99 | -2.4          |
| 8 11      | 14:10     | 114     | 19:28     | 43S     | 00:50     | 246     | 41.51 38.83          | 0.99 | -2.4          |
| 8 12      | 14:06     | 114     | 19:24     | 43S     | 00:46     | 246     | 41.40 38.72          | 0.99 | -2.3          |
| 8 13      | 14:02     | 114     | 19:20     | 43S     | 00:42     | 246     | 41.28 38.60          | 0.99 | -2.3          |
| 8 14      | 13:59     | 114     | 19:17     | 43S     | 00:38     | 246     | 41.16 38.49          | 0.99 | -2.3          |
| 8 15      | 13:55     | 114     | 19:13     | 43S     | 00:35     | 246     | 41.04 38.38          | 0.99 | -2.3          |
| 8 16      | 13:51     | 114     | 19:09     | 43S     | 00:31     | 246     | 40.92 38.27          | 0.99 | -2.3          |
| 8 17      | 13:47     | 114     | 19:05     | 43S     | 00:27     | 246     | 40.79 38.15          | 0.99 | -2.3          |
| 8 18      | 13:43     | 114     | 19:01     | 43S     | 00:23     | 246     | 40.67 38.04          | 0.99 | -2.3          |
| 8 19      | 13:39     | 114     | 18:57     | 43S     | 00:19     | 246     | 40.55 37.93          | 0.99 | -2.3          |
| 8 20      | 13:35     | 114     | 18:53     | 43S     | 00:15     | 246     | 40.43 37.82          | 0.99 | -2.3          |
| 8 21      | 13:32     | 114     | 18:50     | 43S     | 00:11     | 246     | 40.31 37.70          | 0.99 | -2.3          |
| 8 22      | 13:28     | 114     | 18:46     | 43S     | 00:08     | 246     | 40.19 37.59          | 0.99 | -2.3          |
| 8 23      | 13:24     | 114     | 18:42     | 43S     | 00:04     | 246     | 40.07 37.48          | 0.99 | -2.3          |
| 8 24      | 13:20     | 114     | 18:38     | 43S     | 23:56     | 246     | 39.95 37.37          | 0.99 | -2.3          |
| 8 25      | 13:17     | 114     | 18:34     | 43S     | 23:52     | 246     | 39.83 37.25          | 0.99 | -2.3          |
| 8 26      | 13:13     | 114     | 18:31     | 43S     | 23:49     | 246     | 39.71 37.14          | 0.99 | -2.3          |
| 8 27      | 13:09     | 114     | 18:27     | 43S     | 23:45     | 246     | 39.59 37.03          | 0.99 | -2.3          |
| 8 28      | 13:05     | 114     | 18:23     | 43S     | 23:41     | 246     | 39.47 36.92          | 0.99 | -2.2          |
| 8 29      | 13:02     | 114     | 18:20     | 43S     | 23:37     | 246     | 39.36 36.81          | 0.99 | -2.2          |
| 8 30      | 12:58     | 114     | 18:16     | 43S     | 23:34     | 246     | 39.24 36.70          | 0.99 | -2.2          |
| 8 31      | 12:54     | 114     | 18:12     | 43S     | 23:30     | 246     | 39.12 36.59          | 0.99 | -2.2          |

## 木 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 9  | 1  | 16  | 55 | 38.92 | -22 | 16 | 5.62  | 5.05473 | 42.04 | 11.0 |
| 9  | 2  | 16  | 55 | 55.07 | -22 | 16 | 40.95 | 5.06994 | 42.17 | 11.0 |
| 9  | 3  | 16  | 56 | 11.98 | -22 | 17 | 17.25 | 5.08517 | 42.29 | 11.0 |
| 9  | 4  | 16  | 56 | 29.62 | -22 | 17 | 54.49 | 5.10043 | 42.42 | 11.0 |
| 9  | 5  | 16  | 56 | 48.00 | -22 | 18 | 32.66 | 5.11570 | 42.55 | 11.0 |
| 9  | 6  | 16  | 57 | 7.11  | -22 | 19 | 11.75 | 5.13098 | 42.67 | 11.0 |
| 9  | 7  | 16  | 57 | 26.94 | -22 | 19 | 51.74 | 5.14628 | 42.80 | 11.0 |
| 9  | 8  | 16  | 57 | 47.48 | -22 | 20 | 32.58 | 5.16157 | 42.93 | 11.0 |
| 9  | 9  | 16  | 58 | 8.73  | -22 | 21 | 14.27 | 5.17687 | 43.06 | 11.0 |
| 9  | 10 | 16  | 58 | 30.68 | -22 | 21 | 56.75 | 5.19217 | 43.18 | 11.0 |
| 9  | 11 | 16  | 58 | 53.31 | -22 | 22 | 40.00 | 5.20746 | 43.31 | 11.0 |
| 9  | 12 | 16  | 59 | 16.64 | -22 | 23 | 23.99 | 5.22275 | 43.44 | 11.0 |
| 9  | 13 | 16  | 59 | 40.64 | -22 | 24 | 8.67  | 5.23802 | 43.56 | 11.0 |
| 9  | 14 | 17  | 0  | 5.32  | -22 | 24 | 54.02 | 5.25327 | 43.69 | 11.0 |
| 9  | 15 | 17  | 0  | 30.66 | -22 | 25 | 39.99 | 5.26850 | 43.82 | 11.0 |
| 9  | 16 | 17  | 0  | 56.67 | -22 | 26 | 26.58 | 5.28372 | 43.94 | 10.9 |
| 9  | 17 | 17  | 1  | 23.34 | -22 | 27 | 13.73 | 5.29890 | 44.07 | 10.9 |
| 9  | 18 | 17  | 1  | 50.67 | -22 | 28 | 1.44  | 5.31406 | 44.20 | 10.9 |
| 9  | 19 | 17  | 2  | 18.64 | -22 | 28 | 49.67 | 5.32918 | 44.32 | 10.9 |
| 9  | 20 | 17  | 2  | 47.26 | -22 | 29 | 38.40 | 5.34427 | 44.45 | 10.8 |
| 9  | 21 | 17  | 3  | 16.52 | -22 | 30 | 27.62 | 5.35932 | 44.57 | 10.8 |
| 9  | 22 | 17  | 3  | 46.41 | -22 | 31 | 17.30 | 5.37433 | 44.70 | 10.8 |
| 9  | 23 | 17  | 4  | 16.93 | -22 | 32 | 7.42  | 5.38929 | 44.82 | 10.7 |
| 9  | 24 | 17  | 4  | 48.07 | -22 | 32 | 57.94 | 5.40420 | 44.95 | 10.7 |
| 9  | 25 | 17  | 5  | 19.82 | -22 | 33 | 48.84 | 5.41906 | 45.07 | 10.6 |
| 9  | 26 | 17  | 5  | 52.18 | -22 | 34 | 40.08 | 5.43386 | 45.19 | 10.6 |
| 9  | 27 | 17  | 6  | 25.13 | -22 | 35 | 31.62 | 5.44860 | 45.32 | 10.6 |
| 9  | 28 | 17  | 6  | 58.68 | -22 | 36 | 23.40 | 5.46328 | 45.44 | 10.5 |
| 9  | 29 | 17  | 7  | 32.82 | -22 | 37 | 15.40 | 5.47789 | 45.56 | 10.5 |
| 9  | 30 | 17  | 8  | 7.55  | -22 | 38 | 7.58  | 5.49243 | 45.68 | 10.4 |

## 木星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 9 1       | 12:51     | 114     | 18:09     | 43S     | 23:26     | 246     | 39.00        | 36.48         | 0.99 | -2.2          |
| 9 2       | 12:47     | 114     | 18:05     | 43S     | 23:23     | 246     | 38.88        | 36.37         | 0.99 | -2.2          |
| 9 3       | 12:43     | 114     | 18:01     | 43S     | 23:19     | 246     | 38.77        | 36.26         | 0.99 | -2.2          |
| 9 4       | 12:40     | 114     | 17:58     | 43S     | 23:15     | 246     | 38.65        | 36.15         | 0.99 | -2.2          |
| 9 5       | 12:36     | 114     | 17:54     | 43S     | 23:12     | 246     | 38.54        | 36.04         | 0.99 | -2.2          |
| 9 6       | 12:33     | 115     | 17:50     | 43S     | 23:08     | 245     | 38.42        | 35.93         | 0.99 | -2.2          |
| 9 7       | 12:29     | 115     | 17:47     | 43S     | 23:04     | 245     | 38.31        | 35.83         | 0.99 | -2.2          |
| 9 8       | 12:26     | 115     | 17:43     | 43S     | 23:01     | 245     | 38.19        | 35.72         | 0.99 | -2.2          |
| 9 9       | 12:22     | 115     | 17:40     | 43S     | 22:57     | 245     | 38.08        | 35.62         | 0.99 | -2.2          |
| 9 10      | 12:18     | 115     | 17:36     | 43S     | 22:54     | 245     | 37.97        | 35.51         | 0.99 | -2.2          |
| 9 11      | 12:15     | 115     | 17:32     | 43S     | 22:50     | 245     | 37.86        | 35.41         | 0.99 | -2.2          |
| 9 12      | 12:11     | 115     | 17:29     | 43S     | 22:46     | 245     | 37.75        | 35.30         | 0.99 | -2.1          |
| 9 13      | 12:08     | 115     | 17:25     | 43S     | 22:43     | 245     | 37.64        | 35.20         | 0.99 | -2.1          |
| 9 14      | 12:04     | 115     | 17:22     | 43S     | 22:39     | 245     | 37.53        | 35.10         | 0.99 | -2.1          |
| 9 15      | 12:01     | 115     | 17:18     | 43S     | 22:36     | 245     | 37.42        | 35.00         | 0.99 | -2.1          |
| 9 16      | 11:57     | 115     | 17:15     | 42S     | 22:32     | 245     | 37.31        | 34.90         | 0.99 | -2.1          |
| 9 17      | 11:54     | 115     | 17:11     | 42S     | 22:29     | 245     | 37.20        | 34.80         | 0.99 | -2.1          |
| 9 18      | 11:51     | 115     | 17:08     | 42S     | 22:25     | 245     | 37.10        | 34.70         | 0.99 | -2.1          |
| 9 19      | 11:47     | 115     | 17:04     | 42S     | 22:22     | 245     | 36.99        | 34.60         | 0.99 | -2.1          |
| 9 20      | 11:44     | 115     | 17:01     | 42S     | 22:18     | 245     | 36.89        | 34.50         | 0.99 | -2.1          |
| 9 21      | 11:40     | 115     | 16:58     | 42S     | 22:15     | 245     | 36.79        | 34.40         | 0.99 | -2.1          |
| 9 22      | 11:37     | 115     | 16:54     | 42S     | 22:11     | 245     | 36.68        | 34.31         | 0.99 | -2.1          |
| 9 23      | 11:33     | 115     | 16:51     | 42S     | 22:08     | 245     | 36.58        | 34.21         | 0.99 | -2.1          |
| 9 24      | 11:30     | 115     | 16:47     | 42S     | 22:04     | 245     | 36.48        | 34.12         | 0.99 | -2.1          |
| 9 25      | 11:27     | 115     | 16:44     | 42S     | 22:01     | 245     | 36.38        | 34.02         | 0.99 | -2.1          |
| 9 26      | 11:23     | 115     | 16:41     | 42S     | 21:58     | 245     | 36.28        | 33.93         | 0.99 | -2.1          |
| 9 27      | 11:20     | 115     | 16:37     | 42S     | 21:54     | 245     | 36.18        | 33.84         | 0.99 | -2.1          |
| 9 28      | 11:17     | 115     | 16:34     | 42S     | 21:51     | 245     | 36.09        | 33.75         | 0.99 | -2.1          |
| 9 29      | 11:13     | 115     | 16:30     | 42S     | 21:47     | 245     | 35.99        | 33.66         | 0.99 | -2.1          |
| 9 30      | 11:10     | 115     | 16:27     | 42S     | 21:44     | 245     | 35.89        | 33.57         | 0.99 | -2.0          |

## 木 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 10 | 1  | 17  | 8  | 42.86 | -22 | 38 | 59.91 | 5.50690 | 45.80 | 10.3 |
| 10 | 2  | 17  | 9  | 18.73 | -22 | 39 | 52.38 | 5.52129 | 45.92 | 10.3 |
| 10 | 3  | 17  | 9  | 55.18 | -22 | 40 | 44.97 | 5.53560 | 46.04 | 10.2 |
| 10 | 4  | 17  | 10 | 32.18 | -22 | 41 | 37.64 | 5.54982 | 46.16 | 10.2 |
| 10 | 5  | 17  | 11 | 9.73  | -22 | 42 | 30.36 | 5.56396 | 46.27 | 10.1 |
| 10 | 6  | 17  | 11 | 47.81 | -22 | 43 | 23.11 | 5.57800 | 46.39 | 10.0 |
| 10 | 7  | 17  | 12 | 26.43 | -22 | 44 | 15.84 | 5.59196 | 46.51 | 10.0 |
| 10 | 8  | 17  | 13 | 5.57  | -22 | 45 | 8.51  | 5.60581 | 46.62 | 9.9  |
| 10 | 9  | 17  | 13 | 45.22 | -22 | 46 | 1.09  | 5.61957 | 46.74 | 9.8  |
| 10 | 10 | 17  | 14 | 25.38 | -22 | 46 | 53.54 | 5.63323 | 46.85 | 9.8  |
| 10 | 11 | 17  | 15 | 6.05  | -22 | 47 | 45.81 | 5.64679 | 46.96 | 9.7  |
| 10 | 12 | 17  | 15 | 47.20 | -22 | 48 | 37.88 | 5.66023 | 47.08 | 9.6  |
| 10 | 13 | 17  | 16 | 28.85 | -22 | 49 | 29.71 | 5.67358 | 47.19 | 9.5  |
| 10 | 14 | 17  | 17 | 10.98 | -22 | 50 | 21.26 | 5.68681 | 47.30 | 9.4  |
| 10 | 15 | 17  | 17 | 53.59 | -22 | 51 | 12.52 | 5.69992 | 47.41 | 9.4  |
| 10 | 16 | 17  | 18 | 36.67 | -22 | 52 | 3.46  | 5.71292 | 47.51 | 9.3  |
| 10 | 17 | 17  | 19 | 20.23 | -22 | 52 | 54.06 | 5.72581 | 47.62 | 9.2  |
| 10 | 18 | 17  | 20 | 4.24  | -22 | 53 | 44.29 | 5.73857 | 47.73 | 9.1  |
| 10 | 19 | 17  | 20 | 48.71 | -22 | 54 | 34.13 | 5.75121 | 47.83 | 9.0  |
| 10 | 20 | 17  | 21 | 33.63 | -22 | 55 | 23.56 | 5.76373 | 47.94 | 8.9  |
| 10 | 21 | 17  | 22 | 18.99 | -22 | 56 | 12.55 | 5.77612 | 48.04 | 8.8  |
| 10 | 22 | 17  | 23 | 4.78  | -22 | 57 | 1.08  | 5.78837 | 48.14 | 8.7  |
| 10 | 23 | 17  | 23 | 51.00 | -22 | 57 | 49.11 | 5.80050 | 48.24 | 8.6  |
| 10 | 24 | 17  | 24 | 37.65 | -22 | 58 | 36.60 | 5.81249 | 48.34 | 8.5  |
| 10 | 25 | 17  | 25 | 24.70 | -22 | 59 | 23.52 | 5.82434 | 48.44 | 8.4  |
| 10 | 26 | 17  | 26 | 12.17 | -23 | 0  | 9.82  | 5.83605 | 48.54 | 8.3  |
| 10 | 27 | 17  | 27 | 0.04  | -23 | 0  | 55.47 | 5.84761 | 48.63 | 8.2  |
| 10 | 28 | 17  | 27 | 48.31 | -23 | 1  | 40.45 | 5.85903 | 48.73 | 8.1  |
| 10 | 29 | 17  | 28 | 36.98 | -23 | 2  | 24.75 | 5.87030 | 48.82 | 8.0  |
| 10 | 30 | 17  | 29 | 26.04 | -23 | 3  | 8.34  | 5.88142 | 48.91 | 7.9  |
| 10 | 31 | 17  | 30 | 15.47 | -23 | 3  | 51.20 | 5.89239 | 49.01 | 7.8  |



## 木星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |               |
| 10 1      | 11:07     | 115     | 16:24     | 42S     | 21:41     | 245     | 35.80 33.48          | 0.99 | -2.0          |
| 10 2      | 11:03     | 115     | 16:20     | 42S     | 21:37     | 245     | 35.71 33.39          | 0.99 | -2.0          |
| 10 3      | 11:00     | 115     | 16:17     | 42S     | 21:34     | 245     | 35.61 33.31          | 0.99 | -2.0          |
| 10 4      | 10:57     | 115     | 16:14     | 42S     | 21:31     | 245     | 35.52 33.22          | 0.99 | -2.0          |
| 10 5      | 10:54     | 115     | 16:10     | 42S     | 21:27     | 245     | 35.43 33.14          | 0.99 | -2.0          |
| 10 6      | 10:50     | 115     | 16:07     | 42S     | 21:24     | 245     | 35.34 33.05          | 0.99 | -2.0          |
| 10 7      | 10:47     | 115     | 16:04     | 42S     | 21:21     | 245     | 35.25 32.97          | 0.99 | -2.0          |
| 10 8      | 10:44     | 115     | 16:01     | 42S     | 21:17     | 245     | 35.17 32.89          | 0.99 | -2.0          |
| 10 9      | 10:41     | 115     | 15:57     | 42S     | 21:14     | 245     | 35.08 32.81          | 0.99 | -2.0          |
| 10 10     | 10:37     | 115     | 15:54     | 42S     | 21:11     | 245     | 35.00 32.73          | 0.99 | -2.0          |
| 10 11     | 10:34     | 115     | 15:51     | 42S     | 21:07     | 245     | 34.91 32.65          | 0.99 | -2.0          |
| 10 12     | 10:31     | 115     | 15:48     | 42S     | 21:04     | 245     | 34.83 32.57          | 0.99 | -2.0          |
| 10 13     | 10:28     | 115     | 15:44     | 42S     | 21:01     | 245     | 34.75 32.50          | 0.99 | -2.0          |
| 10 14     | 10:24     | 115     | 15:41     | 42S     | 20:58     | 245     | 34.67 32.42          | 0.99 | -2.0          |
| 10 15     | 10:21     | 115     | 15:38     | 42S     | 20:54     | 245     | 34.59 32.35          | 0.99 | -2.0          |
| 10 16     | 10:18     | 115     | 15:35     | 42S     | 20:51     | 245     | 34.51 32.27          | 0.99 | -2.0          |
| 10 17     | 10:15     | 115     | 15:31     | 42S     | 20:48     | 245     | 34.43 32.20          | 0.99 | -2.0          |
| 10 18     | 10:12     | 115     | 15:28     | 42S     | 20:45     | 245     | 34.35 32.13          | 0.99 | -2.0          |
| 10 19     | 10:09     | 115     | 15:25     | 42S     | 20:41     | 245     | 34.28 32.06          | 0.99 | -2.0          |
| 10 20     | 10:05     | 115     | 15:22     | 42S     | 20:38     | 245     | 34.20 31.99          | 0.99 | -2.0          |
| 10 21     | 10:02     | 115     | 15:19     | 42S     | 20:35     | 245     | 34.13 31.92          | 0.99 | -1.9          |
| 10 22     | 09:59     | 115     | 15:15     | 42S     | 20:32     | 245     | 34.06 31.85          | 0.99 | -1.9          |
| 10 23     | 09:56     | 115     | 15:12     | 42S     | 20:29     | 245     | 33.99 31.79          | 0.99 | -1.9          |
| 10 24     | 09:53     | 115     | 15:09     | 42S     | 20:25     | 245     | 33.92 31.72          | 0.99 | -1.9          |
| 10 25     | 09:50     | 115     | 15:06     | 42S     | 20:22     | 245     | 33.85 31.66          | 1.00 | -1.9          |
| 10 26     | 09:47     | 115     | 15:03     | 42S     | 20:19     | 245     | 33.78 31.59          | 1.00 | -1.9          |
| 10 27     | 09:44     | 115     | 15:00     | 42S     | 20:16     | 245     | 33.71 31.53          | 1.00 | -1.9          |
| 10 28     | 09:40     | 115     | 14:57     | 42S     | 20:13     | 245     | 33.65 31.47          | 1.00 | -1.9          |
| 10 29     | 09:37     | 115     | 14:53     | 42S     | 20:10     | 245     | 33.58 31.41          | 1.00 | -1.9          |
| 10 30     | 09:34     | 115     | 14:50     | 42S     | 20:06     | 245     | 33.52 31.35          | 1.00 | -1.9          |
| 10 31     | 09:31     | 115     | 14:47     | 42S     | 20:03     | 245     | 33.46 31.29          | 1.00 | -1.9          |

## 木 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 11 | 1  | 17  | 31 | 5.27  | -23 | 4  | 33.33 | 5.90320 | 49.10 | 7.7  |
| 11 | 2  | 17  | 31 | 55.44 | -23 | 5  | 14.68 | 5.91385 | 49.18 | 7.6  |
| 11 | 3  | 17  | 32 | 45.96 | -23 | 5  | 55.24 | 5.92434 | 49.27 | 7.5  |
| 11 | 4  | 17  | 33 | 36.82 | -23 | 6  | 34.97 | 5.93467 | 49.36 | 7.4  |
| 11 | 5  | 17  | 34 | 28.02 | -23 | 7  | 13.83 | 5.94484 | 49.44 | 7.2  |
| 11 | 6  | 17  | 35 | 19.55 | -23 | 7  | 51.79 | 5.95484 | 49.53 | 7.1  |
| 11 | 7  | 17  | 36 | 11.40 | -23 | 8  | 28.84 | 5.96467 | 49.61 | 7.0  |
| 11 | 8  | 17  | 37 | 3.57  | -23 | 9  | 4.92  | 5.97434 | 49.69 | 6.9  |
| 11 | 9  | 17  | 37 | 56.05 | -23 | 9  | 40.04 | 5.98383 | 49.77 | 6.8  |
| 11 | 10 | 17  | 38 | 48.84 | -23 | 10 | 14.14 | 5.99315 | 49.84 | 6.7  |
| 11 | 11 | 17  | 39 | 41.92 | -23 | 10 | 47.23 | 6.00231 | 49.92 | 6.5  |
| 11 | 12 | 17  | 40 | 35.31 | -23 | 11 | 19.28 | 6.01128 | 49.99 | 6.4  |
| 11 | 13 | 17  | 41 | 28.98 | -23 | 11 | 50.27 | 6.02008 | 50.07 | 6.3  |
| 11 | 14 | 17  | 42 | 22.94 | -23 | 12 | 20.19 | 6.02870 | 50.14 | 6.2  |
| 11 | 15 | 17  | 43 | 17.17 | -23 | 12 | 49.04 | 6.03715 | 50.21 | 6.0  |
| 11 | 16 | 17  | 44 | 11.68 | -23 | 13 | 16.80 | 6.04541 | 50.28 | 5.9  |
| 11 | 17 | 17  | 45 | 6.46  | -23 | 13 | 43.46 | 6.05349 | 50.35 | 5.8  |
| 11 | 18 | 17  | 46 | 1.49  | -23 | 14 | 8.99  | 6.06139 | 50.41 | 5.6  |
| 11 | 19 | 17  | 46 | 56.78 | -23 | 14 | 33.38 | 6.06911 | 50.48 | 5.5  |
| 11 | 20 | 17  | 47 | 52.30 | -23 | 14 | 56.60 | 6.07663 | 50.54 | 5.4  |
| 11 | 21 | 17  | 48 | 48.07 | -23 | 15 | 18.61 | 6.08397 | 50.60 | 5.3  |
| 11 | 22 | 17  | 49 | 44.07 | -23 | 15 | 39.41 | 6.09112 | 50.66 | 5.1  |
| 11 | 23 | 17  | 50 | 40.30 | -23 | 15 | 58.95 | 6.09807 | 50.72 | 5.0  |
| 11 | 24 | 17  | 51 | 36.76 | -23 | 16 | 17.23 | 6.10483 | 50.77 | 4.9  |
| 11 | 25 | 17  | 52 | 33.43 | -23 | 16 | 34.24 | 6.11140 | 50.83 | 4.7  |
| 11 | 26 | 17  | 53 | 30.32 | -23 | 16 | 49.96 | 6.11777 | 50.88 | 4.6  |
| 11 | 27 | 17  | 54 | 27.41 | -23 | 17 | 4.40  | 6.12394 | 50.93 | 4.4  |
| 11 | 28 | 17  | 55 | 24.70 | -23 | 17 | 17.56 | 6.12991 | 50.98 | 4.3  |
| 11 | 29 | 17  | 56 | 22.19 | -23 | 17 | 29.42 | 6.13568 | 51.03 | 4.2  |
| 11 | 30 | 17  | 57 | 19.85 | -23 | 17 | 39.96 | 6.14125 | 51.08 | 4.0  |

## 木星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |               |
| 11 1      | 09:28     | 115     | 14:44     | 42S     | 20:00     | 245     | 33.40 31.23          | 1.00 | -1.9          |
| 11 2      | 09:25     | 115     | 14:41     | 42S     | 19:57     | 245     | 33.34 31.18          | 1.00 | -1.9          |
| 11 3      | 09:22     | 115     | 14:38     | 42S     | 19:54     | 245     | 33.28 31.12          | 1.00 | -1.9          |
| 11 4      | 09:19     | 115     | 14:35     | 42S     | 19:51     | 245     | 33.22 31.07          | 1.00 | -1.9          |
| 11 5      | 09:16     | 115     | 14:32     | 42S     | 19:48     | 245     | 33.16 31.01          | 1.00 | -1.9          |
| 11 6      | 09:13     | 115     | 14:29     | 42S     | 19:45     | 245     | 33.11 30.96          | 1.00 | -1.9          |
| 11 7      | 09:10     | 115     | 14:26     | 42S     | 19:42     | 245     | 33.05 30.91          | 1.00 | -1.9          |
| 11 8      | 09:07     | 115     | 14:23     | 42S     | 19:39     | 245     | 33.00 30.86          | 1.00 | -1.9          |
| 11 9      | 09:04     | 115     | 14:20     | 42S     | 19:35     | 245     | 32.95 30.81          | 1.00 | -1.9          |
| 11 10     | 09:01     | 115     | 14:16     | 42S     | 19:32     | 245     | 32.89 30.76          | 1.00 | -1.9          |
| 11 11     | 08:58     | 115     | 14:13     | 42S     | 19:29     | 245     | 32.84 30.72          | 1.00 | -1.9          |
| 11 12     | 08:55     | 115     | 14:10     | 42S     | 19:26     | 245     | 32.80 30.67          | 1.00 | -1.9          |
| 11 13     | 08:51     | 115     | 14:07     | 42S     | 19:23     | 245     | 32.75 30.63          | 1.00 | -1.9          |
| 11 14     | 08:48     | 115     | 14:04     | 42S     | 19:20     | 245     | 32.70 30.58          | 1.00 | -1.9          |
| 11 15     | 08:45     | 116     | 14:01     | 42S     | 19:17     | 244     | 32.66 30.54          | 1.00 | -1.9          |
| 11 16     | 08:42     | 116     | 13:58     | 42S     | 19:14     | 244     | 32.61 30.50          | 1.00 | -1.9          |
| 11 17     | 08:39     | 116     | 13:55     | 42S     | 19:11     | 244     | 32.57 30.46          | 1.00 | -1.9          |
| 11 18     | 08:36     | 116     | 13:52     | 42S     | 19:08     | 244     | 32.52 30.42          | 1.00 | -1.9          |
| 11 19     | 08:33     | 116     | 13:49     | 42S     | 19:05     | 244     | 32.48 30.38          | 1.00 | -1.9          |
| 11 20     | 08:30     | 116     | 13:46     | 42S     | 19:02     | 244     | 32.44 30.34          | 1.00 | -1.9          |
| 11 21     | 08:27     | 116     | 13:43     | 42S     | 18:59     | 244     | 32.40 30.30          | 1.00 | -1.9          |
| 11 22     | 08:24     | 116     | 13:40     | 42S     | 18:56     | 244     | 32.37 30.27          | 1.00 | -1.9          |
| 11 23     | 08:21     | 116     | 13:37     | 42S     | 18:53     | 244     | 32.33 30.23          | 1.00 | -1.9          |
| 11 24     | 08:18     | 116     | 13:34     | 42S     | 18:50     | 244     | 32.29 30.20          | 1.00 | -1.9          |
| 11 25     | 08:15     | 116     | 13:31     | 42S     | 18:47     | 244     | 32.26 30.17          | 1.00 | -1.8          |
| 11 26     | 08:13     | 116     | 13:28     | 42S     | 18:44     | 244     | 32.22 30.14          | 1.00 | -1.8          |
| 11 27     | 08:10     | 116     | 13:25     | 42S     | 18:41     | 244     | 32.19 30.11          | 1.00 | -1.8          |
| 11 28     | 08:07     | 116     | 13:22     | 42S     | 18:38     | 244     | 32.16 30.08          | 1.00 | -1.8          |
| 11 29     | 08:04     | 116     | 13:19     | 42S     | 18:35     | 244     | 32.13 30.05          | 1.00 | -1.8          |
| 11 30     | 08:01     | 116     | 13:16     | 42S     | 18:32     | 244     | 32.10 30.02          | 1.00 | -1.8          |

## 木 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 12 | 1  | 17  | 58 | 17.68 | -23 | 17 | 49.18 | 6.14661 | 51.12 | 3.9  |
| 12 | 2  | 17  | 59 | 15.68 | -23 | 17 | 57.05 | 6.15177 | 51.16 | 3.8  |
| 12 | 3  | 18  | 0  | 13.83 | -23 | 18 | 3.55  | 6.15673 | 51.20 | 3.6  |
| 12 | 4  | 18  | 1  | 12.13 | -23 | 18 | 8.67  | 6.16148 | 51.24 | 3.5  |
| 12 | 5  | 18  | 2  | 10.58 | -23 | 18 | 12.38 | 6.16602 | 51.28 | 3.3  |
| 12 | 6  | 18  | 3  | 9.17  | -23 | 18 | 14.69 | 6.17036 | 51.32 | 3.2  |
| 12 | 7  | 18  | 4  | 7.89  | -23 | 18 | 15.58 | 6.17449 | 51.35 | 3.0  |
| 12 | 8  | 18  | 5  | 6.74  | -23 | 18 | 15.03 | 6.17841 | 51.38 | 2.9  |
| 12 | 9  | 18  | 6  | 5.71  | -23 | 18 | 13.04 | 6.18212 | 51.42 | 2.8  |
| 12 | 10 | 18  | 7  | 4.80  | -23 | 18 | 9.62  | 6.18563 | 51.44 | 2.6  |
| 12 | 11 | 18  | 8  | 4.00  | -23 | 18 | 4.76  | 6.18893 | 51.47 | 2.5  |
| 12 | 12 | 18  | 9  | 3.31  | -23 | 17 | 58.47 | 6.19201 | 51.50 | 2.3  |
| 12 | 13 | 18  | 10 | 2.72  | -23 | 17 | 50.74 | 6.19489 | 51.52 | 2.2  |
| 12 | 14 | 18  | 11 | 2.22  | -23 | 17 | 41.59 | 6.19756 | 51.54 | 2.0  |
| 12 | 15 | 18  | 12 | 1.81  | -23 | 17 | 31.01 | 6.20001 | 51.56 | 1.9  |
| 12 | 16 | 18  | 13 | 1.48  | -23 | 17 | 18.99 | 6.20226 | 51.58 | 1.7  |
| 12 | 17 | 18  | 14 | 1.23  | -23 | 17 | 5.52  | 6.20429 | 51.60 | 1.6  |
| 12 | 18 | 18  | 15 | 1.04  | -23 | 16 | 50.59 | 6.20611 | 51.61 | 1.4  |
| 12 | 19 | 18  | 16 | 0.91  | -23 | 16 | 34.19 | 6.20771 | 51.63 | 1.3  |
| 12 | 20 | 18  | 17 | 0.84  | -23 | 16 | 16.31 | 6.20910 | 51.64 | 1.2  |
| 12 | 21 | 18  | 18 | 0.82  | -23 | 15 | 56.94 | 6.21028 | 51.65 | 1.0  |
| 12 | 22 | 18  | 19 | 0.86  | -23 | 15 | 36.08 | 6.21124 | 51.66 | 0.9  |
| 12 | 23 | 18  | 20 | 0.93  | -23 | 15 | 13.75 | 6.21198 | 51.66 | 0.7  |
| 12 | 24 | 18  | 21 | 1.05  | -23 | 14 | 49.95 | 6.21251 | 51.67 | 0.6  |
| 12 | 25 | 18  | 22 | 1.19  | -23 | 14 | 24.70 | 6.21281 | 51.67 | 0.4  |
| 12 | 26 | 18  | 23 | 1.36  | -23 | 13 | 58.00 | 6.21290 | 51.67 | 0.3  |
| 12 | 27 | 18  | 24 | 1.56  | -23 | 13 | 29.77 | 6.21278 | 51.67 | 0.1  |
| 12 | 28 | 18  | 25 | 1.57  | -23 | 12 | 59.53 | 6.21243 | 51.67 | 0.0  |
| 12 | 29 | 18  | 26 | 1.84  | -23 | 12 | 29.32 | 6.21187 | 51.66 | 0.2  |
| 12 | 30 | 18  | 27 | 2.01  | -23 | 11 | 56.91 | 6.21109 | 51.66 | 0.3  |
| 12 | 31 | 18  | 28 | 2.16  | -23 | 11 | 23.03 | 6.21009 | 51.65 | 0.5  |

## 木星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |               |
| 12 1      | 07:58     | 116     | 13:13     | 42S     | 18:29     | 244     | 32.07 30.00          | 1.00 | -1.8          |
| 12 2      | 07:55     | 116     | 13:10     | 42S     | 18:26     | 244     | 32.05 29.97          | 1.00 | -1.8          |
| 12 3      | 07:52     | 116     | 13:07     | 42S     | 18:23     | 244     | 32.02 29.95          | 1.00 | -1.8          |
| 12 4      | 07:49     | 116     | 13:04     | 42S     | 18:20     | 244     | 32.00 29.92          | 1.00 | -1.8          |
| 12 5      | 07:46     | 116     | 13:01     | 42S     | 18:17     | 244     | 31.97 29.90          | 1.00 | -1.8          |
| 12 6      | 07:43     | 116     | 12:58     | 42S     | 18:14     | 244     | 31.95 29.88          | 1.00 | -1.8          |
| 12 7      | 07:40     | 116     | 12:56     | 42S     | 18:11     | 244     | 31.93 29.86          | 1.00 | -1.8          |
| 12 8      | 07:37     | 116     | 12:53     | 42S     | 18:08     | 244     | 31.91 29.84          | 1.00 | -1.8          |
| 12 9      | 07:34     | 116     | 12:50     | 42S     | 18:05     | 244     | 31.89 29.82          | 1.00 | -1.8          |
| 12 10     | 07:31     | 116     | 12:47     | 42S     | 18:02     | 244     | 31.87 29.81          | 1.00 | -1.8          |
| 12 11     | 07:28     | 116     | 12:44     | 42S     | 17:59     | 244     | 31.85 29.79          | 1.00 | -1.8          |
| 12 12     | 07:25     | 116     | 12:41     | 42S     | 17:56     | 244     | 31.84 29.78          | 1.00 | -1.8          |
| 12 13     | 07:22     | 116     | 12:38     | 42S     | 17:53     | 244     | 31.82 29.76          | 1.00 | -1.8          |
| 12 14     | 07:19     | 116     | 12:35     | 42S     | 17:51     | 244     | 31.81 29.75          | 1.00 | -1.8          |
| 12 15     | 07:16     | 116     | 12:32     | 42S     | 17:48     | 244     | 31.80 29.74          | 1.00 | -1.8          |
| 12 16     | 07:13     | 116     | 12:29     | 42S     | 17:45     | 244     | 31.79 29.73          | 1.00 | -1.8          |
| 12 17     | 07:10     | 116     | 12:26     | 42S     | 17:42     | 244     | 31.78 29.72          | 1.00 | -1.8          |
| 12 18     | 07:07     | 116     | 12:23     | 42S     | 17:39     | 244     | 31.77 29.71          | 1.00 | -1.8          |
| 12 19     | 07:04     | 116     | 12:20     | 42S     | 17:36     | 244     | 31.76 29.70          | 1.00 | -1.8          |
| 12 20     | 07:02     | 116     | 12:17     | 42S     | 17:33     | 244     | 31.75 29.69          | 1.00 | -1.8          |
| 12 21     | 06:59     | 116     | 12:14     | 42S     | 17:30     | 244     | 31.74 29.69          | 1.00 | -1.8          |
| 12 22     | 06:56     | 116     | 12:11     | 42S     | 17:27     | 244     | 31.74 29.68          | 1.00 | -1.8          |
| 12 23     | 06:53     | 116     | 12:08     | 42S     | 17:24     | 244     | 31.74 29.68          | 1.00 | -1.8          |
| 12 24     | 06:50     | 116     | 12:05     | 42S     | 17:21     | 244     | 31.73 29.68          | 1.00 | -1.8          |
| 12 25     | 06:47     | 116     | 12:03     | 42S     | 17:18     | 244     | 31.73 29.68          | 1.00 | -1.8          |
| 12 26     | 06:44     | 116     | 12:00     | 42S     | 17:15     | 244     | 31.73 29.68          | 1.00 | -1.8          |
| 12 27     | 06:41     | 116     | 11:57     | 42S     | 17:12     | 244     | 31.73 29.68          | 1.00 | -1.8          |
| 12 28     | 06:38     | 116     | 11:54     | 42S     | 17:10     | 244     | 31.73 29.68          | 1.00 | -1.8          |
| 12 29     | 06:35     | 115     | 11:51     | 42S     | 17:07     | 245     | 31.74 29.68          | 1.00 | -1.8          |
| 12 30     | 06:32     | 115     | 11:48     | 42S     | 17:04     | 245     | 31.74 29.68          | 1.00 | -1.8          |
| 12 31     | 06:29     | 115     | 11:45     | 42S     | 17:01     | 245     | 31.75 29.69          | 1.00 | -1.8          |

## 木星表面位置座標表

世界時 0 時

適用於木星表面低緯度可

見之雲帶系統

| 日期<br>月 日 | 中心點座標                                 |                              | 日下點座標 (系統一)                    |                              |                      |                          | 北極點位置                |                          |
|-----------|---------------------------------------|------------------------------|--------------------------------|------------------------------|----------------------|--------------------------|----------------------|--------------------------|
|           | 地 球<br>經度<br>( $\lambda_e$ ) $^\circ$ | 緯度<br>( $\beta_e$ ) $^\circ$ | 經度<br>( $\lambda_s$ ) $^\circ$ | 緯度<br>( $\beta_s$ ) $^\circ$ | 距離<br>( $d_s$ ) $''$ | 方位<br>( $P_s$ ) $^\circ$ | 距離<br>( $d_n$ ) $''$ | 方位<br>( $P_n$ ) $^\circ$ |
| 1 1       | 230.18                                | -3.25                        | 235.21                         | -3.37                        | 1.39                 | 98.85                    | -14.86               | 7.55                     |
| 1 6       | 298.85                                | -3.24                        | 304.53                         | -3.36                        | 1.58                 | 98.25                    | -14.97               | 7.09                     |
| 1 11      | 7.57                                  | -3.24                        | 13.88                          | -3.35                        | 1.77                 | 97.7                     | -15.08               | 6.63                     |
| 1 16      | 76.35                                 | -3.23                        | 83.25                          | -3.34                        | 1.96                 | 97.17                    | -15.21               | 6.19                     |
| 1 21      | 145.17                                | -3.22                        | 152.64                         | -3.33                        | 2.13                 | 96.68                    | -15.35               | 5.76                     |
| 1 26      | 214.04                                | -3.22                        | 222.05                         | -3.32                        | 2.31                 | 96.21                    | -15.51               | 5.34                     |
| 2 1       | 80.77                                 | -3.21                        | 89.37                          | -3.31                        | 2.51                 | 95.68                    | -15.71               | 4.85                     |
| 2 6       | 149.77                                | -3.2                         | 158.82                         | -3.3                         | 2.67                 | 95.26                    | -15.9                | 4.46                     |
| 2 11      | 218.83                                | -3.19                        | 228.28                         | -3.29                        | 2.83                 | 94.86                    | -16.1                | 4.1                      |
| 2 16      | 287.95                                | -3.19                        | 297.76                         | -3.28                        | 2.97                 | 94.48                    | -16.31               | 3.75                     |
| 2 21      | 357.13                                | -3.18                        | 7.25                           | -3.27                        | 3.1                  | 94.13                    | -16.53               | 3.43                     |
| 2 26      | 66.38                                 | -3.18                        | 76.75                          | -3.27                        | 3.23                 | 93.81                    | -16.76               | 3.13                     |
| 3 1       | 179.96                                | -3.17                        | 190.46                         | -3.26                        | 3.29                 | 93.62                    | -16.91               | 2.96                     |
| 3 6       | 249.32                                | -3.17                        | 259.97                         | -3.25                        | 3.39                 | 93.34                    | -17.16               | 2.71                     |
| 3 11      | 318.74                                | -3.17                        | 329.48                         | -3.24                        | 3.47                 | 93.08                    | -17.42               | 2.48                     |
| 3 16      | 28.23                                 | -3.16                        | 39                             | -3.23                        | 3.54                 | 92.85                    | -17.7                | 2.28                     |
| 3 21      | 97.79                                 | -3.16                        | 108.51                         | -3.22                        | 3.58                 | 92.65                    | -17.98               | 2.12                     |
| 3 26      | 167.41                                | -3.16                        | 178.02                         | -3.21                        | 3.59                 | 92.48                    | -18.26               | 1.99                     |
| 4 1       | 35.05                                 | -3.16                        | 45.42                          | -3.19                        | 3.58                 | 92.31                    | -18.61               | 1.88                     |
| 4 6       | 104.83                                | -3.16                        | 114.92                         | -3.18                        | 3.54                 | 92.2                     | -18.9                | 1.83                     |
| 4 11      | 174.67                                | -3.16                        | 184.4                          | -3.17                        | 3.47                 | 92.12                    | -19.2                | 1.81                     |
| 4 16      | 244.58                                | -3.16                        | 253.86                         | -3.16                        | 3.36                 | 92.07                    | -19.49               | 1.83                     |
| 4 21      | 314.54                                | -3.16                        | 323.3                          | -3.15                        | 3.22                 | 92.04                    | -19.77               | 1.89                     |
| 4 26      | 24.56                                 | -3.16                        | 32.73                          | -3.14                        | 3.04                 | 92.03                    | -20.04               | 1.98                     |
| 5 1       | 94.63                                 | -3.16                        | 102.13                         | -3.13                        | 2.83                 | 92.04                    | -20.3                | 2.11                     |
| 5 6       | 164.75                                | -3.16                        | 171.5                          | -3.11                        | 2.58                 | 92.05                    | -20.54               | 2.27                     |
| 5 11      | 234.9                                 | -3.17                        | 240.85                         | -3.1                         | 2.3                  | 92.06                    | -20.77               | 2.46                     |
| 5 16      | 305.08                                | -3.17                        | 310.16                         | -3.09                        | 1.99                 | 92.04                    | -20.97               | 2.67                     |
| 5 21      | 15.28                                 | -3.17                        | 19.44                          | -3.08                        | 1.64                 | 91.95                    | -21.14               | 2.91                     |
| 5 26      | 85.49                                 | -3.16                        | 88.69                          | -3.06                        | 1.27                 | 91.69                    | -21.28               | 3.17                     |
| 6 1       | 313.74                                | -3.16                        | 315.74                         | -3.05                        | 0.8                  | 90.75                    | -21.4                | 3.51                     |
| 6 6       | 23.93                                 | -3.16                        | 24.9                           | -3.04                        | 0.39                 | 87.62                    | -21.46               | 3.8                      |
| 6 11      | 94.1                                  | -3.15                        | 94.03                          | -3.02                        | 0.05                 | 332.97                   | -21.49               | 4.09                     |
| 6 16      | 164.22                                | -3.14                        | 163.12                         | -3.01                        | 0.45                 | 280.42                   | -21.48               | 4.38                     |
| 6 21      | 234.3                                 | -3.13                        | 232.17                         | -3                           | 0.85                 | 277.88                   | -21.43               | 4.67                     |
| 6 26      | 304.32                                | -3.12                        | 301.18                         | -2.98                        | 1.25                 | 277.15                   | -21.35               | 4.94                     |

## 木星表面位置座標表

世界時 0 時

適用於木星表面低緯度可

見之雲帶系統

| 日期<br>月 日 | 中心點座標                                 |                              | 日下點座標 (系統一)                    |                              |                        |                          | 北極點位置            |                          |
|-----------|---------------------------------------|------------------------------|--------------------------------|------------------------------|------------------------|--------------------------|------------------|--------------------------|
|           | 地 球<br>經度<br>( $\lambda_e$ ) $^\circ$ | 緯度<br>( $\beta_e$ ) $^\circ$ | 經度<br>( $\lambda_s$ ) $^\circ$ | 緯度<br>( $\beta_s$ ) $^\circ$ | 太陽<br>距離<br>( $d_s$ )" | 方位<br>( $P_s$ ) $^\circ$ | 距離<br>( $d_n$ )" | 方位<br>( $P_n$ ) $^\circ$ |
| 7 1       | 14.27                                 | -3.11                        | 10.16                          | -2.97                        | 1.63                   | 276.87                   | -21.24           | 5.2                      |
| 7 6       | 84.15                                 | -3.1                         | 79.11                          | -2.95                        | 1.98                   | 276.78                   | -21.09           | 5.45                     |
| 7 11      | 153.94                                | -3.09                        | 148.02                         | -2.94                        | 2.31                   | 276.76                   | -20.91           | 5.66                     |
| 7 16      | 223.64                                | -3.07                        | 216.9                          | -2.93                        | 2.6                    | 276.78                   | -20.71           | 5.85                     |
| 7 21      | 293.25                                | -3.06                        | 285.75                         | -2.91                        | 2.86                   | 276.8                    | -20.49           | 6.02                     |
| 7 26      | 2.77                                  | -3.04                        | 354.58                         | -2.9                         | 3.09                   | 276.82                   | -20.24           | 6.15                     |
| 8 1       | 230.06                                | -3.02                        | 221.14                         | -2.88                        | 3.31                   | 276.83                   | -19.94           | 6.26                     |
| 8 6       | 299.37                                | -3                           | 289.91                         | -2.87                        | 3.46                   | 276.82                   | -19.67           | 6.32                     |
| 8 11      | 8.58                                  | -2.98                        | 358.67                         | -2.85                        | 3.57                   | 276.79                   | -19.39           | 6.34                     |
| 8 16      | 77.69                                 | -2.97                        | 67.42                          | -2.84                        | 3.65                   | 276.73                   | -19.11           | 6.33                     |
| 8 21      | 146.72                                | -2.95                        | 136.15                         | -2.82                        | 3.7                    | 276.65                   | -18.83           | 6.28                     |
| 8 26      | 215.67                                | -2.93                        | 204.87                         | -2.8                         | 3.72                   | 276.54                   | -18.55           | 6.2                      |
| 9 1       | 82.29                                 | -2.91                        | 71.32                          | -2.79                        | 3.71                   | 276.37                   | -18.22           | 6.06                     |
| 9 6       | 151.06                                | -2.89                        | 140.03                         | -2.77                        | 3.67                   | 276.2                    | -17.95           | 5.9                      |
| 9 11      | 219.76                                | -2.87                        | 208.74                         | -2.75                        | 3.61                   | 276                      | -17.68           | 5.71                     |
| 9 16      | 288.39                                | -2.85                        | 277.45                         | -2.74                        | 3.54                   | 275.78                   | -17.43           | 5.5                      |
| 9 21      | 356.97                                | -2.83                        | 346.16                         | -2.72                        | 3.45                   | 275.54                   | -17.18           | 5.25                     |
| 9 26      | 65.49                                 | -2.81                        | 54.88                          | -2.71                        | 3.34                   | 275.27                   | -16.95           | 4.98                     |
| 10 1      | 133.96                                | -2.8                         | 123.6                          | -2.69                        | 3.21                   | 274.97                   | -16.72           | 4.68                     |
| 10 6      | 202.38                                | -2.78                        | 192.33                         | -2.67                        | 3.08                   | 274.65                   | -16.51           | 4.35                     |
| 10 11     | 270.77                                | -2.76                        | 261.08                         | -2.66                        | 2.93                   | 274.31                   | -16.31           | 4                        |
| 10 16     | 339.12                                | -2.74                        | 329.84                         | -2.64                        | 2.78                   | 273.95                   | -16.12           | 3.62                     |
| 10 21     | 47.44                                 | -2.72                        | 38.61                          | -2.62                        | 2.62                   | 273.57                   | -15.94           | 3.23                     |
| 10 26     | 115.74                                | -2.69                        | 107.4                          | -2.6                         | 2.45                   | 273.18                   | -15.78           | 2.81                     |
| 11 1      | 341.67                                | -2.67                        | 333.97                         | -2.58                        | 2.24                   | 272.67                   | -15.6            | 2.28                     |
| 11 6      | 49.94                                 | -2.64                        | 42.8                           | -2.57                        | 2.05                   | 272.24                   | -15.47           | 1.83                     |
| 11 11     | 118.19                                | -2.62                        | 111.65                         | -2.55                        | 1.87                   | 271.78                   | -15.34           | 1.36                     |
| 11 16     | 186.44                                | -2.6                         | 180.53                         | -2.53                        | 1.68                   | 271.31                   | -15.24           | 0.88                     |
| 11 21     | 254.68                                | -2.57                        | 249.42                         | -2.51                        | 1.48                   | 270.83                   | -15.14           | 0.38                     |
| 11 26     | 322.93                                | -2.54                        | 318.34                         | -2.49                        | 1.29                   | 270.33                   | -15.06           | 359.87                   |
| 12 1      | 31.18                                 | -2.52                        | 27.29                          | -2.48                        | 1.09                   | 269.81                   | -14.99           | 359.36                   |
| 12 6      | 99.45                                 | -2.49                        | 96.26                          | -2.46                        | 0.89                   | 269.26                   | -14.93           | 358.83                   |
| 12 11     | 167.72                                | -2.46                        | 165.25                         | -2.44                        | 0.69                   | 268.67                   | -14.88           | 358.3                    |
| 12 16     | 236.02                                | -2.43                        | 234.27                         | -2.42                        | 0.48                   | 268                      | -14.85           | 357.77                   |
| 12 21     | 304.33                                | -2.4                         | 303.32                         | -2.4                         | 0.28                   | 267.07                   | -14.83           | 357.24                   |
| 12 26     | 12.67                                 | -2.37                        | 12.4                           | -2.38                        | 0.07                   | 263.68                   | -14.83           | 356.7                    |

## 木星表面位置座標表

世界時 0 時

適用於木星表面高緯度可

見之雲帶系統

| 日期<br>月 日 | 中心點座標                                 |                              | 日下點座標 (系統二)                    |                              |                      |                          | 北極點位置                |                          |      |
|-----------|---------------------------------------|------------------------------|--------------------------------|------------------------------|----------------------|--------------------------|----------------------|--------------------------|------|
|           | 地 球<br>經度<br>( $\lambda_e$ ) $^\circ$ | 緯度<br>( $\beta_e$ ) $^\circ$ | 經度<br>( $\lambda_s$ ) $^\circ$ | 緯度<br>( $\beta_s$ ) $^\circ$ | 距離<br>( $d_s$ ) $''$ | 方位<br>( $P_s$ ) $^\circ$ | 距離<br>( $d_n$ ) $''$ | 方位<br>( $P_n$ ) $^\circ$ |      |
| 1         | 1                                     | 178.26                       | -3.25                          | 183.29                       | -3.37                | 1.39                     | 98.85                | -14.86                   | 7.55 |
| 1         | 6                                     | 208.78                       | -3.24                          | 214.46                       | -3.36                | 1.58                     | 98.25                | -14.97                   | 7.09 |
| 1         | 11                                    | 239.35                       | -3.24                          | 245.66                       | -3.35                | 1.77                     | 97.7                 | -15.08                   | 6.63 |
| 1         | 16                                    | 269.97                       | -3.23                          | 276.87                       | -3.34                | 1.96                     | 97.17                | -15.21                   | 6.19 |
| 1         | 21                                    | 300.64                       | -3.22                          | 308.11                       | -3.33                | 2.13                     | 96.68                | -15.35                   | 5.76 |
| 1         | 26                                    | 331.37                       | -3.22                          | 339.37                       | -3.32                | 2.31                     | 96.21                | -15.51                   | 5.34 |
| 2         | 1                                     | 152.31                       | -3.21                          | 160.9                        | -3.31                | 2.51                     | 95.68                | -15.71                   | 4.85 |
| 2         | 6                                     | 183.15                       | -3.2                           | 192.2                        | -3.3                 | 2.67                     | 95.26                | -15.9                    | 4.46 |
| 2         | 11                                    | 214.06                       | -3.19                          | 223.51                       | -3.29                | 2.83                     | 94.86                | -16.1                    | 4.1  |
| 2         | 16                                    | 245.03                       | -3.19                          | 254.84                       | -3.28                | 2.97                     | 94.48                | -16.31                   | 3.75 |
| 2         | 21                                    | 276.06                       | -3.18                          | 286.18                       | -3.27                | 3.1                      | 94.13                | -16.53                   | 3.43 |
| 2         | 26                                    | 307.15                       | -3.18                          | 317.52                       | -3.27                | 3.23                     | 93.81                | -16.76                   | 3.13 |
| 3         | 1                                     | 37.84                        | -3.17                          | 48.33                        | -3.26                | 3.29                     | 93.62                | -16.91                   | 2.96 |
| 3         | 6                                     | 69.04                        | -3.17                          | 79.69                        | -3.25                | 3.39                     | 93.34                | -17.16                   | 2.71 |
| 3         | 11                                    | 100.31                       | -3.17                          | 111.05                       | -3.24                | 3.47                     | 93.08                | -17.42                   | 2.48 |
| 3         | 16                                    | 131.65                       | -3.16                          | 142.41                       | -3.23                | 3.54                     | 92.85                | -17.7                    | 2.28 |
| 3         | 21                                    | 163.05                       | -3.16                          | 173.77                       | -3.22                | 3.58                     | 92.65                | -17.98                   | 2.12 |
| 3         | 26                                    | 194.52                       | -3.16                          | 205.13                       | -3.21                | 3.59                     | 92.48                | -18.26                   | 1.99 |
| 4         | 1                                     | 16.38                        | -3.16                          | 26.75                        | -3.19                | 3.58                     | 92.31                | -18.61                   | 1.88 |
| 4         | 6                                     | 48                           | -3.16                          | 58.09                        | -3.18                | 3.54                     | 92.2                 | -18.9                    | 1.83 |
| 4         | 11                                    | 79.69                        | -3.16                          | 89.42                        | -3.17                | 3.47                     | 92.12                | -19.2                    | 1.81 |
| 4         | 16                                    | 111.45                       | -3.16                          | 120.73                       | -3.16                | 3.36                     | 92.07                | -19.49                   | 1.83 |
| 4         | 21                                    | 143.26                       | -3.16                          | 152.02                       | -3.15                | 3.22                     | 92.04                | -19.77                   | 1.89 |
| 4         | 26                                    | 175.12                       | -3.16                          | 183.29                       | -3.14                | 3.04                     | 92.03                | -20.04                   | 1.98 |
| 5         | 1                                     | 207.04                       | -3.16                          | 214.54                       | -3.13                | 2.83                     | 92.04                | -20.3                    | 2.11 |
| 5         | 6                                     | 239                          | -3.16                          | 245.76                       | -3.11                | 2.58                     | 92.05                | -20.54                   | 2.27 |
| 5         | 11                                    | 271.01                       | -3.17                          | 276.95                       | -3.1                 | 2.3                      | 92.06                | -20.77                   | 2.46 |
| 5         | 16                                    | 303.03                       | -3.17                          | 308.11                       | -3.09                | 1.99                     | 92.04                | -20.97                   | 2.67 |
| 5         | 21                                    | 335.08                       | -3.17                          | 339.24                       | -3.08                | 1.64                     | 91.95                | -21.14                   | 2.91 |
| 5         | 26                                    | 7.14                         | -3.16                          | 10.34                        | -3.06                | 1.27                     | 91.69                | -21.28                   | 3.17 |
| 6         | 1                                     | 189.61                       | -3.16                          | 191.6                        | -3.05                | 0.8                      | 90.75                | -21.4                    | 3.51 |
| 6         | 6                                     | 221.65                       | -3.16                          | 222.62                       | -3.04                | 0.39                     | 87.62                | -21.46                   | 3.8  |
| 6         | 11                                    | 253.66                       | -3.15                          | 253.6                        | -3.02                | 0.05                     | 332.97               | -21.49                   | 4.09 |
| 6         | 16                                    | 285.64                       | -3.14                          | 284.53                       | -3.01                | 0.45                     | 280.42               | -21.48                   | 4.38 |
| 6         | 21                                    | 317.57                       | -3.13                          | 315.44                       | -3                   | 0.85                     | 277.88               | -21.43                   | 4.67 |
| 6         | 26                                    | 349.44                       | -3.12                          | 346.3                        | -2.98                | 1.25                     | 277.15               | -21.35                   | 4.94 |



## 木星表面位置座標表

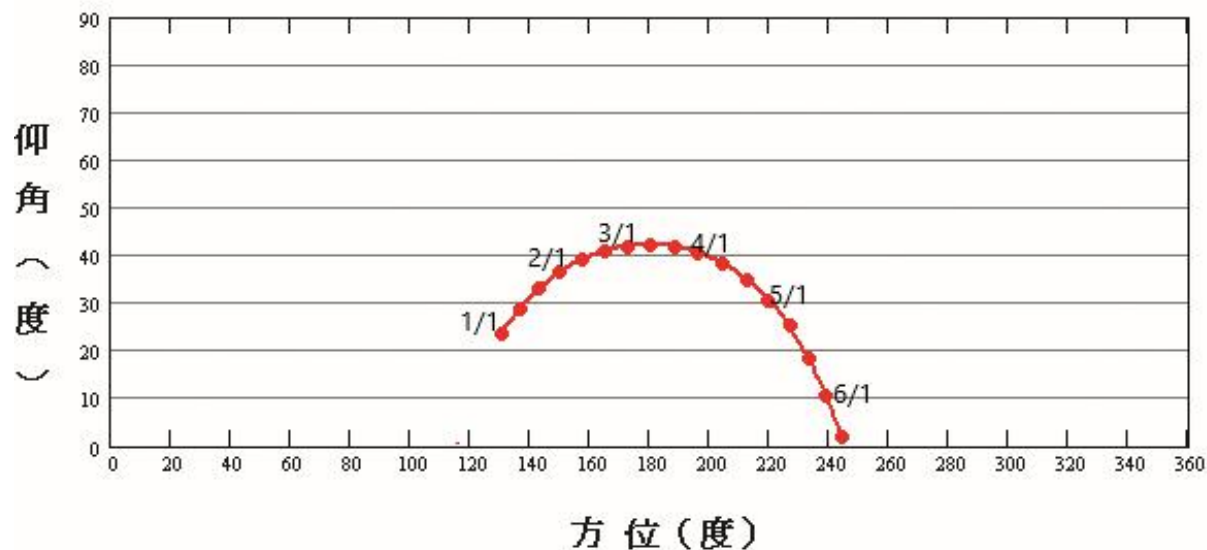
世界時 0 時

適用於木星表面高緯度可

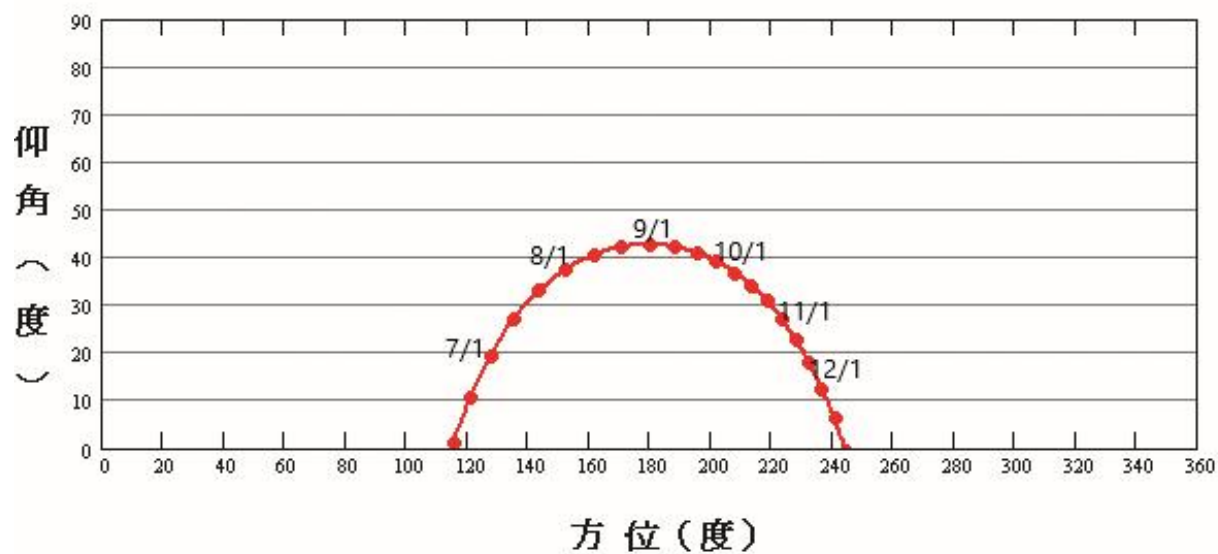
見之雲帶系統

| 日期<br>月 日 | 中心點座標                               |                                   | 日下點座標 (系統二)                    |                                   |                       |                          | 北極點位置            |                          |        |
|-----------|-------------------------------------|-----------------------------------|--------------------------------|-----------------------------------|-----------------------|--------------------------|------------------|--------------------------|--------|
|           | 地<br>經度<br>( $\lambda_e$ ) $^\circ$ | 球<br>緯度<br>( $\beta_e$ ) $^\circ$ | 經度<br>( $\lambda_s$ ) $^\circ$ | 太<br>緯度<br>( $\beta_s$ ) $^\circ$ | 陽<br>距離<br>( $d_s$ )" | 方位<br>( $P_s$ ) $^\circ$ | 距離<br>( $d_n$ )" | 方位<br>( $P_n$ ) $^\circ$ |        |
| 7         | 1                                   | 21.24                             | -3.11                          | 17.13                             | -2.97                 | 1.63                     | 276.87           | -21.24                   | 5.2    |
| 7         | 6                                   | 52.97                             | -3.1                           | 47.93                             | -2.95                 | 1.98                     | 276.78           | -21.09                   | 5.45   |
| 7         | 11                                  | 84.61                             | -3.09                          | 78.69                             | -2.94                 | 2.31                     | 276.76           | -20.91                   | 5.66   |
| 7         | 16                                  | 116.17                            | -3.07                          | 109.42                            | -2.93                 | 2.6                      | 276.78           | -20.71                   | 5.85   |
| 7         | 21                                  | 147.63                            | -3.06                          | 140.13                            | -2.91                 | 2.86                     | 276.8            | -20.49                   | 6.02   |
| 7         | 26                                  | 179                               | -3.04                          | 170.81                            | -2.9                  | 3.09                     | 276.82           | -20.24                   | 6.15   |
| 8         | 1                                   | 0.52                              | -3.02                          | 351.59                            | -2.88                 | 3.31                     | 276.83           | -19.94                   | 6.26   |
| 8         | 6                                   | 31.67                             | -3                             | 22.22                             | -2.87                 | 3.46                     | 276.82           | -19.67                   | 6.32   |
| 8         | 11                                  | 62.74                             | -2.98                          | 52.83                             | -2.85                 | 3.57                     | 276.79           | -19.39                   | 6.34   |
| 8         | 16                                  | 93.71                             | -2.97                          | 83.43                             | -2.84                 | 3.65                     | 276.73           | -19.11                   | 6.33   |
| 8         | 21                                  | 124.59                            | -2.95                          | 114.01                            | -2.82                 | 3.7                      | 276.65           | -18.83                   | 6.28   |
| 8         | 26                                  | 155.38                            | -2.93                          | 144.59                            | -2.8                  | 3.72                     | 276.54           | -18.55                   | 6.2    |
| 9         | 1                                   | 336.23                            | -2.91                          | 325.27                            | -2.79                 | 3.71                     | 276.37           | -18.22                   | 6.06   |
| 9         | 6                                   | 6.86                              | -2.89                          | 355.83                            | -2.77                 | 3.67                     | 276.2            | -17.95                   | 5.9    |
| 9         | 11                                  | 37.41                             | -2.87                          | 26.39                             | -2.75                 | 3.61                     | 276              | -17.68                   | 5.71   |
| 9         | 16                                  | 67.9                              | -2.85                          | 56.95                             | -2.74                 | 3.54                     | 275.78           | -17.43                   | 5.5    |
| 9         | 21                                  | 98.32                             | -2.83                          | 87.52                             | -2.72                 | 3.45                     | 275.54           | -17.18                   | 5.25   |
| 9         | 26                                  | 128.7                             | -2.81                          | 118.09                            | -2.71                 | 3.34                     | 275.27           | -16.95                   | 4.98   |
| 10        | 1                                   | 159.02                            | -2.8                           | 148.66                            | -2.69                 | 3.21                     | 274.97           | -16.72                   | 4.68   |
| 10        | 6                                   | 189.3                             | -2.78                          | 179.25                            | -2.67                 | 3.08                     | 274.65           | -16.51                   | 4.35   |
| 10        | 11                                  | 219.53                            | -2.76                          | 209.85                            | -2.66                 | 2.93                     | 274.31           | -16.31                   | 4      |
| 10        | 16                                  | 249.74                            | -2.74                          | 240.46                            | -2.64                 | 2.78                     | 273.95           | -16.12                   | 3.62   |
| 10        | 21                                  | 279.92                            | -2.72                          | 271.08                            | -2.62                 | 2.62                     | 273.57           | -15.94                   | 3.23   |
| 10        | 26                                  | 310.07                            | -2.69                          | 301.73                            | -2.6                  | 2.45                     | 273.18           | -15.78                   | 2.81   |
| 11        | 1                                   | 130.22                            | -2.67                          | 122.52                            | -2.58                 | 2.24                     | 272.67           | -15.6                    | 2.28   |
| 11        | 6                                   | 160.34                            | -2.64                          | 153.2                             | -2.57                 | 2.05                     | 272.24           | -15.47                   | 1.83   |
| 11        | 11                                  | 190.44                            | -2.62                          | 183.91                            | -2.55                 | 1.87                     | 271.78           | -15.34                   | 1.36   |
| 11        | 16                                  | 220.54                            | -2.6                           | 214.63                            | -2.53                 | 1.68                     | 271.31           | -15.24                   | 0.88   |
| 11        | 21                                  | 250.64                            | -2.57                          | 245.38                            | -2.51                 | 1.48                     | 270.83           | -15.14                   | 0.38   |
| 11        | 26                                  | 280.74                            | -2.54                          | 276.15                            | -2.49                 | 1.29                     | 270.33           | -15.06                   | 359.87 |
| 12        | 1                                   | 310.84                            | -2.52                          | 306.95                            | -2.48                 | 1.09                     | 269.81           | -14.99                   | 359.36 |
| 12        | 6                                   | 340.96                            | -2.49                          | 337.77                            | -2.46                 | 0.89                     | 269.26           | -14.93                   | 358.83 |
| 12        | 11                                  | 11.08                             | -2.46                          | 8.61                              | -2.44                 | 0.69                     | 268.67           | -14.88                   | 358.3  |
| 12        | 16                                  | 41.23                             | -2.43                          | 39.49                             | -2.42                 | 0.48                     | 268              | -14.85                   | 357.77 |
| 12        | 21                                  | 71.39                             | -2.4                           | 70.39                             | -2.4                  | 0.28                     | 267.07           | -14.83                   | 357.24 |
| 12        | 26                                  | 101.58                            | -2.37                          | 101.31                            | -2.38                 | 0.07                     | 263.68           | -14.83                   | 356.7  |

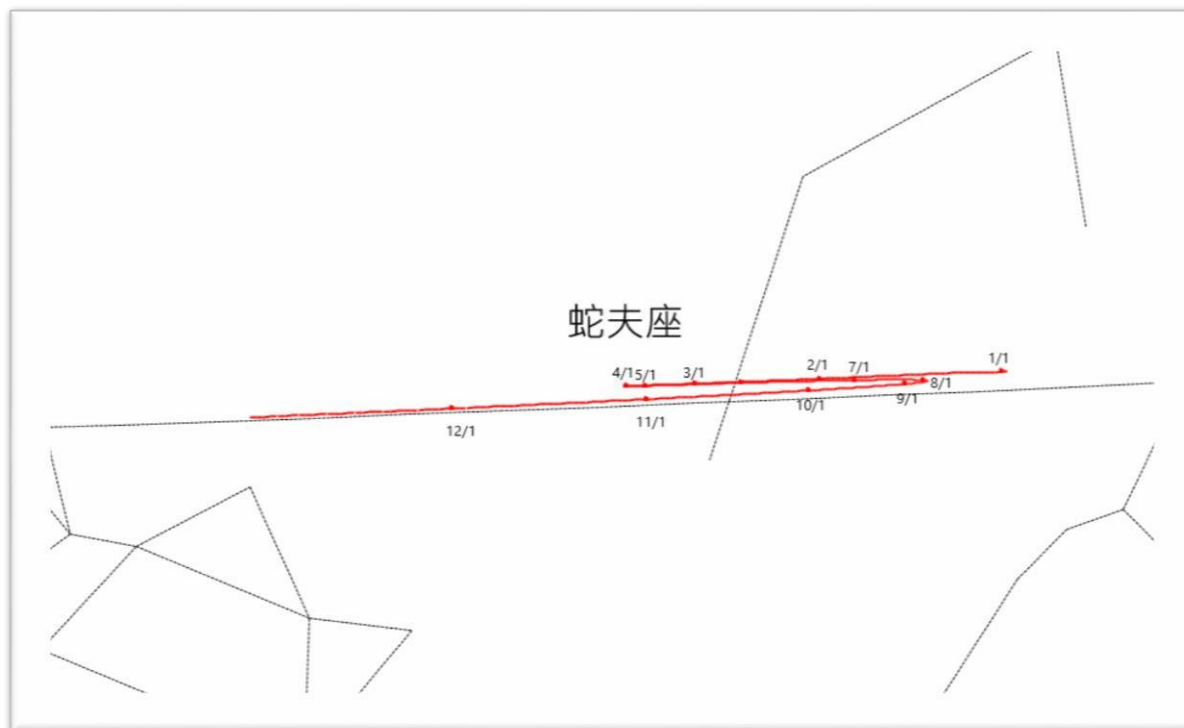
### 日出時木星方位與仰角



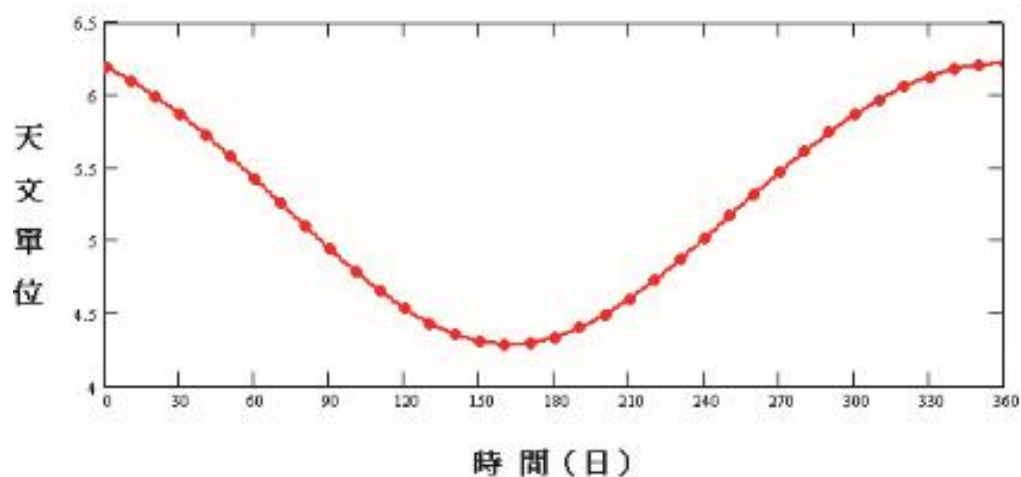
### 日沒時木星方位與仰角



## 木星在天球上運行的軌跡圖

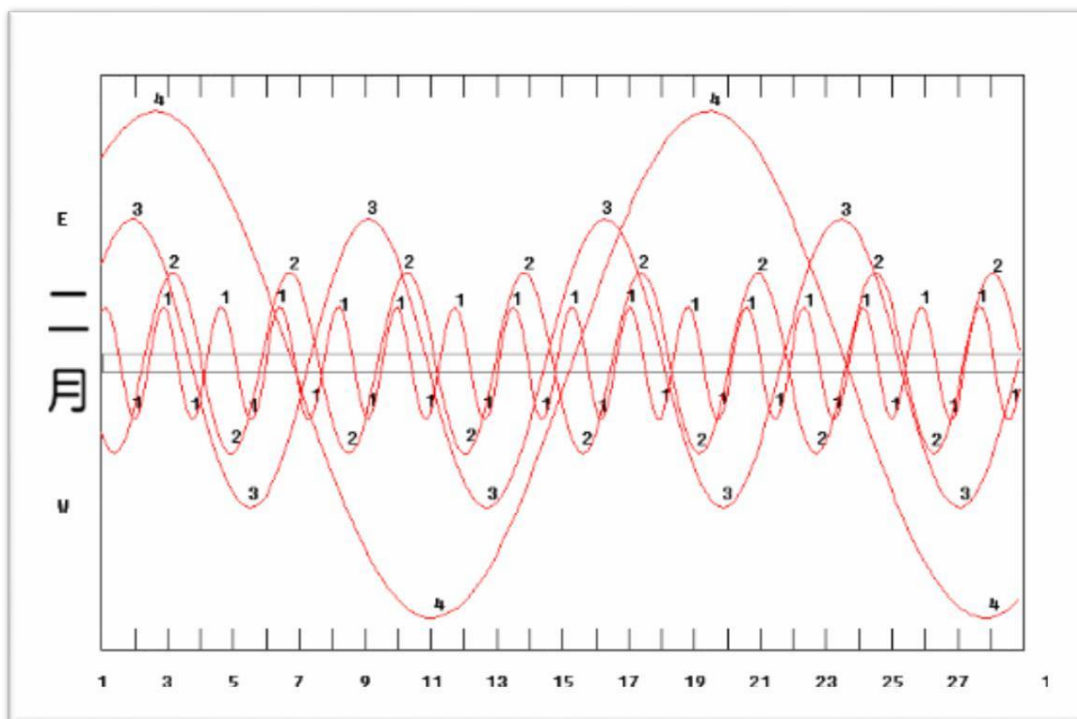
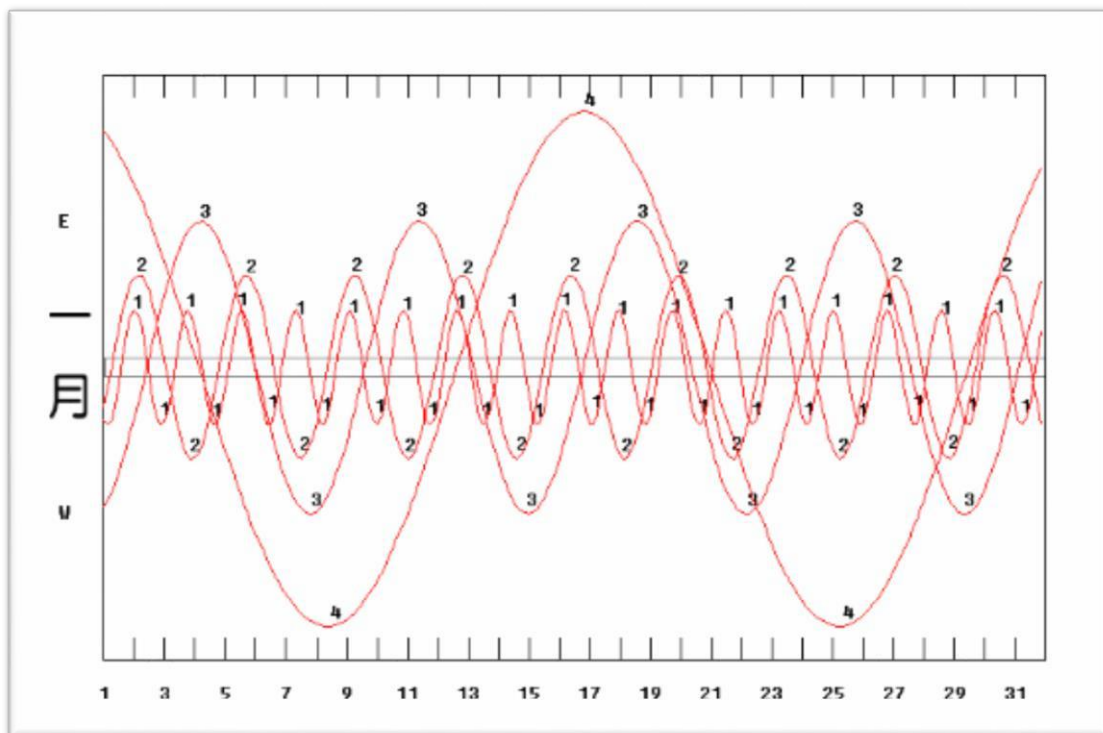


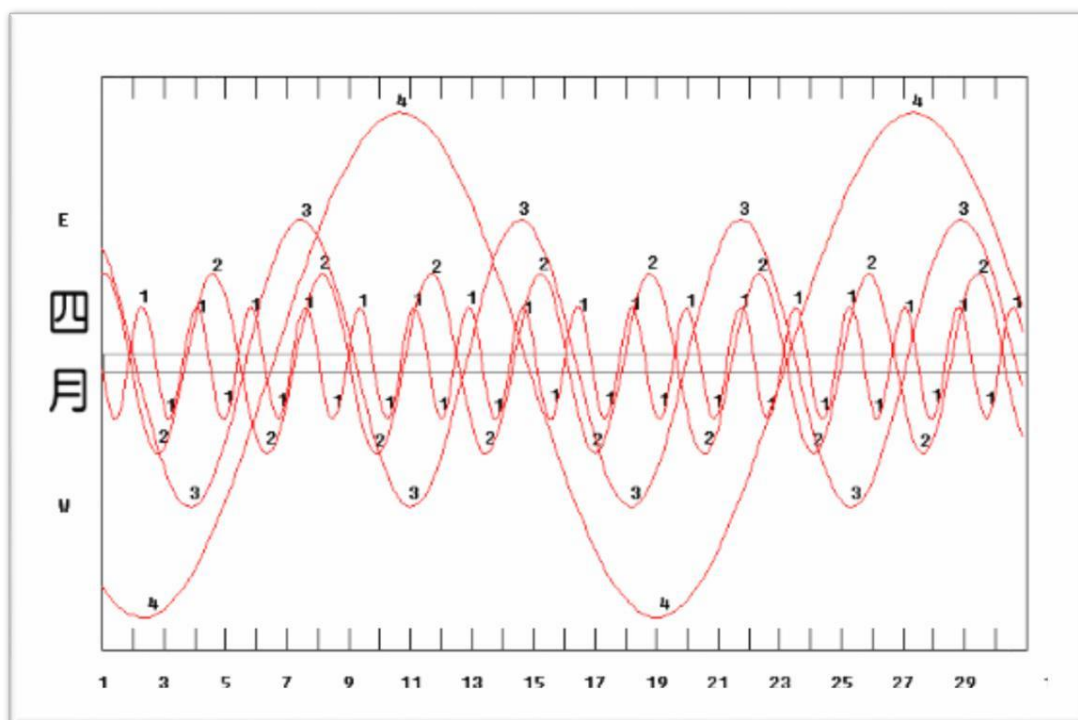
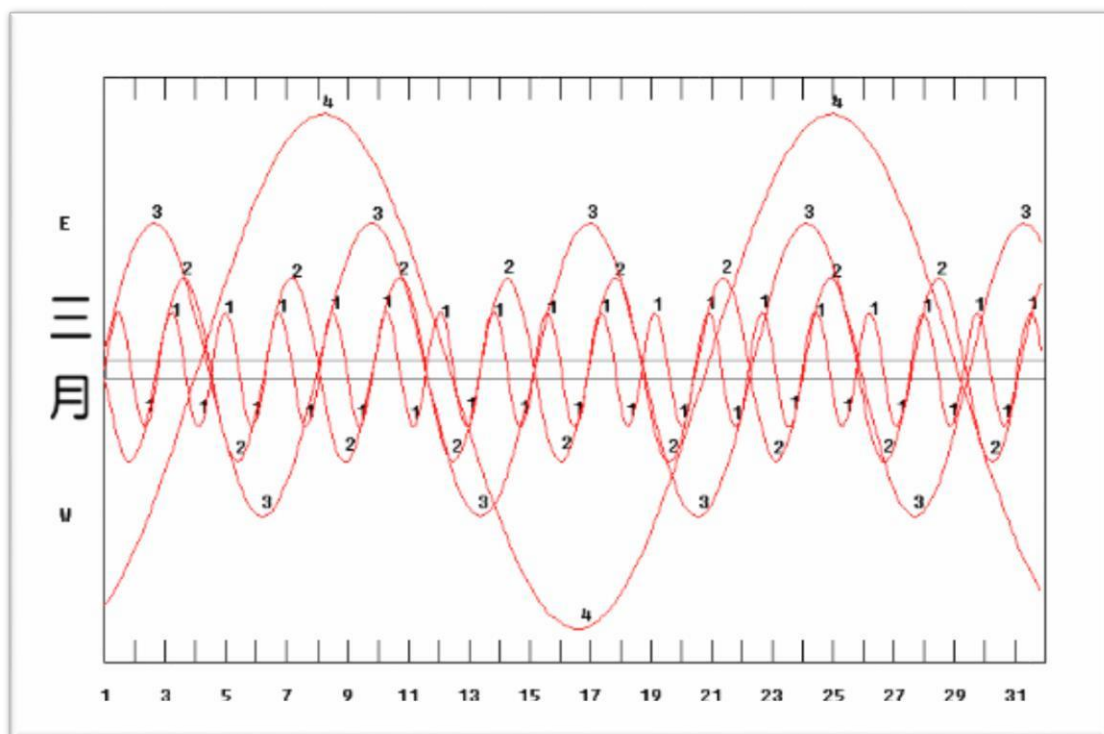
## 木星與地球距離變化圖

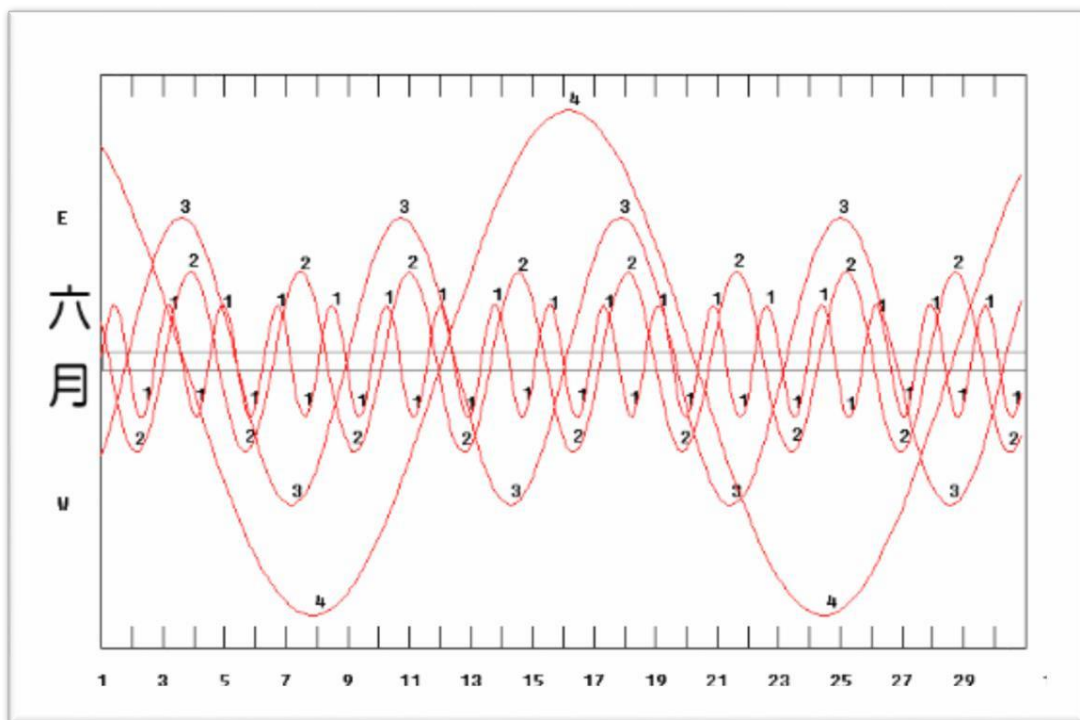
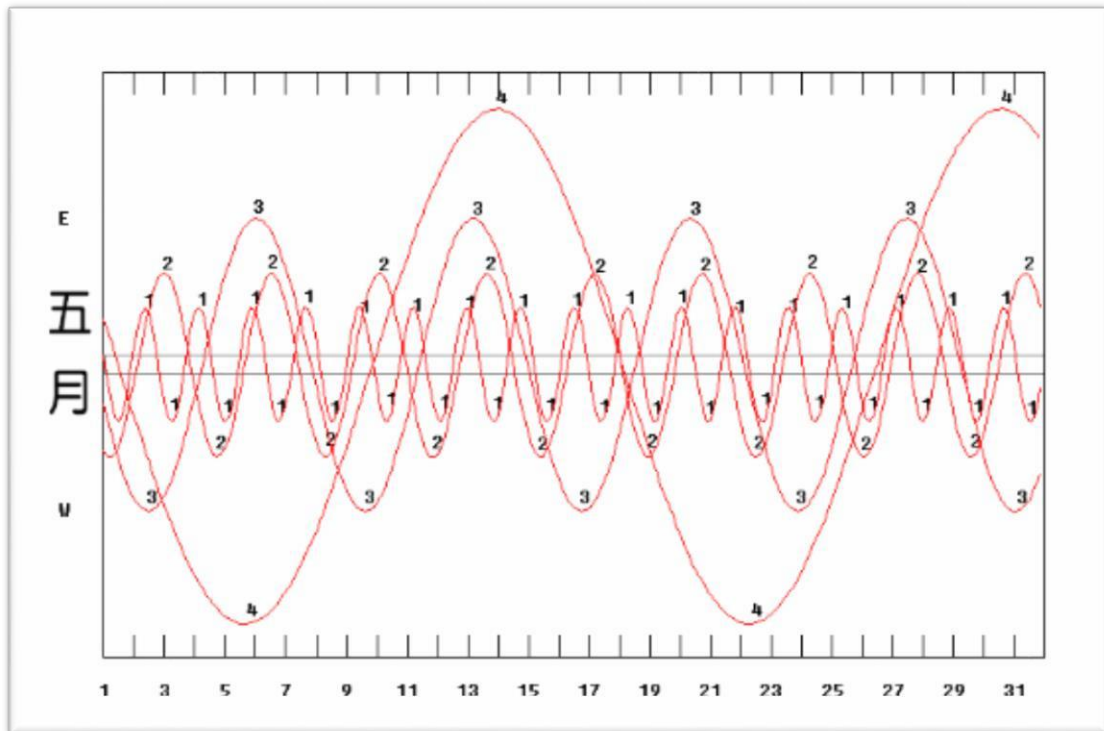


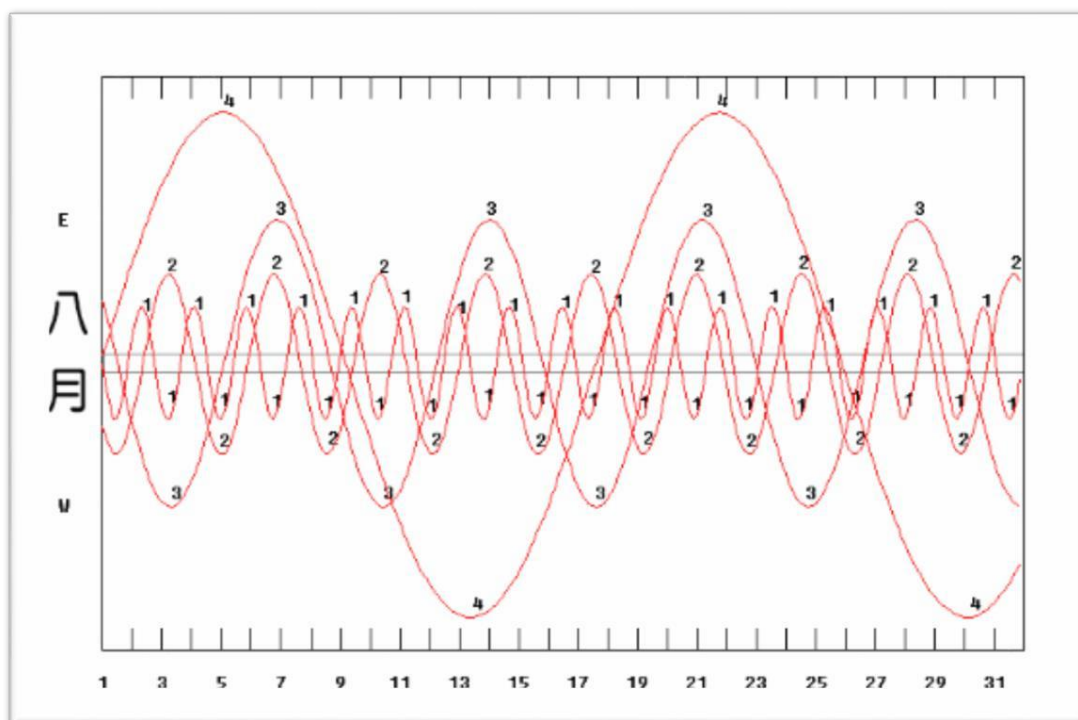
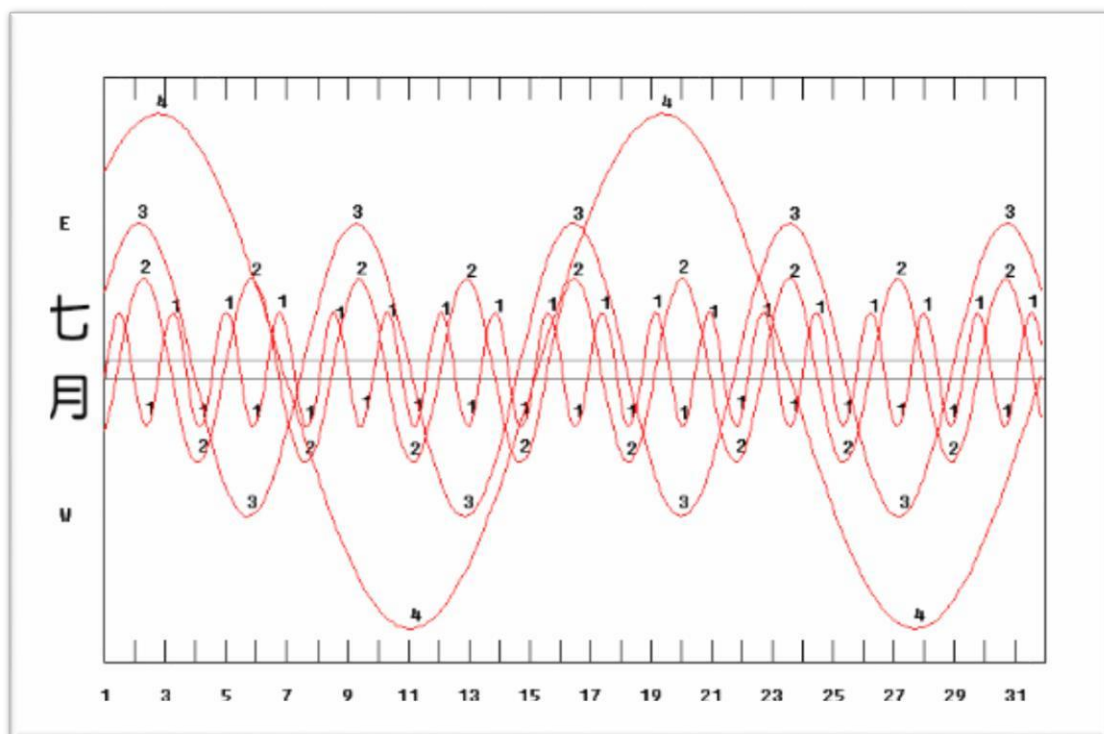
### 2019 年木星四大衛星繞行木星軌跡圖

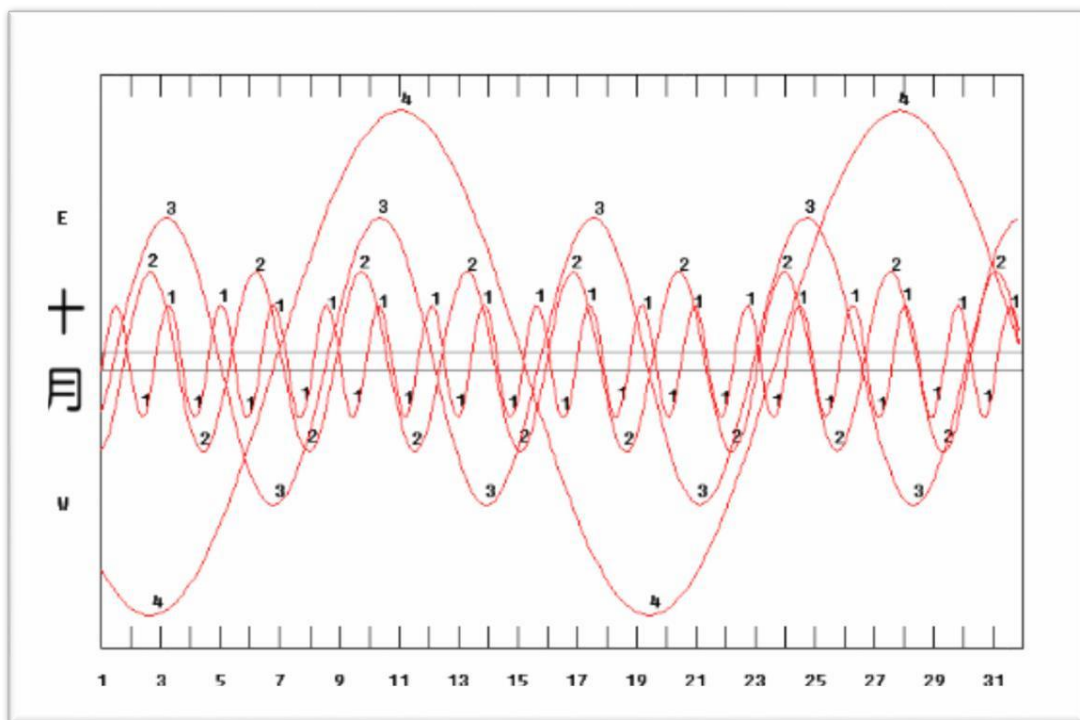
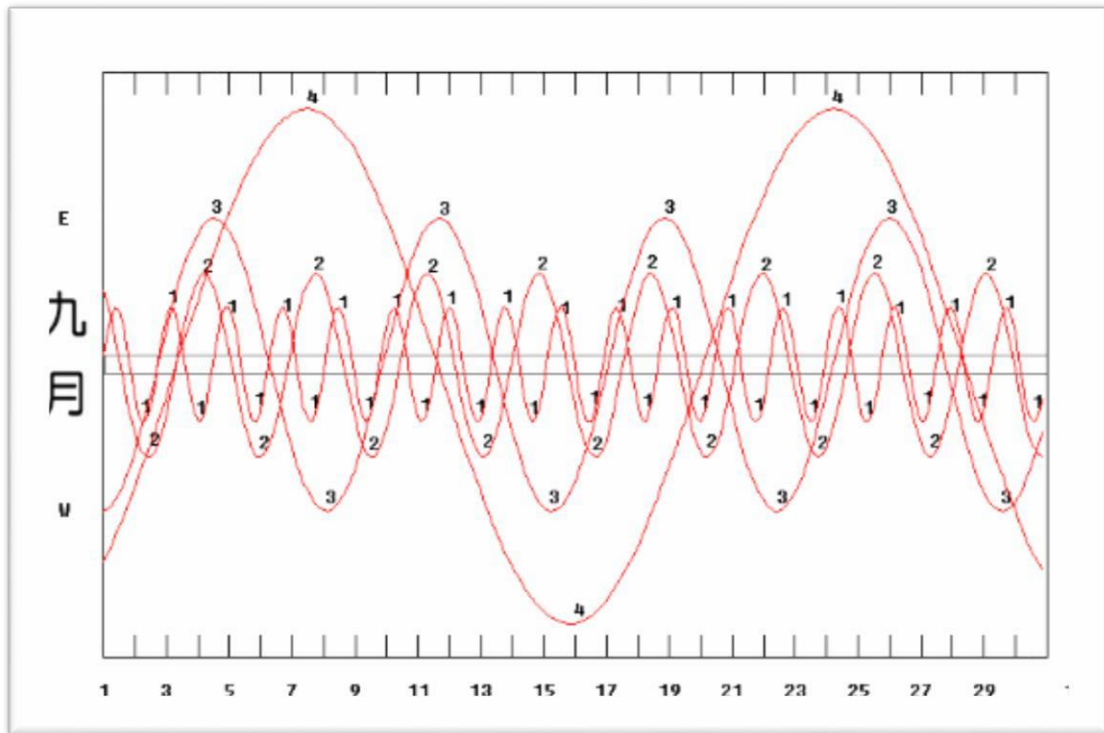
下列每幅圖中央兩條橫線代表木星盤面寬度，「E」及「W」分別代表地球的東、西方向。



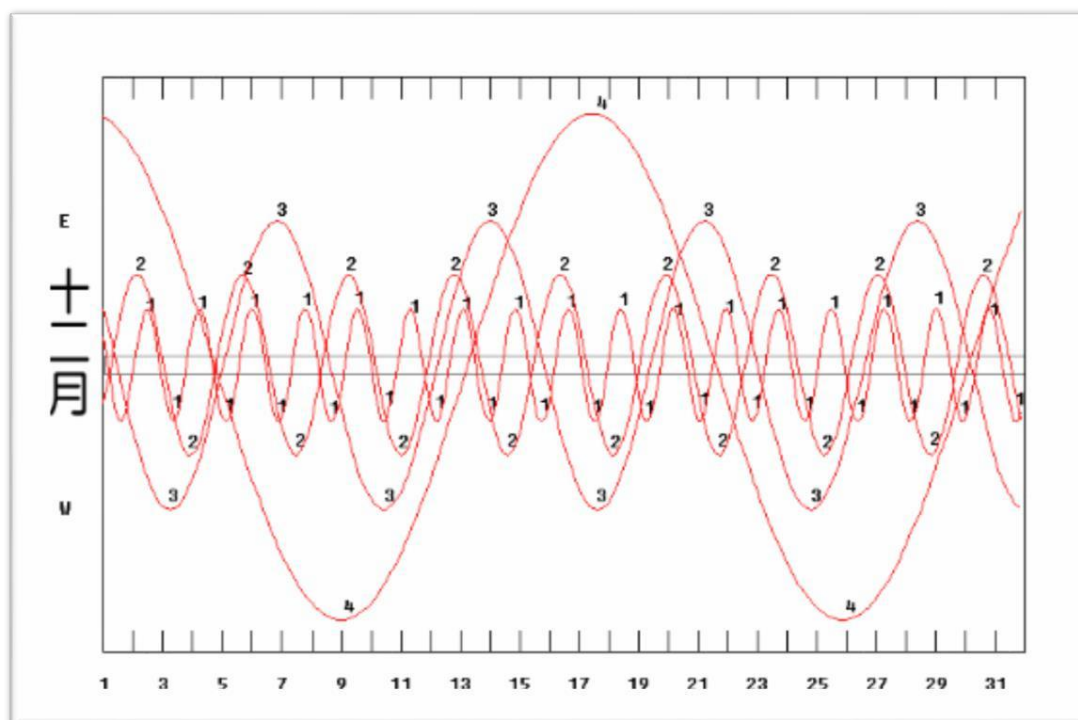
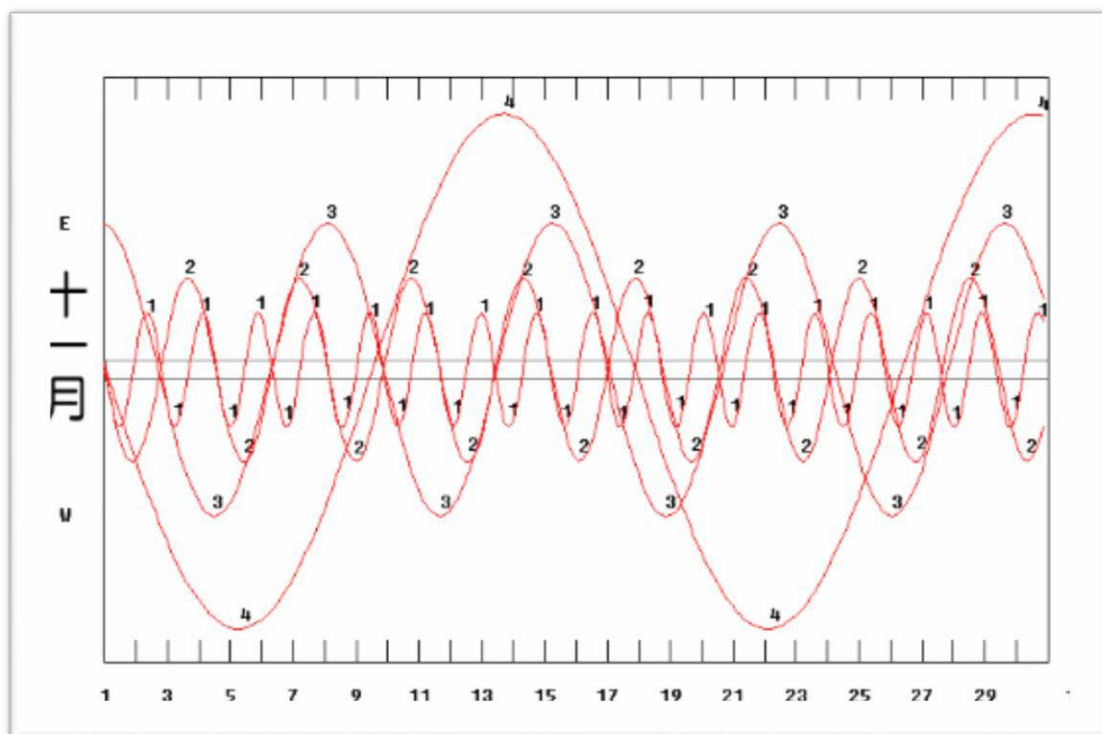












## 土 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經          |              |              | 赤 緯          |              |              | 距 離      | 光 程   | 日地離角         |
|----|----|--------------|--------------|--------------|--------------|--------------|--------------|----------|-------|--------------|
| 月  | 日  | <sup>h</sup> | <sup>m</sup> | <sup>s</sup> | <sup>°</sup> | <sup>'</sup> | <sup>"</sup> | AU       | 分     | <sup>°</sup> |
| 1  | 1  | 18           | 49           | 18.01        | -22          | 28           | 1.47         | 11.04331 | 91.84 | 0.1          |
| 1  | 2  | 18           | 49           | 48.62        | -22          | 27           | 28.74        | 11.04346 | 91.85 | 0.1          |
| 1  | 3  | 18           | 50           | 19.19        | -22          | 26           | 56.72        | 11.04335 | 91.84 | 0.1          |
| 1  | 4  | 18           | 50           | 49.81        | -22          | 26           | 23.99        | 11.04297 | 91.84 | 0.2          |
| 1  | 5  | 18           | 51           | 20.42        | -22          | 25           | 50.71        | 11.04233 | 91.84 | 0.2          |
| 1  | 6  | 18           | 51           | 51.01        | -22          | 25           | 17.02        | 11.04143 | 91.83 | 0.3          |
| 1  | 7  | 18           | 52           | 21.57        | -22          | 24           | 42.97        | 11.04026 | 91.82 | 0.4          |
| 1  | 8  | 18           | 52           | 52.10        | -22          | 24           | 8.55         | 11.03884 | 91.81 | 0.5          |
| 1  | 9  | 18           | 53           | 22.60        | -22          | 23           | 33.76        | 11.03714 | 91.79 | 0.6          |
| 1  | 10 | 18           | 53           | 53.05        | -22          | 22           | 58.63        | 11.03519 | 91.78 | 0.7          |
| 1  | 11 | 18           | 54           | 23.46        | -22          | 22           | 23.14        | 11.03298 | 91.76 | 0.8          |
| 1  | 12 | 18           | 54           | 53.81        | -22          | 21           | 47.30        | 11.03050 | 91.74 | 0.9          |
| 1  | 13 | 18           | 55           | 24.11        | -22          | 21           | 11.11        | 11.02777 | 91.72 | 0.9          |
| 1  | 14 | 18           | 55           | 54.35        | -22          | 20           | 34.59        | 11.02478 | 91.69 | 1.0          |
| 1  | 15 | 18           | 56           | 24.53        | -22          | 19           | 57.73        | 11.02153 | 91.66 | 1.1          |
| 1  | 16 | 18           | 56           | 54.64        | -22          | 19           | 20.55        | 11.01802 | 91.63 | 1.2          |
| 1  | 17 | 18           | 57           | 24.68        | -22          | 18           | 43.07        | 11.01426 | 91.60 | 1.3          |
| 1  | 18 | 18           | 57           | 54.64        | -22          | 18           | 5.29         | 11.01024 | 91.57 | 1.4          |
| 1  | 19 | 18           | 58           | 24.52        | -22          | 17           | 27.26        | 11.00597 | 91.53 | 1.5          |
| 1  | 20 | 18           | 58           | 54.32        | -22          | 16           | 48.97        | 11.00145 | 91.50 | 1.5          |
| 1  | 21 | 18           | 59           | 24.02        | -22          | 16           | 10.46        | 10.99668 | 91.46 | 1.6          |
| 1  | 22 | 18           | 59           | 53.62        | -22          | 15           | 31.72        | 10.99166 | 91.41 | 1.7          |
| 1  | 23 | 19           | 0            | 23.12        | -22          | 14           | 52.76        | 10.98639 | 91.37 | 1.8          |
| 1  | 24 | 19           | 0            | 52.50        | -22          | 14           | 13.58        | 10.98088 | 91.33 | 1.9          |
| 1  | 25 | 19           | 1            | 21.78        | -22          | 13           | 34.17        | 10.97512 | 91.28 | 2.0          |
| 1  | 26 | 19           | 1            | 50.93        | -22          | 12           | 54.54        | 10.96911 | 91.23 | 2.0          |
| 1  | 27 | 19           | 2            | 19.97        | -22          | 12           | 14.70        | 10.96286 | 91.18 | 2.1          |
| 1  | 28 | 19           | 2            | 48.88        | -22          | 11           | 34.67        | 10.95636 | 91.12 | 2.2          |
| 1  | 29 | 19           | 3            | 17.67        | -22          | 10           | 54.46        | 10.94962 | 91.07 | 2.3          |
| 1  | 30 | 19           | 3            | 46.32        | -22          | 10           | 14.10        | 10.94264 | 91.01 | 2.4          |
| 1  | 31 | 19           | 4            | 14.84        | -22          | 9            | 33.60        | 10.93542 | 90.95 | 2.5          |

## 土星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |               |
| 1 1       | 06:44     | 115     | 12:01     | 42S     | 17:19     | 245     | 15.05 13.85          | 1.00 | 0.5           |
| 1 2       | 06:40     | 115     | 11:58     | 42S     | 17:15     | 245     | 15.05 13.85          | 1.00 | 0.5           |
| 1 3       | 06:37     | 115     | 11:54     | 42S     | 17:12     | 245     | 15.05 13.85          | 1.00 | 0.5           |
| 1 4       | 06:33     | 115     | 11:51     | 43S     | 17:08     | 245     | 15.05 13.85          | 1.00 | 0.5           |
| 1 5       | 06:30     | 115     | 11:48     | 43S     | 17:05     | 245     | 15.05 13.85          | 1.00 | 0.5           |
| 1 6       | 06:27     | 115     | 11:44     | 43S     | 17:02     | 245     | 15.05 13.85          | 1.00 | 0.5           |
| 1 7       | 06:23     | 115     | 11:41     | 43S     | 16:58     | 245     | 15.05 13.85          | 1.00 | 0.5           |
| 1 8       | 06:20     | 115     | 11:37     | 43S     | 16:55     | 245     | 15.06 13.85          | 1.00 | 0.5           |
| 1 9       | 06:16     | 115     | 11:34     | 43S     | 16:51     | 245     | 15.06 13.85          | 1.00 | 0.5           |
| 1 10      | 06:13     | 115     | 11:30     | 43S     | 16:48     | 245     | 15.06 13.85          | 1.00 | 0.5           |
| 1 11      | 06:09     | 115     | 11:27     | 43S     | 16:45     | 245     | 15.06 13.86          | 1.00 | 0.5           |
| 1 12      | 06:06     | 115     | 11:24     | 43S     | 16:41     | 245     | 15.07 13.86          | 1.00 | 0.5           |
| 1 13      | 06:02     | 115     | 11:20     | 43S     | 16:38     | 245     | 15.07 13.86          | 1.00 | 0.5           |
| 1 14      | 05:59     | 115     | 11:17     | 43S     | 16:34     | 245     | 15.07 13.86          | 1.00 | 0.5           |
| 1 15      | 05:56     | 115     | 11:13     | 43S     | 16:31     | 245     | 15.08 13.87          | 1.00 | 0.5           |
| 1 16      | 05:52     | 115     | 11:10     | 43S     | 16:27     | 246     | 15.08 13.87          | 1.00 | 0.5           |
| 1 17      | 05:49     | 114     | 11:06     | 43S     | 16:24     | 246     | 15.09 13.88          | 1.00 | 0.5           |
| 1 18      | 05:45     | 114     | 11:03     | 43S     | 16:21     | 246     | 15.09 13.88          | 1.00 | 0.5           |
| 1 19      | 05:42     | 114     | 10:59     | 43S     | 16:17     | 246     | 15.1 13.89           | 1.00 | 0.5           |
| 1 20      | 05:38     | 114     | 10:56     | 43S     | 16:14     | 246     | 15.11 13.89          | 1.00 | 0.5           |
| 1 21      | 05:35     | 114     | 10:53     | 43S     | 16:10     | 246     | 15.11 13.9           | 1.00 | 0.5           |
| 1 22      | 05:31     | 114     | 10:49     | 43S     | 16:07     | 246     | 15.12 13.9           | 1.00 | 0.5           |
| 1 23      | 05:28     | 114     | 10:46     | 43S     | 16:04     | 246     | 15.13 13.91          | 1.00 | 0.5           |
| 1 24      | 05:24     | 114     | 10:42     | 43S     | 16:00     | 246     | 15.13 13.92          | 1.00 | 0.5           |
| 1 25      | 05:21     | 114     | 10:39     | 43S     | 15:57     | 246     | 15.14 13.92          | 1.00 | 0.5           |
| 1 26      | 05:17     | 114     | 10:35     | 43S     | 15:53     | 246     | 15.15 13.93          | 1.00 | 0.5           |
| 1 27      | 05:14     | 114     | 10:32     | 43S     | 15:50     | 246     | 15.16 13.94          | 1.00 | 0.6           |
| 1 28      | 05:11     | 114     | 10:28     | 43S     | 15:46     | 246     | 15.17 13.95          | 1.00 | 0.6           |
| 1 29      | 05:07     | 114     | 10:25     | 43S     | 15:43     | 246     | 15.18 13.95          | 1.00 | 0.6           |
| 1 30      | 05:04     | 114     | 10:22     | 43S     | 15:40     | 246     | 15.19 13.96          | 1.00 | 0.6           |
| 1 31      | 05:00     | 114     | 10:18     | 43S     | 15:36     | 246     | 15.2 13.97           | 1.00 | 0.6           |

## 土 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分     | °    |
| 2  | 1  | 19  | 4  | 43.21 | -22 | 8  | 52.98 | 10.92797 | 90.89 | 2.5  |
| 2  | 2  | 19  | 5  | 11.44 | -22 | 8  | 12.27 | 10.92027 | 90.82 | 2.6  |
| 2  | 3  | 19  | 5  | 39.50 | -22 | 7  | 31.47 | 10.91235 | 90.76 | 2.7  |
| 2  | 4  | 19  | 6  | 7.40  | -22 | 6  | 50.59 | 10.90418 | 90.69 | 2.8  |
| 2  | 5  | 19  | 6  | 35.14 | -22 | 6  | 9.66  | 10.89579 | 90.62 | 2.8  |
| 2  | 6  | 19  | 7  | 2.70  | -22 | 5  | 28.66 | 10.88718 | 90.55 | 2.9  |
| 2  | 7  | 19  | 7  | 30.08 | -22 | 4  | 47.63 | 10.87833 | 90.47 | 3.0  |
| 2  | 8  | 19  | 7  | 57.28 | -22 | 4  | 6.55  | 10.86926 | 90.40 | 3.1  |
| 2  | 9  | 19  | 8  | 24.29 | -22 | 3  | 25.44 | 10.85997 | 90.32 | 3.2  |
| 2  | 10 | 19  | 8  | 51.11 | -22 | 2  | 44.32 | 10.85046 | 90.24 | 3.2  |
| 2  | 11 | 19  | 9  | 17.74 | -22 | 2  | 3.19  | 10.84074 | 90.16 | 3.3  |
| 2  | 12 | 19  | 9  | 44.17 | -22 | 1  | 22.06 | 10.83080 | 90.08 | 3.4  |
| 2  | 13 | 19  | 10 | 10.39 | -22 | 0  | 40.97 | 10.82065 | 89.99 | 3.4  |
| 2  | 14 | 19  | 10 | 36.41 | -21 | 59 | 59.92 | 10.81029 | 89.91 | 3.5  |
| 2  | 15 | 19  | 11 | 2.22  | -21 | 59 | 18.95 | 10.79973 | 89.82 | 3.6  |
| 2  | 16 | 19  | 11 | 27.81 | -21 | 58 | 38.07 | 10.78896 | 89.73 | 3.7  |
| 2  | 17 | 19  | 11 | 53.19 | -21 | 57 | 57.31 | 10.77800 | 89.64 | 3.7  |
| 2  | 18 | 19  | 12 | 18.33 | -21 | 57 | 16.68 | 10.76684 | 89.54 | 3.8  |
| 2  | 19 | 19  | 12 | 43.25 | -21 | 56 | 36.21 | 10.75548 | 89.45 | 3.9  |
| 2  | 20 | 19  | 13 | 7.92  | -21 | 55 | 55.88 | 10.74393 | 89.35 | 3.9  |
| 2  | 21 | 19  | 13 | 32.35 | -21 | 55 | 15.70 | 10.73220 | 89.26 | 4.0  |
| 2  | 22 | 19  | 13 | 56.54 | -21 | 54 | 35.67 | 10.72027 | 89.16 | 4.1  |
| 2  | 23 | 19  | 14 | 20.49 | -21 | 53 | 55.81 | 10.70817 | 89.06 | 4.1  |
| 2  | 24 | 19  | 14 | 44.19 | -21 | 53 | 16.12 | 10.69588 | 88.95 | 4.2  |
| 2  | 25 | 19  | 15 | 7.63  | -21 | 52 | 36.64 | 10.68341 | 88.85 | 4.2  |
| 2  | 26 | 19  | 15 | 30.82 | -21 | 51 | 57.38 | 10.67076 | 88.75 | 4.3  |
| 2  | 27 | 19  | 15 | 53.75 | -21 | 51 | 18.38 | 10.65794 | 88.64 | 4.4  |
| 2  | 28 | 19  | 16 | 16.41 | -21 | 50 | 39.64 | 10.64496 | 88.53 | 4.4  |

## 土星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |     | 中 天   |     | 沒     |     | 視 直徑  |       | 相位   | 視 亮度 |
|----|----|-------|-----|-------|-----|-------|-----|-------|-------|------|------|
| 月  | 日  | 時間    | 方位  | 時間    | 仰角  | 時間    | 方位  | 赤道    | 兩極    |      | 星等   |
|    |    | h m   | °   | h m   | °   | h m   | °   | "     | "     |      |      |
| 2  | 1  | 04:57 | 114 | 10:15 | 43S | 15:33 | 246 | 15.21 | 13.98 | 1.00 | 0.6  |
| 2  | 2  | 04:53 | 114 | 10:11 | 43S | 15:29 | 246 | 15.22 | 13.99 | 1.00 | 0.6  |
| 2  | 3  | 04:50 | 114 | 10:08 | 43S | 15:26 | 246 | 15.23 | 14    | 1.00 | 0.6  |
| 2  | 4  | 04:46 | 114 | 10:04 | 43S | 15:22 | 246 | 15.24 | 14.01 | 1.00 | 0.6  |
| 2  | 5  | 04:43 | 114 | 10:01 | 43S | 15:19 | 246 | 15.25 | 14.02 | 1.00 | 0.6  |
| 2  | 6  | 04:39 | 114 | 09:57 | 43S | 15:15 | 246 | 15.27 | 14.03 | 1.00 | 0.6  |
| 2  | 7  | 04:36 | 114 | 09:54 | 43S | 15:12 | 246 | 15.28 | 14.04 | 1.00 | 0.6  |
| 2  | 8  | 04:32 | 114 | 09:50 | 43S | 15:09 | 246 | 15.29 | 14.05 | 1.00 | 0.6  |
| 2  | 9  | 04:29 | 114 | 09:47 | 43S | 15:05 | 246 | 15.3  | 14.06 | 1.00 | 0.6  |
| 2  | 10 | 04:25 | 114 | 09:43 | 43S | 15:02 | 246 | 15.32 | 14.08 | 1.00 | 0.6  |
| 2  | 11 | 04:22 | 114 | 09:40 | 43S | 14:58 | 246 | 15.33 | 14.09 | 1.00 | 0.6  |
| 2  | 12 | 04:18 | 114 | 09:36 | 43S | 14:55 | 246 | 15.34 | 14.1  | 1.00 | 0.6  |
| 2  | 13 | 04:15 | 114 | 09:33 | 43S | 14:51 | 246 | 15.36 | 14.11 | 1.00 | 0.6  |
| 2  | 14 | 04:11 | 114 | 09:29 | 43S | 14:48 | 246 | 15.37 | 14.13 | 1.00 | 0.6  |
| 2  | 15 | 04:07 | 114 | 09:26 | 43S | 14:44 | 246 | 15.39 | 14.14 | 1.00 | 0.6  |
| 2  | 16 | 04:04 | 114 | 09:22 | 43S | 14:41 | 246 | 15.4  | 14.15 | 1.00 | 0.6  |
| 2  | 17 | 04:00 | 114 | 09:19 | 43S | 14:37 | 246 | 15.42 | 14.17 | 1.00 | 0.6  |
| 2  | 18 | 03:57 | 114 | 09:15 | 43S | 14:34 | 246 | 15.44 | 14.18 | 1.00 | 0.6  |
| 2  | 19 | 03:53 | 114 | 09:12 | 43S | 14:30 | 246 | 15.45 | 14.2  | 1.00 | 0.6  |
| 2  | 20 | 03:50 | 114 | 09:08 | 43S | 14:27 | 246 | 15.47 | 14.21 | 1.00 | 0.6  |
| 2  | 21 | 03:46 | 114 | 09:05 | 43S | 14:23 | 246 | 15.49 | 14.23 | 1.00 | 0.6  |
| 2  | 22 | 03:43 | 114 | 09:01 | 43S | 14:20 | 246 | 15.5  | 14.24 | 1.00 | 0.6  |
| 2  | 23 | 03:39 | 114 | 08:58 | 43S | 14:16 | 246 | 15.52 | 14.26 | 1.00 | 0.6  |
| 2  | 24 | 03:36 | 114 | 08:54 | 43S | 14:13 | 246 | 15.54 | 14.27 | 1.00 | 0.6  |
| 2  | 25 | 03:32 | 114 | 08:51 | 43S | 14:09 | 246 | 15.56 | 14.29 | 1.00 | 0.6  |
| 2  | 26 | 03:28 | 114 | 08:47 | 43S | 14:06 | 246 | 15.57 | 14.31 | 1.00 | 0.6  |
| 2  | 27 | 03:25 | 114 | 08:44 | 43S | 14:02 | 246 | 15.59 | 14.32 | 1.00 | 0.6  |
| 2  | 28 | 03:21 | 114 | 08:40 | 43S | 13:59 | 246 | 15.61 | 14.34 | 1.00 | 0.6  |

## 土 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分     | °    |
| 3  | 1  | 19  | 16 | 38.80 | -21 | 50 | 1.20  | 10.63180 | 88.42 | 4.5  |
| 3  | 2  | 19  | 17 | 0.91  | -21 | 49 | 23.07 | 10.61848 | 88.31 | 4.5  |
| 3  | 3  | 19  | 17 | 22.74 | -21 | 48 | 45.27 | 10.60500 | 88.20 | 4.6  |
| 3  | 4  | 19  | 17 | 44.28 | -21 | 48 | 7.80  | 10.59136 | 88.09 | 4.6  |
| 3  | 5  | 19  | 18 | 5.53  | -21 | 47 | 30.68 | 10.57757 | 87.97 | 4.7  |
| 3  | 6  | 19  | 18 | 26.48 | -21 | 46 | 53.93 | 10.56362 | 87.85 | 4.7  |
| 3  | 7  | 19  | 18 | 47.13 | -21 | 46 | 17.54 | 10.54953 | 87.74 | 4.8  |
| 3  | 8  | 19  | 19 | 7.47  | -21 | 45 | 41.53 | 10.53530 | 87.62 | 4.8  |
| 3  | 9  | 19  | 19 | 27.51 | -21 | 45 | 5.91  | 10.52093 | 87.50 | 4.9  |
| 3  | 10 | 19  | 19 | 47.24 | -21 | 44 | 30.70 | 10.50642 | 87.38 | 4.9  |
| 3  | 11 | 19  | 20 | 6.65  | -21 | 43 | 55.90 | 10.49178 | 87.26 | 5.0  |
| 3  | 12 | 19  | 20 | 25.74 | -21 | 43 | 21.54 | 10.47701 | 87.13 | 5.0  |
| 3  | 13 | 19  | 20 | 44.52 | -21 | 42 | 47.64 | 10.46213 | 87.01 | 5.1  |
| 3  | 14 | 19  | 21 | 2.97  | -21 | 42 | 14.22 | 10.44712 | 86.89 | 5.1  |
| 3  | 15 | 19  | 21 | 21.10 | -21 | 41 | 41.30 | 10.43199 | 86.76 | 5.2  |
| 3  | 16 | 19  | 21 | 38.89 | -21 | 41 | 8.91  | 10.41676 | 86.63 | 5.2  |
| 3  | 17 | 19  | 21 | 56.35 | -21 | 40 | 37.07 | 10.40142 | 86.51 | 5.2  |
| 3  | 18 | 19  | 22 | 13.46 | -21 | 40 | 5.78  | 10.38598 | 86.38 | 5.3  |
| 3  | 19 | 19  | 22 | 30.24 | -21 | 39 | 35.06 | 10.37043 | 86.25 | 5.3  |
| 3  | 20 | 19  | 22 | 46.66 | -21 | 39 | 4.90  | 10.35480 | 86.12 | 5.3  |
| 3  | 21 | 19  | 23 | 2.73  | -21 | 38 | 35.31 | 10.33907 | 85.99 | 5.4  |
| 3  | 22 | 19  | 23 | 18.46 | -21 | 38 | 6.29  | 10.32325 | 85.86 | 5.4  |
| 3  | 23 | 19  | 23 | 33.83 | -21 | 37 | 37.84 | 10.30735 | 85.72 | 5.4  |
| 3  | 24 | 19  | 23 | 48.85 | -21 | 37 | 10.00 | 10.29136 | 85.59 | 5.5  |
| 3  | 25 | 19  | 24 | 3.51  | -21 | 36 | 42.77 | 10.27530 | 85.46 | 5.5  |
| 3  | 26 | 19  | 24 | 17.81 | -21 | 36 | 16.19 | 10.25917 | 85.32 | 5.5  |
| 3  | 27 | 19  | 24 | 31.75 | -21 | 35 | 50.28 | 10.24297 | 85.19 | 5.5  |
| 3  | 28 | 19  | 24 | 45.32 | -21 | 35 | 25.04 | 10.22670 | 85.05 | 5.6  |
| 3  | 29 | 19  | 24 | 58.52 | -21 | 35 | 0.51  | 10.21037 | 84.92 | 5.6  |
| 3  | 30 | 19  | 25 | 11.34 | -21 | 34 | 36.69 | 10.19399 | 84.78 | 5.6  |
| 3  | 31 | 19  | 25 | 23.78 | -21 | 34 | 13.59 | 10.17755 | 84.64 | 5.6  |

## 土星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 3 1       | 03:18     | 114     | 08:36     | 43S     | 13:55     | 246     | 15.63        | 14.36         | 1.00 | 0.6           |
| 3 2       | 03:14     | 114     | 08:33     | 43S     | 13:52     | 246     | 15.65        | 14.37         | 1.00 | 0.6           |
| 3 3       | 03:10     | 114     | 08:29     | 43S     | 13:48     | 246     | 15.67        | 14.39         | 1.00 | 0.6           |
| 3 4       | 03:07     | 114     | 08:26     | 43S     | 13:45     | 246     | 15.69        | 14.41         | 1.00 | 0.6           |
| 3 5       | 03:03     | 114     | 08:22     | 43S     | 13:41     | 246     | 15.71        | 14.43         | 1.00 | 0.6           |
| 3 6       | 03:00     | 114     | 08:19     | 43S     | 13:37     | 246     | 15.73        | 14.45         | 1.00 | 0.6           |
| 3 7       | 02:56     | 114     | 08:15     | 43S     | 13:34     | 246     | 15.75        | 14.47         | 1.00 | 0.6           |
| 3 8       | 02:52     | 114     | 08:11     | 43S     | 13:30     | 246     | 15.78        | 14.49         | 1.00 | 0.6           |
| 3 9       | 02:49     | 114     | 08:08     | 43S     | 13:27     | 246     | 15.8         | 14.5          | 1.00 | 0.6           |
| 3 10      | 02:45     | 114     | 08:04     | 43S     | 13:23     | 246     | 15.82        | 14.52         | 1.00 | 0.6           |
| 3 11      | 02:42     | 114     | 08:01     | 43S     | 13:19     | 246     | 15.84        | 14.54         | 1.00 | 0.6           |
| 3 12      | 02:38     | 114     | 07:57     | 43S     | 13:16     | 246     | 15.86        | 14.56         | 1.00 | 0.6           |
| 3 13      | 02:34     | 114     | 07:53     | 43S     | 13:12     | 246     | 15.89        | 14.58         | 1.00 | 0.6           |
| 3 14      | 02:31     | 114     | 07:50     | 43S     | 13:09     | 246     | 15.91        | 14.61         | 1.00 | 0.6           |
| 3 15      | 02:27     | 114     | 07:46     | 43S     | 13:05     | 246     | 15.93        | 14.63         | 1.00 | 0.6           |
| 3 16      | 02:23     | 114     | 07:42     | 43S     | 13:01     | 246     | 15.95        | 14.65         | 1.00 | 0.6           |
| 3 17      | 02:20     | 114     | 07:39     | 43S     | 12:58     | 246     | 15.98        | 14.67         | 1.00 | 0.6           |
| 3 18      | 02:16     | 114     | 07:35     | 43S     | 12:54     | 246     | 16           | 14.69         | 1.00 | 0.6           |
| 3 19      | 02:12     | 114     | 07:31     | 43S     | 12:51     | 246     | 16.03        | 14.71         | 1.00 | 0.6           |
| 3 20      | 02:09     | 114     | 07:28     | 43S     | 12:47     | 246     | 16.05        | 14.73         | 1.00 | 0.6           |
| 3 21      | 02:05     | 114     | 07:24     | 43S     | 12:43     | 246     | 16.07        | 14.76         | 1.00 | 0.6           |
| 3 22      | 02:01     | 114     | 07:20     | 43S     | 12:40     | 246     | 16.1         | 14.78         | 1.00 | 0.6           |
| 3 23      | 01:58     | 114     | 07:17     | 43S     | 12:36     | 246     | 16.12        | 14.8          | 1.00 | 0.6           |
| 3 24      | 01:54     | 114     | 07:13     | 43S     | 12:32     | 246     | 16.15        | 14.82         | 1.00 | 0.6           |
| 3 25      | 01:50     | 114     | 07:09     | 43S     | 12:29     | 246     | 16.17        | 14.85         | 1.00 | 0.6           |
| 3 26      | 01:47     | 114     | 07:06     | 43S     | 12:25     | 246     | 16.2         | 14.87         | 1.00 | 0.6           |
| 3 27      | 01:43     | 114     | 07:02     | 43S     | 12:21     | 246     | 16.23        | 14.89         | 1.00 | 0.6           |
| 3 28      | 01:39     | 114     | 06:58     | 43S     | 12:18     | 246     | 16.25        | 14.92         | 1.00 | 0.6           |
| 3 29      | 01:35     | 114     | 06:55     | 43S     | 12:14     | 246     | 16.28        | 14.94         | 1.00 | 0.6           |
| 3 30      | 01:32     | 114     | 06:51     | 43S     | 12:10     | 246     | 16.3         | 14.96         | 1.00 | 0.6           |
| 3 31      | 01:28     | 114     | 06:47     | 43S     | 12:06     | 246     | 16.33        | 14.99         | 1.00 | 0.6           |

## 土 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分     | °    |
| 4  | 1  | 19  | 25 | 35.83 | -21 | 33 | 51.22 | 10.16107 | 84.51 | 5.6  |
| 4  | 2  | 19  | 25 | 47.50 | -21 | 33 | 29.58 | 10.14454 | 84.37 | 5.6  |
| 4  | 3  | 19  | 25 | 58.77 | -21 | 33 | 8.69  | 10.12797 | 84.23 | 5.7  |
| 4  | 4  | 19  | 26 | 9.66  | -21 | 32 | 48.54 | 10.11137 | 84.09 | 5.7  |
| 4  | 5  | 19  | 26 | 20.15 | -21 | 32 | 29.14 | 10.09475 | 83.96 | 5.7  |
| 4  | 6  | 19  | 26 | 30.25 | -21 | 32 | 10.50 | 10.07809 | 83.82 | 5.7  |
| 4  | 7  | 19  | 26 | 39.95 | -21 | 31 | 52.63 | 10.06142 | 83.68 | 5.7  |
| 4  | 8  | 19  | 26 | 49.25 | -21 | 31 | 35.55 | 10.04473 | 83.54 | 5.7  |
| 4  | 9  | 19  | 26 | 58.16 | -21 | 31 | 19.25 | 10.02803 | 83.40 | 5.7  |
| 4  | 10 | 19  | 27 | 6.66  | -21 | 31 | 3.77  | 10.01133 | 83.26 | 5.7  |
| 4  | 11 | 19  | 27 | 14.76 | -21 | 30 | 49.11 | 9.99463  | 83.12 | 5.7  |
| 4  | 12 | 19  | 27 | 22.46 | -21 | 30 | 35.30 | 9.97793  | 82.98 | 5.7  |
| 4  | 13 | 19  | 27 | 29.75 | -21 | 30 | 22.35 | 9.96124  | 82.84 | 5.7  |
| 4  | 14 | 19  | 27 | 36.64 | -21 | 30 | 10.26 | 9.94456  | 82.71 | 5.7  |
| 4  | 15 | 19  | 27 | 43.11 | -21 | 29 | 59.04 | 9.92791  | 82.57 | 5.7  |
| 4  | 16 | 19  | 27 | 49.16 | -21 | 29 | 48.67 | 9.91128  | 82.43 | 5.7  |
| 4  | 17 | 19  | 27 | 54.81 | -21 | 29 | 39.17 | 9.89467  | 82.29 | 5.7  |
| 4  | 18 | 19  | 28 | 0.04  | -21 | 29 | 30.51 | 9.87810  | 82.15 | 5.7  |
| 4  | 19 | 19  | 28 | 4.86  | -21 | 29 | 22.69 | 9.86156  | 82.02 | 5.7  |
| 4  | 20 | 19  | 28 | 9.27  | -21 | 29 | 15.73 | 9.84506  | 81.88 | 5.7  |
| 4  | 21 | 19  | 28 | 13.28 | -21 | 29 | 9.63  | 9.82860  | 81.74 | 5.6  |
| 4  | 22 | 19  | 28 | 16.87 | -21 | 29 | 4.41  | 9.81220  | 81.61 | 5.6  |
| 4  | 23 | 19  | 28 | 20.05 | -21 | 29 | 0.09  | 9.79585  | 81.47 | 5.6  |
| 4  | 24 | 19  | 28 | 22.81 | -21 | 28 | 56.67 | 9.77955  | 81.33 | 5.6  |
| 4  | 25 | 19  | 28 | 25.16 | -21 | 28 | 54.16 | 9.76332  | 81.20 | 5.6  |
| 4  | 26 | 19  | 28 | 27.09 | -21 | 28 | 52.56 | 9.74715  | 81.06 | 5.5  |
| 4  | 27 | 19  | 28 | 28.61 | -21 | 28 | 51.88 | 9.73106  | 80.93 | 5.5  |
| 4  | 28 | 19  | 28 | 29.70 | -21 | 28 | 52.11 | 9.71504  | 80.80 | 5.5  |
| 4  | 29 | 19  | 28 | 30.37 | -21 | 28 | 53.25 | 9.69910  | 80.66 | 5.5  |
| 4  | 30 | 19  | 28 | 30.62 | -21 | 28 | 55.29 | 9.68325  | 80.53 | 5.4  |



## 土星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑    |         | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|---------|---------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° | 赤道<br>" | 兩極<br>" |      |               |
| 4 1       | 01:24     | 114     | 06:43     | 43S     | 12:03     | 246     | 16.36   | 15.01   | 1.00 | 0.6           |
| 4 2       | 01:20     | 114     | 06:40     | 43S     | 11:59     | 246     | 16.38   | 15.04   | 1.00 | 0.6           |
| 4 3       | 01:17     | 114     | 06:36     | 43S     | 11:55     | 246     | 16.41   | 15.06   | 1.00 | 0.6           |
| 4 4       | 01:13     | 114     | 06:32     | 43S     | 11:52     | 246     | 16.44   | 15.08   | 1.00 | 0.6           |
| 4 5       | 01:09     | 114     | 06:28     | 43S     | 11:48     | 246     | 16.46   | 15.11   | 1.00 | 0.6           |
| 4 6       | 01:05     | 114     | 06:25     | 43S     | 11:44     | 246     | 16.49   | 15.13   | 1.00 | 0.6           |
| 4 7       | 01:02     | 114     | 06:21     | 43S     | 11:40     | 246     | 16.52   | 15.16   | 1.00 | 0.5           |
| 4 8       | 00:58     | 114     | 06:17     | 43S     | 11:36     | 246     | 16.55   | 15.18   | 1.00 | 0.5           |
| 4 9       | 00:54     | 114     | 06:13     | 43S     | 11:33     | 246     | 16.57   | 15.21   | 1.00 | 0.5           |
| 4 10      | 00:50     | 114     | 06:10     | 43S     | 11:29     | 246     | 16.6    | 15.23   | 1.00 | 0.5           |
| 4 11      | 00:46     | 114     | 06:06     | 43S     | 11:25     | 246     | 16.63   | 15.26   | 1.00 | 0.5           |
| 4 12      | 00:43     | 114     | 06:02     | 43S     | 11:21     | 246     | 16.66   | 15.28   | 1.00 | 0.5           |
| 4 13      | 00:39     | 114     | 05:58     | 43S     | 11:18     | 246     | 16.68   | 15.31   | 1.00 | 0.5           |
| 4 14      | 00:35     | 114     | 05:54     | 43S     | 11:14     | 246     | 16.71   | 15.34   | 1.00 | 0.5           |
| 4 15      | 00:31     | 114     | 05:51     | 43S     | 11:10     | 246     | 16.74   | 15.36   | 1.00 | 0.5           |
| 4 16      | 00:27     | 114     | 05:47     | 43S     | 11:06     | 246     | 16.77   | 15.39   | 1.00 | 0.5           |
| 4 17      | 00:23     | 114     | 05:43     | 43S     | 11:02     | 246     | 16.8    | 15.41   | 1.00 | 0.5           |
| 4 18      | 00:20     | 114     | 05:39     | 43S     | 10:58     | 246     | 16.82   | 15.44   | 1.00 | 0.5           |
| 4 19      | 00:16     | 114     | 05:35     | 43S     | 10:55     | 246     | 16.85   | 15.46   | 1.00 | 0.5           |
| 4 20      | 00:12     | 114     | 05:31     | 43S     | 10:51     | 246     | 16.88   | 15.49   | 1.00 | 0.5           |
| 4 21      | 00:08     | 114     | 05:27     | 43S     | 10:47     | 246     | 16.91   | 15.52   | 1.00 | 0.5           |
| 4 22      | 00:04     | 114     | 05:24     | 43S     | 10:43     | 246     | 16.94   | 15.54   | 1.00 | 0.5           |
| 4 23      | 00:00     | 114     | 05:20     | 43S     | 10:39     | 246     | 16.97   | 15.57   | 1.00 | 0.5           |
| 4 24      | 23:52     | 114     | 05:16     | 43S     | 10:35     | 246     | 16.99   | 15.59   | 1.00 | 0.5           |
| 4 25      | 23:49     | 114     | 05:12     | 43S     | 10:31     | 246     | 17.02   | 15.62   | 1.00 | 0.5           |
| 4 26      | 23:45     | 114     | 05:08     | 43S     | 10:27     | 246     | 17.05   | 15.65   | 1.00 | 0.5           |
| 4 27      | 23:41     | 114     | 05:04     | 43S     | 10:24     | 246     | 17.08   | 15.67   | 1.00 | 0.5           |
| 4 28      | 23:37     | 114     | 05:00     | 43S     | 10:20     | 246     | 17.11   | 15.7    | 1.00 | 0.5           |
| 4 29      | 23:33     | 114     | 04:56     | 43S     | 10:16     | 246     | 17.14   | 15.72   | 1.00 | 0.5           |
| 4 30      | 23:29     | 114     | 04:52     | 43S     | 10:12     | 246     | 17.16   | 15.75   | 1.00 | 0.5           |

## 土 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 5  | 1  | 19  | 28 | 30.46 | -21 | 28 | 58.23 | 9.66749 | 80.40 | 5.4  |
| 5  | 2  | 19  | 28 | 29.87 | -21 | 29 | 2.06  | 9.65182 | 80.27 | 5.4  |
| 5  | 3  | 19  | 28 | 28.87 | -21 | 29 | 6.78  | 9.63625 | 80.14 | 5.3  |
| 5  | 4  | 19  | 28 | 27.45 | -21 | 29 | 12.38 | 9.62079 | 80.01 | 5.3  |
| 5  | 5  | 19  | 28 | 25.62 | -21 | 29 | 18.86 | 9.60544 | 79.89 | 5.3  |
| 5  | 6  | 19  | 28 | 23.38 | -21 | 29 | 26.22 | 9.59020 | 79.76 | 5.2  |
| 5  | 7  | 19  | 28 | 20.73 | -21 | 29 | 34.47 | 9.57509 | 79.63 | 5.2  |
| 5  | 8  | 19  | 28 | 17.68 | -21 | 29 | 43.62 | 9.56010 | 79.51 | 5.1  |
| 5  | 9  | 19  | 28 | 14.22 | -21 | 29 | 53.67 | 9.54523 | 79.39 | 5.1  |
| 5  | 10 | 19  | 28 | 10.35 | -21 | 30 | 4.61  | 9.53051 | 79.26 | 5.1  |
| 5  | 11 | 19  | 28 | 6.08  | -21 | 30 | 16.44 | 9.51592 | 79.14 | 5.0  |
| 5  | 12 | 19  | 28 | 1.40  | -21 | 30 | 29.16 | 9.50147 | 79.02 | 5.0  |
| 5  | 13 | 19  | 27 | 56.33 | -21 | 30 | 42.75 | 9.48717 | 78.90 | 4.9  |
| 5  | 14 | 19  | 27 | 50.85 | -21 | 30 | 57.19 | 9.47303 | 78.78 | 4.9  |
| 5  | 15 | 19  | 27 | 44.98 | -21 | 31 | 12.45 | 9.45904 | 78.67 | 4.8  |
| 5  | 16 | 19  | 27 | 38.73 | -21 | 31 | 28.53 | 9.44520 | 78.55 | 4.8  |
| 5  | 17 | 19  | 27 | 32.09 | -21 | 31 | 45.41 | 9.43153 | 78.44 | 4.7  |
| 5  | 18 | 19  | 27 | 25.07 | -21 | 32 | 3.09  | 9.41803 | 78.33 | 4.6  |
| 5  | 19 | 19  | 27 | 17.68 | -21 | 32 | 21.57 | 9.40470 | 78.22 | 4.6  |
| 5  | 20 | 19  | 27 | 9.91  | -21 | 32 | 40.84 | 9.39155 | 78.11 | 4.5  |
| 5  | 21 | 19  | 27 | 1.77  | -21 | 33 | 0.92  | 9.37857 | 78.00 | 4.5  |
| 5  | 22 | 19  | 26 | 53.27 | -21 | 33 | 21.78 | 9.36577 | 77.89 | 4.4  |
| 5  | 23 | 19  | 26 | 44.39 | -21 | 33 | 43.44 | 9.35317 | 77.79 | 4.3  |
| 5  | 24 | 19  | 26 | 35.16 | -21 | 34 | 5.86  | 9.34075 | 77.68 | 4.3  |
| 5  | 25 | 19  | 26 | 25.56 | -21 | 34 | 29.04 | 9.32853 | 77.58 | 4.2  |
| 5  | 26 | 19  | 26 | 15.60 | -21 | 34 | 52.97 | 9.31650 | 77.48 | 4.1  |
| 5  | 27 | 19  | 26 | 5.29  | -21 | 35 | 17.61 | 9.30468 | 77.38 | 4.1  |
| 5  | 28 | 19  | 25 | 54.63 | -21 | 35 | 42.95 | 9.29306 | 77.29 | 4.0  |
| 5  | 29 | 19  | 25 | 43.63 | -21 | 36 | 8.98  | 9.28166 | 77.19 | 3.9  |
| 5  | 30 | 19  | 25 | 32.29 | -21 | 36 | 35.67 | 9.27047 | 77.10 | 3.8  |
| 5  | 31 | 19  | 25 | 20.62 | -21 | 37 | 3.01  | 9.25950 | 77.01 | 3.8  |

## 土星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |     | 中天    |     | 沒     |     | 視直徑   |       | 相位   | 視亮星 |
|----|----|-------|-----|-------|-----|-------|-----|-------|-------|------|-----|
| 月  | 日  | 時間    | 方位  | 時間    | 仰角  | 時間    | 方位  | 赤道    | 兩極    |      |     |
|    |    | h m   | °   | h m   | °   | h m   | °   | "     | "     |      |     |
| 5  | 1  | 23:25 | 114 | 04:48 | 43S | 10:08 | 246 | 17.19 | 15.77 | 1.00 | 0.5 |
| 5  | 2  | 23:21 | 114 | 04:44 | 43S | 10:04 | 246 | 17.22 | 15.8  | 1.00 | 0.4 |
| 5  | 3  | 23:17 | 114 | 04:41 | 43S | 10:00 | 246 | 17.25 | 15.83 | 1.00 | 0.4 |
| 5  | 4  | 23:13 | 114 | 04:37 | 43S | 09:56 | 246 | 17.27 | 15.85 | 1.00 | 0.4 |
| 5  | 5  | 23:09 | 114 | 04:33 | 43S | 09:52 | 246 | 17.3  | 15.88 | 1.00 | 0.4 |
| 5  | 6  | 23:05 | 114 | 04:29 | 43S | 09:48 | 246 | 17.33 | 15.9  | 1.00 | 0.4 |
| 5  | 7  | 23:01 | 114 | 04:25 | 43S | 09:44 | 246 | 17.36 | 15.93 | 1.00 | 0.4 |
| 5  | 8  | 22:57 | 114 | 04:21 | 43S | 09:40 | 246 | 17.38 | 15.95 | 1.00 | 0.4 |
| 5  | 9  | 22:53 | 114 | 04:17 | 43S | 09:36 | 246 | 17.41 | 15.98 | 1.00 | 0.4 |
| 5  | 10 | 22:49 | 114 | 04:13 | 43S | 09:32 | 246 | 17.44 | 16    | 1.00 | 0.4 |
| 5  | 11 | 22:45 | 114 | 04:09 | 43S | 09:28 | 246 | 17.46 | 16.03 | 1.00 | 0.4 |
| 5  | 12 | 22:41 | 114 | 04:05 | 43S | 09:24 | 246 | 17.49 | 16.05 | 1.00 | 0.4 |
| 5  | 13 | 22:37 | 114 | 04:01 | 43S | 09:20 | 246 | 17.52 | 16.07 | 1.00 | 0.4 |
| 5  | 14 | 22:33 | 114 | 03:57 | 43S | 09:16 | 246 | 17.54 | 16.1  | 1.00 | 0.4 |
| 5  | 15 | 22:29 | 114 | 03:53 | 43S | 09:12 | 246 | 17.57 | 16.12 | 1.00 | 0.4 |
| 5  | 16 | 22:25 | 114 | 03:49 | 43S | 09:08 | 246 | 17.6  | 16.15 | 1.00 | 0.4 |
| 5  | 17 | 22:21 | 114 | 03:45 | 43S | 09:04 | 246 | 17.62 | 16.17 | 1.00 | 0.4 |
| 5  | 18 | 22:17 | 114 | 03:40 | 43S | 09:00 | 246 | 17.65 | 16.19 | 1.00 | 0.4 |
| 5  | 19 | 22:13 | 114 | 03:36 | 43S | 08:56 | 246 | 17.67 | 16.22 | 1.00 | 0.4 |
| 5  | 20 | 22:09 | 114 | 03:32 | 43S | 08:52 | 246 | 17.7  | 16.24 | 1.00 | 0.3 |
| 5  | 21 | 22:05 | 114 | 03:28 | 43S | 08:48 | 246 | 17.72 | 16.26 | 1.00 | 0.3 |
| 5  | 22 | 22:01 | 114 | 03:24 | 43S | 08:43 | 246 | 17.74 | 16.28 | 1.00 | 0.3 |
| 5  | 23 | 21:57 | 114 | 03:20 | 43S | 08:39 | 246 | 17.77 | 16.31 | 1.00 | 0.3 |
| 5  | 24 | 21:53 | 114 | 03:16 | 43S | 08:35 | 246 | 17.79 | 16.33 | 1.00 | 0.3 |
| 5  | 25 | 21:49 | 114 | 03:12 | 43S | 08:31 | 246 | 17.82 | 16.35 | 1.00 | 0.3 |
| 5  | 26 | 21:45 | 114 | 03:08 | 43S | 08:27 | 246 | 17.84 | 16.37 | 1.00 | 0.3 |
| 5  | 27 | 21:41 | 114 | 03:04 | 43S | 08:23 | 246 | 17.86 | 16.39 | 1.00 | 0.3 |
| 5  | 28 | 21:36 | 114 | 03:00 | 43S | 08:19 | 246 | 17.88 | 16.41 | 1.00 | 0.3 |
| 5  | 29 | 21:32 | 114 | 02:56 | 43S | 08:15 | 246 | 17.91 | 16.43 | 1.00 | 0.3 |
| 5  | 30 | 21:28 | 114 | 02:51 | 43S | 08:11 | 246 | 17.93 | 16.45 | 1.00 | 0.3 |
| 5  | 31 | 21:24 | 114 | 02:47 | 43S | 08:06 | 246 | 17.95 | 16.47 | 1.00 | 0.3 |

## 土 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 6  | 1  | 19  | 25 | 8.62  | -21 | 37 | 30.98 | 9.24875 | 76.92 | 3.7  |
| 6  | 2  | 19  | 24 | 56.31 | -21 | 37 | 59.57 | 9.23822 | 76.83 | 3.6  |
| 6  | 3  | 19  | 24 | 43.69 | -21 | 38 | 28.76 | 9.22793 | 76.75 | 3.5  |
| 6  | 4  | 19  | 24 | 30.76 | -21 | 38 | 58.57 | 9.21787 | 76.66 | 3.4  |
| 6  | 5  | 19  | 24 | 17.53 | -21 | 39 | 28.96 | 9.20805 | 76.58 | 3.4  |
| 6  | 6  | 19  | 24 | 4.00  | -21 | 39 | 59.95 | 9.19847 | 76.50 | 3.3  |
| 6  | 7  | 19  | 23 | 50.19 | -21 | 40 | 31.50 | 9.18913 | 76.42 | 3.2  |
| 6  | 8  | 19  | 23 | 36.09 | -21 | 41 | 3.61  | 9.18004 | 76.35 | 3.1  |
| 6  | 9  | 19  | 23 | 21.72 | -21 | 41 | 36.23 | 9.17120 | 76.27 | 3.0  |
| 6  | 10 | 19  | 23 | 7.07  | -21 | 42 | 9.36  | 9.16261 | 76.20 | 2.9  |
| 6  | 11 | 19  | 22 | 52.16 | -21 | 42 | 42.94 | 9.15428 | 76.13 | 2.8  |
| 6  | 12 | 19  | 22 | 37.01 | -21 | 43 | 16.96 | 9.14620 | 76.07 | 2.8  |
| 6  | 13 | 19  | 22 | 21.60 | -21 | 43 | 51.39 | 9.13839 | 76.00 | 2.7  |
| 6  | 14 | 19  | 22 | 5.97  | -21 | 44 | 26.22 | 9.13083 | 75.94 | 2.6  |
| 6  | 15 | 19  | 21 | 50.10 | -21 | 45 | 1.44  | 9.12354 | 75.88 | 2.5  |
| 6  | 16 | 19  | 21 | 34.02 | -21 | 45 | 37.03 | 9.11652 | 75.82 | 2.4  |
| 6  | 17 | 19  | 21 | 17.73 | -21 | 46 | 12.99 | 9.10977 | 75.76 | 2.3  |
| 6  | 18 | 19  | 21 | 1.23  | -21 | 46 | 49.31 | 9.10328 | 75.71 | 2.2  |
| 6  | 19 | 19  | 20 | 44.54 | -21 | 47 | 25.96 | 9.09707 | 75.66 | 2.1  |
| 6  | 20 | 19  | 20 | 27.64 | -21 | 48 | 2.94  | 9.09114 | 75.61 | 2.0  |
| 6  | 21 | 19  | 20 | 10.57 | -21 | 48 | 40.21 | 9.08548 | 75.56 | 1.9  |
| 6  | 22 | 19  | 19 | 53.31 | -21 | 49 | 17.76 | 9.08009 | 75.52 | 1.8  |
| 6  | 23 | 19  | 19 | 35.88 | -21 | 49 | 55.55 | 9.07499 | 75.47 | 1.7  |
| 6  | 24 | 19  | 19 | 18.29 | -21 | 50 | 33.56 | 9.07018 | 75.43 | 1.6  |
| 6  | 25 | 19  | 19 | 0.55  | -21 | 51 | 11.78 | 9.06564 | 75.40 | 1.5  |
| 6  | 26 | 19  | 18 | 42.67 | -21 | 51 | 50.16 | 9.06140 | 75.36 | 1.4  |
| 6  | 27 | 19  | 18 | 24.65 | -21 | 52 | 28.69 | 9.05744 | 75.33 | 1.3  |
| 6  | 28 | 19  | 18 | 6.50  | -21 | 53 | 7.35  | 9.05377 | 75.30 | 1.2  |
| 6  | 29 | 19  | 17 | 48.25 | -21 | 53 | 46.12 | 9.05040 | 75.27 | 1.1  |
| 6  | 30 | 19  | 17 | 29.89 | -21 | 54 | 24.99 | 9.04731 | 75.24 | 1.0  |

## 土星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視 亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |            |
| 6 1       | 21:20     | 114     | 02:43     | 43S     | 08:02     | 246     | 17.97 16.49          | 1.00 | 0.3        |
| 6 2       | 21:16     | 114     | 02:39     | 43S     | 07:58     | 246     | 17.99 16.51          | 1.00 | 0.3        |
| 6 3       | 21:12     | 114     | 02:35     | 43S     | 07:54     | 246     | 18.01 16.53          | 1.00 | 0.3        |
| 6 4       | 21:08     | 114     | 02:31     | 43S     | 07:50     | 246     | 18.03 16.55          | 1.00 | 0.3        |
| 6 5       | 21:03     | 114     | 02:27     | 43S     | 07:46     | 246     | 18.05 16.57          | 1.00 | 0.3        |
| 6 6       | 20:59     | 114     | 02:22     | 43S     | 07:41     | 246     | 18.07 16.59          | 1.00 | 0.2        |
| 6 7       | 20:55     | 114     | 02:18     | 43S     | 07:37     | 246     | 18.09 16.6           | 1.00 | 0.2        |
| 6 8       | 20:51     | 114     | 02:14     | 43S     | 07:33     | 246     | 18.1 16.62           | 1.00 | 0.2        |
| 6 9       | 20:47     | 114     | 02:10     | 43S     | 07:29     | 246     | 18.12 16.64          | 1.00 | 0.2        |
| 6 10      | 20:43     | 114     | 02:06     | 43S     | 07:25     | 246     | 18.14 16.65          | 1.00 | 0.2        |
| 6 11      | 20:39     | 114     | 02:02     | 43S     | 07:20     | 246     | 18.15 16.67          | 1.00 | 0.2        |
| 6 12      | 20:34     | 114     | 01:57     | 43S     | 07:16     | 246     | 18.17 16.68          | 1.00 | 0.2        |
| 6 13      | 20:30     | 114     | 01:53     | 43S     | 07:12     | 246     | 18.19 16.7           | 1.00 | 0.2        |
| 6 14      | 20:26     | 114     | 01:49     | 43S     | 07:08     | 246     | 18.2 16.71           | 1.00 | 0.2        |
| 6 15      | 20:22     | 114     | 01:45     | 43S     | 07:04     | 246     | 18.22 16.72          | 1.00 | 0.2        |
| 6 16      | 20:18     | 114     | 01:41     | 43S     | 06:59     | 246     | 18.23 16.74          | 1.00 | 0.2        |
| 6 17      | 20:14     | 114     | 01:36     | 43S     | 06:55     | 246     | 18.24 16.75          | 1.00 | 0.2        |
| 6 18      | 20:09     | 114     | 01:32     | 43S     | 06:51     | 246     | 18.26 16.76          | 1.00 | 0.2        |
| 6 19      | 20:05     | 114     | 01:28     | 43S     | 06:47     | 246     | 18.27 16.77          | 1.00 | 0.2        |
| 6 20      | 20:01     | 114     | 01:24     | 43S     | 06:43     | 246     | 18.28 16.79          | 1.00 | 0.2        |
| 6 21      | 19:57     | 114     | 01:20     | 43S     | 06:38     | 246     | 18.29 16.8           | 1.00 | 0.2        |
| 6 22      | 19:53     | 114     | 01:15     | 43S     | 06:34     | 246     | 18.3 16.81           | 1.00 | 0.1        |
| 6 23      | 19:48     | 114     | 01:11     | 43S     | 06:30     | 246     | 18.31 16.82          | 1.00 | 0.1        |
| 6 24      | 19:44     | 114     | 01:07     | 43S     | 06:26     | 246     | 18.32 16.83          | 1.00 | 0.1        |
| 6 25      | 19:40     | 114     | 01:03     | 43S     | 06:21     | 246     | 18.33 16.84          | 1.00 | 0.1        |
| 6 26      | 19:36     | 114     | 00:59     | 43S     | 06:17     | 246     | 18.34 16.84          | 1.00 | 0.1        |
| 6 27      | 19:32     | 114     | 00:54     | 43S     | 06:13     | 246     | 18.35 16.85          | 1.00 | 0.1        |
| 6 28      | 19:27     | 114     | 00:50     | 43S     | 06:09     | 246     | 18.36 16.86          | 1.00 | 0.1        |
| 6 29      | 19:23     | 114     | 00:46     | 43S     | 06:04     | 246     | 18.36 16.87          | 1.00 | 0.1        |
| 6 30      | 19:19     | 114     | 00:42     | 43S     | 06:00     | 246     | 18.37 16.87          | 1.00 | 0.1        |

## 土 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU      | 分     | °    |
| 7  | 1  | 19  | 17 | 11.43 | -21 | 55 | 3.94  | 9.04452 | 75.22 | 0.9  |
| 7  | 2  | 19  | 16 | 52.90 | -21 | 55 | 42.97 | 9.04203 | 75.20 | 0.8  |
| 7  | 3  | 19  | 16 | 34.28 | -21 | 56 | 22.06 | 9.03983 | 75.18 | 0.7  |
| 7  | 4  | 19  | 16 | 15.60 | -21 | 57 | 1.21  | 9.03794 | 75.17 | 0.6  |
| 7  | 5  | 19  | 15 | 56.86 | -21 | 57 | 40.38 | 9.03634 | 75.15 | 0.5  |
| 7  | 6  | 19  | 15 | 38.06 | -21 | 58 | 19.56 | 9.03503 | 75.14 | 0.4  |
| 7  | 7  | 19  | 15 | 19.23 | -21 | 58 | 58.71 | 9.03403 | 75.13 | 0.3  |
| 7  | 8  | 19  | 15 | 0.37  | -21 | 59 | 37.79 | 9.03333 | 75.13 | 0.2  |
| 7  | 9  | 19  | 14 | 41.48 | -22 | 0  | 16.79 | 9.03292 | 75.12 | 0.1  |
| 7  | 10 | 19  | 14 | 22.59 | -22 | 0  | 55.68 | 9.03282 | 75.12 | 0.0  |
| 7  | 11 | 19  | 14 | 3.71  | -22 | 1  | 34.45 | 9.03301 | 75.13 | 0.1  |
| 7  | 12 | 19  | 13 | 44.84 | -22 | 2  | 13.08 | 9.03350 | 75.13 | 0.2  |
| 7  | 13 | 19  | 13 | 26.00 | -22 | 2  | 51.57 | 9.03428 | 75.14 | 0.3  |
| 7  | 14 | 19  | 13 | 7.18  | -22 | 3  | 29.91 | 9.03537 | 75.14 | 0.4  |
| 7  | 15 | 19  | 12 | 48.41 | -22 | 4  | 8.08  | 9.03675 | 75.16 | 0.5  |
| 7  | 16 | 19  | 12 | 29.69 | -22 | 4  | 46.09 | 9.03842 | 75.17 | 0.6  |
| 7  | 17 | 19  | 12 | 11.02 | -22 | 5  | 23.91 | 9.04039 | 75.19 | 0.7  |
| 7  | 18 | 19  | 11 | 52.42 | -22 | 6  | 1.53  | 9.04265 | 75.21 | 0.9  |
| 7  | 19 | 19  | 11 | 33.89 | -22 | 6  | 38.92 | 9.04521 | 75.23 | 1.0  |
| 7  | 20 | 19  | 11 | 15.44 | -22 | 7  | 16.07 | 9.04806 | 75.25 | 1.1  |
| 7  | 21 | 19  | 10 | 57.08 | -22 | 7  | 52.96 | 9.05120 | 75.28 | 1.2  |
| 7  | 22 | 19  | 10 | 38.83 | -22 | 8  | 29.56 | 9.05463 | 75.31 | 1.3  |
| 7  | 23 | 19  | 10 | 20.68 | -22 | 9  | 5.85  | 9.05835 | 75.34 | 1.4  |
| 7  | 24 | 19  | 10 | 2.65  | -22 | 9  | 41.83 | 9.06236 | 75.37 | 1.5  |
| 7  | 25 | 19  | 9  | 44.76 | -22 | 10 | 17.47 | 9.06666 | 75.41 | 1.6  |
| 7  | 26 | 19  | 9  | 27.00 | -22 | 10 | 52.77 | 9.07125 | 75.44 | 1.7  |
| 7  | 27 | 19  | 9  | 9.39  | -22 | 11 | 27.71 | 9.07612 | 75.48 | 1.8  |
| 7  | 28 | 19  | 8  | 51.95 | -22 | 12 | 2.29  | 9.08128 | 75.53 | 1.9  |
| 7  | 29 | 19  | 8  | 34.67 | -22 | 12 | 36.50 | 9.08672 | 75.57 | 2.0  |
| 7  | 30 | 19  | 8  | 17.57 | -22 | 13 | 10.35 | 9.09243 | 75.62 | 2.1  |
| 7  | 31 | 19  | 8  | 0.66  | -22 | 13 | 43.83 | 9.09843 | 75.67 | 2.1  |

## 土星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |               |
| 7 1       | 19:15     | 114     | 00:37     | 43S     | 05:56     | 246     | 18.38 16.88          | 1.00 | 0.1           |
| 7 2       | 19:11     | 114     | 00:33     | 43S     | 05:52     | 246     | 18.38 16.88          | 1.00 | 0.1           |
| 7 3       | 19:06     | 114     | 00:29     | 43S     | 05:47     | 246     | 18.38 16.89          | 1.00 | 0.1           |
| 7 4       | 19:02     | 114     | 00:25     | 43S     | 05:43     | 246     | 18.39 16.89          | 1.00 | 0.1           |
| 7 5       | 18:58     | 114     | 00:20     | 43S     | 05:39     | 246     | 18.39 16.89          | 1.00 | 0.1           |
| 7 6       | 18:54     | 114     | 00:16     | 43S     | 05:34     | 246     | 18.39 16.9           | 1.00 | 0.1           |
| 7 7       | 18:49     | 114     | 00:12     | 43S     | 05:30     | 246     | 18.4 16.9            | 1.00 | 0.1           |
| 7 8       | 18:45     | 114     | 00:08     | 43S     | 05:26     | 246     | 18.4 16.9            | 1.00 | 0.1           |
| 7 9       | 18:41     | 114     | 00:03     | 43S     | 05:22     | 246     | 18.4 16.9            | 1.00 | 0.1           |
| 7 10      | 18:37     | 114     | 23:55     | 43S     | 05:17     | 246     | 18.4 16.9            | 1.00 | 0.1           |
| 7 11      | 18:33     | 114     | 23:51     | 43S     | 05:13     | 246     | 18.4 16.9            | 1.00 | 0.1           |
| 7 12      | 18:28     | 114     | 23:46     | 43S     | 05:09     | 246     | 18.4 16.9            | 1.00 | 0.1           |
| 7 13      | 18:24     | 114     | 23:42     | 43S     | 05:05     | 246     | 18.4 16.9            | 1.00 | 0.1           |
| 7 14      | 18:20     | 114     | 23:38     | 43S     | 05:00     | 246     | 18.39 16.9           | 1.00 | 0.1           |
| 7 15      | 18:16     | 114     | 23:34     | 43S     | 04:56     | 246     | 18.39 16.9           | 1.00 | 0.1           |
| 7 16      | 18:11     | 114     | 23:29     | 43S     | 04:52     | 246     | 18.39 16.9           | 1.00 | 0.1           |
| 7 17      | 18:07     | 114     | 23:25     | 43S     | 04:48     | 246     | 18.38 16.89          | 1.00 | 0.1           |
| 7 18      | 18:03     | 114     | 23:21     | 43S     | 04:43     | 246     | 18.38 16.89          | 1.00 | 0.1           |
| 7 19      | 17:59     | 114     | 23:17     | 43S     | 04:39     | 246     | 18.37 16.88          | 1.00 | 0.1           |
| 7 20      | 17:55     | 114     | 23:13     | 43S     | 04:35     | 246     | 18.37 16.88          | 1.00 | 0.1           |
| 7 21      | 17:50     | 114     | 23:08     | 43S     | 04:30     | 246     | 18.36 16.87          | 1.00 | 0.1           |
| 7 22      | 17:46     | 114     | 23:04     | 43S     | 04:26     | 246     | 18.35 16.87          | 1.00 | 0.1           |
| 7 23      | 17:42     | 114     | 23:00     | 43S     | 04:22     | 246     | 18.35 16.86          | 1.00 | 0.1           |
| 7 24      | 17:38     | 114     | 22:56     | 43S     | 04:18     | 246     | 18.34 16.85          | 1.00 | 0.1           |
| 7 25      | 17:34     | 114     | 22:51     | 43S     | 04:13     | 246     | 18.33 16.85          | 1.00 | 0.1           |
| 7 26      | 17:29     | 114     | 22:47     | 43S     | 04:09     | 246     | 18.32 16.84          | 1.00 | 0.1           |
| 7 27      | 17:25     | 114     | 22:43     | 43S     | 04:05     | 246     | 18.31 16.83          | 1.00 | 0.1           |
| 7 28      | 17:21     | 114     | 22:39     | 43S     | 04:01     | 246     | 18.3 16.82           | 1.00 | 0.1           |
| 7 29      | 17:17     | 114     | 22:34     | 43S     | 03:56     | 246     | 18.29 16.81          | 1.00 | 0.1           |
| 7 30      | 17:13     | 114     | 22:30     | 43S     | 03:52     | 246     | 18.28 16.8           | 1.00 | 0.1           |
| 7 31      | 17:08     | 114     | 22:26     | 43S     | 03:48     | 246     | 18.27 16.79          | 1.00 | 0.1           |

## 土 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |   |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|---|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m | s     | °   | '  | "     | AU      | 分     | °    |
| 8  | 1  | 19  | 7 | 43.94 | -22 | 14 | 16.94 | 9.10471 | 75.72 | 2.2  |
| 8  | 2  | 19  | 7 | 27.41 | -22 | 14 | 49.64 | 9.11126 | 75.78 | 2.3  |
| 8  | 3  | 19  | 7 | 11.10 | -22 | 15 | 21.94 | 9.11808 | 75.83 | 2.4  |
| 8  | 4  | 19  | 6 | 54.99 | -22 | 15 | 53.79 | 9.12518 | 75.89 | 2.5  |
| 8  | 5  | 19  | 6 | 39.12 | -22 | 16 | 25.17 | 9.13254 | 75.95 | 2.6  |
| 8  | 6  | 19  | 6 | 23.48 | -22 | 16 | 56.08 | 9.14016 | 76.02 | 2.7  |
| 8  | 7  | 19  | 6 | 8.09  | -22 | 17 | 26.50 | 9.14805 | 76.08 | 2.8  |
| 8  | 8  | 19  | 5 | 52.96 | -22 | 17 | 56.44 | 9.15619 | 76.15 | 2.9  |
| 8  | 9  | 19  | 5 | 38.09 | -22 | 18 | 25.89 | 9.16459 | 76.22 | 3.0  |
| 8  | 10 | 19  | 5 | 23.48 | -22 | 18 | 54.86 | 9.17324 | 76.29 | 3.1  |
| 8  | 11 | 19  | 5 | 9.15  | -22 | 19 | 23.35 | 9.18214 | 76.37 | 3.1  |
| 8  | 12 | 19  | 4 | 55.10 | -22 | 19 | 51.35 | 9.19128 | 76.44 | 3.2  |
| 8  | 13 | 19  | 4 | 41.34 | -22 | 20 | 18.86 | 9.20067 | 76.52 | 3.3  |
| 8  | 14 | 19  | 4 | 27.86 | -22 | 20 | 45.88 | 9.21030 | 76.60 | 3.4  |
| 8  | 15 | 19  | 4 | 14.68 | -22 | 21 | 12.39 | 9.22016 | 76.68 | 3.5  |
| 8  | 16 | 19  | 4 | 1.80  | -22 | 21 | 38.38 | 9.23025 | 76.77 | 3.6  |
| 8  | 17 | 19  | 3 | 49.23 | -22 | 22 | 3.83  | 9.24058 | 76.85 | 3.6  |
| 8  | 18 | 19  | 3 | 36.97 | -22 | 22 | 28.75 | 9.25113 | 76.94 | 3.7  |
| 8  | 19 | 19  | 3 | 25.03 | -22 | 22 | 53.11 | 9.26191 | 77.03 | 3.8  |
| 8  | 20 | 19  | 3 | 13.42 | -22 | 23 | 16.91 | 9.27290 | 77.12 | 3.9  |
| 8  | 21 | 19  | 3 | 2.14  | -22 | 23 | 40.15 | 9.28412 | 77.21 | 3.9  |
| 8  | 22 | 19  | 2 | 51.21 | -22 | 24 | 2.81  | 9.29554 | 77.31 | 4.0  |
| 8  | 23 | 19  | 2 | 40.61 | -22 | 24 | 24.91 | 9.30718 | 77.41 | 4.1  |
| 8  | 24 | 19  | 2 | 30.37 | -22 | 24 | 46.43 | 9.31902 | 77.50 | 4.2  |
| 8  | 25 | 19  | 2 | 20.49 | -22 | 25 | 7.39  | 9.33107 | 77.60 | 4.2  |
| 8  | 26 | 19  | 2 | 10.97 | -22 | 25 | 27.78 | 9.34331 | 77.71 | 4.3  |
| 8  | 27 | 19  | 2 | 1.81  | -22 | 25 | 47.63 | 9.35575 | 77.81 | 4.4  |
| 8  | 28 | 19  | 1 | 53.02 | -22 | 26 | 6.91  | 9.36839 | 77.91 | 4.4  |
| 8  | 29 | 19  | 1 | 44.61 | -22 | 26 | 25.64 | 9.38121 | 78.02 | 4.5  |
| 8  | 30 | 19  | 1 | 36.57 | -22 | 26 | 43.79 | 9.39421 | 78.13 | 4.5  |
| 8  | 31 | 19  | 1 | 28.90 | -22 | 27 | 1.36  | 9.40740 | 78.24 | 4.6  |



## 土星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視 亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |            |
| 8 1       | 17:04     | 114     | 22:22     | 43S     | 03:44     | 246     | 18.25 16.78          | 1.00 | 0.2        |
| 8 2       | 17:00     | 114     | 22:18     | 43S     | 03:40     | 246     | 18.24 16.77          | 1.00 | 0.2        |
| 8 3       | 16:56     | 114     | 22:13     | 43S     | 03:35     | 246     | 18.23 16.76          | 1.00 | 0.2        |
| 8 4       | 16:52     | 114     | 22:09     | 43S     | 03:31     | 246     | 18.21 16.74          | 1.00 | 0.2        |
| 8 5       | 16:47     | 114     | 22:05     | 43S     | 03:27     | 246     | 18.2 16.73           | 1.00 | 0.2        |
| 8 6       | 16:43     | 114     | 22:01     | 43S     | 03:23     | 246     | 18.18 16.72          | 1.00 | 0.2        |
| 8 7       | 16:39     | 114     | 21:57     | 43S     | 03:18     | 246     | 18.17 16.7           | 1.00 | 0.2        |
| 8 8       | 16:35     | 114     | 21:53     | 43S     | 03:14     | 246     | 18.15 16.69          | 1.00 | 0.2        |
| 8 9       | 16:31     | 114     | 21:48     | 43S     | 03:10     | 246     | 18.13 16.67          | 1.00 | 0.2        |
| 8 10      | 16:27     | 114     | 21:44     | 43S     | 03:06     | 246     | 18.12 16.66          | 1.00 | 0.2        |
| 8 11      | 16:22     | 115     | 21:40     | 43S     | 03:02     | 245     | 18.1 16.64           | 1.00 | 0.2        |
| 8 12      | 16:18     | 115     | 21:36     | 43S     | 02:58     | 245     | 18.08 16.62          | 1.00 | 0.2        |
| 8 13      | 16:14     | 115     | 21:32     | 43S     | 02:53     | 245     | 18.06 16.61          | 1.00 | 0.2        |
| 8 14      | 16:10     | 115     | 21:28     | 43S     | 02:49     | 245     | 18.04 16.59          | 1.00 | 0.2        |
| 8 15      | 16:06     | 115     | 21:23     | 43S     | 02:45     | 245     | 18.03 16.57          | 1.00 | 0.2        |
| 8 16      | 16:02     | 115     | 21:19     | 43S     | 02:41     | 245     | 18.01 16.56          | 1.00 | 0.2        |
| 8 17      | 15:58     | 115     | 21:15     | 43S     | 02:37     | 245     | 17.99 16.54          | 1.00 | 0.2        |
| 8 18      | 15:54     | 115     | 21:11     | 43S     | 02:33     | 245     | 17.96 16.52          | 1.00 | 0.2        |
| 8 19      | 15:49     | 115     | 21:07     | 43S     | 02:28     | 245     | 17.94 16.5           | 1.00 | 0.2        |
| 8 20      | 15:45     | 115     | 21:03     | 43S     | 02:24     | 245     | 17.92 16.48          | 1.00 | 0.3        |
| 8 21      | 15:41     | 115     | 20:59     | 43S     | 02:20     | 245     | 17.9 16.46           | 1.00 | 0.3        |
| 8 22      | 15:37     | 115     | 20:54     | 43S     | 02:16     | 245     | 17.88 16.44          | 1.00 | 0.3        |
| 8 23      | 15:33     | 115     | 20:50     | 43S     | 02:12     | 245     | 17.86 16.42          | 1.00 | 0.3        |
| 8 24      | 15:29     | 115     | 20:46     | 43S     | 02:08     | 245     | 17.83 16.4           | 1.00 | 0.3        |
| 8 25      | 15:25     | 115     | 20:42     | 43S     | 02:04     | 245     | 17.81 16.38          | 1.00 | 0.3        |
| 8 26      | 15:21     | 115     | 20:38     | 43S     | 02:00     | 245     | 17.79 16.36          | 1.00 | 0.3        |
| 8 27      | 15:17     | 115     | 20:34     | 43S     | 01:55     | 245     | 17.76 16.34          | 1.00 | 0.3        |
| 8 28      | 15:13     | 115     | 20:30     | 43S     | 01:51     | 245     | 17.74 16.31          | 1.00 | 0.3        |
| 8 29      | 15:09     | 115     | 20:26     | 42S     | 01:47     | 245     | 17.72 16.29          | 1.00 | 0.3        |
| 8 30      | 15:05     | 115     | 20:22     | 42S     | 01:43     | 245     | 17.69 16.27          | 1.00 | 0.3        |
| 8 31      | 15:00     | 115     | 20:18     | 42S     | 01:39     | 245     | 17.67 16.25          | 1.00 | 0.3        |

## 土 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |   |       | 赤 緯 |    |       | 距 離     | 光 程   | 日地離角 |
|----|----|-----|---|-------|-----|----|-------|---------|-------|------|
| 月  | 日  | h   | m | s     | °   | '  | "     | AU      | 分     | °    |
| 9  | 1  | 19  | 1 | 21.63 | -22 | 27 | 18.32 | 9.42075 | 78.35 | 4.7  |
| 9  | 2  | 19  | 1 | 14.74 | -22 | 27 | 34.65 | 9.43428 | 78.46 | 4.7  |
| 9  | 3  | 19  | 1 | 8.25  | -22 | 27 | 50.37 | 9.44797 | 78.58 | 4.8  |
| 9  | 4  | 19  | 1 | 2.16  | -22 | 28 | 5.47  | 9.46183 | 78.69 | 4.8  |
| 9  | 5  | 19  | 0 | 56.48 | -22 | 28 | 19.95 | 9.47584 | 78.81 | 4.9  |
| 9  | 6  | 19  | 0 | 51.20 | -22 | 28 | 33.84 | 9.49000 | 78.93 | 4.9  |
| 9  | 7  | 19  | 0 | 46.33 | -22 | 28 | 47.14 | 9.50430 | 79.05 | 5.0  |
| 9  | 8  | 19  | 0 | 41.86 | -22 | 28 | 59.84 | 9.51875 | 79.17 | 5.0  |
| 9  | 9  | 19  | 0 | 37.81 | -22 | 29 | 11.95 | 9.53333 | 79.29 | 5.1  |
| 9  | 10 | 19  | 0 | 34.16 | -22 | 29 | 23.47 | 9.54805 | 79.41 | 5.1  |
| 9  | 11 | 19  | 0 | 30.93 | -22 | 29 | 34.39 | 9.56290 | 79.53 | 5.2  |
| 9  | 12 | 19  | 0 | 28.11 | -22 | 29 | 44.70 | 9.57787 | 79.66 | 5.2  |
| 9  | 13 | 19  | 0 | 25.69 | -22 | 29 | 54.40 | 9.59296 | 79.78 | 5.2  |
| 9  | 14 | 19  | 0 | 23.70 | -22 | 30 | 3.48  | 9.60816 | 79.91 | 5.3  |
| 9  | 15 | 19  | 0 | 22.12 | -22 | 30 | 11.93 | 9.62348 | 80.04 | 5.3  |
| 9  | 16 | 19  | 0 | 20.95 | -22 | 30 | 19.74 | 9.63890 | 80.16 | 5.4  |
| 9  | 17 | 19  | 0 | 20.21 | -22 | 30 | 26.93 | 9.65442 | 80.29 | 5.4  |
| 9  | 18 | 19  | 0 | 19.89 | -22 | 30 | 33.47 | 9.67004 | 80.42 | 5.4  |
| 9  | 19 | 19  | 0 | 19.99 | -22 | 30 | 39.38 | 9.68576 | 80.55 | 5.5  |
| 9  | 20 | 19  | 0 | 20.52 | -22 | 30 | 44.66 | 9.70156 | 80.69 | 5.5  |
| 9  | 21 | 19  | 0 | 21.47 | -22 | 30 | 49.31 | 9.71745 | 80.82 | 5.5  |
| 9  | 22 | 19  | 0 | 22.86 | -22 | 30 | 53.35 | 9.73342 | 80.95 | 5.5  |
| 9  | 23 | 19  | 0 | 24.66 | -22 | 30 | 56.77 | 9.74947 | 81.08 | 5.6  |
| 9  | 24 | 19  | 0 | 26.90 | -22 | 30 | 59.58 | 9.76559 | 81.22 | 5.6  |
| 9  | 25 | 19  | 0 | 29.55 | -22 | 31 | 1.78  | 9.78177 | 81.35 | 5.6  |
| 9  | 26 | 19  | 0 | 32.63 | -22 | 31 | 3.37  | 9.79802 | 81.49 | 5.6  |
| 9  | 27 | 19  | 0 | 36.13 | -22 | 31 | 4.33  | 9.81432 | 81.62 | 5.6  |
| 9  | 28 | 19  | 0 | 40.05 | -22 | 31 | 4.64  | 9.83067 | 81.76 | 5.6  |
| 9  | 29 | 19  | 0 | 44.40 | -22 | 31 | 4.29  | 9.84707 | 81.90 | 5.7  |
| 9  | 30 | 19  | 0 | 49.17 | -22 | 31 | 3.28  | 9.86351 | 82.03 | 5.7  |

## 土星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑    |         | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|---------|---------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° | 赤道<br>" | 兩極<br>" |      |               |
| 9 1       | 14:56     | 115     | 20:14     | 42S     | 01:35     | 245     | 17.64   | 16.22   | 1.00 | 0.3           |
| 9 2       | 14:52     | 115     | 20:10     | 42S     | 01:31     | 245     | 17.62   | 16.2    | 1.00 | 0.3           |
| 9 3       | 14:48     | 115     | 20:06     | 42S     | 01:27     | 245     | 17.59   | 16.18   | 1.00 | 0.3           |
| 9 4       | 14:44     | 115     | 20:02     | 42S     | 01:23     | 245     | 17.56   | 16.16   | 1.00 | 0.3           |
| 9 5       | 14:40     | 115     | 19:58     | 42S     | 01:19     | 245     | 17.54   | 16.13   | 1.00 | 0.3           |
| 9 6       | 14:36     | 115     | 19:54     | 42S     | 01:15     | 245     | 17.51   | 16.11   | 1.00 | 0.3           |
| 9 7       | 14:32     | 115     | 19:50     | 42S     | 01:11     | 245     | 17.49   | 16.08   | 1.00 | 0.4           |
| 9 8       | 14:28     | 115     | 19:46     | 42S     | 01:07     | 245     | 17.46   | 16.06   | 1.00 | 0.4           |
| 9 9       | 14:24     | 115     | 19:42     | 42S     | 01:03     | 245     | 17.43   | 16.03   | 1.00 | 0.4           |
| 9 10      | 14:20     | 115     | 19:38     | 42S     | 00:59     | 245     | 17.41   | 16.01   | 1.00 | 0.4           |
| 9 11      | 14:16     | 115     | 19:34     | 42S     | 00:55     | 245     | 17.38   | 15.99   | 1.00 | 0.4           |
| 9 12      | 14:12     | 115     | 19:30     | 42S     | 00:51     | 245     | 17.35   | 15.96   | 1.00 | 0.4           |
| 9 13      | 14:08     | 115     | 19:26     | 42S     | 00:47     | 245     | 17.32   | 15.94   | 1.00 | 0.4           |
| 9 14      | 14:05     | 115     | 19:22     | 42S     | 00:43     | 245     | 17.3    | 15.91   | 1.00 | 0.4           |
| 9 15      | 14:01     | 115     | 19:18     | 42S     | 00:39     | 245     | 17.27   | 15.88   | 1.00 | 0.4           |
| 9 16      | 13:57     | 115     | 19:14     | 42S     | 00:35     | 245     | 17.24   | 15.86   | 1.00 | 0.4           |
| 9 17      | 13:53     | 115     | 19:10     | 42S     | 00:31     | 245     | 17.21   | 15.83   | 1.00 | 0.4           |
| 9 18      | 13:49     | 115     | 19:06     | 42S     | 00:27     | 245     | 17.19   | 15.81   | 1.00 | 0.4           |
| 9 19      | 13:45     | 115     | 19:02     | 42S     | 00:23     | 245     | 17.16   | 15.78   | 1.00 | 0.4           |
| 9 20      | 13:41     | 115     | 18:58     | 42S     | 00:19     | 245     | 17.13   | 15.76   | 1.00 | 0.4           |
| 9 21      | 13:37     | 115     | 18:54     | 42S     | 00:15     | 245     | 17.1    | 15.73   | 1.00 | 0.4           |
| 9 22      | 13:33     | 115     | 18:50     | 42S     | 00:11     | 245     | 17.07   | 15.71   | 1.00 | 0.4           |
| 9 23      | 13:29     | 115     | 18:46     | 42S     | 00:07     | 245     | 17.05   | 15.68   | 1.00 | 0.4           |
| 9 24      | 13:25     | 115     | 18:42     | 42S     | 00:04     | 245     | 17.02   | 15.65   | 1.00 | 0.4           |
| 9 25      | 13:21     | 115     | 18:39     | 42S     | 23:56     | 245     | 16.99   | 15.63   | 1.00 | 0.4           |
| 9 26      | 13:18     | 115     | 18:35     | 42S     | 23:52     | 245     | 16.96   | 15.6    | 1.00 | 0.4           |
| 9 27      | 13:14     | 115     | 18:31     | 42S     | 23:48     | 245     | 16.93   | 15.58   | 1.00 | 0.4           |
| 9 28      | 13:10     | 115     | 18:27     | 42S     | 23:44     | 245     | 16.91   | 15.55   | 1.00 | 0.5           |
| 9 29      | 13:06     | 115     | 18:23     | 42S     | 23:40     | 245     | 16.88   | 15.52   | 1.00 | 0.5           |
| 9 30      | 13:02     | 115     | 18:19     | 42S     | 23:36     | 245     | 16.85   | 15.5    | 1.00 | 0.5           |

## 土 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |   |       | 赤 緯 |    |       | 距 離      | 光 程   | 日地離角 |
|----|----|-----|---|-------|-----|----|-------|----------|-------|------|
| 月  | 日  | h   | m | s     | °   | '  | "     | AU       | 分     | °    |
| 10 | 1  | 19  | 0 | 54.37 | -22 | 31 | 1.60  | 9.87999  | 82.17 | 5.7  |
| 10 | 2  | 19  | 0 | 60.00 | -22 | 30 | 59.26 | 9.89650  | 82.31 | 5.7  |
| 10 | 3  | 19  | 1 | 6.05  | -22 | 30 | 56.27 | 9.91304  | 82.44 | 5.7  |
| 10 | 4  | 19  | 1 | 12.53 | -22 | 30 | 52.65 | 9.92959  | 82.58 | 5.7  |
| 10 | 5  | 19  | 1 | 19.42 | -22 | 30 | 48.40 | 9.94616  | 82.72 | 5.7  |
| 10 | 6  | 19  | 1 | 26.73 | -22 | 30 | 43.52 | 9.96275  | 82.86 | 5.7  |
| 10 | 7  | 19  | 1 | 34.45 | -22 | 30 | 38.01 | 9.97934  | 83.00 | 5.7  |
| 10 | 8  | 19  | 1 | 42.58 | -22 | 30 | 31.87 | 9.99593  | 83.13 | 5.7  |
| 10 | 9  | 19  | 1 | 51.12 | -22 | 30 | 25.07 | 10.01252 | 83.27 | 5.7  |
| 10 | 10 | 19  | 2 | 0.06  | -22 | 30 | 17.63 | 10.02911 | 83.41 | 5.7  |
| 10 | 11 | 19  | 2 | 9.41  | -22 | 30 | 9.53  | 10.04568 | 83.55 | 5.7  |
| 10 | 12 | 19  | 2 | 19.15 | -22 | 30 | 0.77  | 10.06224 | 83.69 | 5.7  |
| 10 | 13 | 19  | 2 | 29.30 | -22 | 29 | 51.33 | 10.07878 | 83.82 | 5.7  |
| 10 | 14 | 19  | 2 | 39.84 | -22 | 29 | 41.22 | 10.09529 | 83.96 | 5.7  |
| 10 | 15 | 19  | 2 | 50.78 | -22 | 29 | 30.43 | 10.11178 | 84.10 | 5.7  |
| 10 | 16 | 19  | 3 | 2.11  | -22 | 29 | 18.97 | 10.12823 | 84.23 | 5.6  |
| 10 | 17 | 19  | 3 | 13.84 | -22 | 29 | 6.84  | 10.14465 | 84.37 | 5.6  |
| 10 | 18 | 19  | 3 | 25.96 | -22 | 28 | 54.04 | 10.16103 | 84.51 | 5.6  |
| 10 | 19 | 19  | 3 | 38.47 | -22 | 28 | 40.58 | 10.17736 | 84.64 | 5.6  |
| 10 | 20 | 19  | 3 | 51.36 | -22 | 28 | 26.47 | 10.19364 | 84.78 | 5.6  |
| 10 | 21 | 19  | 4 | 4.64  | -22 | 28 | 11.71 | 10.20987 | 84.91 | 5.6  |
| 10 | 22 | 19  | 4 | 18.29 | -22 | 27 | 56.30 | 10.22605 | 85.05 | 5.5  |
| 10 | 23 | 19  | 4 | 32.32 | -22 | 27 | 40.24 | 10.24216 | 85.18 | 5.5  |
| 10 | 24 | 19  | 4 | 46.71 | -22 | 27 | 23.51 | 10.25820 | 85.32 | 5.5  |
| 10 | 25 | 19  | 5 | 1.47  | -22 | 27 | 6.10  | 10.27418 | 85.45 | 5.5  |
| 10 | 26 | 19  | 5 | 16.60 | -22 | 26 | 48.00 | 10.29008 | 85.58 | 5.4  |
| 10 | 27 | 19  | 5 | 32.09 | -22 | 26 | 29.20 | 10.30589 | 85.71 | 5.4  |
| 10 | 28 | 19  | 5 | 47.94 | -22 | 26 | 9.68  | 10.32163 | 85.84 | 5.4  |
| 10 | 29 | 19  | 6 | 4.16  | -22 | 25 | 49.47 | 10.33727 | 85.97 | 5.3  |
| 10 | 30 | 19  | 6 | 20.73 | -22 | 25 | 28.56 | 10.35282 | 86.10 | 5.3  |
| 10 | 31 | 19  | 6 | 37.66 | -22 | 25 | 6.98  | 10.36827 | 86.23 | 5.3  |

## 土星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑    |         | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|---------|---------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° | 赤道<br>" | 兩極<br>" |      |               |
| 10 1      | 12:58     | 115     | 18:15     | 42S     | 23:33     | 245     | 16.82   | 15.47   | 1.00 | 0.5           |
| 10 2      | 12:54     | 115     | 18:12     | 42S     | 23:29     | 245     | 16.79   | 15.45   | 1.00 | 0.5           |
| 10 3      | 12:51     | 115     | 18:08     | 42S     | 23:25     | 245     | 16.77   | 15.42   | 1.00 | 0.5           |
| 10 4      | 12:47     | 115     | 18:04     | 42S     | 23:21     | 245     | 16.74   | 15.39   | 1.00 | 0.5           |
| 10 5      | 12:43     | 115     | 18:00     | 42S     | 23:17     | 245     | 16.71   | 15.37   | 1.00 | 0.5           |
| 10 6      | 12:39     | 115     | 17:56     | 42S     | 23:13     | 245     | 16.68   | 15.34   | 1.00 | 0.5           |
| 10 7      | 12:35     | 115     | 17:53     | 42S     | 23:10     | 245     | 16.65   | 15.32   | 1.00 | 0.5           |
| 10 8      | 12:32     | 115     | 17:49     | 42S     | 23:06     | 245     | 16.63   | 15.29   | 1.00 | 0.5           |
| 10 9      | 12:28     | 115     | 17:45     | 42S     | 23:02     | 245     | 16.6    | 15.27   | 1.00 | 0.5           |
| 10 10     | 12:24     | 115     | 17:41     | 42S     | 22:58     | 245     | 16.57   | 15.24   | 1.00 | 0.5           |
| 10 11     | 12:20     | 115     | 17:37     | 42S     | 22:55     | 245     | 16.54   | 15.22   | 1.00 | 0.5           |
| 10 12     | 12:16     | 115     | 17:34     | 42S     | 22:51     | 245     | 16.52   | 15.19   | 1.00 | 0.5           |
| 10 13     | 12:13     | 115     | 17:30     | 42S     | 22:47     | 245     | 16.49   | 15.17   | 1.00 | 0.5           |
| 10 14     | 12:09     | 115     | 17:26     | 42S     | 22:43     | 245     | 16.46   | 15.14   | 1.00 | 0.5           |
| 10 15     | 12:05     | 115     | 17:22     | 42S     | 22:40     | 245     | 16.44   | 15.12   | 1.00 | 0.5           |
| 10 16     | 12:01     | 115     | 17:19     | 42S     | 22:36     | 245     | 16.41   | 15.09   | 1.00 | 0.5           |
| 10 17     | 11:58     | 115     | 17:15     | 42S     | 22:32     | 245     | 16.38   | 15.07   | 1.00 | 0.5           |
| 10 18     | 11:54     | 115     | 17:11     | 42S     | 22:28     | 245     | 16.36   | 15.04   | 1.00 | 0.5           |
| 10 19     | 11:50     | 115     | 17:07     | 42S     | 22:25     | 245     | 16.33   | 15.02   | 1.00 | 0.5           |
| 10 20     | 11:46     | 115     | 17:04     | 42S     | 22:21     | 245     | 16.3    | 14.99   | 1.00 | 0.5           |
| 10 21     | 11:43     | 115     | 17:00     | 42S     | 22:17     | 245     | 16.28   | 14.97   | 1.00 | 0.5           |
| 10 22     | 11:39     | 115     | 16:56     | 42S     | 22:14     | 245     | 16.25   | 14.95   | 1.00 | 0.5           |
| 10 23     | 11:35     | 115     | 16:53     | 42S     | 22:10     | 245     | 16.23   | 14.92   | 1.00 | 0.5           |
| 10 24     | 11:32     | 115     | 16:49     | 42S     | 22:06     | 245     | 16.2    | 14.9    | 1.00 | 0.5           |
| 10 25     | 11:28     | 115     | 16:45     | 42S     | 22:03     | 245     | 16.18   | 14.88   | 1.00 | 0.5           |
| 10 26     | 11:24     | 115     | 16:42     | 42S     | 21:59     | 245     | 16.15   | 14.85   | 1.00 | 0.5           |
| 10 27     | 11:20     | 115     | 16:38     | 42S     | 21:55     | 245     | 16.13   | 14.83   | 1.00 | 0.5           |
| 10 28     | 11:17     | 115     | 16:34     | 43S     | 21:52     | 245     | 16.1    | 14.81   | 1.00 | 0.6           |
| 10 29     | 11:13     | 115     | 16:31     | 43S     | 21:48     | 245     | 16.08   | 14.78   | 1.00 | 0.6           |
| 10 30     | 11:09     | 115     | 16:27     | 43S     | 21:44     | 245     | 16.05   | 14.76   | 1.00 | 0.6           |
| 10 31     | 11:06     | 115     | 16:23     | 43S     | 21:41     | 245     | 16.03   | 14.74   | 1.00 | 0.6           |

## 土 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分     | °    |
| 11 | 1  | 19  | 6  | 54.93 | -22 | 24 | 44.72 | 10.38362 | 86.36 | 5.2  |
| 11 | 2  | 19  | 7  | 12.55 | -22 | 24 | 21.80 | 10.39887 | 86.49 | 5.2  |
| 11 | 3  | 19  | 7  | 30.50 | -22 | 23 | 58.21 | 10.41400 | 86.61 | 5.2  |
| 11 | 4  | 19  | 7  | 48.78 | -22 | 23 | 33.95 | 10.42902 | 86.74 | 5.1  |
| 11 | 5  | 19  | 8  | 7.39  | -22 | 23 | 9.01  | 10.44391 | 86.86 | 5.1  |
| 11 | 6  | 19  | 8  | 26.32 | -22 | 22 | 43.39 | 10.45869 | 86.98 | 5.0  |
| 11 | 7  | 19  | 8  | 45.56 | -22 | 22 | 17.08 | 10.47334 | 87.10 | 5.0  |
| 11 | 8  | 19  | 9  | 5.12  | -22 | 21 | 50.08 | 10.48787 | 87.23 | 4.9  |
| 11 | 9  | 19  | 9  | 24.99 | -22 | 21 | 22.37 | 10.50226 | 87.34 | 4.9  |
| 11 | 10 | 19  | 9  | 45.17 | -22 | 20 | 53.96 | 10.51651 | 87.46 | 4.8  |
| 11 | 11 | 19  | 10 | 5.65  | -22 | 20 | 24.84 | 10.53063 | 87.58 | 4.8  |
| 11 | 12 | 19  | 10 | 26.43 | -22 | 19 | 55.02 | 10.54460 | 87.70 | 4.7  |
| 11 | 13 | 19  | 10 | 47.51 | -22 | 19 | 24.50 | 10.55843 | 87.81 | 4.7  |
| 11 | 14 | 19  | 11 | 8.89  | -22 | 18 | 53.28 | 10.57211 | 87.93 | 4.6  |
| 11 | 15 | 19  | 11 | 30.55 | -22 | 18 | 21.38 | 10.58563 | 88.04 | 4.6  |
| 11 | 16 | 19  | 11 | 52.49 | -22 | 17 | 48.81 | 10.59900 | 88.15 | 4.5  |
| 11 | 17 | 19  | 12 | 14.72 | -22 | 17 | 15.56 | 10.61221 | 88.26 | 4.5  |
| 11 | 18 | 19  | 12 | 37.22 | -22 | 16 | 41.65 | 10.62526 | 88.37 | 4.4  |
| 11 | 19 | 19  | 12 | 59.99 | -22 | 16 | 7.06  | 10.63815 | 88.48 | 4.4  |
| 11 | 20 | 19  | 13 | 23.02 | -22 | 15 | 31.81 | 10.65087 | 88.58 | 4.3  |
| 11 | 21 | 19  | 13 | 46.31 | -22 | 14 | 55.86 | 10.66341 | 88.69 | 4.2  |
| 11 | 22 | 19  | 14 | 9.85  | -22 | 14 | 19.22 | 10.67578 | 88.79 | 4.2  |
| 11 | 23 | 19  | 14 | 33.65 | -22 | 13 | 41.87 | 10.68797 | 88.89 | 4.1  |
| 11 | 24 | 19  | 14 | 57.70 | -22 | 13 | 3.82  | 10.69998 | 88.99 | 4.1  |
| 11 | 25 | 19  | 15 | 21.99 | -22 | 12 | 25.06 | 10.71180 | 89.09 | 4.0  |
| 11 | 26 | 19  | 15 | 46.54 | -22 | 11 | 45.60 | 10.72344 | 89.18 | 3.9  |
| 11 | 27 | 19  | 16 | 11.31 | -22 | 11 | 5.46  | 10.73488 | 89.28 | 3.9  |
| 11 | 28 | 19  | 16 | 36.33 | -22 | 10 | 24.65 | 10.74612 | 89.37 | 3.8  |
| 11 | 29 | 19  | 17 | 1.57  | -22 | 9  | 43.18 | 10.75717 | 89.46 | 3.7  |
| 11 | 30 | 19  | 17 | 27.02 | -22 | 9  | 1.06  | 10.76802 | 89.56 | 3.7  |

## 土星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 11 1      | 11:02     | 115     | 16:20     | 43S     | 21:37     | 245     | 16.01        | 14.72         | 1.00 | 0.6           |
| 11 2      | 10:58     | 115     | 16:16     | 43S     | 21:33     | 245     | 15.98        | 14.69         | 1.00 | 0.6           |
| 11 3      | 10:55     | 115     | 16:12     | 43S     | 21:30     | 245     | 15.96        | 14.67         | 1.00 | 0.6           |
| 11 4      | 10:51     | 115     | 16:09     | 43S     | 21:26     | 245     | 15.94        | 14.65         | 1.00 | 0.6           |
| 11 5      | 10:48     | 115     | 16:05     | 43S     | 21:23     | 245     | 15.91        | 14.63         | 1.00 | 0.6           |
| 11 6      | 10:44     | 115     | 16:01     | 43S     | 21:19     | 245     | 15.89        | 14.61         | 1.00 | 0.6           |
| 11 7      | 10:40     | 115     | 15:58     | 43S     | 21:15     | 245     | 15.87        | 14.59         | 1.00 | 0.6           |
| 11 8      | 10:37     | 115     | 15:54     | 43S     | 21:12     | 245     | 15.85        | 14.57         | 1.00 | 0.6           |
| 11 9      | 10:33     | 115     | 15:51     | 43S     | 21:08     | 245     | 15.82        | 14.55         | 1.00 | 0.6           |
| 11 10     | 10:29     | 115     | 15:47     | 43S     | 21:05     | 245     | 15.8         | 14.53         | 1.00 | 0.6           |
| 11 11     | 10:26     | 115     | 15:43     | 43S     | 21:01     | 245     | 15.78        | 14.51         | 1.00 | 0.6           |
| 11 12     | 10:22     | 115     | 15:40     | 43S     | 20:58     | 245     | 15.76        | 14.49         | 1.00 | 0.6           |
| 11 13     | 10:19     | 115     | 15:36     | 43S     | 20:54     | 246     | 15.74        | 14.47         | 1.00 | 0.6           |
| 11 14     | 10:15     | 114     | 15:33     | 43S     | 20:50     | 246     | 15.72        | 14.45         | 1.00 | 0.6           |
| 11 15     | 10:11     | 114     | 15:29     | 43S     | 20:47     | 246     | 15.7         | 14.43         | 1.00 | 0.6           |
| 11 16     | 10:08     | 114     | 15:26     | 43S     | 20:43     | 246     | 15.68        | 14.41         | 1.00 | 0.6           |
| 11 17     | 10:04     | 114     | 15:22     | 43S     | 20:40     | 246     | 15.66        | 14.39         | 1.00 | 0.6           |
| 11 18     | 10:01     | 114     | 15:18     | 43S     | 20:36     | 246     | 15.64        | 14.38         | 1.00 | 0.6           |
| 11 19     | 09:57     | 114     | 15:15     | 43S     | 20:33     | 246     | 15.62        | 14.36         | 1.00 | 0.6           |
| 11 20     | 09:54     | 114     | 15:11     | 43S     | 20:29     | 246     | 15.6         | 14.34         | 1.00 | 0.6           |
| 11 21     | 09:50     | 114     | 15:08     | 43S     | 20:26     | 246     | 15.59        | 14.32         | 1.00 | 0.6           |
| 11 22     | 09:46     | 114     | 15:04     | 43S     | 20:22     | 246     | 15.57        | 14.31         | 1.00 | 0.6           |
| 11 23     | 09:43     | 114     | 15:01     | 43S     | 20:19     | 246     | 15.55        | 14.29         | 1.00 | 0.6           |
| 11 24     | 09:39     | 114     | 14:57     | 43S     | 20:15     | 246     | 15.53        | 14.27         | 1.00 | 0.6           |
| 11 25     | 09:36     | 114     | 14:54     | 43S     | 20:12     | 246     | 15.52        | 14.26         | 1.00 | 0.6           |
| 11 26     | 09:32     | 114     | 14:50     | 43S     | 20:08     | 246     | 15.5         | 14.24         | 1.00 | 0.6           |
| 11 27     | 09:29     | 114     | 14:47     | 43S     | 20:05     | 246     | 15.48        | 14.23         | 1.00 | 0.6           |
| 11 28     | 09:25     | 114     | 14:43     | 43S     | 20:01     | 246     | 15.47        | 14.21         | 1.00 | 0.6           |
| 11 29     | 09:22     | 114     | 14:40     | 43S     | 19:58     | 246     | 15.45        | 14.2          | 1.00 | 0.6           |
| 11 30     | 09:18     | 114     | 14:36     | 43S     | 19:54     | 246     | 15.43        | 14.18         | 1.00 | 0.6           |

## 土 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程   | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|-------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分     | °    |
| 12 | 1  | 19  | 17 | 52.69 | -22 | 8  | 18.30 | 10.77866 | 89.64 | 3.6  |
| 12 | 2  | 19  | 18 | 18.57 | -22 | 7  | 34.87 | 10.78910 | 89.73 | 3.5  |
| 12 | 3  | 19  | 18 | 44.64 | -22 | 6  | 50.80 | 10.79933 | 89.82 | 3.4  |
| 12 | 4  | 19  | 19 | 10.92 | -22 | 6  | 6.06  | 10.80934 | 89.90 | 3.4  |
| 12 | 5  | 19  | 19 | 37.38 | -22 | 5  | 20.67 | 10.81915 | 89.98 | 3.3  |
| 12 | 6  | 19  | 20 | 4.03  | -22 | 4  | 34.61 | 10.82874 | 90.06 | 3.2  |
| 12 | 7  | 19  | 20 | 30.86 | -22 | 3  | 47.88 | 10.83811 | 90.14 | 3.2  |
| 12 | 8  | 19  | 20 | 57.88 | -22 | 3  | 0.50  | 10.84726 | 90.21 | 3.1  |
| 12 | 9  | 19  | 21 | 25.07 | -22 | 2  | 12.46 | 10.85619 | 90.29 | 3.0  |
| 12 | 10 | 19  | 21 | 52.42 | -22 | 1  | 23.77 | 10.86490 | 90.36 | 2.9  |
| 12 | 11 | 19  | 22 | 19.95 | -22 | 0  | 34.45 | 10.87338 | 90.43 | 2.8  |
| 12 | 12 | 19  | 22 | 47.64 | -21 | 59 | 44.49 | 10.88164 | 90.50 | 2.8  |
| 12 | 13 | 19  | 23 | 15.49 | -21 | 58 | 53.93 | 10.88966 | 90.57 | 2.7  |
| 12 | 14 | 19  | 23 | 43.48 | -21 | 58 | 2.76  | 10.89746 | 90.63 | 2.6  |
| 12 | 15 | 19  | 24 | 11.63 | -21 | 57 | 11.01 | 10.90502 | 90.69 | 2.5  |
| 12 | 16 | 19  | 24 | 39.91 | -21 | 56 | 18.66 | 10.91235 | 90.76 | 2.5  |
| 12 | 17 | 19  | 25 | 8.32  | -21 | 55 | 25.73 | 10.91945 | 90.81 | 2.4  |
| 12 | 18 | 19  | 25 | 36.87 | -21 | 54 | 32.21 | 10.92631 | 90.87 | 2.3  |
| 12 | 19 | 19  | 26 | 5.53  | -21 | 53 | 38.10 | 10.93293 | 90.93 | 2.2  |
| 12 | 20 | 19  | 26 | 34.32 | -21 | 52 | 43.37 | 10.93930 | 90.98 | 2.1  |
| 12 | 21 | 19  | 27 | 3.23  | -21 | 51 | 48.05 | 10.94544 | 91.03 | 2.0  |
| 12 | 22 | 19  | 27 | 32.25 | -21 | 50 | 52.13 | 10.95133 | 91.08 | 2.0  |
| 12 | 23 | 19  | 28 | 1.39  | -21 | 49 | 55.63 | 10.95697 | 91.13 | 1.9  |
| 12 | 24 | 19  | 28 | 30.63 | -21 | 48 | 58.56 | 10.96236 | 91.17 | 1.8  |
| 12 | 25 | 19  | 28 | 59.97 | -21 | 48 | 0.95  | 10.96750 | 91.21 | 1.7  |
| 12 | 26 | 19  | 29 | 29.41 | -21 | 47 | 2.81  | 10.97239 | 91.25 | 1.6  |
| 12 | 27 | 19  | 29 | 58.93 | -21 | 46 | 4.15  | 10.97703 | 91.29 | 1.5  |
| 12 | 28 | 19  | 30 | 28.54 | -21 | 45 | 4.98  | 10.98141 | 91.33 | 1.5  |
| 12 | 29 | 19  | 30 | 58.21 | -21 | 44 | 5.31  | 10.98554 | 91.36 | 1.4  |
| 12 | 30 | 19  | 31 | 27.96 | -21 | 43 | 5.15  | 10.98942 | 91.40 | 1.3  |
| 12 | 31 | 19  | 31 | 57.76 | -21 | 42 | 4.50  | 10.99303 | 91.43 | 1.2  |



## 土星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑    |         | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|---------|---------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° | 赤道<br>" | 兩極<br>" |      |               |
| 12 1      | 09:14     | 114     | 14:33     | 43S     | 19:51     | 246     | 15.42   | 14.17   | 1.00 | 0.6           |
| 12 2      | 09:11     | 114     | 14:29     | 43S     | 19:47     | 246     | 15.40   | 14.15   | 1.00 | 0.6           |
| 12 3      | 09:07     | 114     | 14:26     | 43S     | 19:44     | 246     | 15.39   | 14.14   | 1.00 | 0.6           |
| 12 4      | 09:04     | 114     | 14:22     | 43S     | 19:40     | 246     | 15.38   | 14.12   | 1.00 | 0.6           |
| 12 5      | 09:00     | 114     | 14:19     | 43S     | 19:37     | 246     | 15.36   | 14.11   | 1.00 | 0.6           |
| 12 6      | 08:57     | 114     | 14:15     | 43S     | 19:33     | 246     | 15.35   | 14.1    | 1.00 | 0.6           |
| 12 7      | 08:53     | 114     | 14:12     | 43S     | 19:30     | 246     | 15.33   | 14.09   | 1.00 | 0.6           |
| 12 8      | 08:50     | 114     | 14:08     | 43S     | 19:26     | 246     | 15.32   | 14.07   | 1.00 | 0.6           |
| 12 9      | 08:46     | 114     | 14:05     | 43S     | 19:23     | 246     | 15.31   | 14.06   | 1.00 | 0.6           |
| 12 10     | 08:43     | 114     | 14:01     | 43S     | 19:20     | 246     | 15.30   | 14.05   | 1.00 | 0.6           |
| 12 11     | 08:39     | 114     | 13:58     | 43S     | 19:16     | 246     | 15.28   | 14.04   | 1.00 | 0.6           |
| 12 12     | 08:36     | 114     | 13:54     | 43S     | 19:13     | 246     | 15.27   | 14.03   | 1.00 | 0.6           |
| 12 13     | 08:32     | 114     | 13:51     | 43S     | 19:09     | 246     | 15.26   | 14.02   | 1.00 | 0.6           |
| 12 14     | 08:29     | 114     | 13:47     | 43S     | 19:06     | 246     | 15.25   | 14.01   | 1.00 | 0.6           |
| 12 15     | 08:25     | 114     | 13:44     | 43S     | 19:02     | 246     | 15.24   | 14.00   | 1.00 | 0.6           |
| 12 16     | 08:22     | 114     | 13:40     | 43S     | 18:59     | 246     | 15.23   | 13.99   | 1.00 | 0.6           |
| 12 17     | 08:18     | 114     | 13:37     | 43S     | 18:55     | 246     | 15.22   | 13.98   | 1.00 | 0.6           |
| 12 18     | 08:15     | 114     | 13:33     | 43S     | 18:52     | 246     | 15.21   | 13.97   | 1.00 | 0.6           |
| 12 19     | 08:11     | 114     | 13:30     | 43S     | 18:49     | 246     | 15.2    | 13.96   | 1.00 | 0.6           |
| 12 20     | 08:08     | 114     | 13:27     | 43S     | 18:45     | 246     | 15.19   | 13.95   | 1.00 | 0.6           |
| 12 21     | 08:04     | 114     | 13:23     | 43S     | 18:42     | 246     | 15.18   | 13.94   | 1.00 | 0.6           |
| 12 22     | 08:01     | 114     | 13:20     | 43S     | 18:38     | 246     | 15.18   | 13.93   | 1.00 | 0.6           |
| 12 23     | 07:57     | 114     | 13:16     | 43S     | 18:35     | 246     | 15.17   | 13.92   | 1.00 | 0.6           |
| 12 24     | 07:54     | 114     | 13:13     | 43S     | 18:32     | 246     | 15.16   | 13.92   | 1.00 | 0.6           |
| 12 25     | 07:50     | 114     | 13:09     | 43S     | 18:28     | 246     | 15.15   | 13.91   | 1.00 | 0.6           |
| 12 26     | 07:47     | 114     | 13:06     | 43S     | 18:25     | 246     | 15.15   | 13.9    | 1.00 | 0.6           |
| 12 27     | 07:44     | 114     | 13:02     | 43S     | 18:21     | 246     | 15.14   | 13.9    | 1.00 | 0.6           |
| 12 28     | 07:40     | 114     | 12:59     | 43S     | 18:18     | 246     | 15.13   | 13.89   | 1.00 | 0.5           |
| 12 29     | 07:37     | 114     | 12:56     | 43S     | 18:15     | 246     | 15.13   | 13.88   | 1.00 | 0.5           |
| 12 30     | 07:33     | 114     | 12:52     | 43S     | 18:11     | 246     | 15.12   | 13.88   | 1.00 | 0.5           |
| 12 31     | 07:30     | 114     | 12:49     | 43S     | 18:08     | 246     | 15.12   | 13.87   | 1.00 | 0.5           |

## 土星表面位置座標表

世界時 0 時

| 日期<br>月 日 |    | 中心點座標                               |                                   | 日下點座標 (系統三)                    |                              |                            |                          | 北極點位置                |                          |
|-----------|----|-------------------------------------|-----------------------------------|--------------------------------|------------------------------|----------------------------|--------------------------|----------------------|--------------------------|
|           |    | 地<br>經度<br>( $\lambda_e$ ) $^\circ$ | 球<br>緯度<br>( $\beta_e$ ) $^\circ$ | 經度<br>( $\lambda_s$ ) $^\circ$ | 緯度<br>( $\beta_s$ ) $^\circ$ | 太陽<br>距離<br>( $d_s$ ) $''$ | 方位<br>( $P_s$ ) $^\circ$ | 距離<br>( $d_n$ ) $''$ | 方位<br>( $P_n$ ) $^\circ$ |
| 1         | 1  | 78.11                               | 30.33                             | 78.00                          | 30.25                        | 0.02                       | 242.44                   | 6.13                 | 6.18                     |
| 1         | 6  | 171.45                              | 30.21                             | 171.81                         | 30.23                        | 0.04                       | 93.02                    | 6.14                 | 6.21                     |
| 1         | 11 | 264.82                              | 30.08                             | 265.66                         | 30.20                        | 0.10                       | 88.07                    | 6.15                 | 6.24                     |
| 1         | 16 | 358.22                              | 29.95                             | 359.53                         | 30.17                        | 0.16                       | 86.53                    | 6.16                 | 6.27                     |
| 1         | 21 | 91.67                               | 29.82                             | 93.44                          | 30.15                        | 0.21                       | 85.68                    | 6.18                 | 6.30                     |
| 1         | 26 | 185.15                              | 29.69                             | 187.37                         | 30.12                        | 0.27                       | 85.09                    | 6.20                 | 6.33                     |
| 2         | 1  | 9.39                                | 29.53                             | 12.13                          | 30.09                        | 0.33                       | 84.54                    | 6.23                 | 6.36                     |
| 2         | 6  | 102.97                              | 29.40                             | 106.13                         | 30.06                        | 0.38                       | 84.15                    | 6.26                 | 6.38                     |
| 2         | 11 | 196.59                              | 29.27                             | 200.15                         | 30.03                        | 0.43                       | 83.82                    | 6.29                 | 6.41                     |
| 2         | 16 | 290.26                              | 29.14                             | 294.20                         | 30.01                        | 0.48                       | 83.51                    | 6.33                 | 6.43                     |
| 2         | 21 | 23.98                               | 29.02                             | 28.27                          | 29.98                        | 0.53                       | 83.23                    | 6.37                 | 6.45                     |
| 2         | 26 | 117.74                              | 28.90                             | 122.36                         | 29.95                        | 0.57                       | 82.98                    | 6.41                 | 6.46                     |
| 3         | 1  | 30.03                               | 28.83                             | 34.83                          | 29.94                        | 0.60                       | 82.83                    | 6.43                 | 6.47                     |
| 3         | 6  | 123.87                              | 28.72                             | 128.95                         | 29.91                        | 0.64                       | 82.61                    | 6.48                 | 6.49                     |
| 3         | 11 | 217.76                              | 28.61                             | 223.09                         | 29.88                        | 0.68                       | 82.40                    | 6.53                 | 6.50                     |
| 3         | 16 | 311.70                              | 28.51                             | 317.25                         | 29.85                        | 0.71                       | 82.21                    | 6.58                 | 6.52                     |
| 3         | 21 | 45.68                               | 28.42                             | 51.42                          | 29.82                        | 0.74                       | 82.04                    | 6.64                 | 6.53                     |
| 3         | 26 | 139.72                              | 28.34                             | 145.60                         | 29.79                        | 0.76                       | 81.89                    | 6.69                 | 6.54                     |
| 4         | 1  | 324.62                              | 28.26                             | 330.63                         | 29.76                        | 0.79                       | 81.72                    | 6.76                 | 6.55                     |
| 4         | 6  | 58.75                               | 28.20                             | 64.82                          | 29.73                        | 0.80                       | 81.60                    | 6.82                 | 6.55                     |
| 4         | 11 | 152.93                              | 28.15                             | 159.02                         | 29.70                        | 0.81                       | 81.50                    | 6.88                 | 6.56                     |
| 4         | 16 | 247.15                              | 28.12                             | 253.21                         | 29.67                        | 0.82                       | 81.41                    | 6.94                 | 6.56                     |
| 4         | 21 | 341.40                              | 28.09                             | 347.41                         | 29.64                        | 0.82                       | 81.34                    | 7.00                 | 6.57                     |
| 4         | 26 | 75.70                               | 28.08                             | 81.60                          | 29.61                        | 0.81                       | 81.29                    | 7.05                 | 6.57                     |
| 5         | 1  | 170.02                              | 28.08                             | 175.77                         | 29.58                        | 0.80                       | 81.25                    | 7.11                 | 6.57                     |
| 5         | 6  | 264.38                              | 28.09                             | 269.94                         | 29.55                        | 0.78                       | 81.22                    | 7.17                 | 6.57                     |
| 5         | 11 | 358.77                              | 28.12                             | 4.10                           | 29.52                        | 0.75                       | 81.21                    | 7.22                 | 6.57                     |
| 5         | 16 | 93.19                               | 28.15                             | 98.23                          | 29.49                        | 0.72                       | 81.21                    | 7.28                 | 6.56                     |
| 5         | 21 | 187.62                              | 28.20                             | 192.35                         | 29.45                        | 0.68                       | 81.22                    | 7.33                 | 6.56                     |
| 5         | 26 | 282.07                              | 28.26                             | 286.45                         | 29.42                        | 0.63                       | 81.23                    | 7.37                 | 6.55                     |
| 6         | 1  | 107.43                              | 28.34                             | 111.33                         | 29.39                        | 0.57                       | 81.26                    | 7.42                 | 6.55                     |
| 6         | 6  | 201.90                              | 28.42                             | 205.38                         | 29.35                        | 0.51                       | 81.28                    | 7.46                 | 6.54                     |
| 6         | 11 | 296.37                              | 28.51                             | 299.39                         | 29.32                        | 0.44                       | 81.29                    | 7.49                 | 6.53                     |
| 6         | 16 | 30.84                               | 28.60                             | 33.37                          | 29.29                        | 0.37                       | 81.27                    | 7.52                 | 6.52                     |
| 6         | 21 | 125.30                              | 28.70                             | 127.33                         | 29.26                        | 0.30                       | 81.19                    | 7.54                 | 6.51                     |
| 6         | 26 | 219.75                              | 28.80                             | 221.25                         | 29.22                        | 0.22                       | 80.97                    | 7.55                 | 6.50                     |

## 土星表面位置座標表

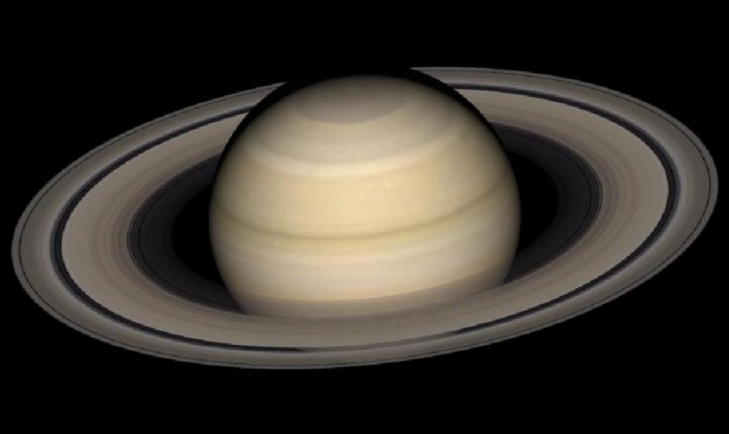
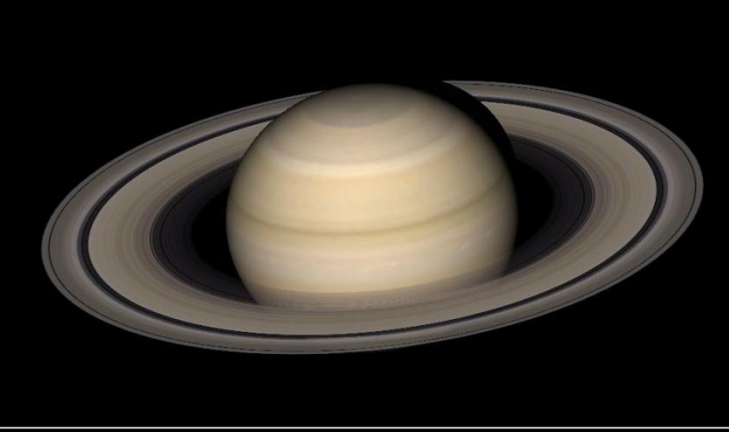
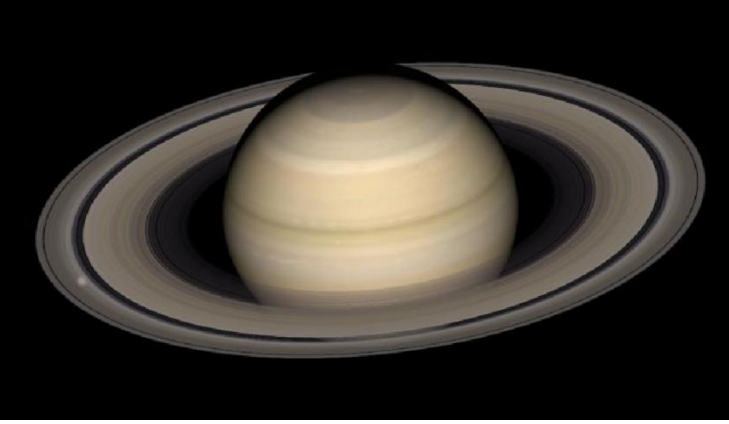
世界時 0 時

| 日期<br>月 日 |    | 中心點座標                               |                                   | 日下點座標 (系統三)                         |                                   |                      |                          | 北極點位置                |                          |
|-----------|----|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|----------------------|--------------------------|----------------------|--------------------------|
|           |    | 地<br>經度<br>( $\lambda_e$ ) $^\circ$ | 球<br>緯度<br>( $\beta_e$ ) $^\circ$ | 太<br>經度<br>( $\lambda_s$ ) $^\circ$ | 陽<br>緯度<br>( $\beta_s$ ) $^\circ$ | 距離<br>( $d_s$ ) $''$ | 方位<br>( $P_s$ ) $^\circ$ | 距離<br>( $d_n$ ) $''$ | 方位<br>( $P_n$ ) $^\circ$ |
| 7         | 1  | 314.17                              | 28.91                             | 315.13                              | 29.19                             | 0.14                 | 80.37                    | 7.56                 | 6.48                     |
| 7         | 6  | 48.57                               | 29.02                             | 48.98                               | 29.16                             | 0.06                 | 77.85                    | 7.56                 | 6.47                     |
| 7         | 11 | 142.94                              | 29.12                             | 142.80                              | 29.12                             | 0.02                 | 276.76                   | 7.56                 | 6.45                     |
| 7         | 16 | 237.28                              | 29.23                             | 236.58                              | 29.09                             | 0.10                 | 265.63                   | 7.55                 | 6.44                     |
| 7         | 21 | 331.57                              | 29.33                             | 330.33                              | 29.06                             | 0.18                 | 264.51                   | 7.53                 | 6.43                     |
| 7         | 26 | 65.82                               | 29.43                             | 64.04                               | 29.02                             | 0.26                 | 264.16                   | 7.51                 | 6.41                     |
| 8         | 1  | 250.86                              | 29.55                             | 248.45                              | 28.98                             | 0.35                 | 264.02                   | 7.48                 | 6.40                     |
| 8         | 6  | 345.00                              | 29.64                             | 342.10                              | 28.95                             | 0.42                 | 263.99                   | 7.44                 | 6.38                     |
| 8         | 11 | 79.08                               | 29.72                             | 75.71                               | 28.91                             | 0.49                 | 264.00                   | 7.40                 | 6.37                     |
| 8         | 16 | 173.10                              | 29.79                             | 169.29                              | 28.88                             | 0.55                 | 264.03                   | 7.36                 | 6.36                     |
| 8         | 21 | 267.07                              | 29.86                             | 262.85                              | 28.84                             | 0.61                 | 264.06                   | 7.32                 | 6.35                     |
| 8         | 26 | 0.97                                | 29.92                             | 356.38                              | 28.81                             | 0.65                 | 264.10                   | 7.27                 | 6.34                     |
| 9         | 1  | 185.58                              | 29.97                             | 180.58                              | 28.77                             | 0.71                 | 264.13                   | 7.20                 | 6.33                     |
| 9         | 6  | 279.35                              | 30.01                             | 274.07                              | 28.73                             | 0.74                 | 264.14                   | 7.15                 | 6.33                     |
| 9         | 11 | 13.06                               | 30.04                             | 7.53                                | 28.69                             | 0.77                 | 264.14                   | 7.09                 | 6.32                     |
| 9         | 16 | 106.72                              | 30.06                             | 100.98                              | 28.66                             | 0.79                 | 264.14                   | 7.04                 | 6.32                     |
| 9         | 21 | 200.32                              | 30.07                             | 194.42                              | 28.62                             | 0.81                 | 264.11                   | 6.98                 | 6.32                     |
| 9         | 26 | 293.86                              | 30.07                             | 287.86                              | 28.59                             | 0.82                 | 264.08                   | 6.92                 | 6.32                     |
| 10        | 1  | 27.35                               | 30.06                             | 21.28                               | 28.55                             | 0.82                 | 264.02                   | 6.86                 | 6.33                     |
| 10        | 6  | 120.80                              | 30.04                             | 114.70                              | 28.51                             | 0.82                 | 263.96                   | 6.81                 | 6.33                     |
| 10        | 11 | 214.20                              | 30.00                             | 208.12                              | 28.47                             | 0.81                 | 263.87                   | 6.75                 | 6.34                     |
| 10        | 16 | 307.56                              | 29.96                             | 301.54                              | 28.44                             | 0.79                 | 263.78                   | 6.70                 | 6.35                     |
| 10        | 21 | 40.89                               | 29.91                             | 34.97                               | 28.40                             | 0.78                 | 263.66                   | 6.65                 | 6.36                     |
| 10        | 26 | 134.18                              | 29.85                             | 128.40                              | 28.36                             | 0.75                 | 263.54                   | 6.60                 | 6.38                     |
| 11        | 1  | 318.10                              | 29.77                             | 312.53                              | 28.32                             | 0.72                 | 263.37                   | 6.54                 | 6.39                     |
| 11        | 6  | 51.33                               | 29.68                             | 45.99                               | 28.28                             | 0.69                 | 263.21                   | 6.50                 | 6.41                     |
| 11        | 11 | 144.55                              | 29.59                             | 139.46                              | 28.24                             | 0.65                 | 263.05                   | 6.46                 | 6.43                     |
| 11        | 16 | 237.76                              | 29.49                             | 232.95                              | 28.20                             | 0.61                 | 262.87                   | 6.42                 | 6.44                     |
| 11        | 21 | 330.95                              | 29.38                             | 326.46                              | 28.16                             | 0.57                 | 262.68                   | 6.39                 | 6.46                     |
| 11        | 26 | 64.14                               | 29.26                             | 59.99                               | 28.12                             | 0.52                 | 262.48                   | 6.36                 | 6.48                     |
| 12        | 1  | 157.33                              | 29.14                             | 153.54                              | 28.09                             | 0.47                 | 262.27                   | 6.33                 | 6.50                     |
| 12        | 6  | 250.52                              | 29.00                             | 247.11                              | 28.05                             | 0.43                 | 262.05                   | 6.31                 | 6.52                     |
| 12        | 11 | 343.71                              | 28.86                             | 340.71                              | 28.01                             | 0.37                 | 261.83                   | 6.29                 | 6.54                     |
| 12        | 16 | 76.92                               | 28.71                             | 74.34                               | 27.97                             | 0.32                 | 261.59                   | 6.27                 | 6.55                     |
| 12        | 21 | 170.14                              | 28.55                             | 167.99                              | 27.93                             | 0.27                 | 261.35                   | 6.26                 | 6.57                     |
| 12        | 26 | 263.38                              | 28.39                             | 261.68                              | 27.89                             | 0.21                 | 261.09                   | 6.25                 | 6.59                     |

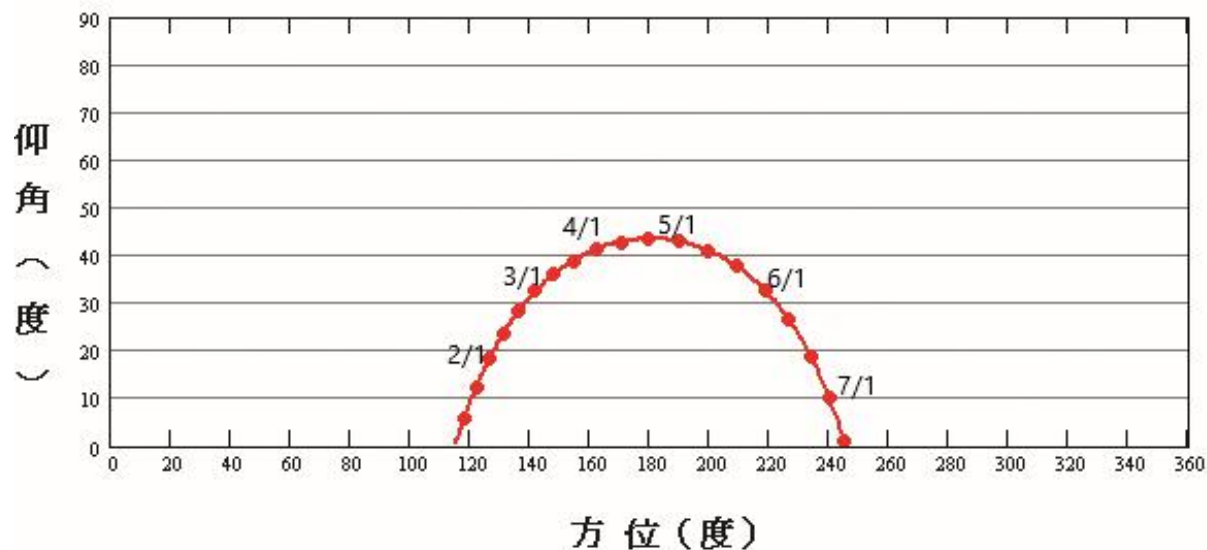
## 土星環的變化

由於土星的自轉軸與軌道面有  $27^\circ$  的傾斜角，因此土星環相對於地球的傾斜角便會隨著土星繞太陽的公轉而改變，再加上土星的軌道面與黃道之間也有  $2.5^\circ$  的夾角，這使得土星環相對於地球的傾斜角在一年之中還會有波浪性的變化。

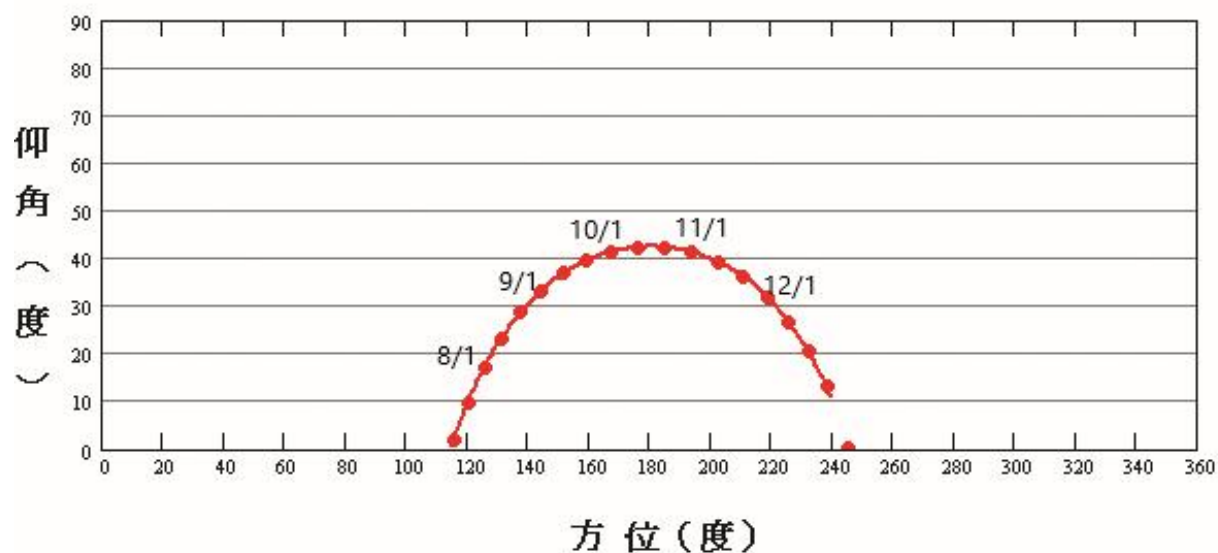
下面三張圖，第一張是今年內土星環相對於地球視直徑最大，第二、第三張分別是臺灣地區所見土星環呈最大傾斜與最小傾斜時所見到的示意景像。三張土星影像示意圖均已做畫面旋轉，與實際觀測到的方位有所不同。

|  |  |  |  |
|--|--|--|--|
| <p>最大視直徑：<br/>7/7~7/13<br/>赤道視直徑：<br/>18".40</p> |  |   |  |
| <p>最小傾斜：<br/>4/24~5/3<br/>環傾斜角：<br/>28°.08</p>   |  |  |  |
| <p>最大傾斜：<br/>1/1~1/4<br/>環傾斜角：<br/>30°.3</p>     |  |  |  |

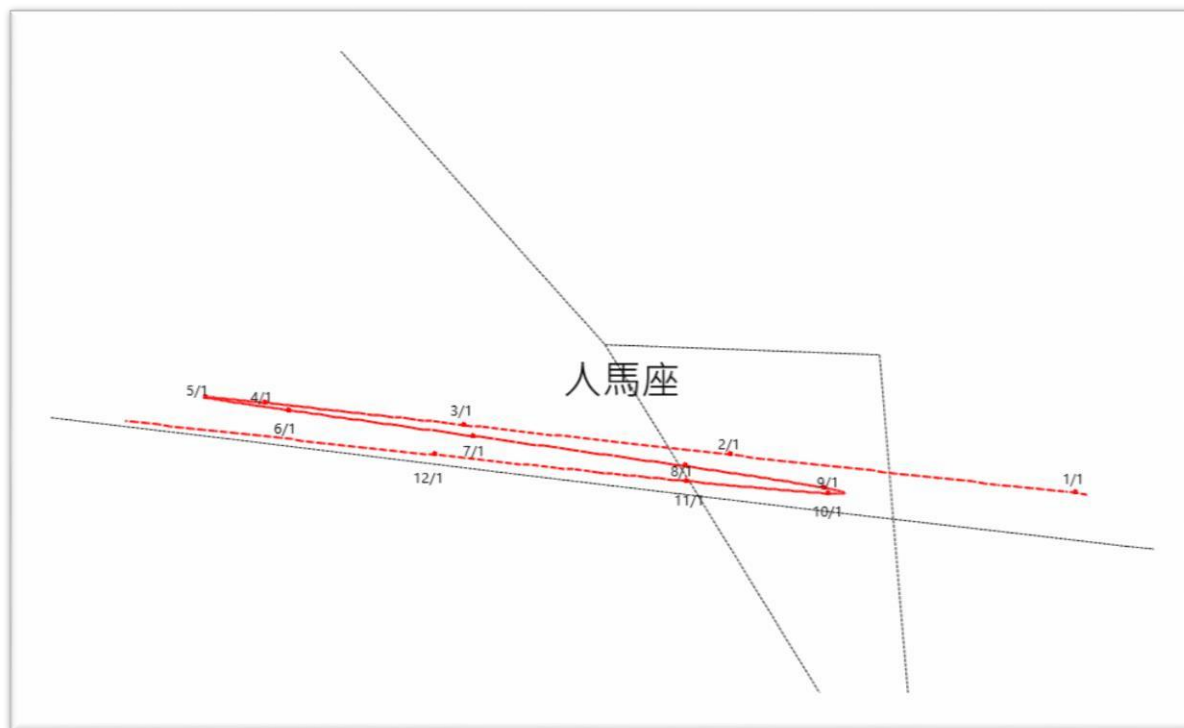
### 日出時土星方位與仰角



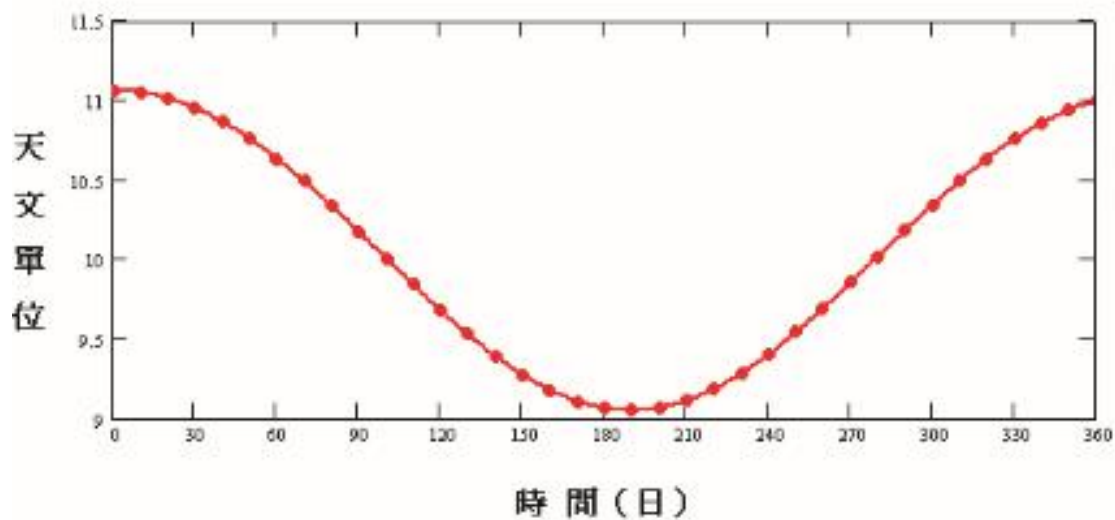
### 日沒時土星方位與仰角



### 土星在天球上運行的軌跡圖



### 土星與地球距離變化圖



## 天王星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距離       | 光程     | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 1  | 1  | 1   | 47 | 7.99  | +10 | 28 | 54.69 | 19.53055 | 162.43 | 2.7  |
| 1  | 2  | 1   | 47 | 6.88  | +10 | 28 | 50.58 | 19.54691 | 162.57 | 2.7  |
| 1  | 3  | 1   | 47 | 5.96  | +10 | 28 | 47.60 | 19.56337 | 162.70 | 2.7  |
| 1  | 4  | 1   | 47 | 5.25  | +10 | 28 | 45.74 | 19.57991 | 162.84 | 2.7  |
| 1  | 5  | 1   | 47 | 4.73  | +10 | 28 | 45.01 | 19.59653 | 162.98 | 2.7  |
| 1  | 6  | 1   | 47 | 4.41  | +10 | 28 | 45.41 | 19.61323 | 163.12 | 2.8  |
| 1  | 7  | 1   | 47 | 4.29  | +10 | 28 | 46.93 | 19.62999 | 163.26 | 2.8  |
| 1  | 8  | 1   | 47 | 4.37  | +10 | 28 | 49.57 | 19.64682 | 163.40 | 2.8  |
| 1  | 9  | 1   | 47 | 4.65  | +10 | 28 | 53.32 | 19.66371 | 163.54 | 2.8  |
| 1  | 10 | 1   | 47 | 5.13  | +10 | 28 | 58.19 | 19.68065 | 163.68 | 2.8  |
| 1  | 11 | 1   | 47 | 5.80  | +10 | 29 | 4.17  | 19.69764 | 163.82 | 2.8  |
| 1  | 12 | 1   | 47 | 6.67  | +10 | 29 | 11.26 | 19.71467 | 163.96 | 2.8  |
| 1  | 13 | 1   | 47 | 7.75  | +10 | 29 | 19.46 | 19.73174 | 164.10 | 2.8  |
| 1  | 14 | 1   | 47 | 9.02  | +10 | 29 | 28.77 | 19.74884 | 164.25 | 2.8  |
| 1  | 15 | 1   | 47 | 10.49 | +10 | 29 | 39.20 | 19.76596 | 164.39 | 2.8  |
| 1  | 16 | 1   | 47 | 12.17 | +10 | 29 | 50.75 | 19.78310 | 164.53 | 2.8  |
| 1  | 17 | 1   | 47 | 14.04 | +10 | 30 | 3.43  | 19.80026 | 164.67 | 2.8  |
| 1  | 18 | 1   | 47 | 16.12 | +10 | 30 | 17.23 | 19.81743 | 164.82 | 2.8  |
| 1  | 19 | 1   | 47 | 18.39 | +10 | 30 | 32.16 | 19.83460 | 164.96 | 2.8  |
| 1  | 20 | 1   | 47 | 20.87 | +10 | 30 | 48.20 | 19.85177 | 165.10 | 2.8  |
| 1  | 21 | 1   | 47 | 23.54 | +10 | 31 | 5.34  | 19.86893 | 165.25 | 2.8  |
| 1  | 22 | 1   | 47 | 26.40 | +10 | 31 | 23.55 | 19.88609 | 165.39 | 2.8  |
| 1  | 23 | 1   | 47 | 29.45 | +10 | 31 | 42.83 | 19.90323 | 165.53 | 2.8  |
| 1  | 24 | 1   | 47 | 32.69 | +10 | 32 | 3.16  | 19.92035 | 165.67 | 2.8  |
| 1  | 25 | 1   | 47 | 36.12 | +10 | 32 | 24.54 | 19.93744 | 165.81 | 2.8  |
| 1  | 26 | 1   | 47 | 39.75 | +10 | 32 | 46.96 | 19.95451 | 165.96 | 2.8  |
| 1  | 27 | 1   | 47 | 43.56 | +10 | 33 | 10.45 | 19.97154 | 166.10 | 2.8  |
| 1  | 28 | 1   | 47 | 47.57 | +10 | 33 | 34.99 | 19.98853 | 166.24 | 2.8  |
| 1  | 29 | 1   | 47 | 51.78 | +10 | 34 | 0.60  | 20.00548 | 166.38 | 2.8  |
| 1  | 30 | 1   | 47 | 56.17 | +10 | 34 | 27.27 | 20.02238 | 166.52 | 2.8  |
| 1  | 31 | 1   | 48 | 0.76  | +10 | 34 | 54.99 | 20.03922 | 166.66 | 2.8  |

## 天王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 1 1       | 12:36     | 78      | 18:58     | 75S     | 01:23     | 282     | 3.61         | 3.56          | 1.00 | 5.8           |
| 1 2       | 12:32     | 78      | 18:54     | 75S     | 01:19     | 282     | 3.61         | 3.56          | 1.00 | 5.8           |
| 1 3       | 12:29     | 78      | 18:50     | 75S     | 01:15     | 282     | 3.60         | 3.55          | 1.00 | 5.8           |
| 1 4       | 12:25     | 78      | 18:46     | 75S     | 01:11     | 282     | 3.60         | 3.55          | 1.00 | 5.8           |
| 1 5       | 12:21     | 78      | 18:42     | 75S     | 01:07     | 282     | 3.60         | 3.55          | 1.00 | 5.8           |
| 1 6       | 12:17     | 78      | 18:38     | 75S     | 01:03     | 282     | 3.59         | 3.55          | 1.00 | 5.8           |
| 1 7       | 12:13     | 78      | 18:34     | 75S     | 00:59     | 282     | 3.59         | 3.54          | 1.00 | 5.8           |
| 1 8       | 12:09     | 78      | 18:30     | 75S     | 00:56     | 282     | 3.59         | 3.54          | 1.00 | 5.8           |
| 1 9       | 12:05     | 78      | 18:26     | 75S     | 00:52     | 282     | 3.58         | 3.54          | 1.00 | 5.8           |
| 1 10      | 12:01     | 78      | 18:22     | 75S     | 00:48     | 282     | 3.58         | 3.53          | 1.00 | 5.8           |
| 1 11      | 11:57     | 78      | 18:18     | 75S     | 00:44     | 282     | 3.58         | 3.53          | 1.00 | 5.8           |
| 1 12      | 11:53     | 78      | 18:15     | 75S     | 00:40     | 282     | 3.58         | 3.53          | 1.00 | 5.8           |
| 1 13      | 11:49     | 78      | 18:11     | 75S     | 00:36     | 282     | 3.57         | 3.52          | 1.00 | 5.8           |
| 1 14      | 11:45     | 78      | 18:07     | 75S     | 00:32     | 282     | 3.57         | 3.52          | 1.00 | 5.8           |
| 1 15      | 11:41     | 78      | 18:03     | 75S     | 00:28     | 282     | 3.57         | 3.52          | 1.00 | 5.8           |
| 1 16      | 11:37     | 78      | 17:59     | 75S     | 00:24     | 282     | 3.56         | 3.52          | 1.00 | 5.8           |
| 1 17      | 11:34     | 78      | 17:55     | 75S     | 00:20     | 282     | 3.56         | 3.51          | 1.00 | 5.8           |
| 1 18      | 11:30     | 78      | 17:51     | 75S     | 00:16     | 282     | 3.56         | 3.51          | 1.00 | 5.8           |
| 1 19      | 11:26     | 78      | 17:47     | 75S     | 00:13     | 282     | 3.55         | 3.51          | 1.00 | 5.8           |
| 1 20      | 11:22     | 78      | 17:43     | 75S     | 00:09     | 282     | 3.55         | 3.50          | 1.00 | 5.8           |
| 1 21      | 11:18     | 78      | 17:39     | 75S     | 00:05     | 282     | 3.55         | 3.50          | 1.00 | 5.8           |
| 1 22      | 11:14     | 78      | 17:36     | 75S     | 00:01     | 282     | 3.54         | 3.50          | 1.00 | 5.8           |
| 1 23      | 11:10     | 78      | 17:32     | 75S     | 23:53     | 282     | 3.54         | 3.49          | 1.00 | 5.8           |
| 1 24      | 11:06     | 78      | 17:28     | 75S     | 23:49     | 282     | 3.54         | 3.49          | 1.00 | 5.8           |
| 1 25      | 11:02     | 78      | 17:24     | 75S     | 23:45     | 282     | 3.54         | 3.49          | 1.00 | 5.8           |
| 1 26      | 10:59     | 78      | 17:20     | 75S     | 23:42     | 282     | 3.53         | 3.49          | 1.00 | 5.8           |
| 1 27      | 10:55     | 78      | 17:16     | 75S     | 23:38     | 282     | 3.53         | 3.48          | 1.00 | 5.8           |
| 1 28      | 10:51     | 78      | 17:12     | 75S     | 23:34     | 282     | 3.53         | 3.48          | 1.00 | 5.8           |
| 1 29      | 10:47     | 78      | 17:08     | 75S     | 23:30     | 282     | 3.52         | 3.48          | 1.00 | 5.8           |
| 1 30      | 10:43     | 78      | 17:05     | 76S     | 23:26     | 282     | 3.52         | 3.47          | 1.00 | 5.8           |
| 1 31      | 10:39     | 78      | 17:01     | 76S     | 23:22     | 282     | 3.52         | 3.47          | 1.00 | 5.8           |



## 天王星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 2  | 1  | 1   | 48 | 5.54  | +10 | 35 | 23.76 | 20.05600 | 166.80 | 2.8  |
| 2  | 2  | 1   | 48 | 10.50 | +10 | 35 | 53.57 | 20.07272 | 166.94 | 2.8  |
| 2  | 3  | 1   | 48 | 15.65 | +10 | 36 | 24.40 | 20.08936 | 167.08 | 2.7  |
| 2  | 4  | 1   | 48 | 20.98 | +10 | 36 | 56.24 | 20.10593 | 167.22 | 2.7  |
| 2  | 5  | 1   | 48 | 26.49 | +10 | 37 | 29.07 | 20.12242 | 167.35 | 2.7  |
| 2  | 6  | 1   | 48 | 32.18 | +10 | 38 | 2.89  | 20.13882 | 167.49 | 2.7  |
| 2  | 7  | 1   | 48 | 38.05 | +10 | 38 | 37.67 | 20.15514 | 167.63 | 2.7  |
| 2  | 8  | 1   | 48 | 44.09 | +10 | 39 | 13.42 | 20.17135 | 167.76 | 2.7  |
| 2  | 9  | 1   | 48 | 50.32 | +10 | 39 | 50.13 | 20.18747 | 167.89 | 2.7  |
| 2  | 10 | 1   | 48 | 56.71 | +10 | 40 | 27.78 | 20.20348 | 168.03 | 2.6  |
| 2  | 11 | 1   | 49 | 3.29  | +10 | 41 | 6.37  | 20.21938 | 168.16 | 2.6  |
| 2  | 12 | 1   | 49 | 10.03 | +10 | 41 | 45.90 | 20.23516 | 168.29 | 2.6  |
| 2  | 13 | 1   | 49 | 16.95 | +10 | 42 | 26.36 | 20.25083 | 168.42 | 2.6  |
| 2  | 14 | 1   | 49 | 24.04 | +10 | 43 | 7.75  | 20.26637 | 168.55 | 2.6  |
| 2  | 15 | 1   | 49 | 31.30 | +10 | 43 | 50.05 | 20.28178 | 168.68 | 2.5  |
| 2  | 16 | 1   | 49 | 38.72 | +10 | 44 | 33.25 | 20.29706 | 168.81 | 2.5  |
| 2  | 17 | 1   | 49 | 46.31 | +10 | 45 | 17.34 | 20.31221 | 168.93 | 2.5  |
| 2  | 18 | 1   | 49 | 54.05 | +10 | 46 | 2.29  | 20.32722 | 169.06 | 2.5  |
| 2  | 19 | 1   | 50 | 1.95  | +10 | 46 | 48.07 | 20.34208 | 169.18 | 2.5  |
| 2  | 20 | 1   | 50 | 10.00 | +10 | 47 | 34.66 | 20.35680 | 169.30 | 2.4  |
| 2  | 21 | 1   | 50 | 18.20 | +10 | 48 | 22.05 | 20.37136 | 169.42 | 2.4  |
| 2  | 22 | 1   | 50 | 26.56 | +10 | 49 | 10.22 | 20.38577 | 169.54 | 2.4  |
| 2  | 23 | 1   | 50 | 35.06 | +10 | 49 | 59.18 | 20.40003 | 169.66 | 2.4  |
| 2  | 24 | 1   | 50 | 43.71 | +10 | 50 | 48.93 | 20.41412 | 169.78 | 2.3  |
| 2  | 25 | 1   | 50 | 52.52 | +10 | 51 | 39.47 | 20.42805 | 169.90 | 2.3  |
| 2  | 26 | 1   | 51 | 1.47  | +10 | 52 | 30.79 | 20.44180 | 170.01 | 2.3  |
| 2  | 27 | 1   | 51 | 10.57 | +10 | 53 | 22.87 | 20.45539 | 170.12 | 2.2  |
| 2  | 28 | 1   | 51 | 19.81 | +10 | 54 | 15.71 | 20.46880 | 170.23 | 2.2  |

## 天王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |    | 中 天   |     | 沒     |     | 視 直徑 |      | 相位   | 視 亮度 |
|----|----|-------|----|-------|-----|-------|-----|------|------|------|------|
| 月  | 日  | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   |      | 星等   |
|    |    | h m   | °  | h m   | °   | h m   | °   | "    | "    |      |      |
| 2  | 1  | 10:35 | 78 | 16:57 | 76S | 23:19 | 282 | 3.51 | 3.47 | 1.00 | 5.8  |
| 2  | 2  | 10:31 | 78 | 16:53 | 76S | 23:15 | 282 | 3.51 | 3.46 | 1.00 | 5.8  |
| 2  | 3  | 10:28 | 78 | 16:49 | 76S | 23:11 | 282 | 3.51 | 3.46 | 1.00 | 5.8  |
| 2  | 4  | 10:24 | 78 | 16:45 | 76S | 23:07 | 282 | 3.51 | 3.46 | 1.00 | 5.8  |
| 2  | 5  | 10:20 | 78 | 16:42 | 76S | 23:03 | 282 | 3.50 | 3.46 | 1.00 | 5.8  |
| 2  | 6  | 10:16 | 78 | 16:38 | 76S | 22:59 | 282 | 3.50 | 3.45 | 1.00 | 5.8  |
| 2  | 7  | 10:12 | 78 | 16:34 | 76S | 22:56 | 282 | 3.50 | 3.45 | 1.00 | 5.8  |
| 2  | 8  | 10:08 | 78 | 16:30 | 76S | 22:52 | 282 | 3.49 | 3.45 | 1.00 | 5.8  |
| 2  | 9  | 10:04 | 78 | 16:26 | 76S | 22:48 | 282 | 3.49 | 3.45 | 1.00 | 5.8  |
| 2  | 10 | 10:01 | 78 | 16:22 | 76S | 22:44 | 282 | 3.49 | 3.44 | 1.00 | 5.8  |
| 2  | 11 | 09:57 | 78 | 16:19 | 76S | 22:40 | 282 | 3.49 | 3.44 | 1.00 | 5.8  |
| 2  | 12 | 09:53 | 78 | 16:15 | 76S | 22:37 | 282 | 3.48 | 3.44 | 1.00 | 5.8  |
| 2  | 13 | 09:49 | 78 | 16:11 | 76S | 22:33 | 282 | 3.48 | 3.43 | 1.00 | 5.8  |
| 2  | 14 | 09:45 | 78 | 16:07 | 76S | 22:29 | 282 | 3.48 | 3.43 | 1.00 | 5.8  |
| 2  | 15 | 09:41 | 78 | 16:03 | 76S | 22:25 | 282 | 3.48 | 3.43 | 1.00 | 5.8  |
| 2  | 16 | 09:38 | 78 | 15:59 | 76S | 22:21 | 282 | 3.47 | 3.43 | 1.00 | 5.8  |
| 2  | 17 | 09:34 | 78 | 15:56 | 76S | 22:18 | 282 | 3.47 | 3.42 | 1.00 | 5.8  |
| 2  | 18 | 09:30 | 78 | 15:52 | 76S | 22:14 | 282 | 3.47 | 3.42 | 1.00 | 5.8  |
| 2  | 19 | 09:26 | 78 | 15:48 | 76S | 22:10 | 282 | 3.46 | 3.42 | 1.00 | 5.8  |
| 2  | 20 | 09:22 | 78 | 15:44 | 76S | 22:06 | 282 | 3.46 | 3.42 | 1.00 | 5.8  |
| 2  | 21 | 09:18 | 78 | 15:40 | 76S | 22:03 | 282 | 3.46 | 3.41 | 1.00 | 5.8  |
| 2  | 22 | 09:15 | 78 | 15:37 | 76S | 21:59 | 282 | 3.46 | 3.41 | 1.00 | 5.9  |
| 2  | 23 | 09:11 | 78 | 15:33 | 76S | 21:55 | 282 | 3.45 | 3.41 | 1.00 | 5.9  |
| 2  | 24 | 09:07 | 78 | 15:29 | 76S | 21:51 | 282 | 3.45 | 3.41 | 1.00 | 5.9  |
| 2  | 25 | 09:03 | 78 | 15:25 | 76S | 21:48 | 282 | 3.45 | 3.41 | 1.00 | 5.9  |
| 2  | 26 | 08:59 | 78 | 15:22 | 76S | 21:44 | 282 | 3.45 | 3.40 | 1.00 | 5.9  |
| 2  | 27 | 08:56 | 78 | 15:18 | 76S | 21:40 | 282 | 3.45 | 3.40 | 1.00 | 5.9  |
| 2  | 28 | 08:52 | 78 | 15:14 | 76S | 21:36 | 282 | 3.44 | 3.40 | 1.00 | 5.9  |

## 天王星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 3  | 1  | 1   | 51 | 29.20 | +10 | 55 | 9.29  | 20.48202 | 170.34 | 2.2  |
| 3  | 2  | 1   | 51 | 38.71 | +10 | 56 | 3.58  | 20.49507 | 170.45 | 2.2  |
| 3  | 3  | 1   | 51 | 48.37 | +10 | 56 | 58.58 | 20.50792 | 170.56 | 2.1  |
| 3  | 4  | 1   | 51 | 58.15 | +10 | 57 | 54.26 | 20.52058 | 170.66 | 2.1  |
| 3  | 5  | 1   | 52 | 8.06  | +10 | 58 | 50.61 | 20.53305 | 170.77 | 2.1  |
| 3  | 6  | 1   | 52 | 18.10 | +10 | 59 | 47.60 | 20.54531 | 170.87 | 2.0  |
| 3  | 7  | 1   | 52 | 28.26 | +11 | 0  | 45.23 | 20.55738 | 170.97 | 2.0  |
| 3  | 8  | 1   | 52 | 38.55 | +11 | 1  | 43.48 | 20.56924 | 171.07 | 2.0  |
| 3  | 9  | 1   | 52 | 48.95 | +11 | 2  | 42.34 | 20.58089 | 171.17 | 1.9  |
| 3  | 10 | 1   | 52 | 59.48 | +11 | 3  | 41.79 | 20.59233 | 171.26 | 1.9  |
| 3  | 11 | 1   | 53 | 10.12 | +11 | 4  | 41.84 | 20.60355 | 171.35 | 1.8  |
| 3  | 12 | 1   | 53 | 20.88 | +11 | 5  | 42.47 | 20.61455 | 171.45 | 1.8  |
| 3  | 13 | 1   | 53 | 31.75 | +11 | 6  | 43.67 | 20.62534 | 171.54 | 1.8  |
| 3  | 14 | 1   | 53 | 42.73 | +11 | 7  | 45.43 | 20.63590 | 171.62 | 1.7  |
| 3  | 15 | 1   | 53 | 53.82 | +11 | 8  | 47.73 | 20.64623 | 171.71 | 1.7  |
| 3  | 16 | 1   | 54 | 5.02  | +11 | 9  | 50.56 | 20.65634 | 171.79 | 1.7  |
| 3  | 17 | 1   | 54 | 16.31 | +11 | 10 | 53.88 | 20.66622 | 171.88 | 1.6  |
| 3  | 18 | 1   | 54 | 27.70 | +11 | 11 | 57.68 | 20.67586 | 171.96 | 1.6  |
| 3  | 19 | 1   | 54 | 39.18 | +11 | 13 | 1.92  | 20.68528 | 172.03 | 1.5  |
| 3  | 20 | 1   | 54 | 50.75 | +11 | 14 | 6.59  | 20.69445 | 172.11 | 1.5  |
| 3  | 21 | 1   | 55 | 2.40  | +11 | 15 | 11.67 | 20.70339 | 172.19 | 1.5  |
| 3  | 22 | 1   | 55 | 14.15 | +11 | 16 | 17.15 | 20.71209 | 172.26 | 1.4  |
| 3  | 23 | 1   | 55 | 25.98 | +11 | 17 | 23.03 | 20.72055 | 172.33 | 1.4  |
| 3  | 24 | 1   | 55 | 37.90 | +11 | 18 | 29.30 | 20.72876 | 172.40 | 1.3  |
| 3  | 25 | 1   | 55 | 49.90 | +11 | 19 | 35.98 | 20.73673 | 172.46 | 1.3  |
| 3  | 26 | 1   | 56 | 1.99  | +11 | 20 | 43.03 | 20.74445 | 172.53 | 1.3  |
| 3  | 27 | 1   | 56 | 14.15 | +11 | 21 | 50.46 | 20.75192 | 172.59 | 1.2  |
| 3  | 28 | 1   | 56 | 26.39 | +11 | 22 | 58.23 | 20.75914 | 172.65 | 1.2  |
| 3  | 29 | 1   | 56 | 38.69 | +11 | 24 | 6.33  | 20.76611 | 172.71 | 1.1  |
| 3  | 30 | 1   | 56 | 51.07 | +11 | 25 | 14.75 | 20.77282 | 172.76 | 1.1  |
| 3  | 31 | 1   | 57 | 3.51  | +11 | 26 | 23.45 | 20.77928 | 172.82 | 1.0  |

## 天王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 3 1       | 08:48     | 78      | 15:10     | 76S     | 21:33     | 282     | 3.44         | 3.40          | 1.00 | 5.9           |
| 3 2       | 08:44     | 78      | 15:06     | 76S     | 21:29     | 282     | 3.44         | 3.39          | 1.00 | 5.9           |
| 3 3       | 08:40     | 78      | 15:03     | 76S     | 21:25     | 282     | 3.44         | 3.39          | 1.00 | 5.9           |
| 3 4       | 08:37     | 78      | 14:59     | 76S     | 21:21     | 282     | 3.43         | 3.39          | 1.00 | 5.9           |
| 3 5       | 08:33     | 78      | 14:55     | 76S     | 21:18     | 282     | 3.43         | 3.39          | 1.00 | 5.9           |
| 3 6       | 08:29     | 78      | 14:51     | 76S     | 21:14     | 282     | 3.43         | 3.39          | 1.00 | 5.9           |
| 3 7       | 08:25     | 78      | 14:48     | 76S     | 21:10     | 282     | 3.43         | 3.38          | 1.00 | 5.9           |
| 3 8       | 08:21     | 78      | 14:44     | 76S     | 21:06     | 282     | 3.43         | 3.38          | 1.00 | 5.9           |
| 3 9       | 08:18     | 78      | 14:40     | 76S     | 21:03     | 282     | 3.42         | 3.38          | 1.00 | 5.9           |
| 3 10      | 08:14     | 77      | 14:36     | 76S     | 20:59     | 283     | 3.42         | 3.38          | 1.00 | 5.9           |
| 3 11      | 08:10     | 77      | 14:33     | 76S     | 20:55     | 283     | 3.42         | 3.38          | 1.00 | 5.9           |
| 3 12      | 08:06     | 77      | 14:29     | 76S     | 20:51     | 283     | 3.42         | 3.38          | 1.00 | 5.9           |
| 3 13      | 08:02     | 77      | 14:25     | 76S     | 20:48     | 283     | 3.42         | 3.37          | 1.00 | 5.9           |
| 3 14      | 07:59     | 77      | 14:21     | 76S     | 20:44     | 283     | 3.42         | 3.37          | 1.00 | 5.9           |
| 3 15      | 07:55     | 77      | 14:18     | 76S     | 20:40     | 283     | 3.41         | 3.37          | 1.00 | 5.9           |
| 3 16      | 07:51     | 77      | 14:14     | 76S     | 20:37     | 283     | 3.41         | 3.37          | 1.00 | 5.9           |
| 3 17      | 07:47     | 77      | 14:10     | 76S     | 20:33     | 283     | 3.41         | 3.37          | 1.00 | 5.9           |
| 3 18      | 07:44     | 77      | 14:06     | 76S     | 20:29     | 283     | 3.41         | 3.37          | 1.00 | 5.9           |
| 3 19      | 07:40     | 77      | 14:03     | 76S     | 20:25     | 283     | 3.41         | 3.36          | 1.00 | 5.9           |
| 3 20      | 07:36     | 77      | 13:59     | 76S     | 20:22     | 283     | 3.41         | 3.36          | 1.00 | 5.9           |
| 3 21      | 07:32     | 77      | 13:55     | 76S     | 20:18     | 283     | 3.40         | 3.36          | 1.00 | 5.9           |
| 3 22      | 07:28     | 77      | 13:51     | 76S     | 20:14     | 283     | 3.40         | 3.36          | 1.00 | 5.9           |
| 3 23      | 07:25     | 77      | 13:48     | 76S     | 20:11     | 283     | 3.40         | 3.36          | 1.00 | 5.9           |
| 3 24      | 07:21     | 77      | 13:44     | 76S     | 20:07     | 283     | 3.40         | 3.36          | 1.00 | 5.9           |
| 3 25      | 07:17     | 77      | 13:40     | 76S     | 20:03     | 283     | 3.40         | 3.36          | 1.00 | 5.9           |
| 3 26      | 07:13     | 77      | 13:36     | 76S     | 20:00     | 283     | 3.40         | 3.36          | 1.00 | 5.9           |
| 3 27      | 07:10     | 77      | 13:33     | 76S     | 19:56     | 283     | 3.40         | 3.35          | 1.00 | 5.9           |
| 3 28      | 07:06     | 77      | 13:29     | 76S     | 19:52     | 283     | 3.40         | 3.35          | 1.00 | 5.9           |
| 3 29      | 07:02     | 77      | 13:25     | 76S     | 19:49     | 283     | 3.39         | 3.35          | 1.00 | 5.9           |
| 3 30      | 06:58     | 77      | 13:22     | 76S     | 19:45     | 283     | 3.39         | 3.35          | 1.00 | 5.9           |
| 3 31      | 06:55     | 77      | 13:18     | 76S     | 19:41     | 283     | 3.39         | 3.35          | 1.00 | 5.9           |

## 天王星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 4  | 1  | 1   | 57 | 16.01 | +11 | 27 | 32.42 | 20.78548 | 172.87 | 1.0  |
| 4  | 2  | 1   | 57 | 28.58 | +11 | 28 | 41.65 | 20.79141 | 172.92 | 1.0  |
| 4  | 3  | 1   | 57 | 41.19 | +11 | 29 | 51.11 | 20.79709 | 172.96 | 0.9  |
| 4  | 4  | 1   | 57 | 53.87 | +11 | 31 | 0.80  | 20.80250 | 173.01 | 0.9  |
| 4  | 5  | 1   | 58 | 6.59  | +11 | 32 | 10.69 | 20.80765 | 173.05 | 0.8  |
| 4  | 6  | 1   | 58 | 19.37 | +11 | 33 | 20.78 | 20.81253 | 173.09 | 0.8  |
| 4  | 7  | 1   | 58 | 32.20 | +11 | 34 | 31.07 | 20.81714 | 173.13 | 0.7  |
| 4  | 8  | 1   | 58 | 45.07 | +11 | 35 | 41.53 | 20.82149 | 173.17 | 0.7  |
| 4  | 9  | 1   | 58 | 57.99 | +11 | 36 | 52.16 | 20.82556 | 173.20 | 0.6  |
| 4  | 10 | 1   | 59 | 10.95 | +11 | 38 | 2.95  | 20.82937 | 173.23 | 0.6  |
| 4  | 11 | 1   | 59 | 23.95 | +11 | 39 | 13.88 | 20.83290 | 173.26 | 0.6  |
| 4  | 12 | 1   | 59 | 36.98 | +11 | 40 | 24.93 | 20.83617 | 173.29 | 0.5  |
| 4  | 13 | 1   | 59 | 50.04 | +11 | 41 | 36.09 | 20.83916 | 173.31 | 0.5  |
| 4  | 14 | 2   | 0  | 3.13  | +11 | 42 | 47.32 | 20.84189 | 173.34 | 0.4  |
| 4  | 15 | 2   | 0  | 16.24 | +11 | 43 | 58.60 | 20.84434 | 173.36 | 0.4  |
| 4  | 16 | 2   | 0  | 29.37 | +11 | 45 | 9.91  | 20.84652 | 173.38 | 0.3  |
| 4  | 17 | 2   | 0  | 42.52 | +11 | 46 | 21.23 | 20.84843 | 173.39 | 0.3  |
| 4  | 18 | 2   | 0  | 55.68 | +11 | 47 | 32.54 | 20.85007 | 173.40 | 0.2  |
| 4  | 19 | 2   | 1  | 8.86  | +11 | 48 | 43.86 | 20.85144 | 173.42 | 0.2  |
| 4  | 20 | 2   | 1  | 22.06 | +11 | 49 | 55.16 | 20.85254 | 173.43 | 0.1  |
| 4  | 21 | 2   | 1  | 35.27 | +11 | 51 | 6.46  | 20.85336 | 173.43 | 0.1  |
| 4  | 22 | 2   | 1  | 48.50 | +11 | 52 | 17.65 | 20.85392 | 173.44 | 0.1  |
| 4  | 23 | 2   | 2  | 1.72  | +11 | 53 | 28.10 | 20.85420 | 173.44 | 0.0  |
| 4  | 24 | 2   | 2  | 14.91 | +11 | 54 | 39.88 | 20.85422 | 173.44 | 0.1  |
| 4  | 25 | 2   | 2  | 28.15 | +11 | 55 | 51.20 | 20.85396 | 173.44 | 0.1  |
| 4  | 26 | 2   | 2  | 41.38 | +11 | 57 | 2.32  | 20.85343 | 173.43 | 0.1  |
| 4  | 27 | 2   | 2  | 54.61 | +11 | 58 | 13.31 | 20.85262 | 173.43 | 0.2  |
| 4  | 28 | 2   | 3  | 7.82  | +11 | 59 | 24.17 | 20.85155 | 173.42 | 0.2  |
| 4  | 29 | 2   | 3  | 21.02 | +12 | 0  | 34.88 | 20.85020 | 173.41 | 0.3  |
| 4  | 30 | 2   | 3  | 34.21 | +12 | 1  | 45.45 | 20.84859 | 173.39 | 0.3  |

## 天王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 4 1       | 06:51     | 77      | 13:14     | 76S     | 19:37     | 283     | 3.39         | 3.35          | 1.00 | 5.9           |
| 4 2       | 06:47     | 77      | 13:10     | 76S     | 19:34     | 283     | 3.39         | 3.35          | 1.00 | 5.9           |
| 4 3       | 06:43     | 77      | 13:07     | 76S     | 19:30     | 283     | 3.39         | 3.35          | 1.00 | 5.9           |
| 4 4       | 06:39     | 77      | 13:03     | 76S     | 19:26     | 283     | 3.39         | 3.35          | 1.00 | 5.9           |
| 4 5       | 06:36     | 77      | 12:59     | 76S     | 19:23     | 283     | 3.39         | 3.35          | 1.00 | 5.9           |
| 4 6       | 06:32     | 77      | 12:55     | 76S     | 19:19     | 283     | 3.39         | 3.35          | 1.00 | 5.9           |
| 4 7       | 06:28     | 77      | 12:52     | 77S     | 19:15     | 283     | 3.39         | 3.34          | 1.00 | 5.9           |
| 4 8       | 06:24     | 77      | 12:48     | 77S     | 19:12     | 283     | 3.39         | 3.34          | 1.00 | 5.9           |
| 4 9       | 06:21     | 77      | 12:44     | 77S     | 19:08     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 10      | 06:17     | 77      | 12:41     | 77S     | 19:04     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 11      | 06:13     | 77      | 12:37     | 77S     | 19:01     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 12      | 06:09     | 77      | 12:33     | 77S     | 18:57     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 13      | 06:06     | 77      | 12:29     | 77S     | 18:53     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 14      | 06:02     | 77      | 12:26     | 77S     | 18:50     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 15      | 05:58     | 77      | 12:22     | 77S     | 18:46     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 16      | 05:54     | 77      | 12:18     | 77S     | 18:42     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 17      | 05:51     | 77      | 12:15     | 77S     | 18:39     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 18      | 05:47     | 77      | 12:11     | 77S     | 18:35     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 19      | 05:43     | 77      | 12:07     | 77S     | 18:31     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 20      | 05:39     | 77      | 12:03     | 77S     | 18:28     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 21      | 05:36     | 77      | 12:00     | 77S     | 18:24     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 22      | 05:32     | 77      | 11:56     | 77S     | 18:20     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 23      | 05:28     | 77      | 11:52     | 77S     | 18:17     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 24      | 05:24     | 77      | 11:49     | 77S     | 18:13     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 25      | 05:21     | 77      | 11:45     | 77S     | 18:09     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 26      | 05:17     | 77      | 11:41     | 77S     | 18:06     | 283     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 27      | 05:13     | 76      | 11:37     | 77S     | 18:02     | 284     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 28      | 05:09     | 76      | 11:34     | 77S     | 17:58     | 284     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 29      | 05:06     | 76      | 11:30     | 77S     | 17:55     | 284     | 3.38         | 3.34          | 1.00 | 5.9           |
| 4 30      | 05:02     | 76      | 11:26     | 77S     | 17:51     | 284     | 3.38         | 3.34          | 1.00 | 5.9           |

## 天王星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 5  | 1  | 2   | 3  | 47.38 | +12 | 2  | 55.84 | 20.84670 | 173.38 | 0.4  |
| 5  | 2  | 2   | 4  | 0.54  | +12 | 4  | 6.05  | 20.84454 | 173.36 | 0.4  |
| 5  | 3  | 2   | 4  | 13.67 | +12 | 5  | 16.07 | 20.84211 | 173.34 | 0.5  |
| 5  | 4  | 2   | 4  | 26.78 | +12 | 6  | 25.90 | 20.83942 | 173.32 | 0.5  |
| 5  | 5  | 2   | 4  | 39.87 | +12 | 7  | 35.52 | 20.83645 | 173.29 | 0.6  |
| 5  | 6  | 2   | 4  | 52.93 | +12 | 8  | 44.93 | 20.83322 | 173.26 | 0.6  |
| 5  | 7  | 2   | 5  | 5.96  | +12 | 9  | 54.11 | 20.82972 | 173.24 | 0.6  |
| 5  | 8  | 2   | 5  | 18.96 | +12 | 11 | 3.06  | 20.82595 | 173.20 | 0.7  |
| 5  | 9  | 2   | 5  | 31.93 | +12 | 12 | 11.76 | 20.82193 | 173.17 | 0.7  |
| 5  | 10 | 2   | 5  | 44.86 | +12 | 13 | 20.19 | 20.81763 | 173.14 | 0.8  |
| 5  | 11 | 2   | 5  | 57.74 | +12 | 14 | 28.32 | 20.81308 | 173.10 | 0.8  |
| 5  | 12 | 2   | 6  | 10.57 | +12 | 15 | 36.14 | 20.80827 | 173.06 | 0.9  |
| 5  | 13 | 2   | 6  | 23.35 | +12 | 16 | 43.61 | 20.80320 | 173.02 | 0.9  |
| 5  | 14 | 2   | 6  | 36.08 | +12 | 17 | 50.73 | 20.79788 | 172.97 | 1.0  |
| 5  | 15 | 2   | 6  | 48.76 | +12 | 18 | 57.48 | 20.79230 | 172.92 | 1.0  |
| 5  | 16 | 2   | 7  | 1.38  | +12 | 20 | 3.85  | 20.78647 | 172.88 | 1.0  |
| 5  | 17 | 2   | 7  | 13.94 | +12 | 21 | 9.86  | 20.78038 | 172.83 | 1.1  |
| 5  | 18 | 2   | 7  | 26.45 | +12 | 22 | 15.49 | 20.77405 | 172.77 | 1.1  |
| 5  | 19 | 2   | 7  | 38.91 | +12 | 23 | 20.74 | 20.76747 | 172.72 | 1.2  |
| 5  | 20 | 2   | 7  | 51.30 | +12 | 24 | 25.61 | 20.76065 | 172.66 | 1.2  |
| 5  | 21 | 2   | 8  | 3.63  | +12 | 25 | 30.09 | 20.75358 | 172.60 | 1.3  |
| 5  | 22 | 2   | 8  | 15.89 | +12 | 26 | 34.15 | 20.74627 | 172.54 | 1.3  |
| 5  | 23 | 2   | 8  | 28.07 | +12 | 27 | 37.79 | 20.73872 | 172.48 | 1.3  |
| 5  | 24 | 2   | 8  | 40.19 | +12 | 28 | 40.98 | 20.73093 | 172.41 | 1.4  |
| 5  | 25 | 2   | 8  | 52.23 | +12 | 29 | 43.70 | 20.72290 | 172.35 | 1.4  |
| 5  | 26 | 2   | 9  | 4.18  | +12 | 30 | 45.95 | 20.71464 | 172.28 | 1.5  |
| 5  | 27 | 2   | 9  | 16.06 | +12 | 31 | 47.70 | 20.70614 | 172.21 | 1.5  |
| 5  | 28 | 2   | 9  | 27.85 | +12 | 32 | 48.95 | 20.69741 | 172.14 | 1.5  |
| 5  | 29 | 2   | 9  | 39.56 | +12 | 33 | 49.68 | 20.68845 | 172.06 | 1.6  |
| 5  | 30 | 2   | 9  | 51.18 | +12 | 34 | 49.88 | 20.67926 | 171.98 | 1.6  |
| 5  | 31 | 2   | 10 | 2.71  | +12 | 35 | 49.56 | 20.66984 | 171.91 | 1.7  |

## 天王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期  |    | 出     |    | 中 天   |     | 沒     |     | 視 直徑 | 相位   | 視    |     |
|-----|----|-------|----|-------|-----|-------|-----|------|------|------|-----|
| 月 日 |    | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   | 亮星   |     |
|     |    | h m   | °  | h m   | °   | h m   | °   | "    | "    |      |     |
| 5   | 1  | 04:58 | 76 | 11:23 | 77S | 17:47 | 284 | 3.38 | 3.34 | 1.00 | 5.9 |
| 5   | 2  | 04:54 | 76 | 11:19 | 77S | 17:43 | 284 | 3.38 | 3.34 | 1.00 | 5.9 |
| 5   | 3  | 04:51 | 76 | 11:15 | 77S | 17:40 | 284 | 3.38 | 3.34 | 1.00 | 5.9 |
| 5   | 4  | 04:47 | 76 | 11:11 | 77S | 17:36 | 284 | 3.38 | 3.34 | 1.00 | 5.9 |
| 5   | 5  | 04:43 | 76 | 11:08 | 77S | 17:32 | 284 | 3.38 | 3.34 | 1.00 | 5.9 |
| 5   | 6  | 04:39 | 76 | 11:04 | 77S | 17:29 | 284 | 3.38 | 3.34 | 1.00 | 5.9 |
| 5   | 7  | 04:36 | 76 | 11:00 | 77S | 17:25 | 284 | 3.38 | 3.34 | 1.00 | 5.9 |
| 5   | 8  | 04:32 | 76 | 10:57 | 77S | 17:21 | 284 | 3.38 | 3.35 | 1.00 | 5.9 |
| 5   | 9  | 04:28 | 76 | 10:53 | 77S | 17:18 | 284 | 3.38 | 3.35 | 1.00 | 5.9 |
| 5   | 10 | 04:24 | 76 | 10:49 | 77S | 17:14 | 284 | 3.39 | 3.35 | 1.00 | 5.9 |
| 5   | 11 | 04:21 | 76 | 10:45 | 77S | 17:10 | 284 | 3.39 | 3.35 | 1.00 | 5.9 |
| 5   | 12 | 04:17 | 76 | 10:42 | 77S | 17:07 | 284 | 3.39 | 3.35 | 1.00 | 5.9 |
| 5   | 13 | 04:13 | 76 | 10:38 | 77S | 17:03 | 284 | 3.39 | 3.35 | 1.00 | 5.9 |
| 5   | 14 | 04:09 | 76 | 10:34 | 77S | 16:59 | 284 | 3.39 | 3.35 | 1.00 | 5.9 |
| 5   | 15 | 04:06 | 76 | 10:31 | 77S | 16:56 | 284 | 3.39 | 3.35 | 1.00 | 5.9 |
| 5   | 16 | 04:02 | 76 | 10:27 | 77S | 16:52 | 284 | 3.39 | 3.35 | 1.00 | 5.9 |
| 5   | 17 | 03:58 | 76 | 10:23 | 77S | 16:48 | 284 | 3.39 | 3.35 | 1.00 | 5.9 |
| 5   | 18 | 03:54 | 76 | 10:19 | 77S | 16:45 | 284 | 3.39 | 3.35 | 1.00 | 5.9 |
| 5   | 19 | 03:51 | 76 | 10:16 | 77S | 16:41 | 284 | 3.39 | 3.36 | 1.00 | 5.9 |
| 5   | 20 | 03:47 | 76 | 10:12 | 77S | 16:37 | 284 | 3.39 | 3.36 | 1.00 | 5.9 |
| 5   | 21 | 03:43 | 76 | 10:08 | 77S | 16:34 | 284 | 3.40 | 3.36 | 1.00 | 5.9 |
| 5   | 22 | 03:39 | 76 | 10:05 | 77S | 16:30 | 284 | 3.40 | 3.36 | 1.00 | 5.9 |
| 5   | 23 | 03:35 | 76 | 10:01 | 77S | 16:26 | 284 | 3.40 | 3.36 | 1.00 | 5.9 |
| 5   | 24 | 03:32 | 76 | 09:57 | 77S | 16:22 | 284 | 3.40 | 3.36 | 1.00 | 5.9 |
| 5   | 25 | 03:28 | 76 | 09:53 | 77S | 16:19 | 284 | 3.40 | 3.36 | 1.00 | 5.9 |
| 5   | 26 | 03:24 | 76 | 09:50 | 77S | 16:15 | 284 | 3.40 | 3.36 | 1.00 | 5.9 |
| 5   | 27 | 03:20 | 76 | 09:46 | 77S | 16:11 | 284 | 3.40 | 3.37 | 1.00 | 5.9 |
| 5   | 28 | 03:17 | 76 | 09:42 | 77S | 16:08 | 284 | 3.41 | 3.37 | 1.00 | 5.9 |
| 5   | 29 | 03:13 | 76 | 09:38 | 77S | 16:04 | 284 | 3.41 | 3.37 | 1.00 | 5.9 |
| 5   | 30 | 03:09 | 76 | 09:35 | 78S | 16:00 | 284 | 3.41 | 3.37 | 1.00 | 5.9 |
| 5   | 31 | 03:05 | 76 | 09:31 | 78S | 15:56 | 284 | 3.41 | 3.37 | 1.00 | 5.9 |



## 天王星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 6  | 1  | 2   | 10 | 14.15 | +12 | 36 | 48.70 | 20.66020 | 171.83 | 1.7  |
| 6  | 2  | 2   | 10 | 25.50 | +12 | 37 | 47.30 | 20.65034 | 171.74 | 1.7  |
| 6  | 3  | 2   | 10 | 36.75 | +12 | 38 | 45.35 | 20.64027 | 171.66 | 1.8  |
| 6  | 4  | 2   | 10 | 47.91 | +12 | 39 | 42.84 | 20.62997 | 171.57 | 1.8  |
| 6  | 5  | 2   | 10 | 58.97 | +12 | 40 | 39.77 | 20.61946 | 171.49 | 1.8  |
| 6  | 6  | 2   | 11 | 9.92  | +12 | 41 | 36.12 | 20.60875 | 171.40 | 1.9  |
| 6  | 7  | 2   | 11 | 20.76 | +12 | 42 | 31.86 | 20.59782 | 171.31 | 1.9  |
| 6  | 8  | 2   | 11 | 31.50 | +12 | 43 | 26.97 | 20.58669 | 171.21 | 2.0  |
| 6  | 9  | 2   | 11 | 42.11 | +12 | 44 | 21.43 | 20.57536 | 171.12 | 2.0  |
| 6  | 10 | 2   | 11 | 52.61 | +12 | 45 | 15.23 | 20.56383 | 171.02 | 2.0  |
| 6  | 11 | 2   | 12 | 2.99  | +12 | 46 | 8.36  | 20.55211 | 170.93 | 2.1  |
| 6  | 12 | 2   | 12 | 13.26 | +12 | 47 | 0.81  | 20.54020 | 170.83 | 2.1  |
| 6  | 13 | 2   | 12 | 23.40 | +12 | 47 | 52.58 | 20.52810 | 170.73 | 2.1  |
| 6  | 14 | 2   | 12 | 33.43 | +12 | 48 | 43.68 | 20.51581 | 170.62 | 2.2  |
| 6  | 15 | 2   | 12 | 43.34 | +12 | 49 | 34.11 | 20.50334 | 170.52 | 2.2  |
| 6  | 16 | 2   | 12 | 53.12 | +12 | 50 | 23.87 | 20.49070 | 170.42 | 2.2  |
| 6  | 17 | 2   | 13 | 2.78  | +12 | 51 | 12.94 | 20.47788 | 170.31 | 2.3  |
| 6  | 18 | 2   | 13 | 12.32 | +12 | 52 | 1.32  | 20.46488 | 170.20 | 2.3  |
| 6  | 19 | 2   | 13 | 21.72 | +12 | 52 | 48.99 | 20.45172 | 170.09 | 2.3  |
| 6  | 20 | 2   | 13 | 30.99 | +12 | 53 | 35.93 | 20.43839 | 169.98 | 2.3  |
| 6  | 21 | 2   | 13 | 40.12 | +12 | 54 | 22.14 | 20.42489 | 169.87 | 2.4  |
| 6  | 22 | 2   | 13 | 49.11 | +12 | 55 | 7.60  | 20.41124 | 169.76 | 2.4  |
| 6  | 23 | 2   | 13 | 57.96 | +12 | 55 | 52.30 | 20.39742 | 169.64 | 2.4  |
| 6  | 24 | 2   | 14 | 6.67  | +12 | 56 | 36.22 | 20.38346 | 169.52 | 2.4  |
| 6  | 25 | 2   | 14 | 15.24 | +12 | 57 | 19.37 | 20.36934 | 169.41 | 2.5  |
| 6  | 26 | 2   | 14 | 23.66 | +12 | 58 | 1.72  | 20.35507 | 169.29 | 2.5  |
| 6  | 27 | 2   | 14 | 31.94 | +12 | 58 | 43.29 | 20.34066 | 169.17 | 2.5  |
| 6  | 28 | 2   | 14 | 40.07 | +12 | 59 | 24.06 | 20.32611 | 169.05 | 2.5  |
| 6  | 29 | 2   | 14 | 48.05 | +13 | 0  | 4.04  | 20.31142 | 168.92 | 2.6  |
| 6  | 30 | 2   | 14 | 55.89 | +13 | 0  | 43.23 | 20.29660 | 168.80 | 2.6  |

## 天王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |               |
| 6 1       | 03:02     | 76      | 09:27     | 78S     | 15:53     | 284     | 3.41 3.37            | 1.00 | 5.9           |
| 6 2       | 02:58     | 76      | 09:23     | 78S     | 15:49     | 284     | 3.41 3.38            | 1.00 | 5.9           |
| 6 3       | 02:54     | 76      | 09:20     | 78S     | 15:45     | 284     | 3.41 3.38            | 1.00 | 5.9           |
| 6 4       | 02:50     | 76      | 09:16     | 78S     | 15:42     | 284     | 3.42 3.38            | 1.00 | 5.9           |
| 6 5       | 02:46     | 76      | 09:12     | 78S     | 15:38     | 284     | 3.42 3.38            | 1.00 | 5.9           |
| 6 6       | 02:43     | 76      | 09:08     | 78S     | 15:34     | 284     | 3.42 3.38            | 1.00 | 5.9           |
| 6 7       | 02:39     | 76      | 09:05     | 78S     | 15:30     | 284     | 3.42 3.38            | 1.00 | 5.9           |
| 6 8       | 02:35     | 76      | 09:01     | 78S     | 15:27     | 284     | 3.42 3.39            | 1.00 | 5.9           |
| 6 9       | 02:31     | 76      | 08:57     | 78S     | 15:23     | 284     | 3.43 3.39            | 1.00 | 5.9           |
| 6 10      | 02:28     | 76      | 08:53     | 78S     | 15:19     | 284     | 3.43 3.39            | 1.00 | 5.9           |
| 6 11      | 02:24     | 76      | 08:50     | 78S     | 15:16     | 284     | 3.43 3.39            | 1.00 | 5.9           |
| 6 12      | 02:20     | 76      | 08:46     | 78S     | 15:12     | 284     | 3.43 3.39            | 1.00 | 5.9           |
| 6 13      | 02:16     | 76      | 08:42     | 78S     | 15:08     | 284     | 3.43 3.40            | 1.00 | 5.9           |
| 6 14      | 02:12     | 76      | 08:38     | 78S     | 15:04     | 284     | 3.44 3.40            | 1.00 | 5.9           |
| 6 15      | 02:09     | 76      | 08:35     | 78S     | 15:01     | 284     | 3.44 3.40            | 1.00 | 5.9           |
| 6 16      | 02:05     | 76      | 08:31     | 78S     | 14:57     | 284     | 3.44 3.40            | 1.00 | 5.9           |
| 6 17      | 02:01     | 76      | 08:27     | 78S     | 14:53     | 284     | 3.44 3.41            | 1.00 | 5.9           |
| 6 18      | 01:57     | 75      | 08:23     | 78S     | 14:49     | 285     | 3.44 3.41            | 1.00 | 5.9           |
| 6 19      | 01:53     | 75      | 08:19     | 78S     | 14:46     | 285     | 3.45 3.41            | 1.00 | 5.9           |
| 6 20      | 01:50     | 75      | 08:16     | 78S     | 14:42     | 285     | 3.45 3.41            | 1.00 | 5.9           |
| 6 21      | 01:46     | 75      | 08:12     | 78S     | 14:38     | 285     | 3.45 3.41            | 1.00 | 5.9           |
| 6 22      | 01:42     | 75      | 08:08     | 78S     | 14:34     | 285     | 3.45 3.42            | 1.00 | 5.9           |
| 6 23      | 01:38     | 75      | 08:04     | 78S     | 14:31     | 285     | 3.46 3.42            | 1.00 | 5.9           |
| 6 24      | 01:34     | 75      | 08:01     | 78S     | 14:27     | 285     | 3.46 3.42            | 1.00 | 5.8           |
| 6 25      | 01:31     | 75      | 07:57     | 78S     | 14:23     | 285     | 3.46 3.42            | 1.00 | 5.8           |
| 6 26      | 01:27     | 75      | 07:53     | 78S     | 14:19     | 285     | 3.46 3.43            | 1.00 | 5.8           |
| 6 27      | 01:23     | 75      | 07:49     | 78S     | 14:16     | 285     | 3.47 3.43            | 1.00 | 5.8           |
| 6 28      | 01:19     | 75      | 07:45     | 78S     | 14:12     | 285     | 3.47 3.43            | 1.00 | 5.8           |
| 6 29      | 01:15     | 75      | 07:42     | 78S     | 14:08     | 285     | 3.47 3.43            | 1.00 | 5.8           |
| 6 30      | 01:11     | 75      | 07:38     | 78S     | 14:04     | 285     | 3.47 3.44            | 1.00 | 5.8           |

## 天王星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 7  | 1  | 2   | 15 | 3.57  | +13 | 1  | 21.61 | 20.28165 | 168.68 | 2.6  |
| 7  | 2  | 2   | 15 | 11.10 | +13 | 1  | 59.19 | 20.26658 | 168.55 | 2.6  |
| 7  | 3  | 2   | 15 | 18.47 | +13 | 2  | 35.95 | 20.25138 | 168.43 | 2.7  |
| 7  | 4  | 2   | 15 | 25.68 | +13 | 3  | 11.88 | 20.23606 | 168.30 | 2.7  |
| 7  | 5  | 2   | 15 | 32.73 | +13 | 3  | 46.95 | 20.22064 | 168.17 | 2.7  |
| 7  | 6  | 2   | 15 | 39.61 | +13 | 4  | 21.14 | 20.20510 | 168.04 | 2.7  |
| 7  | 7  | 2   | 15 | 46.33 | +13 | 4  | 54.45 | 20.18946 | 167.91 | 2.7  |
| 7  | 8  | 2   | 15 | 52.87 | +13 | 5  | 26.86 | 20.17372 | 167.78 | 2.8  |
| 7  | 9  | 2   | 15 | 59.25 | +13 | 5  | 58.37 | 20.15789 | 167.65 | 2.8  |
| 7  | 10 | 2   | 16 | 5.46  | +13 | 6  | 29.00 | 20.14196 | 167.52 | 2.8  |
| 7  | 11 | 2   | 16 | 11.50 | +13 | 6  | 58.74 | 20.12595 | 167.38 | 2.8  |
| 7  | 12 | 2   | 16 | 17.38 | +13 | 7  | 27.59 | 20.10986 | 167.25 | 2.8  |
| 7  | 13 | 2   | 16 | 23.08 | +13 | 7  | 55.57 | 20.09369 | 167.11 | 2.8  |
| 7  | 14 | 2   | 16 | 28.62 | +13 | 8  | 22.67 | 20.07744 | 166.98 | 2.8  |
| 7  | 15 | 2   | 16 | 33.98 | +13 | 8  | 48.87 | 20.06112 | 166.84 | 2.8  |
| 7  | 16 | 2   | 16 | 39.17 | +13 | 9  | 14.19 | 20.04474 | 166.71 | 2.9  |
| 7  | 17 | 2   | 16 | 44.18 | +13 | 9  | 38.59 | 20.02830 | 166.57 | 2.9  |
| 7  | 18 | 2   | 16 | 49.01 | +13 | 10 | 2.08  | 20.01179 | 166.43 | 2.9  |
| 7  | 19 | 2   | 16 | 53.67 | +13 | 10 | 24.64 | 19.99524 | 166.30 | 2.9  |
| 7  | 20 | 2   | 16 | 58.14 | +13 | 10 | 46.26 | 19.97863 | 166.16 | 2.9  |
| 7  | 21 | 2   | 17 | 2.43  | +13 | 11 | 6.95  | 19.96198 | 166.02 | 2.9  |
| 7  | 22 | 2   | 17 | 6.53  | +13 | 11 | 26.68 | 19.94528 | 165.88 | 2.9  |
| 7  | 23 | 2   | 17 | 10.45 | +13 | 11 | 45.47 | 19.92855 | 165.74 | 2.9  |
| 7  | 24 | 2   | 17 | 14.19 | +13 | 12 | 3.31  | 19.91179 | 165.60 | 2.9  |
| 7  | 25 | 2   | 17 | 17.75 | +13 | 12 | 20.21 | 19.89499 | 165.46 | 2.9  |
| 7  | 26 | 2   | 17 | 21.12 | +13 | 12 | 36.16 | 19.87817 | 165.32 | 2.9  |
| 7  | 27 | 2   | 17 | 24.31 | +13 | 12 | 51.16 | 19.86133 | 165.18 | 2.9  |
| 7  | 28 | 2   | 17 | 27.31 | +13 | 13 | 5.23  | 19.84448 | 165.04 | 2.9  |
| 7  | 29 | 2   | 17 | 30.13 | +13 | 13 | 18.36 | 19.82762 | 164.90 | 2.9  |
| 7  | 30 | 2   | 17 | 32.76 | +13 | 13 | 30.54 | 19.81075 | 164.76 | 2.9  |
| 7  | 31 | 2   | 17 | 35.21 | +13 | 13 | 41.78 | 19.79388 | 164.62 | 2.9  |

## 天王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 7 1       | 01:08     | 75      | 07:34     | 78S     | 14:00     | 285     | 3.48         | 3.44          | 1.00 | 5.8           |
| 7 2       | 01:04     | 75      | 07:30     | 78S     | 13:57     | 285     | 3.48         | 3.44          | 1.00 | 5.8           |
| 7 3       | 01:00     | 75      | 07:26     | 78S     | 13:53     | 285     | 3.48         | 3.44          | 1.00 | 5.8           |
| 7 4       | 00:56     | 75      | 07:23     | 78S     | 13:49     | 285     | 3.48         | 3.45          | 1.00 | 5.8           |
| 7 5       | 00:52     | 75      | 07:19     | 78S     | 13:45     | 285     | 3.49         | 3.45          | 1.00 | 5.8           |
| 7 6       | 00:48     | 75      | 07:15     | 78S     | 13:41     | 285     | 3.49         | 3.45          | 1.00 | 5.8           |
| 7 7       | 00:45     | 75      | 07:11     | 78S     | 13:38     | 285     | 3.49         | 3.45          | 1.00 | 5.8           |
| 7 8       | 00:41     | 75      | 07:07     | 78S     | 13:34     | 285     | 3.49         | 3.46          | 1.00 | 5.8           |
| 7 9       | 00:37     | 75      | 07:03     | 78S     | 13:30     | 285     | 3.50         | 3.46          | 1.00 | 5.8           |
| 7 10      | 00:33     | 75      | 07:00     | 78S     | 13:26     | 285     | 3.50         | 3.46          | 1.00 | 5.8           |
| 7 11      | 00:29     | 75      | 06:56     | 78S     | 13:22     | 285     | 3.50         | 3.47          | 1.00 | 5.8           |
| 7 12      | 00:25     | 75      | 06:52     | 78S     | 13:19     | 285     | 3.50         | 3.47          | 1.00 | 5.8           |
| 7 13      | 00:22     | 75      | 06:48     | 78S     | 13:15     | 285     | 3.51         | 3.47          | 1.00 | 5.8           |
| 7 14      | 00:18     | 75      | 06:44     | 78S     | 13:11     | 285     | 3.51         | 3.47          | 1.00 | 5.8           |
| 7 15      | 00:14     | 75      | 06:40     | 78S     | 13:07     | 285     | 3.51         | 3.48          | 1.00 | 5.8           |
| 7 16      | 00:10     | 75      | 06:37     | 78S     | 13:03     | 285     | 3.52         | 3.48          | 1.00 | 5.8           |
| 7 17      | 00:06     | 75      | 06:33     | 78S     | 12:59     | 285     | 3.52         | 3.48          | 1.00 | 5.8           |
| 7 18      | 00:02     | 75      | 06:29     | 78S     | 12:56     | 285     | 3.52         | 3.49          | 1.00 | 5.8           |
| 7 19      | 23:54     | 75      | 06:25     | 78S     | 12:52     | 285     | 3.52         | 3.49          | 1.00 | 5.8           |
| 7 20      | 23:51     | 75      | 06:21     | 78S     | 12:48     | 285     | 3.53         | 3.49          | 1.00 | 5.8           |
| 7 21      | 23:47     | 75      | 06:17     | 78S     | 12:44     | 285     | 3.53         | 3.49          | 1.00 | 5.8           |
| 7 22      | 23:43     | 75      | 06:13     | 78S     | 12:40     | 285     | 3.53         | 3.50          | 1.00 | 5.8           |
| 7 23      | 23:39     | 75      | 06:10     | 78S     | 12:36     | 285     | 3.54         | 3.50          | 1.00 | 5.8           |
| 7 24      | 23:35     | 75      | 06:06     | 78S     | 12:32     | 285     | 3.54         | 3.50          | 1.00 | 5.8           |
| 7 25      | 23:31     | 75      | 06:02     | 78S     | 12:29     | 285     | 3.54         | 3.51          | 1.00 | 5.8           |
| 7 26      | 23:27     | 75      | 05:58     | 78S     | 12:25     | 285     | 3.55         | 3.51          | 1.00 | 5.8           |
| 7 27      | 23:23     | 75      | 05:54     | 78S     | 12:21     | 285     | 3.55         | 3.51          | 1.00 | 5.8           |
| 7 28      | 23:20     | 75      | 05:50     | 78S     | 12:17     | 285     | 3.55         | 3.52          | 1.00 | 5.8           |
| 7 29      | 23:16     | 75      | 05:46     | 78S     | 12:13     | 285     | 3.55         | 3.52          | 1.00 | 5.8           |
| 7 30      | 23:12     | 75      | 05:42     | 78S     | 12:09     | 285     | 3.56         | 3.52          | 1.00 | 5.8           |
| 7 31      | 23:08     | 75      | 05:39     | 78S     | 12:05     | 285     | 3.56         | 3.52          | 1.00 | 5.8           |

## 天王星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 8  | 1  | 2   | 17 | 37.45 | +13 | 13 | 52.04 | 19.77701 | 164.48 | 2.9  |
| 8  | 2  | 2   | 17 | 39.51 | +13 | 14 | 1.33  | 19.76015 | 164.34 | 2.9  |
| 8  | 3  | 2   | 17 | 41.37 | +13 | 14 | 9.61  | 19.74331 | 164.20 | 2.9  |
| 8  | 4  | 2   | 17 | 43.03 | +13 | 14 | 16.90 | 19.72649 | 164.06 | 2.9  |
| 8  | 5  | 2   | 17 | 44.50 | +13 | 14 | 23.18 | 19.70969 | 163.92 | 2.9  |
| 8  | 6  | 2   | 17 | 45.77 | +13 | 14 | 28.48 | 19.69292 | 163.78 | 2.9  |
| 8  | 7  | 2   | 17 | 46.86 | +13 | 14 | 32.80 | 19.67619 | 163.64 | 2.9  |
| 8  | 8  | 2   | 17 | 47.76 | +13 | 14 | 36.16 | 19.65950 | 163.50 | 2.9  |
| 8  | 9  | 2   | 17 | 48.47 | +13 | 14 | 38.55 | 19.64285 | 163.36 | 2.9  |
| 8  | 10 | 2   | 17 | 48.99 | +13 | 14 | 40.00 | 19.62624 | 163.23 | 2.9  |
| 8  | 11 | 2   | 17 | 49.32 | +13 | 14 | 40.49 | 19.60970 | 163.09 | 2.9  |
| 8  | 12 | 2   | 17 | 49.46 | +13 | 14 | 40.03 | 19.59320 | 162.95 | 2.9  |
| 8  | 13 | 2   | 17 | 49.41 | +13 | 14 | 38.61 | 19.57677 | 162.82 | 2.9  |
| 8  | 14 | 2   | 17 | 49.16 | +13 | 14 | 36.23 | 19.56041 | 162.68 | 2.8  |
| 8  | 15 | 2   | 17 | 48.73 | +13 | 14 | 32.88 | 19.54412 | 162.54 | 2.8  |
| 8  | 16 | 2   | 17 | 48.10 | +13 | 14 | 28.57 | 19.52790 | 162.41 | 2.8  |
| 8  | 17 | 2   | 17 | 47.27 | +13 | 14 | 23.28 | 19.51176 | 162.27 | 2.8  |
| 8  | 18 | 2   | 17 | 46.26 | +13 | 14 | 17.02 | 19.49571 | 162.14 | 2.8  |
| 8  | 19 | 2   | 17 | 45.06 | +13 | 14 | 9.80  | 19.47975 | 162.01 | 2.8  |
| 8  | 20 | 2   | 17 | 43.66 | +13 | 14 | 1.63  | 19.46387 | 161.88 | 2.7  |
| 8  | 21 | 2   | 17 | 42.08 | +13 | 13 | 52.50 | 19.44810 | 161.74 | 2.7  |
| 8  | 22 | 2   | 17 | 40.32 | +13 | 13 | 42.43 | 19.43243 | 161.61 | 2.7  |
| 8  | 23 | 2   | 17 | 38.37 | +13 | 13 | 31.42 | 19.41686 | 161.49 | 2.7  |
| 8  | 24 | 2   | 17 | 36.23 | +13 | 13 | 19.50 | 19.40141 | 161.36 | 2.7  |
| 8  | 25 | 2   | 17 | 33.92 | +13 | 13 | 6.65  | 19.38607 | 161.23 | 2.7  |
| 8  | 26 | 2   | 17 | 31.41 | +13 | 12 | 52.89 | 19.37085 | 161.10 | 2.6  |
| 8  | 27 | 2   | 17 | 28.73 | +13 | 12 | 38.23 | 19.35576 | 160.98 | 2.6  |
| 8  | 28 | 2   | 17 | 25.86 | +13 | 12 | 22.64 | 19.34080 | 160.85 | 2.6  |
| 8  | 29 | 2   | 17 | 22.80 | +13 | 12 | 6.14  | 19.32598 | 160.73 | 2.6  |
| 8  | 30 | 2   | 17 | 19.56 | +13 | 11 | 48.71 | 19.31129 | 160.61 | 2.5  |
| 8  | 31 | 2   | 17 | 16.13 | +13 | 11 | 30.34 | 19.29675 | 160.49 | 2.5  |

## 天王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 8 1       | 23:04     | 75      | 05:35     | 78S     | 12:01     | 285     | 3.56         | 3.53          | 1.00 | 5.8           |
| 8 2       | 23:00     | 75      | 05:31     | 78S     | 11:58     | 285     | 3.57         | 3.53          | 1.00 | 5.8           |
| 8 3       | 22:56     | 75      | 05:27     | 78S     | 11:54     | 285     | 3.57         | 3.53          | 1.00 | 5.8           |
| 8 4       | 22:52     | 75      | 05:23     | 78S     | 11:50     | 285     | 3.57         | 3.54          | 1.00 | 5.8           |
| 8 5       | 22:48     | 75      | 05:19     | 78S     | 11:46     | 285     | 3.58         | 3.54          | 1.00 | 5.8           |
| 8 6       | 22:44     | 75      | 05:15     | 78S     | 11:42     | 285     | 3.58         | 3.54          | 1.00 | 5.8           |
| 8 7       | 22:40     | 75      | 05:11     | 78S     | 11:38     | 285     | 3.58         | 3.55          | 1.00 | 5.8           |
| 8 8       | 22:37     | 75      | 05:07     | 78S     | 11:34     | 285     | 3.59         | 3.55          | 1.00 | 5.8           |
| 8 9       | 22:33     | 75      | 05:03     | 78S     | 11:30     | 285     | 3.59         | 3.55          | 1.00 | 5.8           |
| 8 10      | 22:29     | 75      | 04:59     | 78S     | 11:26     | 285     | 3.59         | 3.55          | 1.00 | 5.8           |
| 8 11      | 22:25     | 75      | 04:56     | 78S     | 11:22     | 285     | 3.59         | 3.56          | 1.00 | 5.8           |
| 8 12      | 22:21     | 75      | 04:52     | 78S     | 11:18     | 285     | 3.60         | 3.56          | 1.00 | 5.8           |
| 8 13      | 22:17     | 75      | 04:48     | 78S     | 11:14     | 285     | 3.60         | 3.56          | 1.00 | 5.8           |
| 8 14      | 22:13     | 75      | 04:44     | 78S     | 11:11     | 285     | 3.60         | 3.57          | 1.00 | 5.8           |
| 8 15      | 22:09     | 75      | 04:40     | 78S     | 11:07     | 285     | 3.61         | 3.57          | 1.00 | 5.8           |
| 8 16      | 22:05     | 75      | 04:36     | 78S     | 11:03     | 285     | 3.61         | 3.57          | 1.00 | 5.8           |
| 8 17      | 22:01     | 75      | 04:32     | 78S     | 10:59     | 285     | 3.61         | 3.58          | 1.00 | 5.8           |
| 8 18      | 21:57     | 75      | 04:28     | 78S     | 10:55     | 285     | 3.62         | 3.58          | 1.00 | 5.8           |
| 8 19      | 21:53     | 75      | 04:24     | 78S     | 10:51     | 285     | 3.62         | 3.58          | 1.00 | 5.8           |
| 8 20      | 21:49     | 75      | 04:20     | 78S     | 10:47     | 285     | 3.62         | 3.58          | 1.00 | 5.7           |
| 8 21      | 21:45     | 75      | 04:16     | 78S     | 10:43     | 285     | 3.62         | 3.59          | 1.00 | 5.7           |
| 8 22      | 21:41     | 75      | 04:12     | 78S     | 10:39     | 285     | 3.63         | 3.59          | 1.00 | 5.7           |
| 8 23      | 21:37     | 75      | 04:08     | 78S     | 10:35     | 285     | 3.63         | 3.59          | 1.00 | 5.7           |
| 8 24      | 21:33     | 75      | 04:04     | 78S     | 10:31     | 285     | 3.63         | 3.60          | 1.00 | 5.7           |
| 8 25      | 21:30     | 75      | 04:00     | 78S     | 10:27     | 285     | 3.64         | 3.60          | 1.00 | 5.7           |
| 8 26      | 21:26     | 75      | 03:56     | 78S     | 10:23     | 285     | 3.64         | 3.60          | 1.00 | 5.7           |
| 8 27      | 21:22     | 75      | 03:52     | 78S     | 10:19     | 285     | 3.64         | 3.60          | 1.00 | 5.7           |
| 8 28      | 21:18     | 75      | 03:48     | 78S     | 10:15     | 285     | 3.64         | 3.61          | 1.00 | 5.7           |
| 8 29      | 21:14     | 75      | 03:44     | 78S     | 10:11     | 285     | 3.65         | 3.61          | 1.00 | 5.7           |
| 8 30      | 21:10     | 75      | 03:40     | 78S     | 10:07     | 285     | 3.65         | 3.61          | 1.00 | 5.7           |
| 8 31      | 21:06     | 75      | 03:36     | 78S     | 10:03     | 285     | 3.65         | 3.62          | 1.00 | 5.7           |

## 天王星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 9  | 1  | 2   | 17 | 12.53 | +13 | 11 | 11.04 | 19.28237 | 160.37 | 2.5  |
| 9  | 2  | 2   | 17 | 8.74  | +13 | 10 | 50.83 | 19.26813 | 160.25 | 2.5  |
| 9  | 3  | 2   | 17 | 4.78  | +13 | 10 | 29.74 | 19.25406 | 160.13 | 2.4  |
| 9  | 4  | 2   | 17 | 0.65  | +13 | 10 | 7.77  | 19.24016 | 160.02 | 2.4  |
| 9  | 5  | 2   | 16 | 56.36 | +13 | 9  | 44.95 | 19.22642 | 159.90 | 2.4  |
| 9  | 6  | 2   | 16 | 51.89 | +13 | 9  | 21.30 | 19.21285 | 159.79 | 2.3  |
| 9  | 7  | 2   | 16 | 47.26 | +13 | 8  | 56.81 | 19.19946 | 159.68 | 2.3  |
| 9  | 8  | 2   | 16 | 42.46 | +13 | 8  | 31.50 | 19.18626 | 159.57 | 2.3  |
| 9  | 9  | 2   | 16 | 37.50 | +13 | 8  | 5.38  | 19.17323 | 159.46 | 2.2  |
| 9  | 10 | 2   | 16 | 32.37 | +13 | 7  | 38.43 | 19.16040 | 159.35 | 2.2  |
| 9  | 11 | 2   | 16 | 27.08 | +13 | 7  | 10.68 | 19.14776 | 159.25 | 2.2  |
| 9  | 12 | 2   | 16 | 21.63 | +13 | 6  | 42.12 | 19.13532 | 159.14 | 2.1  |
| 9  | 13 | 2   | 16 | 16.03 | +13 | 6  | 12.77 | 19.12307 | 159.04 | 2.1  |
| 9  | 14 | 2   | 16 | 10.26 | +13 | 5  | 42.62 | 19.11103 | 158.94 | 2.1  |
| 9  | 15 | 2   | 16 | 4.35  | +13 | 5  | 11.70 | 19.09920 | 158.84 | 2.0  |
| 9  | 16 | 2   | 15 | 58.28 | +13 | 4  | 40.02 | 19.08758 | 158.75 | 2.0  |
| 9  | 17 | 2   | 15 | 52.07 | +13 | 4  | 7.59  | 19.07617 | 158.65 | 2.0  |
| 9  | 18 | 2   | 15 | 45.72 | +13 | 3  | 34.43 | 19.06499 | 158.56 | 1.9  |
| 9  | 19 | 2   | 15 | 39.22 | +13 | 3  | 0.56  | 19.05402 | 158.47 | 1.9  |
| 9  | 20 | 2   | 15 | 32.59 | +13 | 2  | 25.99 | 19.04328 | 158.38 | 1.8  |
| 9  | 21 | 2   | 15 | 25.82 | +13 | 1  | 50.75 | 19.03278 | 158.29 | 1.8  |
| 9  | 22 | 2   | 15 | 18.92 | +13 | 1  | 14.84 | 19.02250 | 158.21 | 1.8  |
| 9  | 23 | 2   | 15 | 11.88 | +13 | 0  | 38.27 | 19.01246 | 158.12 | 1.7  |
| 9  | 24 | 2   | 15 | 4.72  | +13 | 0  | 1.06  | 19.00266 | 158.04 | 1.7  |
| 9  | 25 | 2   | 14 | 57.42 | +12 | 59 | 23.21 | 18.99311 | 157.96 | 1.6  |
| 9  | 26 | 2   | 14 | 50.00 | +12 | 58 | 44.72 | 18.98381 | 157.88 | 1.6  |
| 9  | 27 | 2   | 14 | 42.45 | +12 | 58 | 5.58  | 18.97476 | 157.81 | 1.5  |
| 9  | 28 | 2   | 14 | 34.78 | +12 | 57 | 25.82 | 18.96596 | 157.74 | 1.5  |
| 9  | 29 | 2   | 14 | 27.00 | +12 | 56 | 45.46 | 18.95742 | 157.66 | 1.5  |
| 9  | 30 | 2   | 14 | 19.10 | +12 | 56 | 4.51  | 18.94915 | 157.60 | 1.4  |

## 天王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 9 1       | 21:02     | 75      | 03:32     | 78S     | 09:59     | 285     | 3.66         | 3.62          | 1.00 | 5.7           |
| 9 2       | 20:58     | 75      | 03:28     | 78S     | 09:55     | 285     | 3.66         | 3.62          | 1.00 | 5.7           |
| 9 3       | 20:54     | 75      | 03:24     | 78S     | 09:51     | 285     | 3.66         | 3.62          | 1.00 | 5.7           |
| 9 4       | 20:50     | 75      | 03:20     | 78S     | 09:47     | 285     | 3.66         | 3.63          | 1.00 | 5.7           |
| 9 5       | 20:46     | 75      | 03:16     | 78S     | 09:43     | 285     | 3.67         | 3.63          | 1.00 | 5.7           |
| 9 6       | 20:42     | 75      | 03:12     | 78S     | 09:39     | 285     | 3.67         | 3.63          | 1.00 | 5.7           |
| 9 7       | 20:38     | 75      | 03:08     | 78S     | 09:35     | 285     | 3.67         | 3.63          | 1.00 | 5.7           |
| 9 8       | 20:34     | 75      | 03:04     | 78S     | 09:31     | 285     | 3.67         | 3.64          | 1.00 | 5.7           |
| 9 9       | 20:30     | 75      | 03:00     | 78S     | 09:27     | 285     | 3.68         | 3.64          | 1.00 | 5.7           |
| 9 10      | 20:26     | 75      | 02:56     | 78S     | 09:23     | 285     | 3.68         | 3.64          | 1.00 | 5.7           |
| 9 11      | 20:22     | 75      | 02:52     | 78S     | 09:19     | 285     | 3.68         | 3.64          | 1.00 | 5.7           |
| 9 12      | 20:18     | 75      | 02:48     | 78S     | 09:15     | 285     | 3.68         | 3.65          | 1.00 | 5.7           |
| 9 13      | 20:14     | 75      | 02:44     | 78S     | 09:11     | 285     | 3.69         | 3.65          | 1.00 | 5.7           |
| 9 14      | 20:10     | 75      | 02:40     | 78S     | 09:07     | 285     | 3.69         | 3.65          | 1.00 | 5.7           |
| 9 15      | 20:06     | 75      | 02:36     | 78S     | 09:03     | 285     | 3.69         | 3.65          | 1.00 | 5.7           |
| 9 16      | 20:02     | 75      | 02:32     | 78S     | 08:59     | 285     | 3.69         | 3.65          | 1.00 | 5.7           |
| 9 17      | 19:58     | 75      | 02:28     | 78S     | 08:55     | 285     | 3.69         | 3.66          | 1.00 | 5.7           |
| 9 18      | 19:54     | 75      | 02:24     | 78S     | 08:51     | 285     | 3.70         | 3.66          | 1.00 | 5.7           |
| 9 19      | 19:50     | 75      | 02:20     | 78S     | 08:46     | 285     | 3.70         | 3.66          | 1.00 | 5.7           |
| 9 20      | 19:46     | 75      | 02:16     | 78S     | 08:42     | 285     | 3.70         | 3.66          | 1.00 | 5.7           |
| 9 21      | 19:42     | 75      | 02:12     | 78S     | 08:38     | 285     | 3.70         | 3.66          | 1.00 | 5.7           |
| 9 22      | 19:38     | 75      | 02:08     | 78S     | 08:34     | 285     | 3.71         | 3.67          | 1.00 | 5.7           |
| 9 23      | 19:34     | 75      | 02:04     | 78S     | 08:30     | 285     | 3.71         | 3.67          | 1.00 | 5.7           |
| 9 24      | 19:29     | 75      | 02:00     | 78S     | 08:26     | 285     | 3.71         | 3.67          | 1.00 | 5.7           |
| 9 25      | 19:25     | 75      | 01:56     | 78S     | 08:22     | 285     | 3.71         | 3.67          | 1.00 | 5.7           |
| 9 26      | 19:21     | 75      | 01:52     | 78S     | 08:18     | 285     | 3.71         | 3.67          | 1.00 | 5.7           |
| 9 27      | 19:17     | 75      | 01:48     | 78S     | 08:14     | 285     | 3.71         | 3.68          | 1.00 | 5.7           |
| 9 28      | 19:13     | 75      | 01:44     | 78S     | 08:10     | 285     | 3.72         | 3.68          | 1.00 | 5.7           |
| 9 29      | 19:09     | 75      | 01:40     | 78S     | 08:06     | 285     | 3.72         | 3.68          | 1.00 | 5.7           |
| 9 30      | 19:05     | 75      | 01:35     | 78S     | 08:02     | 285     | 3.72         | 3.68          | 1.00 | 5.7           |



## 天王星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 10 | 1  | 2   | 14 | 11.10 | +12 | 55 | 23.01 | 18.94114 | 157.53 | 1.4  |
| 10 | 2  | 2   | 14 | 2.99  | +12 | 54 | 41.00 | 18.93339 | 157.46 | 1.3  |
| 10 | 3  | 2   | 13 | 54.79 | +12 | 53 | 58.49 | 18.92592 | 157.40 | 1.3  |
| 10 | 4  | 2   | 13 | 46.49 | +12 | 53 | 15.50 | 18.91872 | 157.34 | 1.2  |
| 10 | 5  | 2   | 13 | 38.11 | +12 | 52 | 32.06 | 18.91180 | 157.28 | 1.2  |
| 10 | 6  | 2   | 13 | 29.63 | +12 | 51 | 48.16 | 18.90516 | 157.23 | 1.1  |
| 10 | 7  | 2   | 13 | 21.06 | +12 | 51 | 3.83  | 18.89879 | 157.18 | 1.1  |
| 10 | 8  | 2   | 13 | 12.40 | +12 | 50 | 19.07 | 18.89271 | 157.13 | 1.0  |
| 10 | 9  | 2   | 13 | 3.67  | +12 | 49 | 33.91 | 18.88691 | 157.08 | 1.0  |
| 10 | 10 | 2   | 12 | 54.86 | +12 | 48 | 48.34 | 18.88140 | 157.03 | 0.9  |
| 10 | 11 | 2   | 12 | 45.97 | +12 | 48 | 2.40  | 18.87617 | 156.99 | 0.9  |
| 10 | 12 | 2   | 12 | 37.01 | +12 | 47 | 16.09 | 18.87124 | 156.95 | 0.8  |
| 10 | 13 | 2   | 12 | 27.99 | +12 | 46 | 29.45 | 18.86659 | 156.91 | 0.8  |
| 10 | 14 | 2   | 12 | 18.91 | +12 | 45 | 42.49 | 18.86224 | 156.87 | 0.7  |
| 10 | 15 | 2   | 12 | 9.77  | +12 | 44 | 55.24 | 18.85818 | 156.84 | 0.7  |
| 10 | 16 | 2   | 12 | 0.58  | +12 | 44 | 7.73  | 18.85442 | 156.81 | 0.6  |
| 10 | 17 | 2   | 11 | 51.35 | +12 | 43 | 19.97 | 18.85095 | 156.78 | 0.6  |
| 10 | 18 | 2   | 11 | 42.06 | +12 | 42 | 32.00 | 18.84778 | 156.75 | 0.5  |
| 10 | 19 | 2   | 11 | 32.74 | +12 | 41 | 43.83 | 18.84492 | 156.73 | 0.5  |
| 10 | 20 | 2   | 11 | 23.39 | +12 | 40 | 55.48 | 18.84235 | 156.71 | 0.4  |
| 10 | 21 | 2   | 11 | 13.99 | +12 | 40 | 6.97  | 18.84009 | 156.69 | 0.4  |
| 10 | 22 | 2   | 11 | 4.57  | +12 | 39 | 18.30 | 18.83813 | 156.67 | 0.3  |
| 10 | 23 | 2   | 10 | 55.11 | +12 | 38 | 29.49 | 18.83647 | 156.66 | 0.3  |
| 10 | 24 | 2   | 10 | 45.63 | +12 | 37 | 40.55 | 18.83513 | 156.65 | 0.2  |
| 10 | 25 | 2   | 10 | 36.12 | +12 | 36 | 51.50 | 18.83409 | 156.64 | 0.2  |
| 10 | 26 | 2   | 10 | 26.60 | +12 | 36 | 2.34  | 18.83336 | 156.63 | 0.1  |
| 10 | 27 | 2   | 10 | 17.07 | +12 | 35 | 13.12 | 18.83293 | 156.63 | 0.1  |
| 10 | 28 | 2   | 10 | 7.53  | +12 | 34 | 23.87 | 18.83282 | 156.63 | 0.0  |
| 10 | 29 | 2   | 9  | 58.00 | +12 | 33 | 34.63 | 18.83302 | 156.63 | 0.0  |
| 10 | 30 | 2   | 9  | 48.47 | +12 | 32 | 45.42 | 18.83353 | 156.63 | 0.1  |
| 10 | 31 | 2   | 9  | 38.96 | +12 | 31 | 56.27 | 18.83435 | 156.64 | 0.1  |

## 天王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 10 1      | 19:01     | 75      | 01:31     | 78S     | 07:58     | 285     | 3.72         | 3.68          | 1.00 | 5.7           |
| 10 2      | 18:57     | 75      | 01:27     | 78S     | 07:53     | 285     | 3.72         | 3.68          | 1.00 | 5.7           |
| 10 3      | 18:53     | 75      | 01:23     | 78S     | 07:49     | 285     | 3.72         | 3.68          | 1.00 | 5.7           |
| 10 4      | 18:49     | 75      | 01:19     | 78S     | 07:45     | 285     | 3.73         | 3.69          | 1.00 | 5.7           |
| 10 5      | 18:45     | 75      | 01:15     | 78S     | 07:41     | 285     | 3.73         | 3.69          | 1.00 | 5.7           |
| 10 6      | 18:41     | 76      | 01:11     | 78S     | 07:37     | 285     | 3.73         | 3.69          | 1.00 | 5.7           |
| 10 7      | 18:37     | 76      | 01:07     | 78S     | 07:33     | 284     | 3.73         | 3.69          | 1.00 | 5.7           |
| 10 8      | 18:33     | 76      | 01:03     | 78S     | 07:29     | 284     | 3.73         | 3.69          | 1.00 | 5.7           |
| 10 9      | 18:29     | 76      | 00:59     | 78S     | 07:25     | 284     | 3.73         | 3.69          | 1.00 | 5.7           |
| 10 10     | 18:25     | 76      | 00:55     | 78S     | 07:21     | 284     | 3.73         | 3.69          | 1.00 | 5.7           |
| 10 11     | 18:21     | 76      | 00:51     | 78S     | 07:17     | 284     | 3.73         | 3.69          | 1.00 | 5.7           |
| 10 12     | 18:17     | 76      | 00:47     | 78S     | 07:12     | 284     | 3.73         | 3.69          | 1.00 | 5.7           |
| 10 13     | 18:13     | 76      | 00:43     | 78S     | 07:08     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 14     | 18:09     | 76      | 00:38     | 78S     | 07:04     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 15     | 18:05     | 76      | 00:34     | 78S     | 07:00     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 16     | 18:00     | 76      | 00:30     | 78S     | 06:56     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 17     | 17:56     | 76      | 00:26     | 78S     | 06:52     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 18     | 17:52     | 76      | 00:22     | 78S     | 06:48     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 19     | 17:48     | 76      | 00:18     | 78S     | 06:44     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 20     | 17:44     | 76      | 00:14     | 78S     | 06:40     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 21     | 17:40     | 76      | 00:10     | 78S     | 06:36     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 22     | 17:36     | 76      | 00:06     | 78S     | 06:31     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 23     | 17:32     | 76      | 00:02     | 78S     | 06:27     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 24     | 17:28     | 76      | 23:54     | 78S     | 06:23     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 25     | 17:24     | 76      | 23:49     | 78S     | 06:19     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 26     | 17:20     | 76      | 23:45     | 78S     | 06:15     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 27     | 17:16     | 76      | 23:41     | 78S     | 06:11     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 28     | 17:12     | 76      | 23:37     | 77S     | 06:07     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 29     | 17:08     | 76      | 23:33     | 77S     | 06:03     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 30     | 17:04     | 76      | 23:29     | 77S     | 05:58     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |
| 10 31     | 17:00     | 76      | 23:25     | 77S     | 05:54     | 284     | 3.74         | 3.70          | 1.00 | 5.7           |

## 天王星位置表

世界時 0 時

| 日期 |    | 赤 經 |   |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|---|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m | s     | °   | '  | "     | AU       | 分      | °    |
| 11 | 1  | 2   | 9 | 29.45 | +12 | 31 | 7.22  | 18.83548 | 156.65 | 0.2  |
| 11 | 2  | 2   | 9 | 19.97 | +12 | 30 | 18.26 | 18.83692 | 156.66 | 0.2  |
| 11 | 3  | 2   | 9 | 10.50 | +12 | 29 | 29.42 | 18.83867 | 156.68 | 0.3  |
| 11 | 4  | 2   | 9 | 1.05  | +12 | 28 | 40.71 | 18.84073 | 156.69 | 0.3  |
| 11 | 5  | 2   | 8 | 51.64 | +12 | 27 | 52.15 | 18.84309 | 156.71 | 0.4  |
| 11 | 6  | 2   | 8 | 42.25 | +12 | 27 | 3.75  | 18.84576 | 156.74 | 0.4  |
| 11 | 7  | 2   | 8 | 32.89 | +12 | 26 | 15.54 | 18.84873 | 156.76 | 0.5  |
| 11 | 8  | 2   | 8 | 23.58 | +12 | 25 | 27.53 | 18.85201 | 156.79 | 0.5  |
| 11 | 9  | 2   | 8 | 14.31 | +12 | 24 | 39.76 | 18.85560 | 156.82 | 0.6  |
| 11 | 10 | 2   | 8 | 5.09  | +12 | 23 | 52.24 | 18.85948 | 156.85 | 0.6  |
| 11 | 11 | 2   | 7 | 55.92 | +12 | 23 | 5.00  | 18.86366 | 156.88 | 0.7  |
| 11 | 12 | 2   | 7 | 46.81 | +12 | 22 | 18.07 | 18.86815 | 156.92 | 0.7  |
| 11 | 13 | 2   | 7 | 37.77 | +12 | 21 | 31.48 | 18.87293 | 156.96 | 0.8  |
| 11 | 14 | 2   | 7 | 28.79 | +12 | 20 | 45.24 | 18.87801 | 157.00 | 0.8  |
| 11 | 15 | 2   | 7 | 19.88 | +12 | 19 | 59.39 | 18.88338 | 157.05 | 0.9  |
| 11 | 16 | 2   | 7 | 11.04 | +12 | 19 | 13.93 | 18.88905 | 157.10 | 0.9  |
| 11 | 17 | 2   | 7 | 2.28  | +12 | 18 | 28.89 | 18.89500 | 157.15 | 1.0  |
| 11 | 18 | 2   | 6 | 53.60 | +12 | 17 | 44.28 | 18.90125 | 157.20 | 1.0  |
| 11 | 19 | 2   | 6 | 45.00 | +12 | 17 | 0.11  | 18.90779 | 157.25 | 1.1  |
| 11 | 20 | 2   | 6 | 36.48 | +12 | 16 | 16.38 | 18.91461 | 157.31 | 1.1  |
| 11 | 21 | 2   | 6 | 28.04 | +12 | 15 | 33.11 | 18.92172 | 157.37 | 1.2  |
| 11 | 22 | 2   | 6 | 19.70 | +12 | 14 | 50.32 | 18.92912 | 157.43 | 1.2  |
| 11 | 23 | 2   | 6 | 11.45 | +12 | 14 | 8.04  | 18.93679 | 157.49 | 1.3  |
| 11 | 24 | 2   | 6 | 3.31  | +12 | 13 | 26.29 | 18.94474 | 157.56 | 1.3  |
| 11 | 25 | 2   | 5 | 55.28 | +12 | 12 | 45.11 | 18.95297 | 157.63 | 1.4  |
| 11 | 26 | 2   | 5 | 47.36 | +12 | 12 | 4.53  | 18.96147 | 157.70 | 1.4  |
| 11 | 27 | 2   | 5 | 39.55 | +12 | 11 | 24.58 | 18.97025 | 157.77 | 1.5  |
| 11 | 28 | 2   | 5 | 31.87 | +12 | 10 | 45.27 | 18.97929 | 157.85 | 1.5  |
| 11 | 29 | 2   | 5 | 24.30 | +12 | 10 | 6.62  | 18.98860 | 157.92 | 1.5  |
| 11 | 30 | 2   | 5 | 16.86 | +12 | 9  | 28.65 | 18.99816 | 158.00 | 1.6  |

## 天王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |               |
| 11 1      | 16:55     | 76      | 23:21     | 77S     | 05:50     | 284     | 3.74 3.70            | 1.00 | 5.7           |
| 11 2      | 16:51     | 76      | 23:17     | 77S     | 05:46     | 284     | 3.74 3.70            | 1.00 | 5.7           |
| 11 3      | 16:47     | 76      | 23:13     | 77S     | 05:42     | 284     | 3.74 3.70            | 1.00 | 5.7           |
| 11 4      | 16:43     | 76      | 23:09     | 77S     | 05:38     | 284     | 3.74 3.70            | 1.00 | 5.7           |
| 11 5      | 16:39     | 76      | 23:04     | 77S     | 05:34     | 284     | 3.74 3.70            | 1.00 | 5.7           |
| 11 6      | 16:35     | 76      | 23:00     | 77S     | 05:30     | 284     | 3.74 3.70            | 1.00 | 5.7           |
| 11 7      | 16:31     | 76      | 22:56     | 77S     | 05:26     | 284     | 3.74 3.70            | 1.00 | 5.7           |
| 11 8      | 16:27     | 76      | 22:52     | 77S     | 05:21     | 284     | 3.74 3.70            | 1.00 | 5.7           |
| 11 9      | 16:23     | 76      | 22:48     | 77S     | 05:17     | 284     | 3.74 3.70            | 1.00 | 5.7           |
| 11 10     | 16:19     | 76      | 22:44     | 77S     | 05:13     | 284     | 3.74 3.70            | 1.00 | 5.7           |
| 11 11     | 16:15     | 76      | 22:40     | 77S     | 05:09     | 284     | 3.74 3.69            | 1.00 | 5.7           |
| 11 12     | 16:11     | 76      | 22:36     | 77S     | 05:05     | 284     | 3.74 3.69            | 1.00 | 5.7           |
| 11 13     | 16:07     | 76      | 22:32     | 77S     | 05:01     | 284     | 3.73 3.69            | 1.00 | 5.7           |
| 11 14     | 16:03     | 76      | 22:28     | 77S     | 04:57     | 284     | 3.73 3.69            | 1.00 | 5.7           |
| 11 15     | 15:59     | 76      | 22:24     | 77S     | 04:53     | 284     | 3.73 3.69            | 1.00 | 5.7           |
| 11 16     | 15:55     | 76      | 22:20     | 77S     | 04:49     | 284     | 3.73 3.69            | 1.00 | 5.7           |
| 11 17     | 15:51     | 76      | 22:15     | 77S     | 04:44     | 284     | 3.73 3.69            | 1.00 | 5.7           |
| 11 18     | 15:47     | 76      | 22:11     | 77S     | 04:40     | 284     | 3.73 3.69            | 1.00 | 5.7           |
| 11 19     | 15:42     | 76      | 22:07     | 77S     | 04:36     | 284     | 3.73 3.69            | 1.00 | 5.7           |
| 11 20     | 15:38     | 76      | 22:03     | 77S     | 04:32     | 284     | 3.73 3.68            | 1.00 | 5.7           |
| 11 21     | 15:34     | 76      | 21:59     | 77S     | 04:28     | 284     | 3.72 3.68            | 1.00 | 5.7           |
| 11 22     | 15:30     | 76      | 21:55     | 77S     | 04:24     | 284     | 3.72 3.68            | 1.00 | 5.7           |
| 11 23     | 15:26     | 76      | 21:51     | 77S     | 04:20     | 284     | 3.72 3.68            | 1.00 | 5.7           |
| 11 24     | 15:22     | 76      | 21:47     | 77S     | 04:16     | 284     | 3.72 3.68            | 1.00 | 5.7           |
| 11 25     | 15:18     | 76      | 21:43     | 77S     | 04:12     | 284     | 3.72 3.68            | 1.00 | 5.7           |
| 11 26     | 15:14     | 76      | 21:39     | 77S     | 04:08     | 284     | 3.72 3.67            | 1.00 | 5.7           |
| 11 27     | 15:10     | 76      | 21:35     | 77S     | 04:04     | 284     | 3.72 3.67            | 1.00 | 5.7           |
| 11 28     | 15:06     | 76      | 21:31     | 77S     | 03:59     | 284     | 3.71 3.67            | 1.00 | 5.7           |
| 11 29     | 15:02     | 76      | 21:27     | 77S     | 03:55     | 284     | 3.71 3.67            | 1.00 | 5.7           |
| 11 30     | 14:58     | 76      | 21:23     | 77S     | 03:51     | 284     | 3.71 3.67            | 1.00 | 5.7           |

## 天王星位置表

世界時 0 時

| 日期 |    | 赤 經 |   |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|---|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m | s     | °   | '  | "     | AU       | 分      | °    |
| 12 | 1  | 2   | 5 | 9.54  | +12 | 8  | 51.35 | 19.00799 | 158.08 | 1.6  |
| 12 | 2  | 2   | 5 | 2.36  | +12 | 8  | 14.75 | 19.01806 | 158.17 | 1.7  |
| 12 | 3  | 2   | 4 | 55.30 | +12 | 7  | 38.85 | 19.02839 | 158.25 | 1.7  |
| 12 | 4  | 2   | 4 | 48.37 | +12 | 7  | 3.68  | 19.03896 | 158.34 | 1.8  |
| 12 | 5  | 2   | 4 | 41.59 | +12 | 6  | 29.23 | 19.04978 | 158.43 | 1.8  |
| 12 | 6  | 2   | 4 | 34.94 | +12 | 5  | 55.54 | 19.06084 | 158.52 | 1.8  |
| 12 | 7  | 2   | 4 | 28.44 | +12 | 5  | 22.62 | 19.07213 | 158.62 | 1.9  |
| 12 | 8  | 2   | 4 | 22.09 | +12 | 4  | 50.49 | 19.08365 | 158.71 | 1.9  |
| 12 | 9  | 2   | 4 | 15.89 | +12 | 4  | 19.18 | 19.09539 | 158.81 | 2.0  |
| 12 | 10 | 2   | 4 | 9.84  | +12 | 3  | 48.69 | 19.10736 | 158.91 | 2.0  |
| 12 | 11 | 2   | 4 | 3.95  | +12 | 3  | 19.05 | 19.11955 | 159.01 | 2.0  |
| 12 | 12 | 2   | 3 | 58.23 | +12 | 2  | 50.28 | 19.13196 | 159.12 | 2.1  |
| 12 | 13 | 2   | 3 | 52.66 | +12 | 2  | 22.39 | 19.14457 | 159.22 | 2.1  |
| 12 | 14 | 2   | 3 | 47.26 | +12 | 1  | 55.39 | 19.15740 | 159.33 | 2.1  |
| 12 | 15 | 2   | 3 | 42.01 | +12 | 1  | 29.27 | 19.17042 | 159.44 | 2.2  |
| 12 | 16 | 2   | 3 | 36.94 | +12 | 1  | 4.05  | 19.18365 | 159.55 | 2.2  |
| 12 | 17 | 2   | 3 | 32.02 | +12 | 0  | 39.72 | 19.19707 | 159.66 | 2.2  |
| 12 | 18 | 2   | 3 | 27.28 | +12 | 0  | 16.29 | 19.21068 | 159.77 | 2.3  |
| 12 | 19 | 2   | 3 | 22.70 | +11 | 59 | 53.77 | 19.22448 | 159.89 | 2.3  |
| 12 | 20 | 2   | 3 | 18.30 | +11 | 59 | 32.17 | 19.23846 | 160.00 | 2.3  |
| 12 | 21 | 2   | 3 | 14.08 | +11 | 59 | 11.51 | 19.25263 | 160.12 | 2.4  |
| 12 | 22 | 2   | 3 | 10.04 | +11 | 58 | 51.81 | 19.26696 | 160.24 | 2.4  |
| 12 | 23 | 2   | 3 | 6.18  | +11 | 58 | 33.11 | 19.28146 | 160.36 | 2.4  |
| 12 | 24 | 2   | 3 | 2.51  | +11 | 58 | 15.41 | 19.29613 | 160.48 | 2.4  |
| 12 | 25 | 2   | 2 | 59.03 | +11 | 57 | 58.72 | 19.31096 | 160.60 | 2.5  |
| 12 | 26 | 2   | 2 | 55.73 | +11 | 57 | 43.06 | 19.32594 | 160.73 | 2.5  |
| 12 | 27 | 2   | 2 | 52.63 | +11 | 57 | 28.43 | 19.34107 | 160.86 | 2.5  |
| 12 | 28 | 2   | 2 | 49.71 | +11 | 57 | 14.82 | 19.35635 | 160.98 | 2.5  |
| 12 | 29 | 2   | 2 | 46.98 | +11 | 57 | 2.24  | 19.37176 | 161.11 | 2.6  |
| 12 | 30 | 2   | 2 | 44.45 | +11 | 56 | 50.68 | 19.38730 | 161.24 | 2.6  |
| 12 | 31 | 2   | 2 | 42.10 | +11 | 56 | 40.16 | 19.40298 | 161.37 | 2.6  |

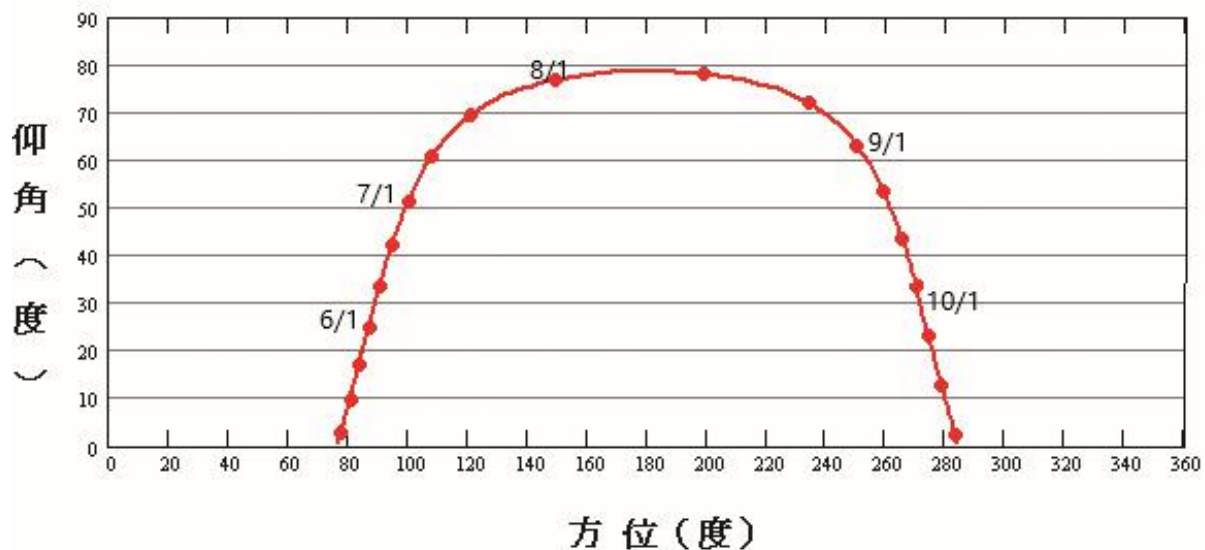
## 天王星出沒時間表

東經：121.52° · 北緯：25.10°

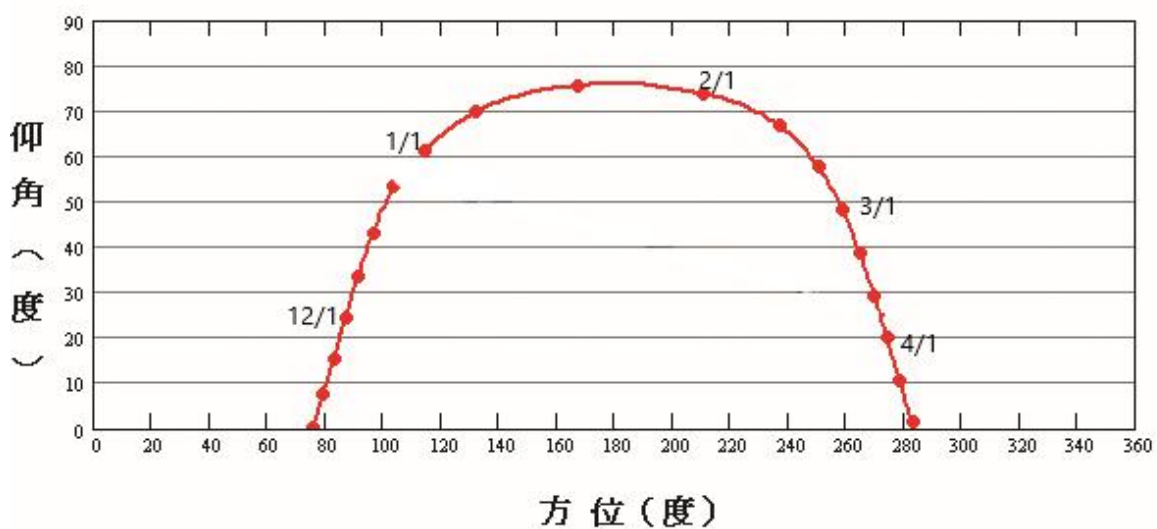
東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 12 1      | 14:54     | 76      | 21:19     | 77S     | 03:47     | 284     | 3.71         | 3.67          | 1.00 | 5.7           |
| 12 2      | 14:50     | 76      | 21:15     | 77S     | 03:43     | 284     | 3.71         | 3.66          | 1.00 | 5.7           |
| 12 3      | 14:46     | 76      | 21:10     | 77S     | 03:39     | 284     | 3.70         | 3.66          | 1.00 | 5.7           |
| 12 4      | 14:42     | 76      | 21:06     | 77S     | 03:35     | 284     | 3.70         | 3.66          | 1.00 | 5.7           |
| 12 5      | 14:38     | 76      | 21:02     | 77S     | 03:31     | 284     | 3.70         | 3.66          | 1.00 | 5.7           |
| 12 6      | 14:34     | 76      | 20:58     | 77S     | 03:27     | 284     | 3.70         | 3.66          | 1.00 | 5.7           |
| 12 7      | 14:30     | 76      | 20:54     | 77S     | 03:23     | 284     | 3.70         | 3.65          | 1.00 | 5.7           |
| 12 8      | 14:26     | 76      | 20:50     | 77S     | 03:19     | 284     | 3.69         | 3.65          | 1.00 | 5.7           |
| 12 9      | 14:22     | 76      | 20:46     | 77S     | 03:15     | 284     | 3.69         | 3.65          | 1.00 | 5.7           |
| 12 10     | 14:18     | 76      | 20:42     | 77S     | 03:11     | 284     | 3.69         | 3.65          | 1.00 | 5.7           |
| 12 11     | 14:14     | 76      | 20:38     | 77S     | 03:07     | 284     | 3.69         | 3.64          | 1.00 | 5.7           |
| 12 12     | 14:10     | 76      | 20:34     | 77S     | 03:03     | 284     | 3.68         | 3.64          | 1.00 | 5.7           |
| 12 13     | 14:06     | 76      | 20:30     | 77S     | 02:59     | 284     | 3.68         | 3.64          | 1.00 | 5.7           |
| 12 14     | 14:02     | 76      | 20:26     | 77S     | 02:55     | 284     | 3.68         | 3.64          | 1.00 | 5.7           |
| 12 15     | 13:58     | 76      | 20:22     | 77S     | 02:50     | 284     | 3.68         | 3.63          | 1.00 | 5.7           |
| 12 16     | 13:54     | 76      | 20:18     | 77S     | 02:46     | 284     | 3.67         | 3.63          | 1.00 | 5.7           |
| 12 17     | 13:50     | 76      | 20:14     | 77S     | 02:42     | 284     | 3.67         | 3.63          | 1.00 | 5.7           |
| 12 18     | 13:46     | 76      | 20:10     | 77S     | 02:38     | 284     | 3.67         | 3.63          | 1.00 | 5.7           |
| 12 19     | 13:42     | 76      | 20:06     | 77S     | 02:34     | 284     | 3.67         | 3.62          | 1.00 | 5.7           |
| 12 20     | 13:38     | 76      | 20:02     | 77S     | 02:30     | 284     | 3.66         | 3.62          | 1.00 | 5.7           |
| 12 21     | 13:34     | 76      | 19:58     | 77S     | 02:26     | 284     | 3.66         | 3.62          | 1.00 | 5.7           |
| 12 22     | 13:30     | 76      | 19:54     | 77S     | 02:22     | 284     | 3.66         | 3.62          | 1.00 | 5.7           |
| 12 23     | 13:26     | 76      | 19:50     | 77S     | 02:18     | 284     | 3.66         | 3.61          | 1.00 | 5.7           |
| 12 24     | 13:22     | 76      | 19:46     | 77S     | 02:14     | 284     | 3.65         | 3.61          | 1.00 | 5.7           |
| 12 25     | 13:18     | 76      | 19:42     | 77S     | 02:10     | 284     | 3.65         | 3.61          | 1.00 | 5.7           |
| 12 26     | 13:14     | 76      | 19:38     | 77S     | 02:06     | 284     | 3.65         | 3.60          | 1.00 | 5.7           |
| 12 27     | 13:10     | 77      | 19:34     | 77S     | 02:02     | 283     | 3.64         | 3.60          | 1.00 | 5.7           |
| 12 28     | 13:06     | 77      | 19:30     | 77S     | 01:58     | 283     | 3.64         | 3.60          | 1.00 | 5.7           |
| 12 29     | 13:02     | 77      | 19:26     | 77S     | 01:54     | 283     | 3.64         | 3.60          | 1.00 | 5.7           |
| 12 30     | 12:58     | 77      | 19:22     | 77S     | 01:50     | 283     | 3.64         | 3.59          | 1.00 | 5.7           |
| 12 31     | 12:54     | 77      | 19:18     | 77S     | 01:46     | 283     | 3.63         | 3.59          | 1.00 | 5.7           |

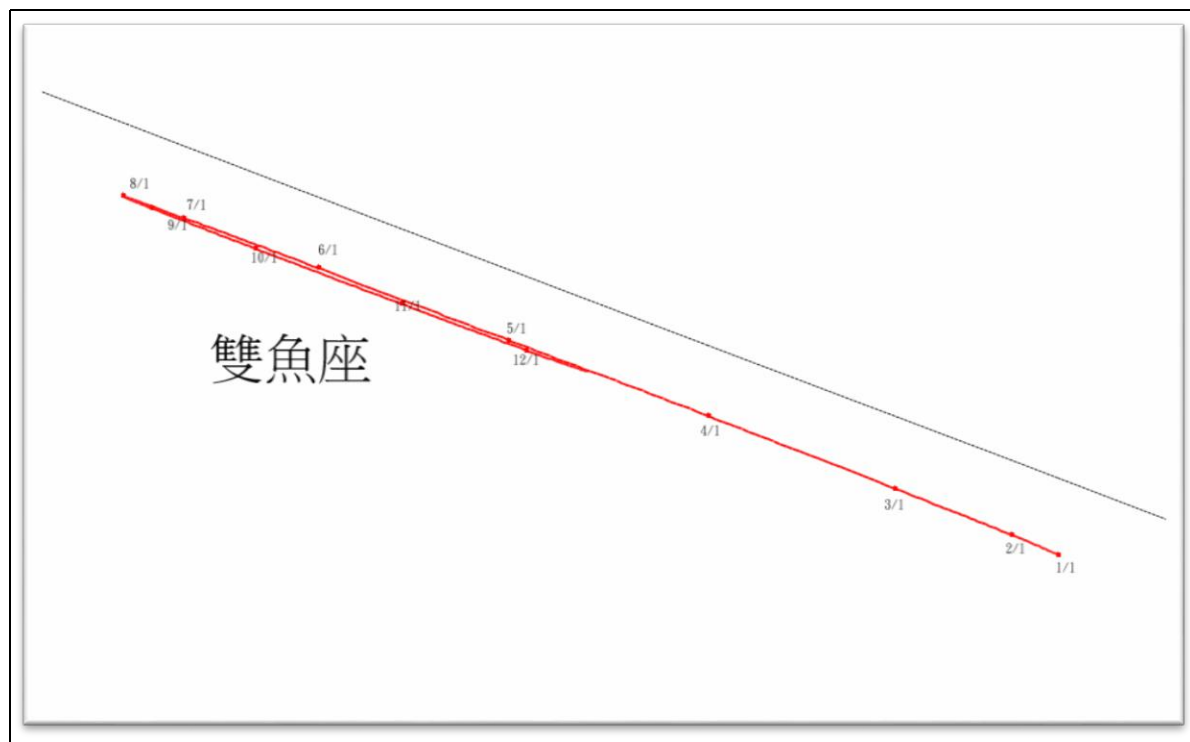
### 日出時天王星方位與仰角



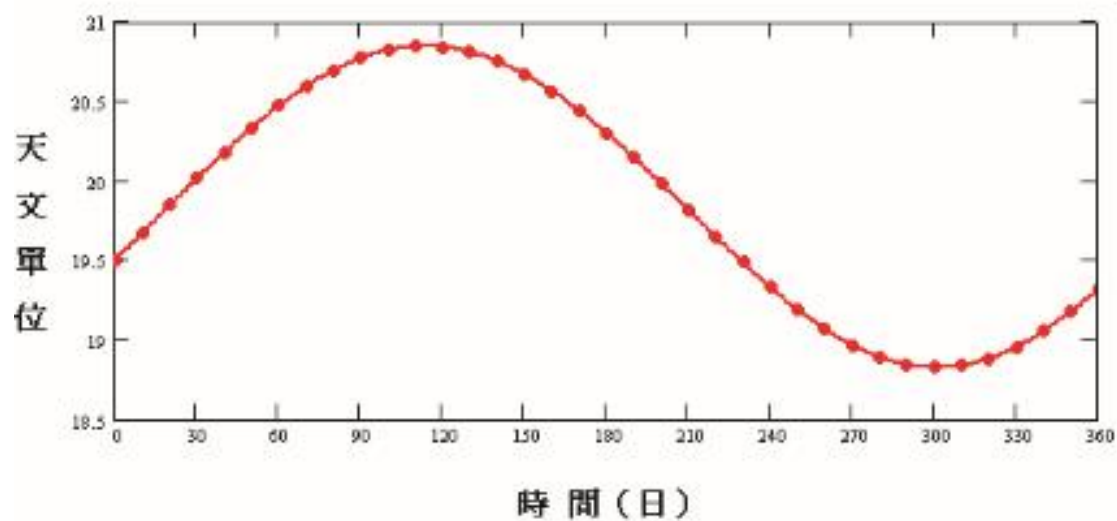
### 日沒時天王星方位與仰角



## 天王星在天球上運行的軌跡圖



## 天王星與地球距離變化圖





## 海王星位置表

世界時 0 時

| 日期<br>月 日 | 赤 經<br>h m s | 赤 緯<br>' "  | 距離<br>AU | 光程<br>分 | 日地離角<br>° |
|-----------|--------------|-------------|----------|---------|-----------|
| 1 1       | 23 2 50.70   | -7 9 28.75  | 30.35943 | 252.49  | 1.7       |
| 1 2       | 23 2 55.29   | -7 8 58.83  | 30.37495 | 252.62  | 1.7       |
| 1 3       | 23 3 0.00    | -7 8 28.22  | 30.39033 | 252.75  | 1.7       |
| 1 4       | 23 3 4.82    | -7 7 56.93  | 30.40558 | 252.88  | 1.6       |
| 1 5       | 23 3 9.75    | -7 7 24.99  | 30.42067 | 253.00  | 1.6       |
| 1 6       | 23 3 14.79   | -7 6 52.39  | 30.43562 | 253.13  | 1.6       |
| 1 7       | 23 3 19.93   | -7 6 19.16  | 30.45042 | 253.25  | 1.6       |
| 1 8       | 23 3 25.18   | -7 5 45.31  | 30.46505 | 253.37  | 1.6       |
| 1 9       | 23 3 30.53   | -7 5 10.85  | 30.47952 | 253.49  | 1.6       |
| 1 10      | 23 3 35.97   | -7 4 35.78  | 30.49382 | 253.61  | 1.5       |
| 1 11      | 23 3 41.52   | -7 4 0.12   | 30.50795 | 253.73  | 1.5       |
| 1 12      | 23 3 47.16   | -7 3 23.86  | 30.52191 | 253.84  | 1.5       |
| 1 13      | 23 3 52.90   | -7 2 47.02  | 30.53568 | 253.96  | 1.5       |
| 1 14      | 23 3 58.74   | -7 2 9.60   | 30.54927 | 254.07  | 1.5       |
| 1 15      | 23 4 4.67    | -7 1 31.59  | 30.56267 | 254.18  | 1.4       |
| 1 16      | 23 4 10.69   | -7 0 53.01  | 30.57588 | 254.29  | 1.4       |
| 1 17      | 23 4 16.81   | -7 0 13.86  | 30.58890 | 254.40  | 1.4       |
| 1 18      | 23 4 23.02   | -6 59 34.15 | 30.60171 | 254.51  | 1.4       |
| 1 19      | 23 4 29.33   | -6 58 53.90 | 30.61433 | 254.61  | 1.4       |
| 1 20      | 23 4 35.72   | -6 58 13.12 | 30.62674 | 254.71  | 1.3       |
| 1 21      | 23 4 42.19   | -6 57 31.85 | 30.63894 | 254.82  | 1.3       |
| 1 22      | 23 4 48.75   | -6 56 50.10 | 30.65093 | 254.92  | 1.3       |
| 1 23      | 23 4 55.38   | -6 56 7.89  | 30.66271 | 255.01  | 1.3       |
| 1 24      | 23 5 2.09    | -6 55 25.22 | 30.67427 | 255.11  | 1.2       |
| 1 25      | 23 5 8.88    | -6 54 42.09 | 30.68560 | 255.20  | 1.2       |
| 1 26      | 23 5 15.74   | -6 53 58.50 | 30.69672 | 255.30  | 1.2       |
| 1 27      | 23 5 22.68   | -6 53 14.45 | 30.70761 | 255.39  | 1.2       |
| 1 28      | 23 5 29.70   | -6 52 29.94 | 30.71827 | 255.48  | 1.1       |
| 1 29      | 23 5 36.79   | -6 51 44.98 | 30.72869 | 255.56  | 1.1       |
| 1 30      | 23 5 43.95   | -6 50 59.58 | 30.73888 | 255.65  | 1.1       |
| 1 31      | 23 5 51.18   | -6 50 13.77 | 30.74883 | 255.73  | 1.1       |

## 海王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |    | 中 天   |     | 沒     |     | 視 直徑 |      | 相位   | 視 亮度 |
|----|----|-------|----|-------|-----|-------|-----|------|------|------|------|
| 月  | 日  | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   |      | 星等   |
|    |    | h m   | °  | h m   | °   | h m   | °   | "    | "    |      |      |
| 1  | 1  | 10:26 | 98 | 16:14 | 58S | 22:02 | 262 | 2.25 | 2.22 | 1.00 | 7.9  |
| 1  | 2  | 10:22 | 98 | 16:10 | 58S | 21:58 | 262 | 2.25 | 2.22 | 1.00 | 7.9  |
| 1  | 3  | 10:18 | 98 | 16:06 | 58S | 21:54 | 262 | 2.25 | 2.22 | 1.00 | 7.9  |
| 1  | 4  | 10:14 | 98 | 16:02 | 58S | 21:51 | 262 | 2.25 | 2.21 | 1.00 | 7.9  |
| 1  | 5  | 10:10 | 98 | 15:59 | 58S | 21:47 | 262 | 2.24 | 2.21 | 1.00 | 7.9  |
| 1  | 6  | 10:07 | 98 | 15:55 | 58S | 21:43 | 262 | 2.24 | 2.21 | 1.00 | 7.9  |
| 1  | 7  | 10:03 | 98 | 15:51 | 58S | 21:39 | 262 | 2.24 | 2.21 | 1.00 | 7.9  |
| 1  | 8  | 09:59 | 98 | 15:47 | 58S | 21:35 | 262 | 2.24 | 2.21 | 1.00 | 7.9  |
| 1  | 9  | 09:55 | 98 | 15:43 | 58S | 21:31 | 262 | 2.24 | 2.21 | 1.00 | 7.9  |
| 1  | 10 | 09:51 | 98 | 15:39 | 58S | 21:28 | 262 | 2.24 | 2.21 | 1.00 | 7.9  |
| 1  | 11 | 09:47 | 98 | 15:36 | 58S | 21:24 | 262 | 2.24 | 2.21 | 1.00 | 7.9  |
| 1  | 12 | 09:43 | 98 | 15:32 | 58S | 21:20 | 262 | 2.24 | 2.21 | 1.00 | 7.9  |
| 1  | 13 | 09:40 | 98 | 15:28 | 58S | 21:16 | 262 | 2.24 | 2.20 | 1.00 | 7.9  |
| 1  | 14 | 09:36 | 98 | 15:24 | 58S | 21:12 | 263 | 2.24 | 2.20 | 1.00 | 7.9  |
| 1  | 15 | 09:32 | 97 | 15:20 | 58S | 21:09 | 263 | 2.23 | 2.20 | 1.00 | 7.9  |
| 1  | 16 | 09:28 | 97 | 15:16 | 58S | 21:05 | 263 | 2.23 | 2.20 | 1.00 | 7.9  |
| 1  | 17 | 09:24 | 97 | 15:13 | 58S | 21:01 | 263 | 2.23 | 2.20 | 1.00 | 7.9  |
| 1  | 18 | 09:20 | 97 | 15:09 | 58S | 20:57 | 263 | 2.23 | 2.20 | 1.00 | 7.9  |
| 1  | 19 | 09:16 | 97 | 15:05 | 58S | 20:53 | 263 | 2.23 | 2.20 | 1.00 | 7.9  |
| 1  | 20 | 09:13 | 97 | 15:01 | 58S | 20:50 | 263 | 2.23 | 2.20 | 1.00 | 7.9  |
| 1  | 21 | 09:09 | 97 | 14:57 | 58S | 20:46 | 263 | 2.23 | 2.20 | 1.00 | 7.9  |
| 1  | 22 | 09:05 | 97 | 14:53 | 58S | 20:42 | 263 | 2.23 | 2.20 | 1.00 | 7.9  |
| 1  | 23 | 09:01 | 97 | 14:50 | 58S | 20:38 | 263 | 2.23 | 2.20 | 1.00 | 7.9  |
| 1  | 24 | 08:57 | 97 | 14:46 | 58S | 20:34 | 263 | 2.23 | 2.19 | 1.00 | 7.9  |
| 1  | 25 | 08:53 | 97 | 14:42 | 58S | 20:31 | 263 | 2.23 | 2.19 | 1.00 | 7.9  |
| 1  | 26 | 08:50 | 97 | 14:38 | 58S | 20:27 | 263 | 2.22 | 2.19 | 1.00 | 7.9  |
| 1  | 27 | 08:46 | 97 | 14:34 | 58S | 20:23 | 263 | 2.22 | 2.19 | 1.00 | 7.9  |
| 1  | 28 | 08:42 | 97 | 14:30 | 58S | 20:19 | 263 | 2.22 | 2.19 | 1.00 | 7.9  |
| 1  | 29 | 08:38 | 97 | 14:27 | 58S | 20:15 | 263 | 2.22 | 2.19 | 1.00 | 7.9  |
| 1  | 30 | 08:34 | 97 | 14:23 | 58S | 20:12 | 263 | 2.22 | 2.19 | 1.00 | 7.9  |
| 1  | 31 | 08:30 | 97 | 14:19 | 58S | 20:08 | 263 | 2.22 | 2.19 | 1.00 | 8.0  |

## 海 王 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |   |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|---|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m | s     | °   | '  | "     | AU       | 分      | °    |
| 2  | 1  | 23  | 5 | 58.49 | -6  | 49 | 27.56 | 30.75853 | 255.81 | 1.0  |
| 2  | 2  | 23  | 6 | 5.86  | -6  | 48 | 40.95 | 30.76799 | 255.89 | 1.0  |
| 2  | 3  | 23  | 6 | 13.29 | -6  | 47 | 53.98 | 30.77720 | 255.97 | 1.0  |
| 2  | 4  | 23  | 6 | 20.79 | -6  | 47 | 6.66  | 30.78616 | 256.04 | 1.0  |
| 2  | 5  | 23  | 6 | 28.34 | -6  | 46 | 18.99 | 30.79487 | 256.11 | 0.9  |
| 2  | 6  | 23  | 6 | 35.95 | -6  | 45 | 31.00 | 30.80331 | 256.18 | 0.9  |
| 2  | 7  | 23  | 6 | 43.61 | -6  | 44 | 42.69 | 30.81150 | 256.25 | 0.9  |
| 2  | 8  | 23  | 6 | 51.32 | -6  | 43 | 54.07 | 30.81943 | 256.32 | 0.8  |
| 2  | 9  | 23  | 6 | 59.09 | -6  | 43 | 5.14  | 30.82710 | 256.38 | 0.8  |
| 2  | 10 | 23  | 7 | 6.91  | -6  | 42 | 15.92 | 30.83450 | 256.44 | 0.8  |
| 2  | 11 | 23  | 7 | 14.77 | -6  | 41 | 26.42 | 30.84163 | 256.50 | 0.8  |
| 2  | 12 | 23  | 7 | 22.69 | -6  | 40 | 36.63 | 30.84850 | 256.56 | 0.7  |
| 2  | 13 | 23  | 7 | 30.65 | -6  | 39 | 46.57 | 30.85509 | 256.61 | 0.7  |
| 2  | 14 | 23  | 7 | 38.66 | -6  | 38 | 56.24 | 30.86141 | 256.67 | 0.7  |
| 2  | 15 | 23  | 7 | 46.71 | -6  | 38 | 5.67  | 30.86746 | 256.72 | 0.6  |
| 2  | 16 | 23  | 7 | 54.80 | -6  | 37 | 14.87 | 30.87324 | 256.76 | 0.6  |
| 2  | 17 | 23  | 8 | 2.92  | -6  | 36 | 23.87 | 30.87874 | 256.81 | 0.6  |
| 2  | 18 | 23  | 8 | 11.08 | -6  | 35 | 32.69 | 30.88397 | 256.85 | 0.5  |
| 2  | 19 | 23  | 8 | 19.28 | -6  | 34 | 41.35 | 30.88892 | 256.90 | 0.5  |
| 2  | 20 | 23  | 8 | 27.49 | -6  | 33 | 49.87 | 30.89359 | 256.93 | 0.5  |
| 2  | 21 | 23  | 8 | 35.74 | -6  | 32 | 58.24 | 30.89798 | 256.97 | 0.4  |
| 2  | 22 | 23  | 8 | 44.01 | -6  | 32 | 6.47  | 30.90209 | 257.00 | 0.4  |
| 2  | 23 | 23  | 8 | 52.30 | -6  | 31 | 14.55 | 30.90593 | 257.04 | 0.4  |
| 2  | 24 | 23  | 9 | 0.63  | -6  | 30 | 22.50 | 30.90948 | 257.07 | 0.4  |
| 2  | 25 | 23  | 9 | 8.97  | -6  | 29 | 30.30 | 30.91274 | 257.09 | 0.3  |
| 2  | 26 | 23  | 9 | 17.34 | -6  | 28 | 37.99 | 30.91573 | 257.12 | 0.3  |
| 2  | 27 | 23  | 9 | 25.73 | -6  | 27 | 45.57 | 30.91842 | 257.14 | 0.3  |
| 2  | 28 | 23  | 9 | 34.14 | -6  | 26 | 53.07 | 30.92084 | 257.16 | 0.2  |

## 海王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期 |    | 出     |    | 中 天   |     | 沒     |     | 視 直徑 | 相位   | 視 亮度 |     |
|----|----|-------|----|-------|-----|-------|-----|------|------|------|-----|
| 月  | 日  | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   | 星等   |     |
|    |    | h m   | °  | h m   | °   | h m   | °   | "    | "    |      |     |
| 2  | 1  | 08:26 | 97 | 14:15 | 58S | 20:04 | 263 | 2.22 | 2.19 | 1.00 | 8.0 |
| 2  | 2  | 08:23 | 97 | 14:11 | 58S | 20:00 | 263 | 2.22 | 2.19 | 1.00 | 8.0 |
| 2  | 3  | 08:19 | 97 | 14:08 | 58S | 19:56 | 263 | 2.22 | 2.19 | 1.00 | 8.0 |
| 2  | 4  | 08:15 | 97 | 14:04 | 58S | 19:53 | 263 | 2.22 | 2.19 | 1.00 | 8.0 |
| 2  | 5  | 08:11 | 97 | 14:00 | 58S | 19:49 | 263 | 2.22 | 2.19 | 1.00 | 8.0 |
| 2  | 6  | 08:07 | 97 | 13:56 | 58S | 19:45 | 263 | 2.22 | 2.19 | 1.00 | 8.0 |
| 2  | 7  | 08:03 | 97 | 13:52 | 58S | 19:41 | 263 | 2.22 | 2.18 | 1.00 | 8.0 |
| 2  | 8  | 08:00 | 97 | 13:49 | 58S | 19:38 | 263 | 2.22 | 2.18 | 1.00 | 8.0 |
| 2  | 9  | 07:56 | 97 | 13:45 | 58S | 19:34 | 263 | 2.22 | 2.18 | 1.00 | 8.0 |
| 2  | 10 | 07:52 | 97 | 13:41 | 58S | 19:30 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 11 | 07:48 | 97 | 13:37 | 58S | 19:26 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 12 | 07:44 | 97 | 13:33 | 58S | 19:22 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 13 | 07:41 | 97 | 13:30 | 58S | 19:19 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 14 | 07:37 | 97 | 13:26 | 58S | 19:15 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 15 | 07:33 | 97 | 13:22 | 58S | 19:11 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 16 | 07:29 | 97 | 13:18 | 58S | 19:07 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 17 | 07:25 | 97 | 13:14 | 58S | 19:04 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 18 | 07:21 | 97 | 13:11 | 58S | 19:00 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 19 | 07:18 | 97 | 13:07 | 58S | 18:56 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 20 | 07:14 | 97 | 13:03 | 58S | 18:52 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 21 | 07:10 | 97 | 12:59 | 58S | 18:49 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 22 | 07:06 | 97 | 12:55 | 58S | 18:45 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 23 | 07:02 | 97 | 12:52 | 58S | 18:41 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 24 | 06:58 | 97 | 12:48 | 58S | 18:37 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 25 | 06:55 | 97 | 12:44 | 58S | 18:33 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 26 | 06:51 | 97 | 12:40 | 58S | 18:30 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 27 | 06:47 | 97 | 12:36 | 58S | 18:26 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2  | 28 | 06:43 | 97 | 12:33 | 58S | 18:22 | 263 | 2.21 | 2.18 | 1.00 | 8.0 |

## 海王星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 3  | 1  | 23  | 9  | 42.57 | -6  | 26 | 0.50  | 30.92296 | 257.18 | 0.2  |
| 3  | 2  | 23  | 9  | 51.01 | -6  | 25 | 7.89  | 30.92480 | 257.19 | 0.2  |
| 3  | 3  | 23  | 9  | 59.45 | -6  | 24 | 15.24 | 30.92635 | 257.21 | 0.1  |
| 3  | 4  | 23  | 10 | 7.91  | -6  | 23 | 22.58 | 30.92761 | 257.22 | 0.1  |
| 3  | 5  | 23  | 10 | 16.37 | -6  | 22 | 29.93 | 30.92859 | 257.23 | 0.1  |
| 3  | 6  | 23  | 10 | 24.84 | -6  | 21 | 37.37 | 30.92927 | 257.23 | 0.0  |
| 3  | 7  | 23  | 10 | 33.29 | -6  | 20 | 45.04 | 30.92967 | 257.23 | 0.0  |
| 3  | 8  | 23  | 10 | 41.73 | -6  | 19 | 52.30 | 30.92977 | 257.24 | 0.0  |
| 3  | 9  | 23  | 10 | 50.19 | -6  | 18 | 59.56 | 30.92959 | 257.23 | 0.1  |
| 3  | 10 | 23  | 10 | 58.65 | -6  | 18 | 6.94  | 30.92912 | 257.23 | 0.1  |
| 3  | 11 | 23  | 11 | 7.10  | -6  | 17 | 14.40 | 30.92837 | 257.22 | 0.1  |
| 3  | 12 | 23  | 11 | 15.55 | -6  | 16 | 21.93 | 30.92732 | 257.21 | 0.2  |
| 3  | 13 | 23  | 11 | 23.99 | -6  | 15 | 29.53 | 30.92599 | 257.20 | 0.2  |
| 3  | 14 | 23  | 11 | 32.42 | -6  | 14 | 37.22 | 30.92438 | 257.19 | 0.2  |
| 3  | 15 | 23  | 11 | 40.85 | -6  | 13 | 45.00 | 30.92248 | 257.17 | 0.3  |
| 3  | 16 | 23  | 11 | 49.25 | -6  | 12 | 52.91 | 30.92029 | 257.16 | 0.3  |
| 3  | 17 | 23  | 11 | 57.64 | -6  | 12 | 0.96  | 30.91783 | 257.14 | 0.3  |
| 3  | 18 | 23  | 12 | 6.01  | -6  | 11 | 9.17  | 30.91508 | 257.11 | 0.3  |
| 3  | 19 | 23  | 12 | 14.35 | -6  | 10 | 17.56 | 30.91206 | 257.09 | 0.4  |
| 3  | 20 | 23  | 12 | 22.67 | -6  | 9  | 26.14 | 30.90875 | 257.06 | 0.4  |
| 3  | 21 | 23  | 12 | 30.96 | -6  | 8  | 34.90 | 30.90517 | 257.03 | 0.4  |
| 3  | 22 | 23  | 12 | 39.23 | -6  | 7  | 43.86 | 30.90132 | 257.00 | 0.5  |
| 3  | 23 | 23  | 12 | 47.46 | -6  | 6  | 53.00 | 30.89719 | 256.96 | 0.5  |
| 3  | 24 | 23  | 12 | 55.68 | -6  | 6  | 2.33  | 30.89278 | 256.93 | 0.5  |
| 3  | 25 | 23  | 13 | 3.86  | -6  | 5  | 11.85 | 30.88810 | 256.89 | 0.6  |
| 3  | 26 | 23  | 13 | 12.01 | -6  | 4  | 21.60 | 30.88316 | 256.85 | 0.6  |
| 3  | 27 | 23  | 13 | 20.14 | -6  | 3  | 31.57 | 30.87794 | 256.80 | 0.6  |
| 3  | 28 | 23  | 13 | 28.22 | -6  | 2  | 41.80 | 30.87245 | 256.76 | 0.7  |
| 3  | 29 | 23  | 13 | 36.27 | -6  | 1  | 52.29 | 30.86670 | 256.71 | 0.7  |
| 3  | 30 | 23  | 13 | 44.28 | -6  | 1  | 3.07  | 30.86067 | 256.66 | 0.7  |
| 3  | 31 | 23  | 13 | 52.24 | -6  | 0  | 14.15 | 30.85439 | 256.61 | 0.7  |

## 海王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 3 1       | 06:39     | 97      | 12:29     | 59S     | 18:18     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 2       | 06:36     | 97      | 12:25     | 59S     | 18:15     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 3       | 06:32     | 97      | 12:21     | 59S     | 18:11     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 4       | 06:28     | 97      | 12:17     | 59S     | 18:07     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 5       | 06:24     | 97      | 12:14     | 59S     | 18:03     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 6       | 06:20     | 97      | 12:10     | 59S     | 18:00     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 7       | 06:16     | 97      | 12:06     | 59S     | 17:56     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 8       | 06:13     | 97      | 12:02     | 59S     | 17:52     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 9       | 06:09     | 97      | 11:59     | 59S     | 17:48     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 10      | 06:05     | 97      | 11:55     | 59S     | 17:45     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 11      | 06:01     | 97      | 11:51     | 59S     | 17:41     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 12      | 05:57     | 97      | 11:47     | 59S     | 17:37     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 13      | 05:54     | 97      | 11:43     | 59S     | 17:33     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 14      | 05:50     | 97      | 11:40     | 59S     | 17:29     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 15      | 05:46     | 97      | 11:36     | 59S     | 17:26     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 16      | 05:42     | 97      | 11:32     | 59S     | 17:22     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 17      | 05:38     | 97      | 11:28     | 59S     | 17:18     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 18      | 05:34     | 97      | 11:24     | 59S     | 17:14     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 19      | 05:31     | 97      | 11:21     | 59S     | 17:11     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 20      | 05:27     | 97      | 11:17     | 59S     | 17:07     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 21      | 05:23     | 97      | 11:13     | 59S     | 17:03     | 263     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 22      | 05:19     | 97      | 11:09     | 59S     | 16:59     | 264     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 23      | 05:15     | 96      | 11:05     | 59S     | 16:56     | 264     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 24      | 05:12     | 96      | 11:02     | 59S     | 16:52     | 264     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 25      | 05:08     | 96      | 10:58     | 59S     | 16:48     | 264     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 26      | 05:04     | 96      | 10:54     | 59S     | 16:44     | 264     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 27      | 05:00     | 96      | 10:50     | 59S     | 16:40     | 264     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 28      | 04:56     | 96      | 10:46     | 59S     | 16:37     | 264     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 29      | 04:52     | 96      | 10:43     | 59S     | 16:33     | 264     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 30      | 04:49     | 96      | 10:39     | 59S     | 16:29     | 264     | 2.21         | 2.18          | 1.00 | 8.0           |
| 3 31      | 04:45     | 96      | 10:35     | 59S     | 16:25     | 264     | 2.21         | 2.18          | 1.00 | 8.0           |

## 海王星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 4  | 1  | 23  | 14 | 0.16  | -5  | 59 | 25.54 | 30.84784 | 256.55 | 0.8  |
| 4  | 2  | 23  | 14 | 8.03  | -5  | 58 | 37.26 | 30.84103 | 256.50 | 0.8  |
| 4  | 3  | 23  | 14 | 15.86 | -5  | 57 | 49.30 | 30.83396 | 256.44 | 0.8  |
| 4  | 4  | 23  | 14 | 23.63 | -5  | 57 | 1.68  | 30.82664 | 256.38 | 0.9  |
| 4  | 5  | 23  | 14 | 31.35 | -5  | 56 | 14.41 | 30.81906 | 256.31 | 0.9  |
| 4  | 6  | 23  | 14 | 39.02 | -5  | 55 | 27.48 | 30.81122 | 256.25 | 0.9  |
| 4  | 7  | 23  | 14 | 46.64 | -5  | 54 | 40.91 | 30.80314 | 256.18 | 0.9  |
| 4  | 8  | 23  | 14 | 54.20 | -5  | 53 | 54.69 | 30.79481 | 256.11 | 1.0  |
| 4  | 9  | 23  | 15 | 1.71  | -5  | 53 | 8.85  | 30.78624 | 256.04 | 1.0  |
| 4  | 10 | 23  | 15 | 9.16  | -5  | 52 | 23.39 | 30.77742 | 255.97 | 1.0  |
| 4  | 11 | 23  | 15 | 16.55 | -5  | 51 | 38.32 | 30.76836 | 255.89 | 1.1  |
| 4  | 12 | 23  | 15 | 23.88 | -5  | 50 | 53.68 | 30.75907 | 255.82 | 1.1  |
| 4  | 13 | 23  | 15 | 31.15 | -5  | 50 | 9.47  | 30.74955 | 255.74 | 1.1  |
| 4  | 14 | 23  | 15 | 38.35 | -5  | 49 | 25.71 | 30.73979 | 255.66 | 1.1  |
| 4  | 15 | 23  | 15 | 45.48 | -5  | 48 | 42.42 | 30.72981 | 255.57 | 1.2  |
| 4  | 16 | 23  | 15 | 52.54 | -5  | 47 | 59.61 | 30.71961 | 255.49 | 1.2  |
| 4  | 17 | 23  | 15 | 59.52 | -5  | 47 | 17.28 | 30.70918 | 255.40 | 1.2  |
| 4  | 18 | 23  | 16 | 6.43  | -5  | 46 | 35.43 | 30.69854 | 255.31 | 1.2  |
| 4  | 19 | 23  | 16 | 13.27 | -5  | 45 | 54.06 | 30.68768 | 255.22 | 1.3  |
| 4  | 20 | 23  | 16 | 20.04 | -5  | 45 | 13.16 | 30.67662 | 255.13 | 1.3  |
| 4  | 21 | 23  | 16 | 26.73 | -5  | 44 | 32.73 | 30.66534 | 255.04 | 1.3  |
| 4  | 22 | 23  | 16 | 33.35 | -5  | 43 | 52.80 | 30.65385 | 254.94 | 1.3  |
| 4  | 23 | 23  | 16 | 39.90 | -5  | 43 | 13.37 | 30.64217 | 254.84 | 1.4  |
| 4  | 24 | 23  | 16 | 46.37 | -5  | 42 | 34.46 | 30.63028 | 254.74 | 1.4  |
| 4  | 25 | 23  | 16 | 52.76 | -5  | 41 | 56.08 | 30.61819 | 254.64 | 1.4  |
| 4  | 26 | 23  | 16 | 59.06 | -5  | 41 | 18.25 | 30.60592 | 254.54 | 1.4  |
| 4  | 27 | 23  | 17 | 5.28  | -5  | 40 | 40.99 | 30.59344 | 254.44 | 1.4  |
| 4  | 28 | 23  | 17 | 11.41 | -5  | 40 | 4.30  | 30.58079 | 254.33 | 1.5  |
| 4  | 29 | 23  | 17 | 17.46 | -5  | 39 | 28.19 | 30.56794 | 254.23 | 1.5  |
| 4  | 30 | 23  | 17 | 23.41 | -5  | 38 | 52.67 | 30.55492 | 254.12 | 1.5  |

## 海王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 4 1       | 04:41     | 96      | 10:31     | 59S     | 16:22     | 264     | 2.21         | 2.18          | 1.00 | 8.0           |
| 4 2       | 04:37     | 96      | 10:27     | 59S     | 16:18     | 264     | 2.21         | 2.18          | 1.00 | 8.0           |
| 4 3       | 04:33     | 96      | 10:24     | 59S     | 16:14     | 264     | 2.21         | 2.18          | 1.00 | 8.0           |
| 4 4       | 04:29     | 96      | 10:20     | 59S     | 16:10     | 264     | 2.22         | 2.18          | 1.00 | 8.0           |
| 4 5       | 04:26     | 96      | 10:16     | 59S     | 16:06     | 264     | 2.22         | 2.18          | 1.00 | 8.0           |
| 4 6       | 04:22     | 96      | 10:12     | 59S     | 16:03     | 264     | 2.22         | 2.18          | 1.00 | 8.0           |
| 4 7       | 04:18     | 96      | 10:08     | 59S     | 15:59     | 264     | 2.22         | 2.19          | 1.00 | 8.0           |
| 4 8       | 04:14     | 96      | 10:05     | 59S     | 15:55     | 264     | 2.22         | 2.19          | 1.00 | 8.0           |
| 4 9       | 04:10     | 96      | 10:01     | 59S     | 15:51     | 264     | 2.22         | 2.19          | 1.00 | 8.0           |
| 4 10      | 04:06     | 96      | 09:57     | 59S     | 15:48     | 264     | 2.22         | 2.19          | 1.00 | 8.0           |
| 4 11      | 04:03     | 96      | 09:53     | 59S     | 15:44     | 264     | 2.22         | 2.19          | 1.00 | 8.0           |
| 4 12      | 03:59     | 96      | 09:49     | 59S     | 15:40     | 264     | 2.22         | 2.19          | 1.00 | 8.0           |
| 4 13      | 03:55     | 96      | 09:46     | 59S     | 15:36     | 264     | 2.22         | 2.19          | 1.00 | 8.0           |
| 4 14      | 03:51     | 96      | 09:42     | 59S     | 15:32     | 264     | 2.22         | 2.19          | 1.00 | 7.9           |
| 4 15      | 03:47     | 96      | 09:38     | 59S     | 15:29     | 264     | 2.22         | 2.19          | 1.00 | 7.9           |
| 4 16      | 03:43     | 96      | 09:34     | 59S     | 15:25     | 264     | 2.22         | 2.19          | 1.00 | 7.9           |
| 4 17      | 03:40     | 96      | 09:30     | 59S     | 15:21     | 264     | 2.22         | 2.19          | 1.00 | 7.9           |
| 4 18      | 03:36     | 96      | 09:26     | 59S     | 15:17     | 264     | 2.22         | 2.19          | 1.00 | 7.9           |
| 4 19      | 03:32     | 96      | 09:23     | 59S     | 15:13     | 264     | 2.23         | 2.19          | 1.00 | 7.9           |
| 4 20      | 03:28     | 96      | 09:19     | 59S     | 15:10     | 264     | 2.23         | 2.19          | 1.00 | 7.9           |
| 4 21      | 03:24     | 96      | 09:15     | 59S     | 15:06     | 264     | 2.23         | 2.20          | 1.00 | 7.9           |
| 4 22      | 03:20     | 96      | 09:11     | 59S     | 15:02     | 264     | 2.23         | 2.20          | 1.00 | 7.9           |
| 4 23      | 03:17     | 96      | 09:07     | 59S     | 14:58     | 264     | 2.23         | 2.20          | 1.00 | 7.9           |
| 4 24      | 03:13     | 96      | 09:04     | 59S     | 14:54     | 264     | 2.23         | 2.20          | 1.00 | 7.9           |
| 4 25      | 03:09     | 96      | 09:00     | 59S     | 14:51     | 264     | 2.23         | 2.20          | 1.00 | 7.9           |
| 4 26      | 03:05     | 96      | 08:56     | 59S     | 14:47     | 264     | 2.23         | 2.20          | 1.00 | 7.9           |
| 4 27      | 03:01     | 96      | 08:52     | 59S     | 14:43     | 264     | 2.23         | 2.20          | 1.00 | 7.9           |
| 4 28      | 02:57     | 96      | 08:48     | 59S     | 14:39     | 264     | 2.23         | 2.20          | 1.00 | 7.9           |
| 4 29      | 02:53     | 96      | 08:44     | 59S     | 14:35     | 264     | 2.23         | 2.20          | 1.00 | 7.9           |
| 4 30      | 02:50     | 96      | 08:41     | 59S     | 14:32     | 264     | 2.23         | 2.20          | 1.00 | 7.9           |



## 海 王 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 5  | 1  | 23  | 17 | 29.27 | -5  | 38 | 17.74 | 30.54172 | 254.01 | 1.5  |
| 5  | 2  | 23  | 17 | 35.04 | -5  | 37 | 43.41 | 30.52834 | 253.90 | 1.5  |
| 5  | 3  | 23  | 17 | 40.73 | -5  | 37 | 9.67  | 30.51480 | 253.78 | 1.6  |
| 5  | 4  | 23  | 17 | 46.31 | -5  | 36 | 36.54 | 30.50109 | 253.67 | 1.6  |
| 5  | 5  | 23  | 17 | 51.81 | -5  | 36 | 4.00  | 30.48722 | 253.55 | 1.6  |
| 5  | 6  | 23  | 17 | 57.21 | -5  | 35 | 32.07 | 30.47319 | 253.44 | 1.6  |
| 5  | 7  | 23  | 18 | 2.52  | -5  | 35 | 0.75  | 30.45900 | 253.32 | 1.6  |
| 5  | 8  | 23  | 18 | 7.73  | -5  | 34 | 30.06 | 30.44467 | 253.20 | 1.7  |
| 5  | 9  | 23  | 18 | 12.85 | -5  | 34 | 0.01  | 30.43019 | 253.08 | 1.7  |
| 5  | 10 | 23  | 18 | 17.86 | -5  | 33 | 30.62 | 30.41557 | 252.96 | 1.7  |
| 5  | 11 | 23  | 18 | 22.78 | -5  | 33 | 1.91  | 30.40081 | 252.84 | 1.7  |
| 5  | 12 | 23  | 18 | 27.58 | -5  | 32 | 33.88 | 30.38592 | 252.71 | 1.7  |
| 5  | 13 | 23  | 18 | 32.28 | -5  | 32 | 6.54  | 30.37091 | 252.59 | 1.7  |
| 5  | 14 | 23  | 18 | 36.88 | -5  | 31 | 39.90 | 30.35577 | 252.46 | 1.7  |
| 5  | 15 | 23  | 18 | 41.37 | -5  | 31 | 13.94 | 30.34051 | 252.33 | 1.8  |
| 5  | 16 | 23  | 18 | 45.75 | -5  | 30 | 48.67 | 30.32514 | 252.21 | 1.8  |
| 5  | 17 | 23  | 18 | 50.02 | -5  | 30 | 24.07 | 30.30965 | 252.08 | 1.8  |
| 5  | 18 | 23  | 18 | 54.20 | -5  | 30 | 0.15  | 30.29406 | 251.95 | 1.8  |
| 5  | 19 | 23  | 18 | 58.27 | -5  | 29 | 36.90 | 30.27837 | 251.82 | 1.8  |
| 5  | 20 | 23  | 19 | 2.23  | -5  | 29 | 14.35 | 30.26258 | 251.69 | 1.8  |
| 5  | 21 | 23  | 19 | 6.08  | -5  | 28 | 52.49 | 30.24669 | 251.55 | 1.8  |
| 5  | 22 | 23  | 19 | 9.83  | -5  | 28 | 31.34 | 30.23071 | 251.42 | 1.8  |
| 5  | 23 | 23  | 19 | 13.46 | -5  | 28 | 10.92 | 30.21464 | 251.29 | 1.9  |
| 5  | 24 | 23  | 19 | 16.98 | -5  | 27 | 51.23 | 30.19850 | 251.15 | 1.9  |
| 5  | 25 | 23  | 19 | 20.39 | -5  | 27 | 32.28 | 30.18227 | 251.02 | 1.9  |
| 5  | 26 | 23  | 19 | 23.68 | -5  | 27 | 14.07 | 30.16597 | 250.88 | 1.9  |
| 5  | 27 | 23  | 19 | 26.86 | -5  | 26 | 56.62 | 30.14960 | 250.75 | 1.9  |
| 5  | 28 | 23  | 19 | 29.92 | -5  | 26 | 39.90 | 30.13316 | 250.61 | 1.9  |
| 5  | 29 | 23  | 19 | 32.86 | -5  | 26 | 23.94 | 30.11667 | 250.47 | 1.9  |
| 5  | 30 | 23  | 19 | 35.69 | -5  | 26 | 8.72  | 30.10011 | 250.33 | 1.9  |
| 5  | 31 | 23  | 11 | 23.80 | -6  | 14 | 27.00 | 30.04662 | 249.89 | 1.9  |

## 海王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期  |    | 出     |    | 中 天   |     | 沒     |     | 視 直徑 |      | 相位   | 視   |
|-----|----|-------|----|-------|-----|-------|-----|------|------|------|-----|
| 月 日 |    | 時間    | 方位 | 時間    | 仰角  | 時間    | 方位  | 赤道   | 兩極   |      | 亮   |
|     |    | h m   | °  | h m   | °   | h m   | °   | "    | "    |      | 星   |
| 5   | 1  | 02:46 | 96 | 08:37 | 59S | 14:28 | 264 | 2.24 | 2.20 | 1.00 | 7.9 |
| 5   | 2  | 02:42 | 96 | 08:33 | 59S | 14:24 | 264 | 2.24 | 2.20 | 1.00 | 7.9 |
| 5   | 3  | 02:38 | 96 | 08:29 | 59S | 14:20 | 264 | 2.24 | 2.21 | 1.00 | 7.9 |
| 5   | 4  | 02:34 | 96 | 08:25 | 59S | 14:16 | 264 | 2.24 | 2.21 | 1.00 | 7.9 |
| 5   | 5  | 02:30 | 96 | 08:21 | 59S | 14:12 | 264 | 2.24 | 2.21 | 1.00 | 7.9 |
| 5   | 6  | 02:26 | 96 | 08:18 | 59S | 14:09 | 264 | 2.24 | 2.21 | 1.00 | 7.9 |
| 5   | 7  | 02:23 | 96 | 08:14 | 59S | 14:05 | 264 | 2.24 | 2.21 | 1.00 | 7.9 |
| 5   | 8  | 02:19 | 96 | 08:10 | 59S | 14:01 | 264 | 2.24 | 2.21 | 1.00 | 7.9 |
| 5   | 9  | 02:15 | 96 | 08:06 | 59S | 13:57 | 264 | 2.24 | 2.21 | 1.00 | 7.9 |
| 5   | 10 | 02:11 | 96 | 08:02 | 59S | 13:53 | 264 | 2.25 | 2.21 | 1.00 | 7.9 |
| 5   | 11 | 02:07 | 96 | 07:58 | 59S | 13:49 | 264 | 2.25 | 2.21 | 1.00 | 7.9 |
| 5   | 12 | 02:03 | 96 | 07:54 | 59S | 13:46 | 264 | 2.25 | 2.22 | 1.00 | 7.9 |
| 5   | 13 | 01:59 | 96 | 07:51 | 59S | 13:42 | 264 | 2.25 | 2.22 | 1.00 | 7.9 |
| 5   | 14 | 01:56 | 96 | 07:47 | 59S | 13:38 | 264 | 2.25 | 2.22 | 1.00 | 7.9 |
| 5   | 15 | 01:52 | 96 | 07:43 | 59S | 13:34 | 264 | 2.25 | 2.22 | 1.00 | 7.9 |
| 5   | 16 | 01:48 | 96 | 07:39 | 59S | 13:30 | 264 | 2.25 | 2.22 | 1.00 | 7.9 |
| 5   | 17 | 01:44 | 96 | 07:35 | 59S | 13:26 | 264 | 2.25 | 2.22 | 1.00 | 7.9 |
| 5   | 18 | 01:40 | 96 | 07:31 | 59S | 13:23 | 264 | 2.25 | 2.22 | 1.00 | 7.9 |
| 5   | 19 | 01:36 | 96 | 07:27 | 59S | 13:19 | 264 | 2.26 | 2.22 | 1.00 | 7.9 |
| 5   | 20 | 01:32 | 96 | 07:24 | 59S | 13:15 | 264 | 2.26 | 2.22 | 1.00 | 7.9 |
| 5   | 21 | 01:28 | 96 | 07:20 | 59S | 13:11 | 264 | 2.26 | 2.23 | 1.00 | 7.9 |
| 5   | 22 | 01:25 | 96 | 07:16 | 59S | 13:07 | 264 | 2.26 | 2.23 | 1.00 | 7.9 |
| 5   | 23 | 01:21 | 96 | 07:12 | 59S | 13:03 | 264 | 2.26 | 2.23 | 1.00 | 7.9 |
| 5   | 24 | 01:17 | 96 | 07:08 | 59S | 12:59 | 264 | 2.26 | 2.23 | 1.00 | 7.9 |
| 5   | 25 | 01:13 | 96 | 07:04 | 59S | 12:56 | 264 | 2.26 | 2.23 | 1.00 | 7.9 |
| 5   | 26 | 01:09 | 96 | 07:00 | 59S | 12:52 | 264 | 2.26 | 2.23 | 1.00 | 7.9 |
| 5   | 27 | 01:05 | 96 | 06:56 | 59S | 12:48 | 264 | 2.27 | 2.23 | 1.00 | 7.9 |
| 5   | 28 | 01:01 | 96 | 06:53 | 59S | 12:44 | 264 | 2.27 | 2.23 | 1.00 | 7.9 |
| 5   | 29 | 00:57 | 96 | 06:49 | 59S | 12:40 | 264 | 2.27 | 2.23 | 1.00 | 7.9 |
| 5   | 30 | 00:53 | 96 | 06:45 | 59S | 12:36 | 264 | 2.27 | 2.24 | 1.00 | 7.9 |
| 5   | 31 | 00:50 | 96 | 06:41 | 59S | 12:32 | 264 | 2.27 | 2.24 | 1.00 | 7.9 |

## 海王星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 6  | 1  | 23  | 19 | 40.99 | -5  | 25 | 40.50 | 30.06686 | 250.06 | 1.9  |
| 6  | 2  | 23  | 19 | 43.47 | -5  | 25 | 27.50 | 30.05016 | 249.92 | 1.9  |
| 6  | 3  | 23  | 19 | 45.84 | -5  | 25 | 15.23 | 30.03343 | 249.78 | 1.9  |
| 6  | 4  | 23  | 19 | 48.08 | -5  | 25 | 3.72  | 30.01667 | 249.64 | 1.9  |
| 6  | 5  | 23  | 19 | 50.22 | -5  | 24 | 52.95 | 29.99988 | 249.50 | 1.9  |
| 6  | 6  | 23  | 19 | 52.23 | -5  | 24 | 42.96 | 29.98307 | 249.36 | 1.9  |
| 6  | 7  | 23  | 19 | 54.12 | -5  | 24 | 33.75 | 29.96624 | 249.22 | 1.9  |
| 6  | 8  | 23  | 19 | 55.89 | -5  | 24 | 25.32 | 29.94940 | 249.08 | 1.9  |
| 6  | 9  | 23  | 19 | 57.53 | -5  | 24 | 17.69 | 29.93255 | 248.94 | 1.9  |
| 6  | 10 | 23  | 19 | 59.05 | -5  | 24 | 10.85 | 29.91570 | 248.80 | 1.9  |
| 6  | 11 | 23  | 20 | 0.45  | -5  | 24 | 4.79  | 29.89885 | 248.66 | 1.9  |
| 6  | 12 | 23  | 20 | 1.72  | -5  | 23 | 59.49 | 29.88201 | 248.52 | 1.9  |
| 6  | 13 | 23  | 20 | 2.88  | -5  | 23 | 54.95 | 29.86519 | 248.38 | 1.9  |
| 6  | 14 | 23  | 20 | 3.92  | -5  | 23 | 51.17 | 29.84838 | 248.24 | 1.9  |
| 6  | 15 | 23  | 20 | 4.84  | -5  | 23 | 48.13 | 29.83158 | 248.10 | 1.9  |
| 6  | 16 | 23  | 20 | 5.65  | -5  | 23 | 45.83 | 29.81482 | 247.96 | 1.9  |
| 6  | 17 | 23  | 20 | 6.33  | -5  | 23 | 44.30 | 29.79808 | 247.82 | 1.9  |
| 6  | 18 | 23  | 20 | 6.90  | -5  | 23 | 43.52 | 29.78138 | 247.68 | 1.9  |
| 6  | 19 | 23  | 20 | 7.35  | -5  | 23 | 43.51 | 29.76472 | 247.55 | 1.9  |
| 6  | 20 | 23  | 20 | 7.67  | -5  | 23 | 44.27 | 29.74810 | 247.41 | 1.9  |
| 6  | 21 | 23  | 20 | 7.87  | -5  | 23 | 45.80 | 29.73152 | 247.27 | 1.9  |
| 6  | 22 | 23  | 20 | 7.96  | -5  | 23 | 48.11 | 29.71500 | 247.13 | 1.9  |
| 6  | 23 | 23  | 20 | 7.91  | -5  | 23 | 51.20 | 29.69853 | 247.00 | 1.9  |
| 6  | 24 | 23  | 20 | 7.75  | -5  | 23 | 55.05 | 29.68212 | 246.86 | 1.9  |
| 6  | 25 | 23  | 20 | 7.47  | -5  | 23 | 59.66 | 29.66578 | 246.72 | 1.9  |
| 6  | 26 | 23  | 20 | 7.06  | -5  | 24 | 5.03  | 29.64951 | 246.59 | 1.9  |
| 6  | 27 | 23  | 20 | 6.54  | -5  | 24 | 11.14 | 29.63331 | 246.45 | 1.9  |
| 6  | 28 | 23  | 20 | 5.90  | -5  | 24 | 17.99 | 29.61720 | 246.32 | 1.9  |
| 6  | 29 | 23  | 20 | 5.14  | -5  | 24 | 25.57 | 29.60116 | 246.19 | 1.9  |
| 6  | 30 | 23  | 20 | 4.27  | -5  | 24 | 33.87 | 29.58522 | 246.05 | 1.8  |

## 海王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 6 1       | 00:46     | 96      | 06:37     | 60S     | 12:28     | 264     | 2.27         | 2.24          | 1.00 | 7.9           |
| 6 2       | 00:42     | 96      | 06:33     | 60S     | 12:25     | 264     | 2.27         | 2.24          | 1.00 | 7.9           |
| 6 3       | 00:38     | 96      | 06:29     | 60S     | 12:21     | 264     | 2.27         | 2.24          | 1.00 | 7.9           |
| 6 4       | 00:34     | 96      | 06:25     | 60S     | 12:17     | 264     | 2.28         | 2.24          | 1.00 | 7.9           |
| 6 5       | 00:30     | 96      | 06:21     | 60S     | 12:13     | 264     | 2.28         | 2.24          | 1.00 | 7.9           |
| 6 6       | 00:26     | 96      | 06:18     | 60S     | 12:09     | 264     | 2.28         | 2.24          | 1.00 | 7.9           |
| 6 7       | 00:22     | 96      | 06:14     | 60S     | 12:05     | 264     | 2.28         | 2.25          | 1.00 | 7.9           |
| 6 8       | 00:18     | 96      | 06:10     | 60S     | 12:01     | 264     | 2.28         | 2.25          | 1.00 | 7.9           |
| 6 9       | 00:14     | 96      | 06:06     | 60S     | 11:57     | 264     | 2.28         | 2.25          | 1.00 | 7.9           |
| 6 10      | 00:11     | 96      | 06:02     | 60S     | 11:53     | 264     | 2.28         | 2.25          | 1.00 | 7.9           |
| 6 11      | 00:07     | 96      | 05:58     | 60S     | 11:49     | 264     | 2.28         | 2.25          | 1.00 | 7.9           |
| 6 12      | 00:03     | 96      | 05:54     | 60S     | 11:46     | 264     | 2.29         | 2.25          | 1.00 | 7.9           |
| 6 13      | 23:55     | 96      | 05:50     | 60S     | 11:42     | 264     | 2.29         | 2.25          | 1.00 | 7.9           |
| 6 14      | 23:51     | 96      | 05:46     | 60S     | 11:38     | 264     | 2.29         | 2.26          | 1.00 | 7.9           |
| 6 15      | 23:47     | 96      | 05:42     | 60S     | 11:34     | 264     | 2.29         | 2.26          | 1.00 | 7.9           |
| 6 16      | 23:43     | 96      | 05:38     | 60S     | 11:30     | 264     | 2.29         | 2.26          | 1.00 | 7.9           |
| 6 17      | 23:39     | 96      | 05:35     | 60S     | 11:26     | 264     | 2.29         | 2.26          | 1.00 | 7.9           |
| 6 18      | 23:35     | 96      | 05:31     | 60S     | 11:22     | 264     | 2.29         | 2.26          | 1.00 | 7.9           |
| 6 19      | 23:31     | 96      | 05:27     | 60S     | 11:18     | 264     | 2.29         | 2.26          | 1.00 | 7.9           |
| 6 20      | 23:27     | 96      | 05:23     | 60S     | 11:14     | 264     | 2.30         | 2.26          | 1.00 | 7.9           |
| 6 21      | 23:24     | 96      | 05:19     | 60S     | 11:10     | 264     | 2.30         | 2.26          | 1.00 | 7.9           |
| 6 22      | 23:20     | 96      | 05:15     | 60S     | 11:06     | 264     | 2.30         | 2.27          | 1.00 | 7.9           |
| 6 23      | 23:16     | 96      | 05:11     | 60S     | 11:02     | 264     | 2.30         | 2.27          | 1.00 | 7.9           |
| 6 24      | 23:12     | 96      | 05:07     | 60S     | 10:58     | 264     | 2.30         | 2.27          | 1.00 | 7.9           |
| 6 25      | 23:08     | 96      | 05:03     | 60S     | 10:55     | 264     | 2.30         | 2.27          | 1.00 | 7.9           |
| 6 26      | 23:04     | 96      | 04:59     | 60S     | 10:51     | 264     | 2.30         | 2.27          | 1.00 | 7.9           |
| 6 27      | 23:00     | 96      | 04:55     | 60S     | 10:47     | 264     | 2.30         | 2.27          | 1.00 | 7.9           |
| 6 28      | 22:56     | 96      | 04:51     | 60S     | 10:43     | 264     | 2.31         | 2.27          | 1.00 | 7.9           |
| 6 29      | 22:52     | 96      | 04:47     | 60S     | 10:39     | 264     | 2.31         | 2.27          | 1.00 | 7.9           |
| 6 30      | 22:48     | 96      | 04:43     | 60S     | 10:35     | 264     | 2.31         | 2.28          | 1.00 | 7.9           |

## 海 王 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 7  | 1  | 23  | 20 | 3.28  | -5  | 24 | 42.90 | 29.56936 | 245.92 | 1.8  |
| 7  | 2  | 23  | 20 | 2.17  | -5  | 24 | 52.65 | 29.55361 | 245.79 | 1.8  |
| 7  | 3  | 23  | 20 | 0.95  | -5  | 25 | 3.14  | 29.53796 | 245.66 | 1.8  |
| 7  | 4  | 23  | 19 | 59.62 | -5  | 25 | 14.36 | 29.52242 | 245.53 | 1.8  |
| 7  | 5  | 23  | 19 | 58.16 | -5  | 25 | 26.33 | 29.50700 | 245.40 | 1.8  |
| 7  | 6  | 23  | 19 | 56.59 | -5  | 25 | 39.04 | 29.49169 | 245.27 | 1.8  |
| 7  | 7  | 23  | 19 | 54.89 | -5  | 25 | 52.48 | 29.47650 | 245.15 | 1.8  |
| 7  | 8  | 23  | 19 | 53.09 | -5  | 26 | 6.65  | 29.46144 | 245.02 | 1.7  |
| 7  | 9  | 23  | 19 | 51.16 | -5  | 26 | 21.52 | 29.44652 | 244.90 | 1.7  |
| 7  | 10 | 23  | 19 | 49.13 | -5  | 26 | 37.08 | 29.43173 | 244.78 | 1.7  |
| 7  | 11 | 23  | 19 | 46.99 | -5  | 26 | 53.31 | 29.41708 | 244.65 | 1.7  |
| 7  | 12 | 23  | 19 | 44.74 | -5  | 27 | 10.20 | 29.40257 | 244.53 | 1.7  |
| 7  | 13 | 23  | 19 | 42.38 | -5  | 27 | 27.75 | 29.38821 | 244.41 | 1.7  |
| 7  | 14 | 23  | 19 | 39.92 | -5  | 27 | 45.95 | 29.37401 | 244.30 | 1.6  |
| 7  | 15 | 23  | 19 | 37.36 | -5  | 28 | 4.81  | 29.35995 | 244.18 | 1.6  |
| 7  | 16 | 23  | 19 | 34.68 | -5  | 28 | 24.32 | 29.34606 | 244.06 | 1.6  |
| 7  | 17 | 23  | 19 | 31.91 | -5  | 28 | 44.48 | 29.33234 | 243.95 | 1.6  |
| 7  | 18 | 23  | 19 | 29.02 | -5  | 29 | 5.30  | 29.31878 | 243.84 | 1.6  |
| 7  | 19 | 23  | 19 | 26.04 | -5  | 29 | 26.76 | 29.30539 | 243.73 | 1.5  |
| 7  | 20 | 23  | 19 | 22.94 | -5  | 29 | 48.87 | 29.29217 | 243.62 | 1.5  |
| 7  | 21 | 23  | 19 | 19.75 | -5  | 30 | 11.60 | 29.27913 | 243.51 | 1.5  |
| 7  | 22 | 23  | 19 | 16.45 | -5  | 30 | 34.94 | 29.26628 | 243.40 | 1.5  |
| 7  | 23 | 23  | 19 | 13.06 | -5  | 30 | 58.90 | 29.25361 | 243.29 | 1.5  |
| 7  | 24 | 23  | 19 | 9.56  | -5  | 31 | 23.44 | 29.24113 | 243.19 | 1.4  |
| 7  | 25 | 23  | 19 | 5.97  | -5  | 31 | 48.55 | 29.22885 | 243.09 | 1.4  |
| 7  | 26 | 23  | 19 | 2.29  | -5  | 32 | 14.23 | 29.21676 | 242.99 | 1.4  |
| 7  | 27 | 23  | 18 | 58.52 | -5  | 32 | 40.46 | 29.20488 | 242.89 | 1.4  |
| 7  | 28 | 23  | 18 | 54.66 | -5  | 33 | 7.23  | 29.19320 | 242.79 | 1.3  |
| 7  | 29 | 23  | 18 | 50.70 | -5  | 33 | 34.53 | 29.18173 | 242.70 | 1.3  |
| 7  | 30 | 23  | 18 | 46.66 | -5  | 34 | 2.36  | 29.17048 | 242.60 | 1.3  |
| 7  | 31 | 23  | 18 | 42.54 | -5  | 34 | 30.73 | 29.15944 | 242.51 | 1.3  |

## 海王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 7 1       | 22:44     | 96      | 04:39     | 60S     | 10:31     | 264     | 2.31         | 2.28          | 1.00 | 7.9           |
| 7 2       | 22:40     | 96      | 04:36     | 60S     | 10:27     | 264     | 2.31         | 2.28          | 1.00 | 7.9           |
| 7 3       | 22:36     | 96      | 04:32     | 60S     | 10:23     | 264     | 2.31         | 2.28          | 1.00 | 7.9           |
| 7 4       | 22:32     | 96      | 04:28     | 60S     | 10:19     | 264     | 2.31         | 2.28          | 1.00 | 7.9           |
| 7 5       | 22:28     | 96      | 04:24     | 60S     | 10:15     | 264     | 2.31         | 2.28          | 1.00 | 7.9           |
| 7 6       | 22:24     | 96      | 04:20     | 60S     | 10:11     | 264     | 2.32         | 2.28          | 1.00 | 7.9           |
| 7 7       | 22:20     | 96      | 04:16     | 60S     | 10:07     | 264     | 2.32         | 2.28          | 1.00 | 7.9           |
| 7 8       | 22:16     | 96      | 04:12     | 59S     | 10:03     | 264     | 2.32         | 2.28          | 1.00 | 7.9           |
| 7 9       | 22:13     | 96      | 04:08     | 59S     | 09:59     | 264     | 2.32         | 2.29          | 1.00 | 7.9           |
| 7 10      | 22:09     | 96      | 04:04     | 59S     | 09:55     | 264     | 2.32         | 2.29          | 1.00 | 7.9           |
| 7 11      | 22:05     | 96      | 04:00     | 59S     | 09:51     | 264     | 2.32         | 2.29          | 1.00 | 7.9           |
| 7 12      | 22:01     | 96      | 03:56     | 59S     | 09:47     | 264     | 2.32         | 2.29          | 1.00 | 7.9           |
| 7 13      | 21:57     | 96      | 03:52     | 59S     | 09:43     | 264     | 2.32         | 2.29          | 1.00 | 7.9           |
| 7 14      | 21:53     | 96      | 03:48     | 59S     | 09:39     | 264     | 2.32         | 2.29          | 1.00 | 7.9           |
| 7 15      | 21:49     | 96      | 03:44     | 59S     | 09:35     | 264     | 2.33         | 2.29          | 1.00 | 7.8           |
| 7 16      | 21:45     | 96      | 03:40     | 59S     | 09:31     | 264     | 2.33         | 2.29          | 1.00 | 7.8           |
| 7 17      | 21:41     | 96      | 03:36     | 59S     | 09:27     | 264     | 2.33         | 2.29          | 1.00 | 7.8           |
| 7 18      | 21:37     | 96      | 03:32     | 59S     | 09:23     | 264     | 2.33         | 2.30          | 1.00 | 7.8           |
| 7 19      | 21:33     | 96      | 03:28     | 59S     | 09:19     | 264     | 2.33         | 2.30          | 1.00 | 7.8           |
| 7 20      | 21:29     | 96      | 03:24     | 59S     | 09:15     | 264     | 2.33         | 2.30          | 1.00 | 7.8           |
| 7 21      | 21:25     | 96      | 03:20     | 59S     | 09:11     | 264     | 2.33         | 2.30          | 1.00 | 7.8           |
| 7 22      | 21:21     | 96      | 03:16     | 59S     | 09:07     | 264     | 2.33         | 2.30          | 1.00 | 7.8           |
| 7 23      | 21:17     | 96      | 03:12     | 59S     | 09:03     | 264     | 2.33         | 2.30          | 1.00 | 7.8           |
| 7 24      | 21:13     | 96      | 03:08     | 59S     | 08:59     | 264     | 2.34         | 2.30          | 1.00 | 7.8           |
| 7 25      | 21:09     | 96      | 03:04     | 59S     | 08:55     | 264     | 2.34         | 2.30          | 1.00 | 7.8           |
| 7 26      | 21:05     | 96      | 03:00     | 59S     | 08:51     | 264     | 2.34         | 2.30          | 1.00 | 7.8           |
| 7 27      | 21:01     | 96      | 02:56     | 59S     | 08:47     | 264     | 2.34         | 2.30          | 1.00 | 7.8           |
| 7 28      | 20:57     | 96      | 02:52     | 59S     | 08:43     | 264     | 2.34         | 2.31          | 1.00 | 7.8           |
| 7 29      | 20:53     | 96      | 02:48     | 59S     | 08:39     | 264     | 2.34         | 2.31          | 1.00 | 7.8           |
| 7 30      | 20:49     | 96      | 02:44     | 59S     | 08:35     | 264     | 2.34         | 2.31          | 1.00 | 7.8           |
| 7 31      | 20:45     | 96      | 02:40     | 59S     | 08:31     | 264     | 2.34         | 2.31          | 1.00 | 7.8           |

## 海王星位置表

世界時 0 時

| 日期 |    | 赤經 |    |       | 赤緯 |    |       | 距離       | 光程     | 日地離角 |
|----|----|----|----|-------|----|----|-------|----------|--------|------|
| 月  | 日  | h  | m  | s     | °  | '  | "     | AU       | 分      | °    |
| 8  | 1  | 23 | 18 | 38.32 | -5 | 34 | 59.63 | 29.14863 | 242.42 | 1.2  |
| 8  | 2  | 23 | 18 | 34.02 | -5 | 35 | 29.06 | 29.13803 | 242.33 | 1.2  |
| 8  | 3  | 23 | 18 | 29.63 | -5 | 35 | 59.02 | 29.12767 | 242.25 | 1.2  |
| 8  | 4  | 23 | 18 | 25.15 | -5 | 36 | 29.48 | 29.11754 | 242.16 | 1.2  |
| 8  | 5  | 23 | 18 | 20.59 | -5 | 37 | 0.42  | 29.10765 | 242.08 | 1.1  |
| 8  | 6  | 23 | 18 | 15.96 | -5 | 37 | 31.81 | 29.09799 | 242.00 | 1.1  |
| 8  | 7  | 23 | 18 | 11.25 | -5 | 38 | 3.63  | 29.08857 | 241.92 | 1.1  |
| 8  | 8  | 23 | 18 | 6.46  | -5 | 38 | 35.88 | 29.07940 | 241.85 | 1.1  |
| 8  | 9  | 23 | 18 | 1.61  | -5 | 39 | 8.52  | 29.07047 | 241.77 | 1.0  |
| 8  | 10 | 23 | 17 | 56.70 | -5 | 39 | 41.57 | 29.06179 | 241.70 | 1.0  |
| 8  | 11 | 23 | 17 | 51.71 | -5 | 40 | 15.00 | 29.05337 | 241.63 | 1.0  |
| 8  | 12 | 23 | 17 | 46.66 | -5 | 40 | 48.82 | 29.04519 | 241.56 | 0.9  |
| 8  | 13 | 23 | 17 | 41.54 | -5 | 41 | 23.02 | 29.03727 | 241.50 | 0.9  |
| 8  | 14 | 23 | 17 | 36.36 | -5 | 41 | 57.60 | 29.02961 | 241.43 | 0.9  |
| 8  | 15 | 23 | 17 | 31.11 | -5 | 42 | 32.54 | 29.02221 | 241.37 | 0.9  |
| 8  | 16 | 23 | 17 | 25.81 | -5 | 43 | 7.83  | 29.01508 | 241.31 | 0.8  |
| 8  | 17 | 23 | 17 | 20.44 | -5 | 43 | 43.45 | 29.00820 | 241.25 | 0.8  |
| 8  | 18 | 23 | 17 | 15.02 | -5 | 44 | 19.39 | 29.00160 | 241.20 | 0.8  |
| 8  | 19 | 23 | 17 | 9.54  | -5 | 44 | 55.64 | 28.99526 | 241.15 | 0.7  |
| 8  | 20 | 23 | 17 | 4.01  | -5 | 45 | 32.17 | 28.98920 | 241.10 | 0.7  |
| 8  | 21 | 23 | 16 | 58.43 | -5 | 46 | 8.97  | 28.98340 | 241.05 | 0.7  |
| 8  | 22 | 23 | 16 | 52.80 | -5 | 46 | 46.01 | 28.97789 | 241.00 | 0.6  |
| 8  | 23 | 23 | 16 | 47.14 | -5 | 47 | 23.28 | 28.97265 | 240.96 | 0.6  |
| 8  | 24 | 23 | 16 | 41.42 | -5 | 48 | 0.77  | 28.96769 | 240.92 | 0.6  |
| 8  | 25 | 23 | 16 | 35.68 | -5 | 48 | 38.47 | 28.96301 | 240.88 | 0.5  |
| 8  | 26 | 23 | 16 | 29.89 | -5 | 49 | 16.36 | 28.95862 | 240.84 | 0.5  |
| 8  | 27 | 23 | 16 | 24.07 | -5 | 49 | 54.44 | 28.95451 | 240.81 | 0.5  |
| 8  | 28 | 23 | 16 | 18.21 | -5 | 50 | 32.70 | 28.95069 | 240.78 | 0.5  |
| 8  | 29 | 23 | 16 | 12.31 | -5 | 51 | 11.15 | 28.94716 | 240.75 | 0.4  |
| 8  | 30 | 23 | 16 | 6.38  | -5 | 51 | 49.77 | 28.94391 | 240.72 | 0.4  |
| 8  | 31 | 23 | 16 | 0.42  | -5 | 52 | 28.55 | 28.94097 | 240.69 | 0.4  |

## 海王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視 亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |            |
| 8 1       | 20:41     | 96      | 02:36     | 59S     | 08:27     | 264     | 2.34 2.31            | 1.00 | 7.8        |
| 8 2       | 20:37     | 96      | 02:32     | 59S     | 08:23     | 264     | 2.34 2.31            | 1.00 | 7.8        |
| 8 3       | 20:33     | 96      | 02:28     | 59S     | 08:19     | 264     | 2.34 2.31            | 1.00 | 7.8        |
| 8 4       | 20:29     | 96      | 02:24     | 59S     | 08:15     | 264     | 2.35 2.31            | 1.00 | 7.8        |
| 8 5       | 20:25     | 96      | 02:20     | 59S     | 08:11     | 264     | 2.35 2.31            | 1.00 | 7.8        |
| 8 6       | 20:21     | 96      | 02:16     | 59S     | 08:07     | 264     | 2.35 2.31            | 1.00 | 7.8        |
| 8 7       | 20:17     | 96      | 02:12     | 59S     | 08:03     | 264     | 2.35 2.31            | 1.00 | 7.8        |
| 8 8       | 20:13     | 96      | 02:08     | 59S     | 07:59     | 264     | 2.35 2.31            | 1.00 | 7.8        |
| 8 9       | 20:09     | 96      | 02:04     | 59S     | 07:55     | 264     | 2.35 2.32            | 1.00 | 7.8        |
| 8 10      | 20:05     | 96      | 02:00     | 59S     | 07:51     | 264     | 2.35 2.32            | 1.00 | 7.8        |
| 8 11      | 20:01     | 96      | 01:56     | 59S     | 07:47     | 264     | 2.35 2.32            | 1.00 | 7.8        |
| 8 12      | 19:57     | 96      | 01:52     | 59S     | 07:43     | 264     | 2.35 2.32            | 1.00 | 7.8        |
| 8 13      | 19:53     | 96      | 01:48     | 59S     | 07:39     | 264     | 2.35 2.32            | 1.00 | 7.8        |
| 8 14      | 19:49     | 96      | 01:44     | 59S     | 07:35     | 264     | 2.35 2.32            | 1.00 | 7.8        |
| 8 15      | 19:45     | 96      | 01:40     | 59S     | 07:31     | 264     | 2.35 2.32            | 1.00 | 7.8        |
| 8 16      | 19:41     | 96      | 01:36     | 59S     | 07:27     | 264     | 2.35 2.32            | 1.00 | 7.8        |
| 8 17      | 19:37     | 96      | 01:32     | 59S     | 07:23     | 264     | 2.35 2.32            | 1.00 | 7.8        |
| 8 18      | 19:33     | 96      | 01:28     | 59S     | 07:19     | 264     | 2.35 2.32            | 1.00 | 7.8        |
| 8 19      | 19:29     | 96      | 01:24     | 59S     | 07:15     | 264     | 2.36 2.32            | 1.00 | 7.8        |
| 8 20      | 19:25     | 96      | 01:20     | 59S     | 07:11     | 264     | 2.36 2.32            | 1.00 | 7.8        |
| 8 21      | 19:21     | 96      | 01:16     | 59S     | 07:07     | 264     | 2.36 2.32            | 1.00 | 7.8        |
| 8 22      | 19:17     | 96      | 01:12     | 59S     | 07:03     | 264     | 2.36 2.32            | 1.00 | 7.8        |
| 8 23      | 19:13     | 96      | 01:08     | 59S     | 06:59     | 264     | 2.36 2.32            | 1.00 | 7.8        |
| 8 24      | 19:09     | 96      | 01:04     | 59S     | 06:54     | 264     | 2.36 2.32            | 1.00 | 7.8        |
| 8 25      | 19:05     | 96      | 01:00     | 59S     | 06:50     | 264     | 2.36 2.32            | 1.00 | 7.8        |
| 8 26      | 19:01     | 96      | 00:56     | 59S     | 06:46     | 264     | 2.36 2.32            | 1.00 | 7.8        |
| 8 27      | 18:57     | 96      | 00:52     | 59S     | 06:42     | 264     | 2.36 2.32            | 1.00 | 7.8        |
| 8 28      | 18:53     | 96      | 00:48     | 59S     | 06:38     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 8 29      | 18:49     | 96      | 00:44     | 59S     | 06:34     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 8 30      | 18:45     | 96      | 00:40     | 59S     | 06:30     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 8 31      | 18:41     | 96      | 00:36     | 59S     | 06:26     | 264     | 2.36 2.33            | 1.00 | 7.8        |



## 海 王 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 9  | 1  | 23  | 15 | 54.44 | -5  | 53 | 7.45  | 28.93831 | 240.67 | 0.3  |
| 9  | 2  | 23  | 15 | 48.42 | -5  | 53 | 46.46 | 28.93595 | 240.65 | 0.3  |
| 9  | 3  | 23  | 15 | 42.39 | -5  | 54 | 25.54 | 28.93389 | 240.64 | 0.3  |
| 9  | 4  | 23  | 15 | 36.34 | -5  | 55 | 4.66  | 28.93212 | 240.62 | 0.2  |
| 9  | 5  | 23  | 15 | 30.28 | -5  | 55 | 43.82 | 28.93064 | 240.61 | 0.2  |
| 9  | 6  | 23  | 15 | 24.21 | -5  | 56 | 23.00 | 28.92947 | 240.60 | 0.2  |
| 9  | 7  | 23  | 15 | 18.13 | -5  | 57 | 2.20  | 28.92859 | 240.59 | 0.1  |
| 9  | 8  | 23  | 15 | 12.05 | -5  | 57 | 41.40 | 28.92800 | 240.59 | 0.1  |
| 9  | 9  | 23  | 15 | 5.95  | -5  | 58 | 20.61 | 28.92772 | 240.58 | 0.1  |
| 9  | 10 | 23  | 14 | 59.85 | -5  | 58 | 59.80 | 28.92773 | 240.58 | 0.0  |
| 9  | 11 | 23  | 14 | 53.75 | -5  | 59 | 38.97 | 28.92804 | 240.59 | 0.0  |
| 9  | 12 | 23  | 14 | 47.64 | -6  | 0  | 18.11 | 28.92864 | 240.59 | 0.1  |
| 9  | 13 | 23  | 14 | 41.54 | -6  | 0  | 57.19 | 28.92954 | 240.60 | 0.1  |
| 9  | 14 | 23  | 14 | 35.44 | -6  | 1  | 36.21 | 28.93074 | 240.61 | 0.1  |
| 9  | 15 | 23  | 14 | 29.34 | -6  | 2  | 15.13 | 28.93224 | 240.62 | 0.2  |
| 9  | 16 | 23  | 14 | 23.25 | -6  | 2  | 53.95 | 28.93403 | 240.64 | 0.2  |
| 9  | 17 | 23  | 14 | 17.18 | -6  | 3  | 32.63 | 28.93612 | 240.65 | 0.2  |
| 9  | 18 | 23  | 14 | 11.12 | -6  | 4  | 11.17 | 28.93850 | 240.67 | 0.3  |
| 9  | 19 | 23  | 14 | 5.08  | -6  | 4  | 49.55 | 28.94118 | 240.70 | 0.3  |
| 9  | 20 | 23  | 13 | 59.06 | -6  | 5  | 27.74 | 28.94415 | 240.72 | 0.3  |
| 9  | 21 | 23  | 13 | 53.06 | -6  | 6  | 5.73  | 28.94742 | 240.75 | 0.4  |
| 9  | 22 | 23  | 13 | 47.09 | -6  | 6  | 43.53 | 28.95098 | 240.78 | 0.4  |
| 9  | 23 | 23  | 13 | 41.15 | -6  | 7  | 21.10 | 28.95484 | 240.81 | 0.4  |
| 9  | 24 | 23  | 13 | 35.23 | -6  | 7  | 58.47 | 28.95899 | 240.84 | 0.5  |
| 9  | 25 | 23  | 13 | 29.34 | -6  | 8  | 35.61 | 28.96343 | 240.88 | 0.5  |
| 9  | 26 | 23  | 13 | 23.49 | -6  | 9  | 12.52 | 28.96816 | 240.92 | 0.5  |
| 9  | 27 | 23  | 13 | 17.66 | -6  | 9  | 49.18 | 28.97319 | 240.96 | 0.5  |
| 9  | 28 | 23  | 13 | 11.87 | -6  | 10 | 25.58 | 28.97850 | 241.01 | 0.6  |
| 9  | 29 | 23  | 13 | 6.11  | -6  | 11 | 1.69  | 28.98410 | 241.05 | 0.6  |
| 9  | 30 | 23  | 13 | 0.40  | -6  | 11 | 37.47 | 28.98999 | 241.10 | 0.6  |

## 海王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視 亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |            |
| 9 1       | 18:37     | 96      | 00:32     | 59S     | 06:22     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 2       | 18:33     | 96      | 00:28     | 59S     | 06:18     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 3       | 18:29     | 96      | 00:24     | 59S     | 06:14     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 4       | 18:25     | 96      | 00:19     | 59S     | 06:10     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 5       | 18:21     | 96      | 00:15     | 59S     | 06:06     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 6       | 18:17     | 96      | 00:11     | 59S     | 06:02     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 7       | 18:13     | 96      | 00:07     | 59S     | 05:58     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 9       | 18:05     | 96      | 23:55     | 59S     | 05:50     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 10      | 18:01     | 96      | 23:51     | 59S     | 05:46     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 11      | 17:57     | 96      | 23:47     | 59S     | 05:42     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 12      | 17:53     | 96      | 23:43     | 59S     | 05:37     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 13      | 17:49     | 96      | 23:39     | 59S     | 05:33     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 14      | 17:45     | 96      | 23:35     | 59S     | 05:29     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 15      | 17:41     | 96      | 23:31     | 59S     | 05:25     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 16      | 17:37     | 96      | 23:27     | 59S     | 05:21     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 17      | 17:33     | 96      | 23:23     | 59S     | 05:17     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 18      | 17:29     | 96      | 23:19     | 59S     | 05:13     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 19      | 17:25     | 96      | 23:15     | 59S     | 05:09     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 20      | 17:21     | 96      | 23:11     | 59S     | 05:05     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 21      | 17:17     | 96      | 23:07     | 59S     | 05:01     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 22      | 17:13     | 96      | 23:03     | 59S     | 04:57     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 23      | 17:09     | 96      | 22:59     | 59S     | 04:53     | 264     | 2.36 2.33            | 1.00 | 7.8        |
| 9 24      | 17:05     | 97      | 22:55     | 59S     | 04:49     | 263     | 2.36 2.32            | 1.00 | 7.8        |
| 9 25      | 17:01     | 97      | 22:51     | 59S     | 04:45     | 263     | 2.36 2.32            | 1.00 | 7.8        |
| 9 26      | 16:57     | 97      | 22:47     | 59S     | 04:41     | 263     | 2.36 2.32            | 1.00 | 7.8        |
| 9 27      | 16:53     | 97      | 22:43     | 59S     | 04:37     | 263     | 2.36 2.32            | 1.00 | 7.8        |
| 9 28      | 16:49     | 97      | 22:39     | 59S     | 04:33     | 263     | 2.36 2.32            | 1.00 | 7.8        |
| 9 29      | 16:45     | 97      | 22:35     | 59S     | 04:29     | 263     | 2.36 2.32            | 1.00 | 7.8        |
| 9 30      | 16:41     | 97      | 22:31     | 59S     | 04:25     | 263     | 2.36 2.32            | 1.00 | 7.8        |

## 海 王 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 10 | 1  | 23  | 12 | 54.74 | -6  | 12 | 12.91 | 28.99616 | 241.15 | 0.7  |
| 10 | 2  | 23  | 12 | 49.13 | -6  | 12 | 47.97 | 29.00262 | 241.21 | 0.7  |
| 10 | 3  | 23  | 12 | 43.57 | -6  | 13 | 22.67 | 29.00935 | 241.26 | 0.7  |
| 10 | 4  | 23  | 12 | 38.07 | -6  | 13 | 56.98 | 29.01636 | 241.32 | 0.8  |
| 10 | 5  | 23  | 12 | 32.62 | -6  | 14 | 30.90 | 29.02365 | 241.38 | 0.8  |
| 10 | 6  | 23  | 12 | 27.22 | -6  | 15 | 4.43  | 29.03121 | 241.45 | 0.8  |
| 10 | 7  | 23  | 12 | 21.89 | -6  | 15 | 37.56 | 29.03904 | 241.51 | 0.9  |
| 10 | 8  | 23  | 12 | 16.61 | -6  | 16 | 10.28 | 29.04714 | 241.58 | 0.9  |
| 10 | 9  | 23  | 12 | 11.39 | -6  | 16 | 42.58 | 29.05550 | 241.65 | 0.9  |
| 10 | 10 | 23  | 12 | 6.24  | -6  | 17 | 14.44 | 29.06413 | 241.72 | 0.9  |
| 10 | 11 | 23  | 12 | 1.15  | -6  | 17 | 45.85 | 29.07301 | 241.79 | 1.0  |
| 10 | 12 | 23  | 11 | 56.13 | -6  | 18 | 16.80 | 29.08216 | 241.87 | 1.0  |
| 10 | 13 | 23  | 11 | 51.18 | -6  | 18 | 47.26 | 29.09156 | 241.95 | 1.0  |
| 10 | 14 | 23  | 11 | 46.30 | -6  | 19 | 17.22 | 29.10121 | 242.03 | 1.1  |
| 10 | 15 | 23  | 11 | 41.49 | -6  | 19 | 46.67 | 29.11111 | 242.11 | 1.1  |
| 10 | 16 | 23  | 11 | 36.77 | -6  | 20 | 15.58 | 29.12125 | 242.19 | 1.1  |
| 10 | 17 | 23  | 11 | 32.12 | -6  | 20 | 43.95 | 29.13164 | 242.28 | 1.1  |
| 10 | 18 | 23  | 11 | 27.56 | -6  | 21 | 11.76 | 29.14227 | 242.37 | 1.2  |
| 10 | 19 | 23  | 11 | 23.08 | -6  | 21 | 39.01 | 29.15314 | 242.46 | 1.2  |
| 10 | 20 | 23  | 11 | 18.68 | -6  | 22 | 5.69  | 29.16424 | 242.55 | 1.2  |
| 10 | 21 | 23  | 11 | 14.38 | -6  | 22 | 31.80 | 29.17558 | 242.65 | 1.2  |
| 10 | 22 | 23  | 11 | 10.15 | -6  | 22 | 57.34 | 29.18715 | 242.74 | 1.3  |
| 10 | 23 | 23  | 11 | 6.02  | -6  | 23 | 22.31 | 29.19894 | 242.84 | 1.3  |
| 10 | 24 | 23  | 11 | 1.97  | -6  | 23 | 46.70 | 29.21095 | 242.94 | 1.3  |
| 10 | 25 | 23  | 10 | 58.01 | -6  | 24 | 10.49 | 29.22318 | 243.04 | 1.3  |
| 10 | 26 | 23  | 10 | 54.14 | -6  | 24 | 33.66 | 29.23563 | 243.15 | 1.4  |
| 10 | 27 | 23  | 10 | 50.37 | -6  | 24 | 56.20 | 29.24829 | 243.25 | 1.4  |
| 10 | 28 | 23  | 10 | 46.70 | -6  | 25 | 18.07 | 29.26116 | 243.36 | 1.4  |
| 10 | 29 | 23  | 10 | 43.13 | -6  | 25 | 39.26 | 29.27423 | 243.47 | 1.4  |
| 10 | 30 | 23  | 10 | 39.67 | -6  | 25 | 59.76 | 29.28750 | 243.58 | 1.5  |
| 10 | 31 | 23  | 10 | 36.31 | -6  | 26 | 19.57 | 29.30096 | 243.69 | 1.5  |

## 海王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 10 1      | 16:37     | 97      | 22:27     | 59S     | 04:21     | 263     | 2.36         | 2.32          | 1.00 | 7.8           |
| 10 2      | 16:33     | 97      | 22:23     | 59S     | 04:16     | 263     | 2.36         | 2.32          | 1.00 | 7.8           |
| 10 3      | 16:29     | 97      | 22:19     | 59S     | 04:12     | 263     | 2.35         | 2.32          | 1.00 | 7.8           |
| 10 4      | 16:25     | 97      | 22:15     | 59S     | 04:08     | 263     | 2.35         | 2.32          | 1.00 | 7.8           |
| 10 5      | 16:21     | 97      | 22:11     | 59S     | 04:04     | 263     | 2.35         | 2.32          | 1.00 | 7.8           |
| 10 6      | 16:17     | 97      | 22:07     | 59S     | 04:00     | 263     | 2.35         | 2.32          | 1.00 | 7.8           |
| 10 7      | 16:13     | 97      | 22:03     | 59S     | 03:56     | 263     | 2.35         | 2.32          | 1.00 | 7.8           |
| 10 8      | 16:09     | 97      | 21:58     | 59S     | 03:52     | 263     | 2.35         | 2.32          | 1.00 | 7.8           |
| 10 9      | 16:05     | 97      | 21:54     | 59S     | 03:48     | 263     | 2.35         | 2.32          | 1.00 | 7.8           |
| 10 10     | 16:01     | 97      | 21:50     | 59S     | 03:44     | 263     | 2.35         | 2.32          | 1.00 | 7.8           |
| 10 11     | 15:57     | 97      | 21:46     | 59S     | 03:40     | 263     | 2.35         | 2.32          | 1.00 | 7.8           |
| 10 12     | 15:53     | 97      | 21:42     | 59S     | 03:36     | 263     | 2.35         | 2.32          | 1.00 | 7.8           |
| 10 13     | 15:49     | 97      | 21:38     | 59S     | 03:32     | 263     | 2.35         | 2.31          | 1.00 | 7.8           |
| 10 14     | 15:45     | 97      | 21:34     | 59S     | 03:28     | 263     | 2.35         | 2.31          | 1.00 | 7.8           |
| 10 15     | 15:41     | 97      | 21:30     | 59S     | 03:24     | 263     | 2.35         | 2.31          | 1.00 | 7.8           |
| 10 16     | 15:37     | 97      | 21:26     | 59S     | 03:20     | 263     | 2.35         | 2.31          | 1.00 | 7.8           |
| 10 17     | 15:33     | 97      | 21:22     | 59S     | 03:16     | 263     | 2.34         | 2.31          | 1.00 | 7.8           |
| 10 18     | 15:29     | 97      | 21:18     | 59S     | 03:12     | 263     | 2.34         | 2.31          | 1.00 | 7.8           |
| 10 19     | 15:25     | 97      | 21:14     | 59S     | 03:08     | 263     | 2.34         | 2.31          | 1.00 | 7.8           |
| 10 20     | 15:21     | 97      | 21:10     | 59S     | 03:04     | 263     | 2.34         | 2.31          | 1.00 | 7.8           |
| 10 21     | 15:17     | 97      | 21:06     | 59S     | 03:00     | 263     | 2.34         | 2.31          | 1.00 | 7.8           |
| 10 22     | 15:13     | 97      | 21:02     | 59S     | 02:56     | 263     | 2.34         | 2.31          | 1.00 | 7.8           |
| 10 23     | 15:09     | 97      | 20:58     | 59S     | 02:52     | 263     | 2.34         | 2.31          | 1.00 | 7.8           |
| 10 24     | 15:05     | 97      | 20:54     | 59S     | 02:48     | 263     | 2.34         | 2.31          | 1.00 | 7.8           |
| 10 25     | 15:01     | 97      | 20:50     | 59S     | 02:44     | 263     | 2.34         | 2.30          | 1.00 | 7.8           |
| 10 26     | 14:57     | 97      | 20:46     | 59S     | 02:40     | 263     | 2.34         | 2.30          | 1.00 | 7.8           |
| 10 27     | 14:53     | 97      | 20:42     | 59S     | 02:36     | 263     | 2.34         | 2.30          | 1.00 | 7.8           |
| 10 28     | 14:49     | 97      | 20:38     | 59S     | 02:32     | 263     | 2.33         | 2.30          | 1.00 | 7.8           |
| 10 29     | 14:45     | 97      | 20:34     | 59S     | 02:28     | 263     | 2.33         | 2.30          | 1.00 | 7.8           |
| 10 30     | 14:41     | 97      | 20:30     | 58S     | 02:24     | 263     | 2.33         | 2.30          | 1.00 | 7.8           |
| 10 31     | 14:37     | 97      | 20:26     | 58S     | 02:20     | 263     | 2.33         | 2.30          | 1.00 | 7.8           |

## 海王星位置表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 11 | 1  | 23  | 10 | 33.06 | -6  | 26 | 38.69 | 29.31462 | 243.80 | 1.5  |
| 11 | 2  | 23  | 10 | 29.92 | -6  | 26 | 57.12 | 29.32846 | 243.92 | 1.5  |
| 11 | 3  | 23  | 10 | 26.88 | -6  | 27 | 14.87 | 29.34248 | 244.03 | 1.5  |
| 11 | 4  | 23  | 10 | 23.95 | -6  | 27 | 31.92 | 29.35667 | 244.15 | 1.6  |
| 11 | 5  | 23  | 10 | 21.13 | -6  | 27 | 48.27 | 29.37104 | 244.27 | 1.6  |
| 11 | 6  | 23  | 10 | 18.41 | -6  | 28 | 3.92  | 29.38558 | 244.39 | 1.6  |
| 11 | 7  | 23  | 10 | 15.81 | -6  | 28 | 18.85 | 29.40027 | 244.51 | 1.6  |
| 11 | 8  | 23  | 10 | 13.31 | -6  | 28 | 33.06 | 29.41513 | 244.64 | 1.6  |
| 11 | 9  | 23  | 10 | 10.93 | -6  | 28 | 46.54 | 29.43014 | 244.76 | 1.6  |
| 11 | 10 | 23  | 10 | 8.66  | -6  | 28 | 59.26 | 29.44529 | 244.89 | 1.7  |
| 11 | 11 | 23  | 10 | 6.51  | -6  | 29 | 11.23 | 29.46059 | 245.02 | 1.7  |
| 11 | 12 | 23  | 10 | 4.48  | -6  | 29 | 22.43 | 29.47604 | 245.14 | 1.7  |
| 11 | 13 | 23  | 10 | 2.57  | -6  | 29 | 32.85 | 29.49161 | 245.27 | 1.7  |
| 11 | 14 | 23  | 10 | 0.78  | -6  | 29 | 42.50 | 29.50732 | 245.41 | 1.7  |
| 11 | 15 | 23  | 9  | 59.12 | -6  | 29 | 51.37 | 29.52315 | 245.54 | 1.7  |
| 11 | 16 | 23  | 9  | 57.57 | -6  | 29 | 59.45 | 29.53910 | 245.67 | 1.7  |
| 11 | 17 | 23  | 9  | 56.15 | -6  | 30 | 6.77  | 29.55518 | 245.80 | 1.8  |
| 11 | 18 | 23  | 9  | 54.84 | -6  | 30 | 13.32 | 29.57136 | 245.94 | 1.8  |
| 11 | 19 | 23  | 9  | 53.66 | -6  | 30 | 19.10 | 29.58765 | 246.07 | 1.8  |
| 11 | 20 | 23  | 9  | 52.60 | -6  | 30 | 24.11 | 29.60404 | 246.21 | 1.8  |
| 11 | 21 | 23  | 9  | 51.66 | -6  | 30 | 28.36 | 29.62054 | 246.35 | 1.8  |
| 11 | 22 | 23  | 9  | 50.84 | -6  | 30 | 31.82 | 29.63712 | 246.48 | 1.8  |
| 11 | 23 | 23  | 9  | 50.14 | -6  | 30 | 34.48 | 29.65379 | 246.62 | 1.8  |
| 11 | 24 | 23  | 9  | 49.58 | -6  | 30 | 36.33 | 29.67055 | 246.76 | 1.8  |
| 11 | 25 | 23  | 9  | 49.14 | -6  | 30 | 37.36 | 29.68738 | 246.90 | 1.8  |
| 11 | 26 | 23  | 9  | 48.83 | -6  | 30 | 37.55 | 29.70429 | 247.04 | 1.8  |
| 11 | 27 | 23  | 9  | 48.66 | -6  | 30 | 36.91 | 29.72126 | 247.18 | 1.8  |
| 11 | 28 | 23  | 9  | 48.61 | -6  | 30 | 35.45 | 29.73829 | 247.33 | 1.9  |
| 11 | 29 | 23  | 9  | 48.70 | -6  | 30 | 33.17 | 29.75538 | 247.47 | 1.9  |
| 11 | 30 | 23  | 9  | 48.91 | -6  | 30 | 30.09 | 29.77251 | 247.61 | 1.9  |

## 海王星出沒時間表

東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視<br>赤道<br>" | 直徑<br>兩極<br>" | 相位   | 視<br>亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|--------------|---------------|------|---------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |              |               |      |               |
| 11 1      | 14:33     | 97      | 20:22     | 58S     | 02:16     | 263     | 2.33         | 2.30          | 1.00 | 7.8           |
| 11 2      | 14:29     | 97      | 20:18     | 58S     | 02:12     | 263     | 2.33         | 2.30          | 1.00 | 7.8           |
| 11 3      | 14:25     | 97      | 20:14     | 58S     | 02:08     | 263     | 2.33         | 2.30          | 1.00 | 7.8           |
| 11 4      | 14:21     | 97      | 20:10     | 58S     | 02:04     | 263     | 2.33         | 2.29          | 1.00 | 7.8           |
| 11 5      | 14:17     | 97      | 20:07     | 58S     | 02:00     | 263     | 2.33         | 2.29          | 1.00 | 7.8           |
| 11 6      | 14:13     | 97      | 20:03     | 58S     | 01:56     | 263     | 2.33         | 2.29          | 1.00 | 7.9           |
| 11 7      | 14:09     | 97      | 19:59     | 58S     | 01:52     | 263     | 2.32         | 2.29          | 1.00 | 7.9           |
| 11 8      | 14:05     | 97      | 19:55     | 58S     | 01:48     | 263     | 2.32         | 2.29          | 1.00 | 7.9           |
| 11 9      | 14:01     | 97      | 19:51     | 58S     | 01:44     | 263     | 2.32         | 2.29          | 1.00 | 7.9           |
| 11 10     | 13:57     | 97      | 19:47     | 58S     | 01:40     | 263     | 2.32         | 2.29          | 1.00 | 7.9           |
| 11 11     | 13:53     | 97      | 19:43     | 58S     | 01:36     | 263     | 2.32         | 2.29          | 1.00 | 7.9           |
| 11 12     | 13:49     | 97      | 19:39     | 58S     | 01:32     | 263     | 2.32         | 2.29          | 1.00 | 7.9           |
| 11 13     | 13:45     | 97      | 19:35     | 58S     | 01:28     | 263     | 2.32         | 2.28          | 1.00 | 7.9           |
| 11 14     | 13:41     | 97      | 19:31     | 58S     | 01:24     | 263     | 2.32         | 2.28          | 1.00 | 7.9           |
| 11 15     | 13:37     | 97      | 19:27     | 58S     | 01:20     | 263     | 2.31         | 2.28          | 1.00 | 7.9           |
| 11 16     | 13:34     | 97      | 19:23     | 58S     | 01:16     | 263     | 2.31         | 2.28          | 1.00 | 7.9           |
| 11 17     | 13:30     | 97      | 19:19     | 58S     | 01:12     | 263     | 2.31         | 2.28          | 1.00 | 7.9           |
| 11 18     | 13:26     | 97      | 19:15     | 58S     | 01:08     | 263     | 2.31         | 2.28          | 1.00 | 7.9           |
| 11 19     | 13:22     | 97      | 19:11     | 58S     | 01:04     | 263     | 2.31         | 2.28          | 1.00 | 7.9           |
| 11 20     | 13:18     | 97      | 19:07     | 58S     | 01:00     | 263     | 2.31         | 2.28          | 1.00 | 7.9           |
| 11 21     | 13:14     | 97      | 19:03     | 58S     | 00:56     | 263     | 2.31         | 2.27          | 1.00 | 7.9           |
| 11 22     | 13:10     | 97      | 18:59     | 58S     | 00:52     | 263     | 2.31         | 2.27          | 1.00 | 7.9           |
| 11 23     | 13:06     | 97      | 18:55     | 58S     | 00:48     | 263     | 2.30         | 2.27          | 1.00 | 7.9           |
| 11 24     | 13:02     | 97      | 18:51     | 58S     | 00:45     | 263     | 2.30         | 2.27          | 1.00 | 7.9           |
| 11 25     | 12:58     | 97      | 18:47     | 58S     | 00:41     | 263     | 2.30         | 2.27          | 1.00 | 7.9           |
| 11 26     | 12:54     | 97      | 18:43     | 58S     | 00:37     | 263     | 2.30         | 2.27          | 1.00 | 7.9           |
| 11 27     | 12:50     | 97      | 18:39     | 58S     | 00:33     | 263     | 2.30         | 2.27          | 1.00 | 7.9           |
| 11 28     | 12:46     | 97      | 18:36     | 58S     | 00:29     | 263     | 2.30         | 2.27          | 1.00 | 7.9           |
| 11 29     | 12:42     | 97      | 18:32     | 58S     | 00:25     | 263     | 2.30         | 2.26          | 1.00 | 7.9           |
| 11 30     | 12:38     | 97      | 18:28     | 58S     | 00:21     | 263     | 2.30         | 2.26          | 1.00 | 7.9           |

## 海 王 星 位 置 表

世界時 0 時

| 日期 |    | 赤 經 |    |       | 赤 緯 |    |       | 距 離      | 光 程    | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|--------|------|
| 月  | 日  | h   | m  | s     | °   | '  | "     | AU       | 分      | °    |
| 12 | 1  | 23  | 9  | 49.25 | -6  | 30 | 26.21 | 29.78969 | 247.75 | 1.9  |
| 12 | 2  | 23  | 9  | 49.72 | -6  | 30 | 21.53 | 29.80691 | 247.90 | 1.9  |
| 12 | 3  | 23  | 9  | 50.32 | -6  | 30 | 16.06 | 29.82415 | 248.04 | 1.9  |
| 12 | 4  | 23  | 9  | 51.04 | -6  | 30 | 9.79  | 29.84143 | 248.18 | 1.9  |
| 12 | 5  | 23  | 9  | 51.88 | -6  | 30 | 2.71  | 29.85873 | 248.33 | 1.9  |
| 12 | 6  | 23  | 9  | 52.86 | -6  | 29 | 54.83 | 29.87604 | 248.47 | 1.9  |
| 12 | 7  | 23  | 9  | 53.96 | -6  | 29 | 46.14 | 29.89337 | 248.62 | 1.9  |
| 12 | 8  | 23  | 9  | 55.20 | -6  | 29 | 36.63 | 29.91070 | 248.76 | 1.9  |
| 12 | 9  | 23  | 9  | 56.56 | -6  | 29 | 26.31 | 29.92803 | 248.90 | 1.9  |
| 12 | 10 | 23  | 9  | 58.05 | -6  | 29 | 15.17 | 29.94536 | 249.05 | 1.9  |
| 12 | 11 | 23  | 9  | 59.67 | -6  | 29 | 3.21  | 29.96268 | 249.19 | 1.9  |
| 12 | 12 | 23  | 10 | 1.43  | -6  | 28 | 50.44 | 29.97998 | 249.34 | 1.9  |
| 12 | 13 | 23  | 10 | 3.31  | -6  | 28 | 36.87 | 29.99727 | 249.48 | 1.9  |
| 12 | 14 | 23  | 10 | 5.32  | -6  | 28 | 22.51 | 30.01453 | 249.62 | 1.9  |
| 12 | 15 | 23  | 10 | 7.45  | -6  | 28 | 7.37  | 30.03176 | 249.77 | 1.9  |
| 12 | 16 | 23  | 10 | 9.71  | -6  | 27 | 51.46 | 30.04896 | 249.91 | 1.9  |
| 12 | 17 | 23  | 10 | 12.09 | -6  | 27 | 34.79 | 30.06612 | 250.05 | 1.9  |
| 12 | 18 | 23  | 10 | 14.60 | -6  | 27 | 17.36 | 30.08324 | 250.19 | 1.9  |
| 12 | 19 | 23  | 10 | 17.22 | -6  | 26 | 59.17 | 30.10030 | 250.34 | 1.9  |
| 12 | 20 | 23  | 10 | 19.97 | -6  | 26 | 40.21 | 30.11732 | 250.48 | 1.8  |
| 12 | 21 | 23  | 10 | 22.84 | -6  | 26 | 20.47 | 30.13427 | 250.62 | 1.8  |
| 12 | 22 | 23  | 10 | 25.84 | -6  | 25 | 59.96 | 30.15116 | 250.76 | 1.8  |
| 12 | 23 | 23  | 10 | 28.97 | -6  | 25 | 38.65 | 30.16798 | 250.90 | 1.8  |
| 12 | 24 | 23  | 10 | 32.21 | -6  | 25 | 16.57 | 30.18472 | 251.04 | 1.8  |
| 12 | 25 | 23  | 10 | 35.59 | -6  | 24 | 53.72 | 30.20139 | 251.18 | 1.8  |
| 12 | 26 | 23  | 10 | 39.09 | -6  | 24 | 30.12 | 30.21797 | 251.32 | 1.8  |
| 12 | 27 | 23  | 10 | 42.70 | -6  | 24 | 5.78  | 30.23445 | 251.45 | 1.8  |
| 12 | 28 | 23  | 10 | 46.44 | -6  | 23 | 40.71 | 30.25084 | 251.59 | 1.8  |
| 12 | 29 | 23  | 10 | 50.29 | -6  | 23 | 14.94 | 30.26713 | 251.72 | 1.8  |
| 12 | 30 | 23  | 10 | 54.25 | -6  | 22 | 48.45 | 30.28331 | 251.86 | 1.7  |
| 12 | 31 | 23  | 10 | 58.33 | -6  | 22 | 21.27 | 30.29938 | 251.99 | 1.7  |

## 海王星出沒時間表

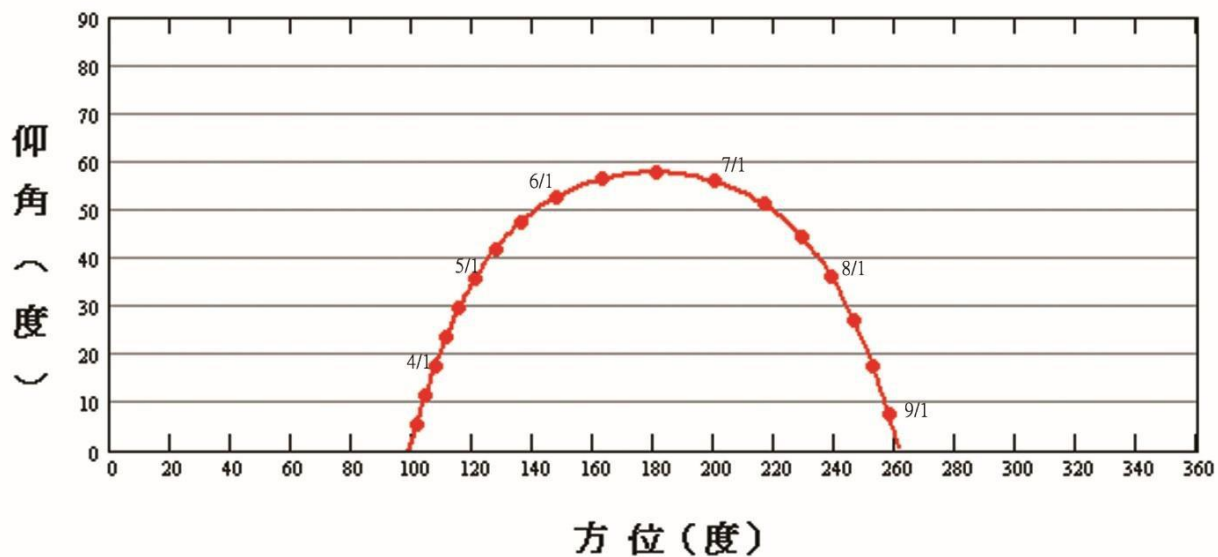
東經：121.52° · 北緯：25.10°

東經 120° 平太陽時

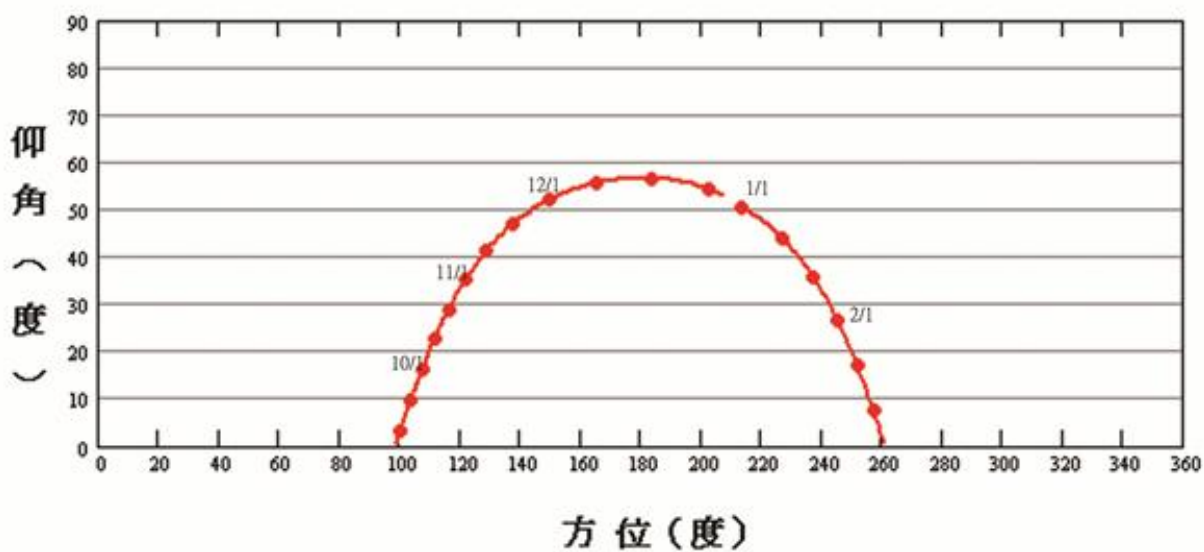
| 日期<br>月 日 | 出         |         | 中 天       |         | 沒         |         | 視 直徑<br>赤道 兩極<br>" " | 相位   | 視 亮度<br>星等 |
|-----------|-----------|---------|-----------|---------|-----------|---------|----------------------|------|------------|
|           | 時間<br>h m | 方位<br>° | 時間<br>h m | 仰角<br>° | 時間<br>h m | 方位<br>° |                      |      |            |
| 12 1      | 12:34     | 97      | 18:24     | 58S     | 00:17     | 263     | 2.29 2.26            | 1.00 | 7.9        |
| 12 2      | 12:31     | 97      | 18:20     | 58S     | 00:13     | 263     | 2.29 2.26            | 1.00 | 7.9        |
| 12 3      | 12:27     | 97      | 18:16     | 58S     | 00:09     | 263     | 2.29 2.26            | 1.00 | 7.9        |
| 12 4      | 12:23     | 97      | 18:12     | 58S     | 00:05     | 263     | 2.29 2.26            | 1.00 | 7.9        |
| 12 5      | 12:19     | 97      | 18:08     | 58S     | 00:01     | 263     | 2.29 2.26            | 1.00 | 7.9        |
| 12 6      | 12:15     | 97      | 18:04     | 58S     | 23:54     | 263     | 2.29 2.25            | 1.00 | 7.9        |
| 12 7      | 12:11     | 97      | 18:00     | 58S     | 23:50     | 263     | 2.29 2.25            | 1.00 | 7.9        |
| 12 8      | 12:07     | 97      | 17:56     | 58S     | 23:46     | 263     | 2.28 2.25            | 1.00 | 7.9        |
| 12 9      | 12:03     | 97      | 17:52     | 58S     | 23:42     | 263     | 2.28 2.25            | 1.00 | 7.9        |
| 12 10     | 11:59     | 97      | 17:49     | 58S     | 23:38     | 263     | 2.28 2.25            | 1.00 | 7.9        |
| 12 11     | 11:55     | 97      | 17:45     | 58S     | 23:34     | 263     | 2.28 2.25            | 1.00 | 7.9        |
| 12 12     | 11:51     | 97      | 17:41     | 58S     | 23:30     | 263     | 2.28 2.25            | 1.00 | 7.9        |
| 12 13     | 11:47     | 97      | 17:37     | 58S     | 23:26     | 263     | 2.28 2.25            | 1.00 | 7.9        |
| 12 14     | 11:44     | 97      | 17:33     | 58S     | 23:22     | 263     | 2.28 2.24            | 1.00 | 7.9        |
| 12 15     | 11:40     | 97      | 17:29     | 58S     | 23:18     | 263     | 2.28 2.24            | 1.00 | 7.9        |
| 12 16     | 11:36     | 97      | 17:25     | 58S     | 23:15     | 263     | 2.27 2.24            | 1.00 | 7.9        |
| 12 17     | 11:32     | 97      | 17:21     | 58S     | 23:11     | 263     | 2.27 2.24            | 1.00 | 7.9        |
| 12 18     | 11:28     | 97      | 17:17     | 58S     | 23:07     | 263     | 2.27 2.24            | 1.00 | 7.9        |
| 12 19     | 11:24     | 97      | 17:13     | 58S     | 23:03     | 263     | 2.27 2.24            | 1.00 | 7.9        |
| 12 20     | 11:20     | 97      | 17:10     | 58S     | 22:59     | 263     | 2.27 2.24            | 1.00 | 7.9        |
| 12 21     | 11:16     | 97      | 17:06     | 58S     | 22:55     | 263     | 2.27 2.24            | 1.00 | 7.9        |
| 12 22     | 11:12     | 97      | 17:02     | 59S     | 22:51     | 263     | 2.27 2.23            | 1.00 | 7.9        |
| 12 23     | 11:08     | 97      | 16:58     | 59S     | 22:47     | 263     | 2.26 2.23            | 1.00 | 7.9        |
| 12 24     | 11:05     | 97      | 16:54     | 59S     | 22:44     | 263     | 2.26 2.23            | 1.00 | 7.9        |
| 12 25     | 11:01     | 97      | 16:50     | 59S     | 22:40     | 263     | 2.26 2.23            | 1.00 | 7.9        |
| 12 26     | 10:57     | 97      | 16:46     | 59S     | 22:36     | 263     | 2.26 2.23            | 1.00 | 7.9        |
| 12 27     | 10:53     | 97      | 16:42     | 59S     | 22:32     | 263     | 2.26 2.23            | 1.00 | 7.9        |
| 12 28     | 10:49     | 97      | 16:39     | 59S     | 22:28     | 263     | 2.26 2.23            | 1.00 | 7.9        |
| 12 29     | 10:45     | 97      | 16:35     | 59S     | 22:24     | 263     | 2.26 2.23            | 1.00 | 7.9        |
| 12 30     | 10:41     | 97      | 16:31     | 59S     | 22:20     | 263     | 2.26 2.22            | 1.00 | 7.9        |
| 12 31     | 10:37     | 97      | 16:27     | 59S     | 22:17     | 263     | 2.26 2.22            | 1.00 | 7.9        |



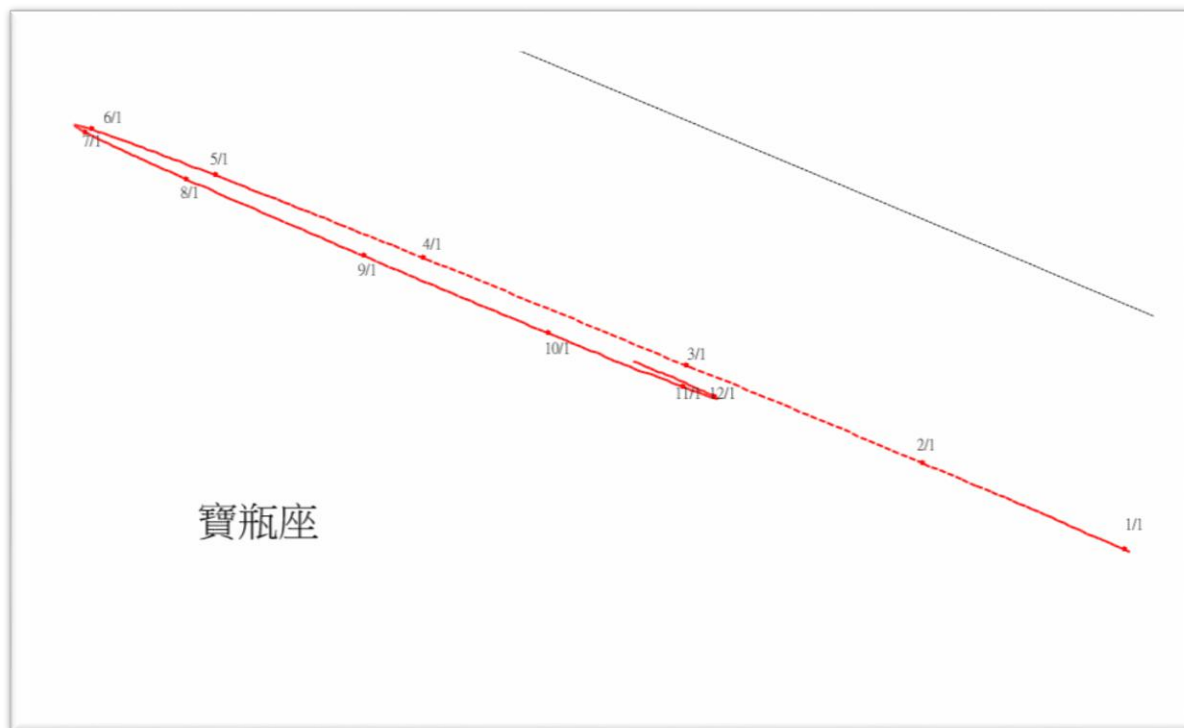
### 日出時海王星方位與仰角



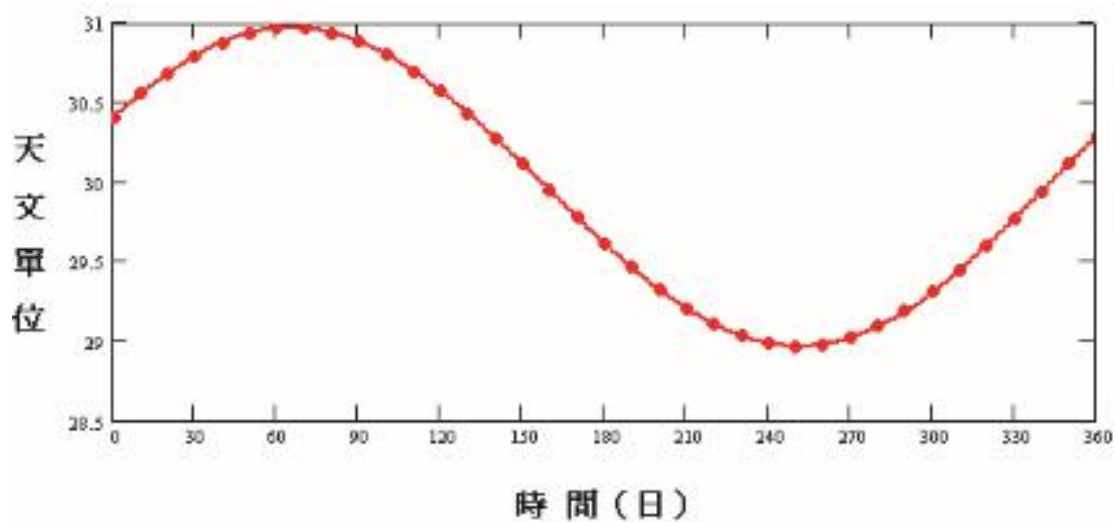
### 日沒時海王星方位與仰角



### 海王星在天球上運行的軌跡圖



### 海王星與地球距離變化圖



## 冥王星位置與出沒時間表

東經: 121.52°, 北緯: 25.10°

東經 120° 平太陽時

| 日期 |    | 出     |     | 沒     |     | 赤 經 |    |       | 赤 緯 |    |       | 距 離     | 視 亮 度 |
|----|----|-------|-----|-------|-----|-----|----|-------|-----|----|-------|---------|-------|
| 月  | 日  | 時間    | 方位  | 時間    | 方位  | h   | m  | s     | °   | '  | "     | AU      | 星等    |
| 1  | 1  | 07:22 | 114 | 17:59 | 246 | 19  | 29 | 8.95  | -21 | 57 | 37.72 | 34.6787 | 14.3  |
|    | 11 | 06:45 | 114 | 17:21 | 246 | 19  | 30 | 35.79 | -21 | 55 | 27.31 | 34.7017 | 14.3  |
|    | 21 | 06:07 | 114 | 16:44 | 246 | 19  | 32 | 2.51  | -21 | 53 | 13.98 | 34.6953 | 14.3  |
| 2  | 1  | 05:25 | 114 | 16:02 | 246 | 19  | 33 | 35.59 | -21 | 50 | 50.07 | 34.6550 | 14.3  |
|    | 11 | 04:47 | 114 | 15:24 | 246 | 19  | 34 | 55.88 | -21 | 48 | 46.88 | 34.5893 | 14.3  |
|    | 21 | 04:09 | 114 | 14:46 | 246 | 19  | 36 | 10.12 | -21 | 46 | 55.60 | 34.4984 | 14.3  |
| 3  | 1  | 03:38 | 114 | 14:16 | 246 | 19  | 37 | 3.98  | -21 | 45 | 38.18 | 34.4094 | 14.3  |
|    | 11 | 03:00 | 114 | 13:37 | 246 | 19  | 38 | 3.11  | -21 | 44 | 19.94 | 34.2806 | 14.3  |
|    | 21 | 02:21 | 114 | 12:59 | 246 | 19  | 38 | 51.95 | -21 | 43 | 25.25 | 34.1362 | 14.3  |
| 4  | 1  | 01:38 | 114 | 12:16 | 246 | 19  | 39 | 32.56 | -21 | 42 | 55.83 | 33.9645 | 14.3  |
|    | 11 | 01:00 | 114 | 11:37 | 246 | 19  | 39 | 56.71 | -21 | 42 | 59.56 | 33.8019 | 14.3  |
|    | 21 | 00:20 | 114 | 10:58 | 246 | 19  | 40 | 8.36  | -21 | 43 | 33.60 | 33.6381 | 14.3  |
| 5  | 1  | 23:37 | 114 | 10:19 | 246 | 19  | 40 | 7.54  | -21 | 44 | 37.74 | 33.4782 | 14.3  |
|    | 11 | 22:58 | 114 | 09:39 | 246 | 19  | 39 | 54.49 | -21 | 46 | 11.00 | 33.3267 | 14.3  |
|    | 21 | 22:18 | 114 | 08:59 | 246 | 19  | 39 | 29.95 | -21 | 48 | 11.60 | 33.1886 | 14.2  |
| 6  | 1  | 21:34 | 114 | 08:15 | 246 | 19  | 38 | 50.96 | -21 | 50 | 52.16 | 33.0567 | 14.2  |
|    | 11 | 20:54 | 114 | 07:35 | 246 | 19  | 38 | 6.10  | -21 | 53 | 39.06 | 32.9592 | 14.2  |
|    | 21 | 20:14 | 114 | 06:55 | 246 | 19  | 37 | 14.07 | -21 | 56 | 41.01 | 32.8861 | 14.2  |
| 7  | 1  | 19:34 | 114 | 06:15 | 246 | 19  | 36 | 16.71 | -21 | 59 | 53.23 | 32.8397 | 14.2  |
|    | 11 | 18:54 | 114 | 05:34 | 246 | 19  | 35 | 16.21 | -22 | 3  | 10.28 | 32.8217 | 14.2  |
|    | 21 | 18:14 | 114 | 04:54 | 246 | 19  | 34 | 14.87 | -22 | 6  | 26.42 | 32.8327 | 14.2  |
| 8  | 1  | 17:29 | 114 | 04:09 | 246 | 19  | 33 | 9.01  | -22 | 9  | 55.02 | 32.8782 | 14.2  |
|    | 11 | 16:49 | 114 | 03:29 | 246 | 19  | 32 | 13.08 | -22 | 12 | 52.96 | 32.9491 | 14.2  |
|    | 21 | 16:09 | 114 | 02:49 | 246 | 19  | 31 | 23.11 | -22 | 15 | 35.28 | 33.0458 | 14.2  |
| 9  | 1  | 15:25 | 114 | 02:05 | 246 | 19  | 30 | 37.28 | -22 | 18 | 11.03 | 33.1793 | 14.3  |
|    | 11 | 14:46 | 115 | 01:25 | 245 | 19  | 30 | 5.74  | -22 | 20 | 8.54  | 33.3216 | 14.3  |
|    | 21 | 14:06 | 115 | 00:45 | 245 | 19  | 29 | 45.13 | -22 | 21 | 41.06 | 33.4796 | 14.3  |
| 10 | 1  | 13:27 | 115 | 00:05 | 245 | 19  | 29 | 36.47 | -22 | 22 | 46.97 | 33.6491 | 14.3  |
|    | 11 | 12:47 | 115 | 23:22 | 245 | 19  | 29 | 40.41 | -22 | 23 | 25.09 | 33.8252 | 14.3  |
|    | 21 | 12:08 | 115 | 22:43 | 245 | 19  | 29 | 57.03 | -22 | 23 | 35.33 | 34.0030 | 14.3  |
| 11 | 1  | 11:26 | 115 | 22:00 | 245 | 19  | 30 | 29.81 | -22 | 23 | 15.20 | 34.1945 | 14.3  |
|    | 11 | 10:47 | 115 | 21:22 | 245 | 19  | 31 | 12.18 | -22 | 22 | 29.58 | 34.3596 | 14.3  |
|    | 21 | 10:08 | 115 | 20:44 | 245 | 19  | 32 | 5.58  | -22 | 21 | 19.45 | 34.5111 | 14.3  |
| 12 | 1  | 09:30 | 115 | 20:05 | 245 | 19  | 33 | 8.80  | -22 | 19 | 47.23 | 34.6450 | 14.4  |
|    | 11 | 08:52 | 114 | 19:27 | 246 | 19  | 34 | 20.30 | -22 | 17 | 56.18 | 34.7572 | 14.4  |
|    | 21 | 08:14 | 114 | 18:49 | 246 | 19  | 35 | 38.42 | -22 | 15 | 49.61 | 34.8450 | 14.4  |
|    | 31 | 07:36 | 114 | 18:11 | 246 | 19  | 37 | 1.33  | -22 | 13 | 31.20 | 34.9057 | 14.4  |

## 穀神星 ( Ceres ) 位置與出沒時間表

東經: 121.52° , 北緯: 25.10°

東經 120° 平太陽時

| 日期 |    | 出     |     | 沒     |     | 赤 經 |    |       | 赤 緯 |    |       | 距離     | 視<br>亮度<br>星等 |
|----|----|-------|-----|-------|-----|-----|----|-------|-----|----|-------|--------|---------------|
| 月  | 日  | 時間    | 方位  | 時間    | 方位  | h   | m  | s     | °   | '  | "     | AU     |               |
| 1  | 1  | 02:54 | 103 | 14:13 | 257 | 15  | 21 | 7.29  | -11 | 50 | 23.73 | 3.1820 | 8.9           |
|    | 11 | 02:31 | 104 | 13:47 | 256 | 15  | 36 | 1.93  | -12 | 47 | 58.24 | 3.0824 | 8.9           |
|    | 21 | 02:08 | 105 | 13:20 | 255 | 15  | 50 | 16.65 | -13 | 37 | 53.11 | 2.9744 | 8.9           |
| 2  | 1  | 01:41 | 106 | 12:50 | 254 | 16  | 4  | 59.11 | -14 | 24 | 14.58 | 2.8473 | 8.8           |
|    | 11 | 01:15 | 106 | 12:21 | 254 | 16  | 17 | 15.15 | -14 | 59 | 0.32  | 2.7257 | 8.7           |
|    | 21 | 00:48 | 107 | 11:52 | 253 | 16  | 28 | 13.85 | -15 | 27 | 21.95 | 2.6004 | 8.7           |
| 3  | 1  | 00:24 | 107 | 11:28 | 253 | 16  | 35 | 55.43 | -15 | 46 | 0.42  | 2.4986 | 8.6           |
|    | 11 | 23:51 | 108 | 10:56 | 252 | 16  | 43 | 55.96 | -16 | 5  | 1.04  | 2.3716 | 8.5           |
|    | 21 | 23:18 | 108 | 10:22 | 252 | 16  | 49 | 53.23 | -16 | 20 | 17.08 | 2.2475 | 8.3           |
| 4  | 1  | 22:39 | 108 | 09:42 | 252 | 16  | 53 | 44.61 | -16 | 34 | 9.50  | 2.1178 | 8.2           |
|    | 11 | 22:00 | 108 | 09:03 | 252 | 16  | 54 | 31.21 | -16 | 45 | 16.08 | 2.0101 | 8.0           |
|    | 21 | 21:19 | 108 | 08:21 | 252 | 16  | 52 | 34.33 | -16 | 55 | 59.11 | 1.9162 | 7.8           |
| 5  | 1  | 20:35 | 109 | 07:37 | 251 | 16  | 47 | 57.18 | -17 | 6  | 59.56 | 1.8399 | 7.6           |
|    | 11 | 19:50 | 109 | 06:50 | 251 | 16  | 40 | 57.61 | -17 | 18 | 39.78 | 1.7855 | 7.4           |
|    | 21 | 19:02 | 109 | 06:02 | 251 | 16  | 32 | 14.77 | -17 | 31 | 20.18 | 1.7561 | 7.1           |
| 6  | 1  | 18:09 | 109 | 05:08 | 251 | 16  | 21 | 44.33 | -17 | 46 | 47.21 | 1.7550 | 7.0           |
|    | 11 | 17:21 | 110 | 04:19 | 250 | 16  | 12 | 28.54 | -18 | 2  | 52.33 | 1.7829 | 7.3           |
|    | 21 | 16:34 | 110 | 03:31 | 250 | 16  | 4  | 30.35 | -18 | 21 | 52.24 | 1.8369 | 7.5           |
| 7  | 1  | 15:50 | 111 | 02:45 | 250 | 15  | 58 | 31.88 | -18 | 44 | 35.23 | 1.9142 | 7.8           |
|    | 11 | 15:08 | 111 | 02:01 | 249 | 15  | 54 | 59.64 | -19 | 11 | 40.60 | 2.0114 | 8.0           |
|    | 21 | 14:29 | 112 | 01:19 | 248 | 15  | 54 | 2.58  | -19 | 43 | 16.66 | 2.1245 | 8.2           |
| 8  | 1  | 13:49 | 112 | 00:36 | 248 | 15  | 55 | 54.14 | -20 | 22 | 43.25 | 2.2627 | 8.4           |
|    | 11 | 13:15 | 113 | 00:00 | 247 | 16  | 0  | 4.13  | -21 | 2  | 4.82  | 2.3971 | 8.5           |
|    | 21 | 12:44 | 114 | 23:25 | 246 | 16  | 6  | 21.02 | -21 | 43 | 40.80 | 2.5364 | 8.7           |
| 9  | 1  | 12:11 | 115 | 22:49 | 245 | 16  | 15 | 25.49 | -22 | 30 | 37.17 | 2.6922 | 8.8           |
|    | 11 | 11:44 | 116 | 22:18 | 245 | 16  | 25 | 24.81 | -23 | 13 | 7.11  | 2.8334 | 8.9           |
|    | 21 | 11:17 | 116 | 21:49 | 244 | 16  | 36 | 49.96 | -23 | 54 | 11.25 | 2.9720 | 9.0           |
| 10 | 1  | 10:52 | 117 | 21:20 | 243 | 16  | 49 | 30.65 | -24 | 32 | 43.99 | 3.1061 | 9.1           |
|    | 11 | 10:28 | 118 | 20:53 | 242 | 17  | 3  | 17.21 | -25 | 7  | 44.60 | 3.2339 | 9.1           |
|    | 21 | 10:04 | 118 | 20:27 | 242 | 17  | 17 | 59.83 | -25 | 38 | 14.97 | 3.3540 | 9.2           |
| 11 | 1  | 09:39 | 119 | 20:00 | 241 | 17  | 35 | 6.35  | -26 | 5  | 40.60 | 3.4755 | 9.2           |
|    | 11 | 09:17 | 119 | 19:36 | 241 | 17  | 51 | 21.29 | -26 | 24 | 18.82 | 3.5749 | 9.2           |
|    | 21 | 08:54 | 119 | 19:13 | 241 | 18  | 8  | 7.83  | -26 | 36 | 23.72 | 3.6627 | 9.2           |
| 12 | 1  | 08:32 | 119 | 18:51 | 241 | 18  | 25 | 19.34 | -26 | 41 | 34.87 | 3.7380 | 9.1           |
|    | 11 | 08:10 | 119 | 18:29 | 241 | 18  | 42 | 48.16 | -26 | 39 | 41.06 | 3.7998 | 9.1           |
|    | 21 | 07:48 | 119 | 18:07 | 241 | 19  | 0  | 27.51 | -26 | 30 | 40.76 | 3.8477 | 9.0           |
|    | 31 | 07:26 | 119 | 17:46 | 241 | 19  | 18 | 11.46 | -26 | 14 | 43.24 | 3.8810 | 8.9           |

## 智神星 ( Pallas ) 位置與出沒時間表

東經: 121.52°, 北緯: 25.10°

東經 120° 平太陽時

| 日期 |    | 出     |    | 沒     |     | 赤 經 |    |       | 赤 緯 |    |       | 距 離    | 視 亮 度 |
|----|----|-------|----|-------|-----|-----|----|-------|-----|----|-------|--------|-------|
| 月  | 日  | 時間    | 方位 | 時間    | 方位  | h   | m  | s     | °   | '  | "     | AU     | 星等    |
| 1  | 1  | 00:46 | 96 | 12:26 | 264 | 13  | 23 | 18.90 | -6  | 5  | 43.80 | 2.2954 | 9.0   |
|    | 11 | 00:18 | 96 | 12:02 | 264 | 13  | 36 | 19.04 | -5  | 16 | 41.18 | 2.1826 | 8.9   |
|    | 21 | 23:44 | 94 | 11:36 | 266 | 13  | 47 | 46.51 | -4  | 4  | 2.16  | 2.0699 | 8.8   |
| 2  | 1  | 23:08 | 92 | 11:06 | 268 | 13  | 58 | 15.57 | -2  | 14 | 1.12  | 1.9495 | 8.6   |
|    | 11 | 22:32 | 90 | 10:38 | 270 | 14  | 5  | 29.98 | -0  | 4  | 43.77 | 1.8474 | 8.5   |
|    | 21 | 21:52 | 87 | 10:09 | 273 | 14  | 10 | 14.97 | +2  | 32 | 18.82 | 1.7566 | 8.3   |
| 3  | 1  | 21:18 | 84 | 09:44 | 276 | 14  | 12 | 5.75  | +4  | 56 | 6.43  | 1.6951 | 8.2   |
|    | 11 | 20:32 | 80 | 09:10 | 279 | 14  | 11 | 50.29 | +8  | 13 | 18.19 | 1.6357 | 8.1   |
|    | 21 | 19:43 | 77 | 08:34 | 283 | 14  | 8  | 49.83 | +11 | 39 | 49.65 | 1.5999 | 7.9   |
| 4  | 1  | 18:46 | 73 | 07:53 | 287 | 14  | 2  | 48.75 | +15 | 21 | 2.92  | 1.5907 | 7.9   |
|    | 11 | 17:53 | 69 | 07:12 | 291 | 13  | 55 | 38.37 | +18 | 20 | 20.39 | 1.6113 | 7.9   |
|    | 21 | 17:01 | 67 | 06:31 | 293 | 13  | 47 | 52.68 | +20 | 45 | 51.55 | 1.6585 | 8.0   |
| 5  | 1  | 16:11 | 65 | 05:48 | 295 | 13  | 40 | 32.81 | +22 | 31 | 0.73  | 1.7297 | 8.2   |
|    | 11 | 15:23 | 63 | 05:05 | 296 | 13  | 34 | 32.09 | +23 | 34 | 46.90 | 1.8216 | 8.4   |
|    | 21 | 14:39 | 63 | 04:23 | 297 | 13  | 30 | 28.13 | +24 | 0  | 49.26 | 1.9299 | 8.7   |
| 6  | 1  | 13:54 | 63 | 03:37 | 297 | 13  | 28 | 33.84 | +23 | 53 | 10.24 | 2.0634 | 8.9   |
|    | 11 | 13:17 | 64 | 02:57 | 296 | 13  | 29 | 13.18 | +23 | 20 | 3.72  | 2.1941 | 9.1   |
|    | 21 | 12:42 | 65 | 02:19 | 295 | 13  | 32 | 0.84  | +22 | 28 | 18.26 | 2.3302 | 9.2   |
| 7  | 1  | 12:10 | 66 | 01:42 | 294 | 13  | 36 | 43.26 | +21 | 22 | 50.11 | 2.4693 | 9.4   |
|    | 11 | 11:40 | 67 | 01:06 | 293 | 13  | 43 | 7.41  | +20 | 7  | 33.18 | 2.6092 | 9.5   |
|    | 21 | 11:11 | 69 | 00:31 | 291 | 13  | 50 | 59.03 | +18 | 45 | 47.50 | 2.7478 | 9.6   |
| 8  | 1  | 10:41 | 71 | 23:51 | 289 | 14  | 1  | 3.98  | +17 | 11 | 18.90 | 2.8971 | 9.7   |
|    | 11 | 10:15 | 72 | 23:19 | 288 | 14  | 11 | 21.66 | +15 | 43 | 30.74 | 3.0284 | 9.8   |
|    | 21 | 09:50 | 74 | 22:48 | 286 | 14  | 22 | 33.93 | +14 | 15 | 44.48 | 3.1542 | 9.9   |
| 9  | 1  | 09:23 | 76 | 22:15 | 284 | 14  | 35 | 48.11 | +12 | 40 | 51.03 | 3.2851 | 10.0  |
|    | 11 | 08:59 | 77 | 21:46 | 283 | 14  | 48 | 33.34 | +11 | 17 | 32.13 | 3.3961 | 10.0  |
|    | 21 | 08:36 | 79 | 21:17 | 281 | 15  | 1  | 53.57 | +9  | 58 | 14.72 | 3.4987 | 10.0  |
| 10 | 1  | 08:13 | 80 | 20:49 | 280 | 15  | 15 | 44.75 | +8  | 43 | 56.69 | 3.5921 | 10.1  |
|    | 11 | 07:50 | 81 | 20:22 | 279 | 15  | 30 | 2.42  | +7  | 35 | 41.55 | 3.6756 | 10.1  |
|    | 21 | 07:27 | 82 | 19:56 | 277 | 15  | 44 | 41.94 | +6  | 34 | 22.55 | 3.7486 | 10.1  |
| 11 | 1  | 07:02 | 84 | 19:27 | 276 | 16  | 1  | 10.46 | +5  | 35 | 51.96 | 3.8160 | 10.1  |
|    | 11 | 06:39 | 84 | 19:01 | 276 | 16  | 16 | 23.18 | +4  | 51 | 41.73 | 3.8650 | 10.1  |
|    | 21 | 06:16 | 85 | 18:36 | 275 | 16  | 31 | 44.64 | +4  | 16 | 44.48 | 3.9020 | 10.1  |
| 12 | 1  | 05:53 | 85 | 18:12 | 275 | 16  | 47 | 10.57 | +3  | 51 | 34.10 | 3.9266 | 10.1  |
|    | 11 | 05:30 | 86 | 17:47 | 274 | 17  | 2  | 35.29 | +3  | 36 | 40.40 | 3.9386 | 10.2  |
|    | 21 | 05:06 | 86 | 17:23 | 274 | 17  | 17 | 53.70 | +3  | 32 | 18.41 | 3.9380 | 10.2  |
|    | 31 | 04:41 | 86 | 16:59 | 274 | 17  | 33 | 0.45  | +3  | 38 | 42.60 | 3.9248 | 10.2  |

## 婚神星 ( Juno ) 位置與出沒時間表

東經: 121.52° , 北緯: 25.10°

東經 120° 平太陽時

| 日期 |    | 出     |    | 沒     |     | 赤 經 |    |       | 赤 緯 |    |       | 距 離    | 視 亮 度 |
|----|----|-------|----|-------|-----|-----|----|-------|-----|----|-------|--------|-------|
| 月  | 日  | 時間    | 方位 | 時間    | 方位  | h   | m  | s     | °   | '  | "     | AU     | 星等    |
| 1  | 1  | 14:48 | 92 | 02:46 | 268 | 3   | 34 | 32.61 | -2  | 24 | 47.01 | 1.2433 | 8.2   |
|    | 11 | 14:09 | 91 | 02:12 | 269 | 3   | 37 | 30.89 | -0  | 55 | 12.00 | 1.3321 | 8.4   |
|    | 21 | 13:32 | 89 | 01:42 | 271 | 3   | 43 | 29.55 | +0  | 47 | 18.67 | 1.4309 | 8.6   |
| 2  | 1  | 12:55 | 87 | 01:12 | 273 | 3   | 53 | 8.29  | +2  | 47 | 22.67 | 1.5483 | 8.8   |
|    | 11 | 12:23 | 85 | 00:47 | 275 | 4   | 4  | 20.33 | +4  | 37 | 52.81 | 1.6613 | 9.0   |
|    | 21 | 11:54 | 83 | 00:24 | 277 | 4   | 17 | 30.35 | +6  | 25 | 32.80 | 1.7784 | 9.2   |
| 3  | 1  | 11:31 | 81 | 00:07 | 279 | 4   | 29 | 13.90 | +7  | 47 | 33.93 | 1.8743 | 9.3   |
|    | 11 | 11:05 | 79 | 23:45 | 281 | 4   | 45 | 9.98  | +9  | 23 | 2.03  | 1.9960 | 9.4   |
|    | 21 | 10:40 | 78 | 23:25 | 282 | 5   | 2  | 17.35 | +10 | 48 | 51.75 | 2.1185 | 9.6   |
| 4  | 1  | 10:14 | 76 | 23:04 | 284 | 5   | 22 | 12.93 | +12 | 10 | 27.86 | 2.2533 | 9.7   |
|    | 11 | 09:51 | 75 | 22:46 | 285 | 5   | 41 | 7.67  | +13 | 11 | 59.25 | 2.3749 | 9.8   |
|    | 21 | 09:30 | 74 | 22:28 | 286 | 6   | 0  | 36.40 | +14 | 0  | 45.88 | 2.4945 | 9.9   |
| 5  | 1  | 09:09 | 74 | 22:09 | 286 | 6   | 20 | 29.12 | +14 | 36 | 31.61 | 2.6116 | 10.0  |
|    | 11 | 08:49 | 73 | 21:51 | 287 | 6   | 40 | 37.92 | +14 | 59 | 15.39 | 2.7252 | 10.0  |
|    | 21 | 08:30 | 73 | 21:32 | 287 | 7   | 0  | 54.08 | +15 | 9  | 10.05 | 2.8345 | 10.1  |
| 6  | 1  | 08:09 | 73 | 21:11 | 287 | 7   | 23 | 12.19 | +15 | 5  | 50.58 | 2.9489 | 10.2  |
|    | 11 | 07:50 | 73 | 20:51 | 287 | 7   | 43 | 23.09 | +14 | 50 | 32.81 | 3.0467 | 10.2  |
|    | 21 | 07:31 | 74 | 20:31 | 286 | 8   | 3  | 22.61 | +14 | 24 | 23.07 | 3.1378 | 10.2  |
| 7  | 1  | 07:13 | 74 | 20:10 | 286 | 8   | 23 | 7.18  | +13 | 48 | 16.27 | 3.2215 | 10.3  |
|    | 11 | 06:55 | 75 | 19:48 | 285 | 8   | 42 | 33.91 | +13 | 3  | 8.99  | 3.2970 | 10.3  |
|    | 21 | 06:36 | 76 | 19:26 | 284 | 9   | 1  | 39.67 | +12 | 10 | 5.30  | 3.3635 | 10.3  |
| 8  | 1  | 06:15 | 77 | 19:01 | 282 | 9   | 22 | 14.48 | +11 | 3  | 48.31 | 3.4255 | 10.3  |
|    | 11 | 05:57 | 79 | 18:38 | 281 | 9   | 40 | 32.44 | +9  | 57 | 30.78 | 3.4709 | 10.2  |
|    | 21 | 05:37 | 80 | 18:14 | 280 | 9   | 58 | 25.82 | +8  | 46 | 38.68 | 3.5053 | 10.2  |
| 9  | 1  | 05:16 | 82 | 17:48 | 278 | 10  | 17 | 38.35 | +7  | 24 | 38.81 | 3.5297 | 10.3  |
|    | 11 | 04:56 | 83 | 17:23 | 277 | 10  | 34 | 39.48 | +6  | 7  | 37.74 | 3.5390 | 10.4  |
|    | 21 | 04:36 | 84 | 16:57 | 276 | 10  | 51 | 14.66 | +4  | 49 | 24.49 | 3.5358 | 10.5  |
| 10 | 1  | 04:15 | 86 | 16:32 | 274 | 11  | 7  | 23.70 | +3  | 31 | 0.53  | 3.5197 | 10.6  |
|    | 11 | 03:54 | 87 | 16:06 | 273 | 11  | 23 | 4.72  | +2  | 13 | 34.93 | 3.4905 | 10.7  |
|    | 21 | 03:32 | 89 | 15:39 | 271 | 11  | 38 | 16.18 | +0  | 58 | 14.47 | 3.4482 | 10.7  |
| 11 | 1  | 03:07 | 90 | 15:09 | 270 | 11  | 54 | 21.94 | -0  | 20 | 55.74 | 3.3866 | 10.8  |
|    | 11 | 02:44 | 91 | 14:42 | 269 | 12  | 8  | 21.87 | -1  | 28 | 11.59 | 3.3175 | 10.8  |
|    | 21 | 02:20 | 92 | 14:14 | 267 | 12  | 21 | 41.30 | -2  | 29 | 46.73 | 3.2365 | 10.8  |
| 12 | 1  | 01:54 | 93 | 13:45 | 266 | 12  | 34 | 14.02 | -3  | 24 | 26.54 | 3.1445 | 10.8  |
|    | 11 | 01:28 | 94 | 13:16 | 266 | 12  | 45 | 51.86 | -4  | 10 | 48.58 | 3.0427 | 10.8  |
|    | 21 | 01:01 | 95 | 12:46 | 265 | 12  | 56 | 26.31 | -4  | 47 | 36.46 | 2.9329 | 10.7  |
|    | 31 | 00:31 | 95 | 12:15 | 264 | 13  | 5  | 45.92 | -5  | 13 | 23.93 | 2.8168 | 10.7  |

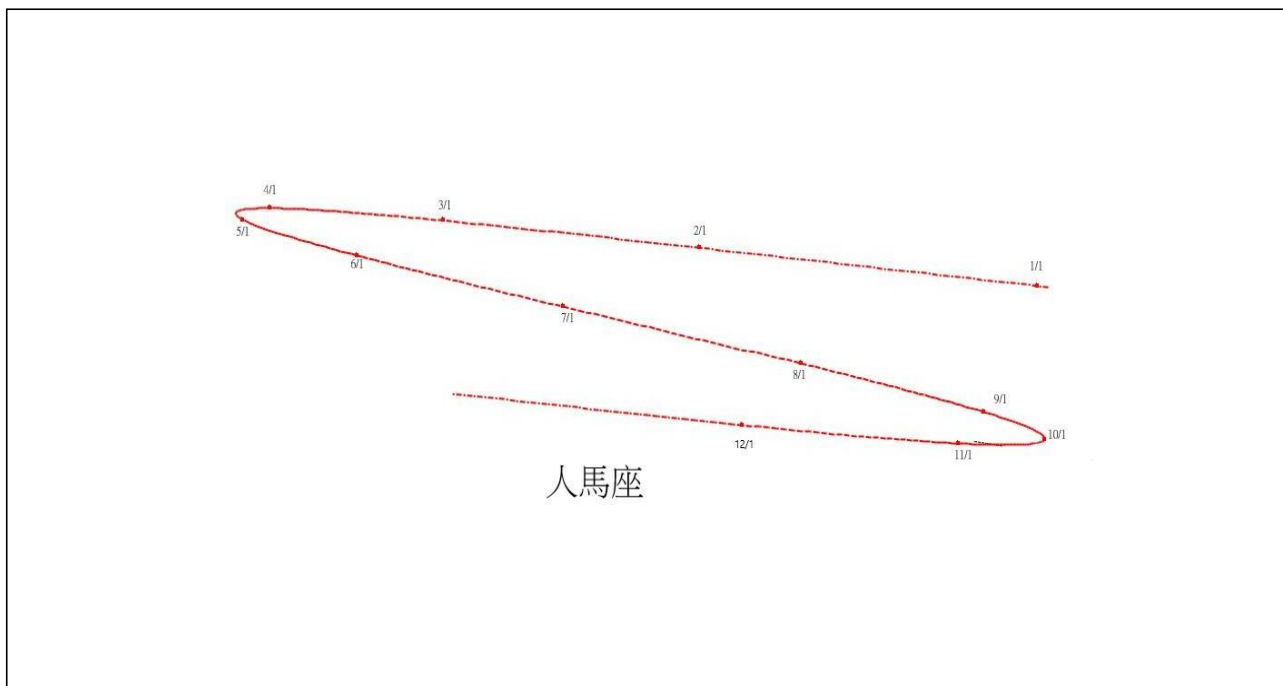
## 灶神星 ( Vesta ) 位置與出沒時間表

東經: 121.52°, 北緯: 25.10°

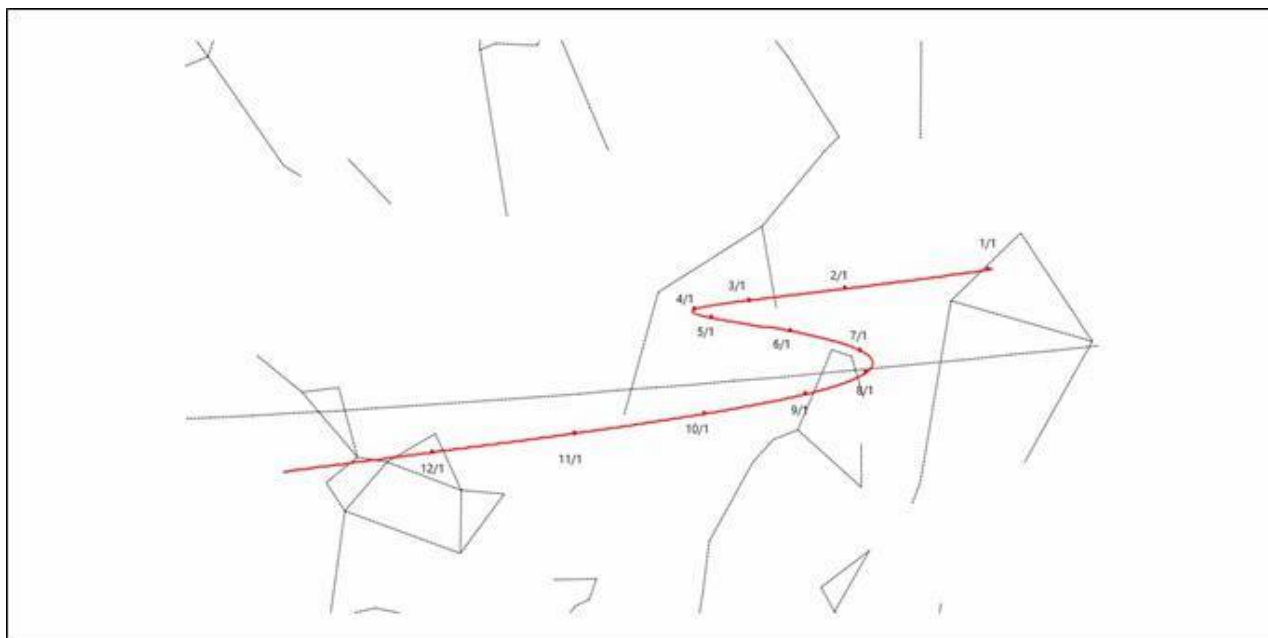
東經 120° 平太陽時

| 日期 |    | 出     |     | 沒     |     | 赤 經 |    |       | 赤 緯 |    |       | 距 離    | 視 亮 度 |
|----|----|-------|-----|-------|-----|-----|----|-------|-----|----|-------|--------|-------|
| 月  | 日  | 時間    | 方位  | 時間    | 方位  | h   | m  | s     | °   | '  | "     | AU     | 星等    |
| 1  | 1  | 09:02 | 112 | 19:47 | 248 | 21  | 12 | 23.19 | -20 | 6  | 25.55 | 3.0296 | 8.0   |
|    | 11 | 08:39 | 110 | 19:31 | 250 | 21  | 32 | 18.47 | -18 | 42 | 1.49  | 3.1045 | 8.0   |
|    | 21 | 08:16 | 109 | 19:14 | 251 | 21  | 52 | 2.07  | -17 | 10 | 45.38 | 3.1700 | 8.0   |
| 2  | 1  | 07:51 | 107 | 18:56 | 253 | 22  | 13 | 27.78 | -15 | 23 | 42.64 | 3.2308 | 8.0   |
|    | 11 | 07:27 | 105 | 18:39 | 255 | 22  | 32 | 40.84 | -13 | 41 | 31.67 | 3.2753 | 8.0   |
|    | 21 | 07:03 | 103 | 18:22 | 257 | 22  | 51 | 37.44 | -11 | 55 | 55.74 | 3.3092 | 7.9   |
| 3  | 1  | 06:44 | 101 | 18:08 | 259 | 23  | 6  | 34.95 | -10 | 29 | 44.16 | 3.3286 | 7.9   |
|    | 11 | 06:19 | 99  | 17:51 | 261 | 23  | 25 | 2.58  | -8  | 40 | 45.73 | 3.3430 | 7.9   |
|    | 21 | 05:55 | 97  | 17:33 | 263 | 23  | 43 | 14.08 | -6  | 51 | 29.05 | 3.3465 | 8.0   |
| 4  | 1  | 05:27 | 95  | 17:13 | 265 | 0   | 2  | 56.91 | -4  | 52 | 9.09  | 3.3377 | 8.1   |
|    | 11 | 05:02 | 93  | 16:55 | 267 | 0   | 20 | 36.55 | -3  | 5  | 32.09 | 3.3182 | 8.1   |
|    | 21 | 04:37 | 91  | 16:36 | 269 | 0   | 38 | 0.78  | -1  | 21 | 44.74 | 3.2881 | 8.2   |
| 5  | 1  | 04:12 | 89  | 16:17 | 271 | 0   | 55 | 9.93  | +0  | 18 | 22.14 | 3.2475 | 8.2   |
|    | 11 | 03:46 | 88  | 15:57 | 272 | 1   | 12 | 3.07  | +1  | 53 | 55.97 | 3.1965 | 8.3   |
|    | 21 | 03:21 | 86  | 15:37 | 274 | 1   | 28 | 38.25 | +3  | 24 | 5.22  | 3.1358 | 8.3   |
| 6  | 1  | 02:52 | 84  | 15:15 | 276 | 1   | 46 | 30.40 | +4  | 56 | 11.88 | 3.0581 | 8.3   |
|    | 11 | 02:26 | 83  | 14:54 | 277 | 2   | 2  | 20.64 | +6  | 12 | 43.17 | 2.9779 | 8.3   |
|    | 21 | 02:00 | 82  | 14:32 | 278 | 2   | 17 | 42.87 | +7  | 21 | 41.89 | 2.8895 | 8.3   |
| 7  | 1  | 01:34 | 81  | 14:09 | 280 | 2   | 32 | 31.97 | +8  | 22 | 38.23 | 2.7934 | 8.2   |
|    | 11 | 01:07 | 80  | 13:46 | 281 | 2   | 46 | 39.94 | +9  | 14 | 59.04 | 2.6903 | 8.2   |
|    | 21 | 00:39 | 79  | 13:21 | 281 | 2   | 59 | 57.85 | +9  | 58 | 21.41 | 2.5813 | 8.1   |
| 8  | 1  | 00:08 | 78  | 12:52 | 282 | 3   | 13 | 24.90 | +10 | 35 | 22.31 | 2.4559 | 8.0   |
|    | 11 | 23:36 | 78  | 12:24 | 282 | 3   | 24 | 18.67 | +10 | 59 | 0.17  | 2.3384 | 7.9   |
|    | 21 | 23:06 | 77  | 11:55 | 283 | 3   | 33 | 40.64 | +11 | 13 | 5.29  | 2.2195 | 7.8   |
| 9  | 1  | 22:30 | 77  | 11:20 | 283 | 3   | 41 | 50.81 | +11 | 17 | 37.26 | 2.0893 | 7.7   |
|    | 11 | 21:56 | 77  | 10:45 | 283 | 3   | 46 | 57.53 | +11 | 12 | 1.87  | 1.9745 | 7.5   |
|    | 21 | 21:20 | 78  | 10:08 | 282 | 3   | 49 | 32.52 | +10 | 57 | 51.23 | 1.8663 | 7.4   |
| 10 | 1  | 20:41 | 78  | 09:28 | 282 | 3   | 49 | 18.18 | +10 | 35 | 58.25 | 1.7683 | 7.2   |
|    | 11 | 19:59 | 79  | 08:44 | 281 | 3   | 46 | 5.95  | +10 | 7  | 57.62 | 1.6850 | 7.0   |
|    | 21 | 19:15 | 79  | 07:58 | 281 | 3   | 40 | 3.46  | +9  | 36 | 14.45 | 1.6206 | 6.8   |
| 11 | 1  | 18:23 | 80  | 07:04 | 280 | 3   | 30 | 40.39 | +9  | 0  | 55.39 | 1.5768 | 6.6   |
|    | 11 | 17:35 | 80  | 06:14 | 280 | 3   | 20 | 37.31 | +8  | 33 | 2.73  | 1.5650 | 6.5   |
|    | 21 | 16:46 | 81  | 05:24 | 279 | 3   | 10 | 19.63 | +8  | 13 | 37.27 | 1.5813 | 6.6   |
| 12 | 1  | 15:57 | 81  | 04:35 | 279 | 3   | 0  | 58.88 | +8  | 6  | 8.97  | 1.6254 | 6.8   |
|    | 11 | 15:10 | 81  | 03:49 | 279 | 2   | 53 | 36.30 | +8  | 12 | 48.66 | 1.6948 | 7.0   |
|    | 21 | 14:26 | 80  | 03:05 | 280 | 2   | 48 | 48.49 | +8  | 33 | 49.11 | 1.7855 | 7.2   |
|    | 31 | 13:43 | 80  | 02:25 | 280 | 2   | 46 | 50.76 | +9  | 8  | 6.63  | 1.8933 | 7.4   |

### 冥王星在天球上運行的軌跡圖

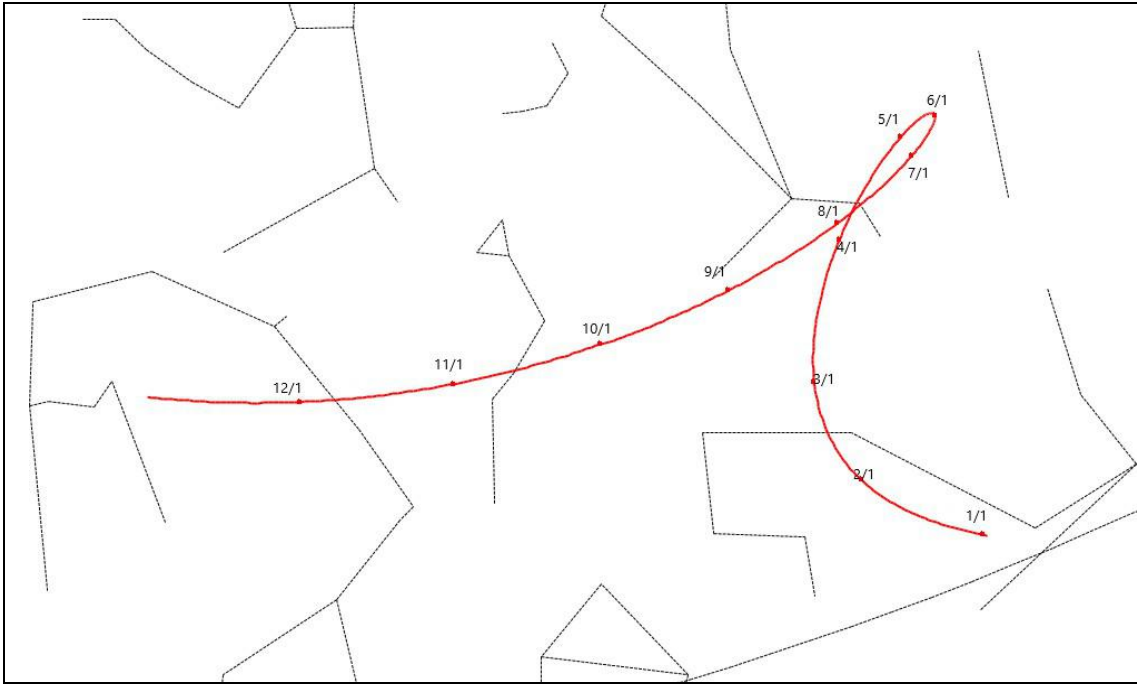


### 穀神星在天球上運行的軌跡圖

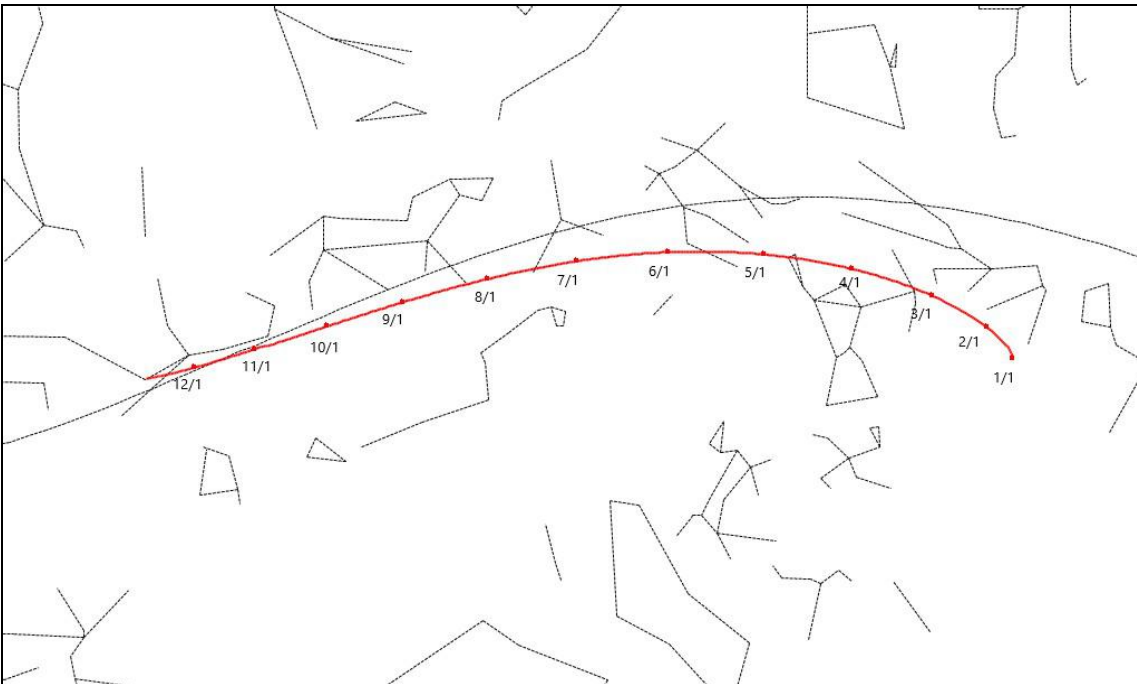




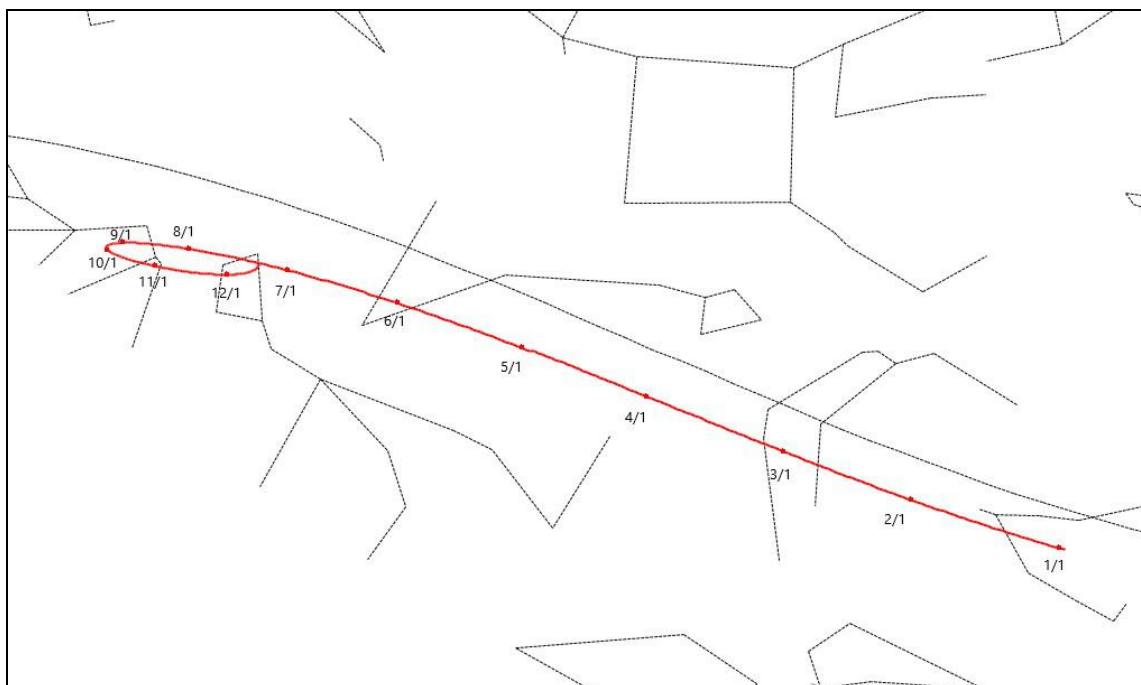
### 智神星在天球上運行的軌跡圖



### 婚神星在天球上運行的軌跡圖



# 灶神星在天球上運行的軌跡圖



## 日食、月食

今年全球發生 3 次日食，2 次月食。1 月 6 日日偏食，臺灣中部以北能見。7 月 3 日日全食，臺灣不可見。12 月 26 日日環食，臺灣可見偏食。1 月 21 日月全食，臺灣不可見。7 月 17 日月偏食，臺灣可見月沒帶食。

日食或月食在全球所對應的食象以 P1、U1 等符號代表，其意義分別如下：

| 代號       | 日食對應食象            | 代號       | 月食對應食象             |
|----------|-------------------|----------|--------------------|
| P1       | 月球半影前緣與地球接觸 (外切)  | P1       | 月球與地球半影接觸 (外切)     |
| P2       | 月球半影完全進入地球 (內切)   | P2       | 月球完全進入地球半影 (內切)    |
| U1       | 月球本影前緣與地球接觸 (外切)  | U1       | 月球與地球本影接觸 (外切)     |
| U2       | 月球本影完全進入地球 (內切)   | U2       | 月球完全進入地球本影 (內切)    |
| GREATEST | 月球影錐軸線最接近地球中心的時刻  | GREATEST | 月球最接近地球本影中央，食的中間時刻 |
| U3       | 月球本影即將脫離地球 (內切)   | U3       | 月球即將脫離地球本影 (內切)    |
| U4       | 月球本影後緣完全脫離地球 (外切) | U4       | 月球完全脫離地球本影 (外切)    |
| P3       | 月球半影即將脫離地球 (內切)   | P3       | 月球即將脫離地球半影 (內切)    |
| P4       | 月球半影後緣完全脫離地球 (外切) | P4       | 月球完全脫離地球半影 (外切)    |

針對臺灣地區可見到的食象再增列本地預報。方位與高度取日、月的盤面中心座標，並未考慮大氣偏光效應，時間則取東經 120 度平太陽時。各食象代表的意義分別為：

| 食象 | 日食                           | 月食                      |
|----|------------------------------|-------------------------|
| 初虧 | 月球外緣與太陽外緣剛好接觸形成外切，開始偏食的過程    | 月球外緣與地球本影剛相接觸，即將開始偏食的過程 |
| 食既 | 月球內緣與太陽內緣剛好接觸形成內切，開始全食或環食的過程 | 月球剛完全進入地球本影區，開始全食階段     |
| 食甚 | 發生最大食分的時刻                    | 發生最大食分的時刻，月球最接近地球本影中央   |
| 生光 | 月球內緣與太陽內緣剛好接觸形成內切，全食或環食過程結束  | 月球即將離開地球本影區，全食階段結束      |
| 復圓 | 月球外緣與太陽外緣剛好接觸形成外切，日食過程結束     | 月球外緣與地球本影剛相接觸，偏食結束      |

## (一) 1月6日日偏食(臺灣中部以北可見偏食)

※ 食的要素(世界時 UT, 採  $\Delta T = 75.7s$ ; 赤道地心座標觀點)

日心、月心黃經合: 1月6日  $01^h 43^m 34.7^s$

食甚時日、月位置:

|        | 太 陽                    | 月 球                    |
|--------|------------------------|------------------------|
| 赤經     | $19^h 06^m 57.3^s$     | $19^h 06^m 52.9^s$     |
| 赤緯     | $-22^\circ 32' 36.8''$ | $-21^\circ 30' 36.9''$ |
| 視半徑    | $00^\circ 16' 15.9''$  | $00^\circ 14' 50.4''$  |
| 赤道地平視差 | $00^\circ 00' 08.9''$  | $00^\circ 54' 27.6''$  |

※ 全球食的現象與發生時間(世界時 UT, 採  $\Delta T = 75.7s$ ; 赤道地心座標觀點)

本次日偏食最大食分 0.7147, 歷時 4 時 15 分。本次日偏食從中國東北部始, 通過西伯利亞、日本、韓國至北太平洋止。臺灣中部以北可見偏食。

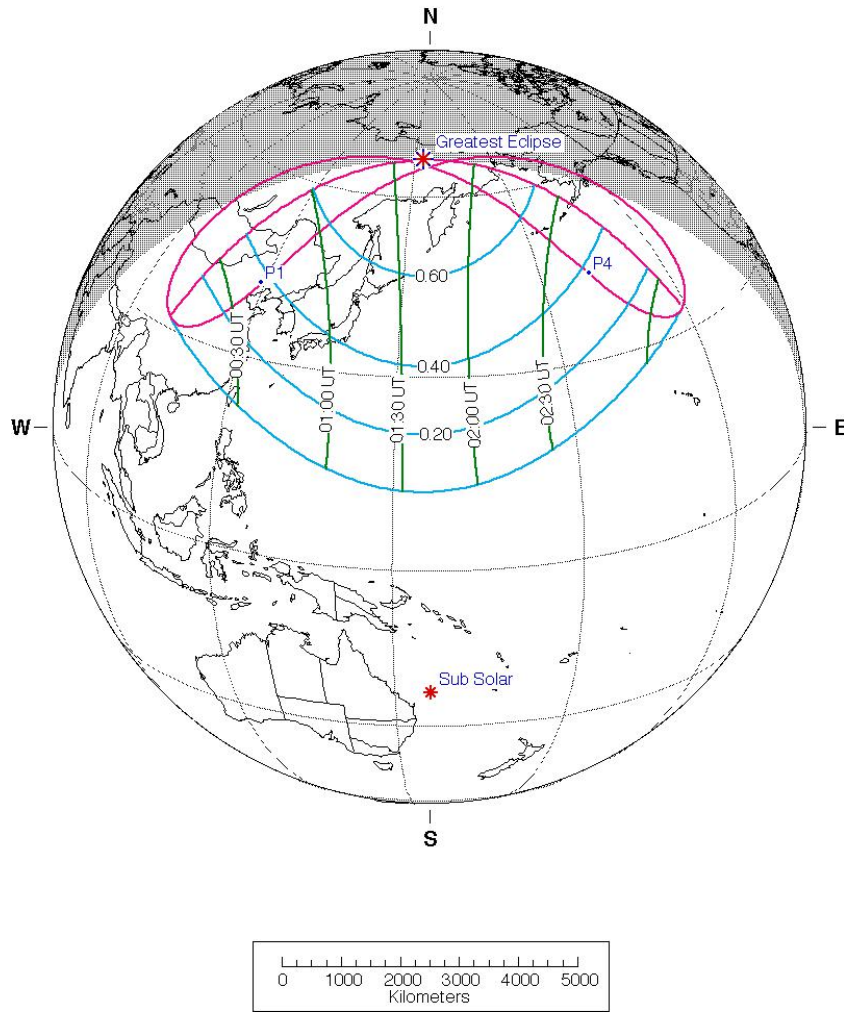
|    | 日 | 時  | 分  | 秒    |
|----|---|----|----|------|
| P1 | 6 | 23 | 34 | 01.8 |
| P4 | 7 | 04 | 48 | 44.1 |

※ 臺灣本地預報

臺灣中部以北位於偏食帶, 經歷時間約 1 時 00 分 50.3 秒, 食分 0.054, 被遮蔽的日面面積約 1.5%。

|     | 時 間 |    |      | 位 置   |      |
|-----|-----|----|------|-------|------|
|     | 時   | 分  | 秒    | 方位角   | 仰角   |
| 初 虧 | 08  | 00 | 15.0 | 124.3 | 15.0 |
| 食 甚 | 08  | 29 | 32.9 | 128.7 | 20.3 |
| 復 圓 | 09  | 01 | 05.3 | 134.0 | 25.7 |

# 2019年1月6日 日偏食



## (二) 1月21日月全食(臺灣不可見)

※ 食的要素 ( $\Delta T = 71s$ ; 赤道地心座標觀點)

日心、月心黃經衝: 1月21日 05<sup>h</sup> 17<sup>m</sup> 14.0<sup>s</sup> TD

食甚時日、月位置:

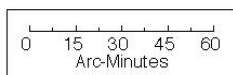
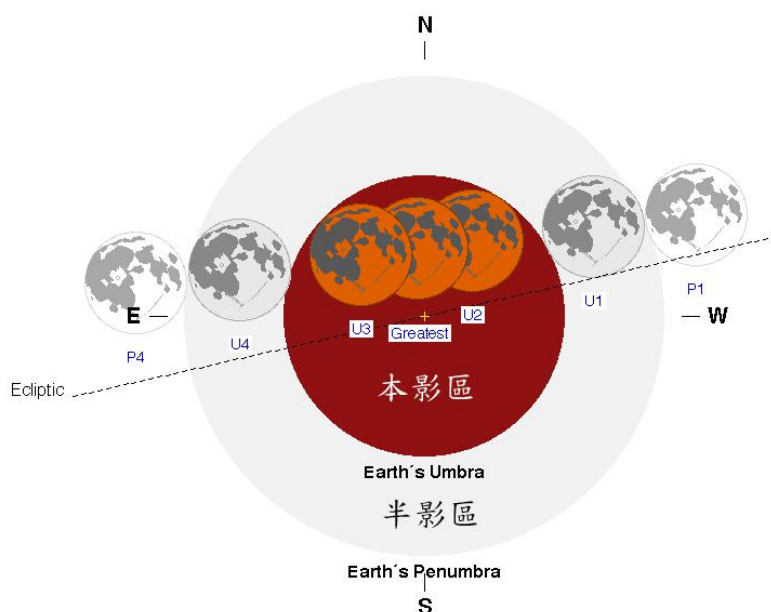
|        | 太 陽   | 月 球  |
|--------|---|--|
| 赤經     | 20 <sup>h</sup> 12 <sup>m</sup> 17.2 <sup>s</sup> | 08 <sup>h</sup> 12 <sup>m</sup> 28.70 <sup>s</sup> |
| 赤緯     | -19°57' 48.0"                                     | +20°20' 13.1"                                      |
| 視半徑    | 00°16' 15.2"                                      | 00°16' 42.1"                                       |
| 赤道地平視差 | 00°00' 08.9"                                      | 01°01' 17.9"                                       |

※ 全球食的現象與發生時間

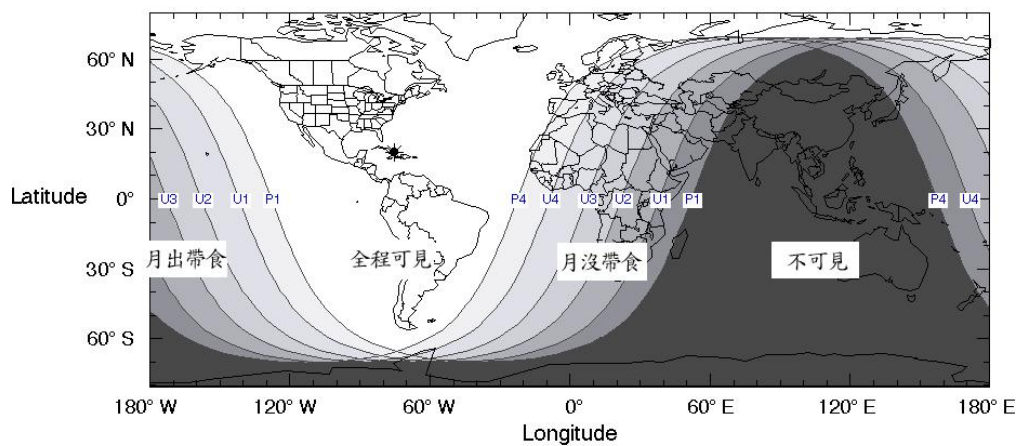
本次月食的本影最大食分為 1.1953，共歷時 5 時 12 分，本影食歷時 3 時 17 分。美洲全程可見。

|    | 日  | 時  | 分  | 秒  |
|----|----|----|----|----|
| P1 | 21 | 02 | 36 | 30 |
| U1 | 21 | 03 | 33 | 54 |
| U2 | 21 | 04 | 41 | 17 |
| U3 | 21 | 05 | 43 | 16 |
| U4 | 21 | 06 | 50 | 39 |
| P4 | 21 | 07 | 48 | 00 |

# 2019年1月21日 月全食



F. Espenak, NASA's GSFC  
eclipse.gsfc.nasa.gov/eclipse.html



2009 Apr 29

## (三) 7月3日日全食(臺灣不可見)

※ 食的要素 ( $\Delta T = 76.2s$ ; 赤道地心座標觀點)

日心、月心黃經合: 7月2日19<sup>h</sup>21<sup>m</sup>36.4<sup>s</sup>UT

食甚時日、月位置:

|        | 太 陽   | 月 球   |
|--------|---|---|
| 赤經     | 06 <sup>h</sup> 46 <sup>m</sup> 14.7 <sup>s</sup> | 06 <sup>h</sup> 46 <sup>m</sup> 17.8 <sup>s</sup> |
| 赤緯     | -23°00' 36.5"                                     | +22°22' 09.7"                                     |
| 視半徑    | 00°15' 43.8"                                      | 00°16' 14.94"                                     |
| 赤道地平視差 | 00°00' 08.6"                                      | 00°59' 37.8"                                      |

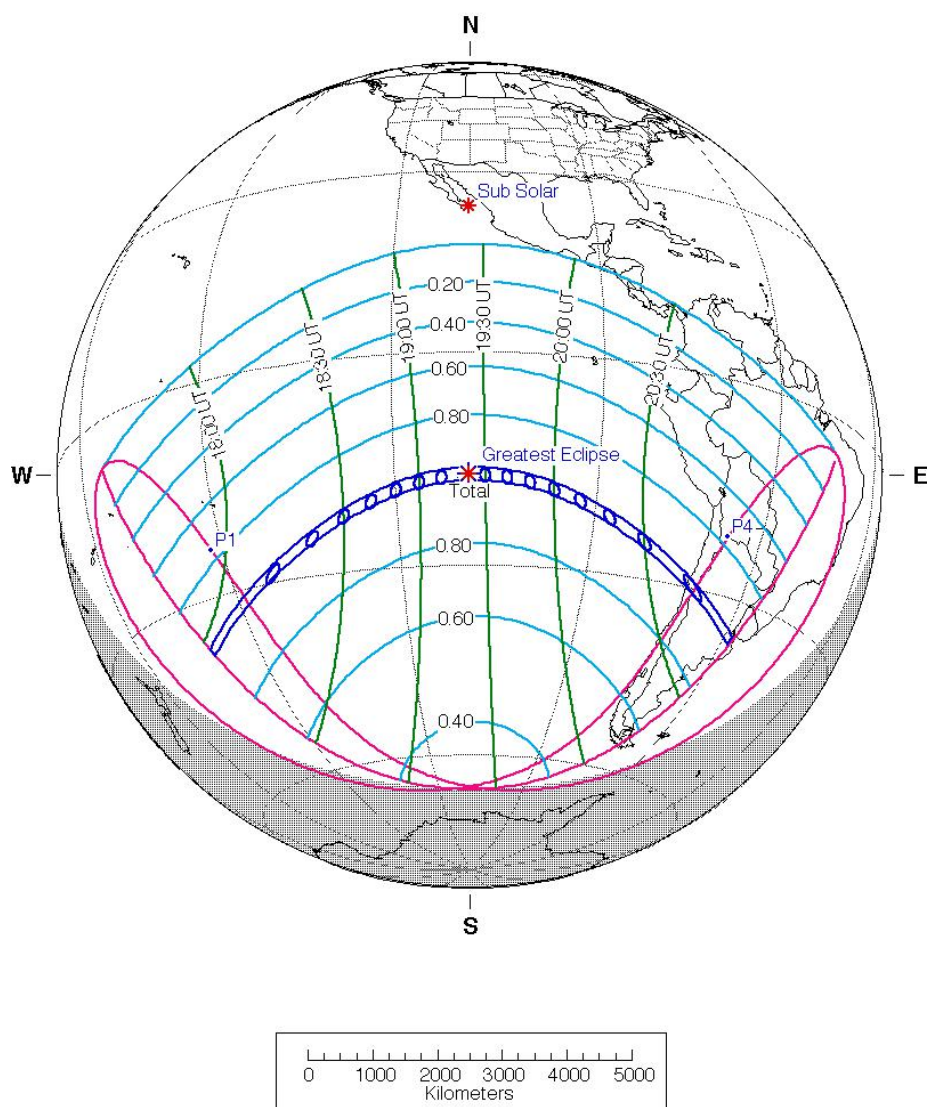
※ 全球食的現象與發生時間

本次日食發生於臺灣時間 7 月 3 日。最大食分 1.0459，全食歷時 4 分 32.8 秒，食帶寬 200.6 公里。本次日全食從南太平洋始、智利、阿根廷止。臺灣不可見。

|    | 日 | 時  | 分  | 秒    |
|----|---|----|----|------|
| P1 | 2 | 16 | 55 | 08.1 |
| P4 | 2 | 21 | 50 | 33.8 |



# 2019年7月3日 日全食



## (四) 7月17日月偏食(臺灣可見月沒帶食)

※ 食的要素 ( $\Delta T = 71s$ ; 赤道地心座標觀點)日心、月心黃經衝: 7月17日  $21^h 39^m 22.1^s$  TD

食甚時日、月位置:

|        | 太陽                     | 月球                     |
|--------|------------------------|------------------------|
| 赤經     | $07^h 43^m 48.8^s$     | $19^h 44^m 00.3^s$     |
| 赤緯     | $+21^\circ 17' 38.5''$ | $-21^\circ 52' 53.0''$ |
| 視半徑    | $00^\circ 15' 44.1''$  | $00^\circ 14' 58.7''$  |
| 赤道地平視差 | $00^\circ 00' 08.7''$  | $00^\circ 54' 58.2''$  |

※ 全球食的現象與發生時間

本次月食的本影最大食分為 0.6531。共歷時 5 時 34 分，本影食歷時 2 時 58 分。非洲、西亞、印度洋全程可見。

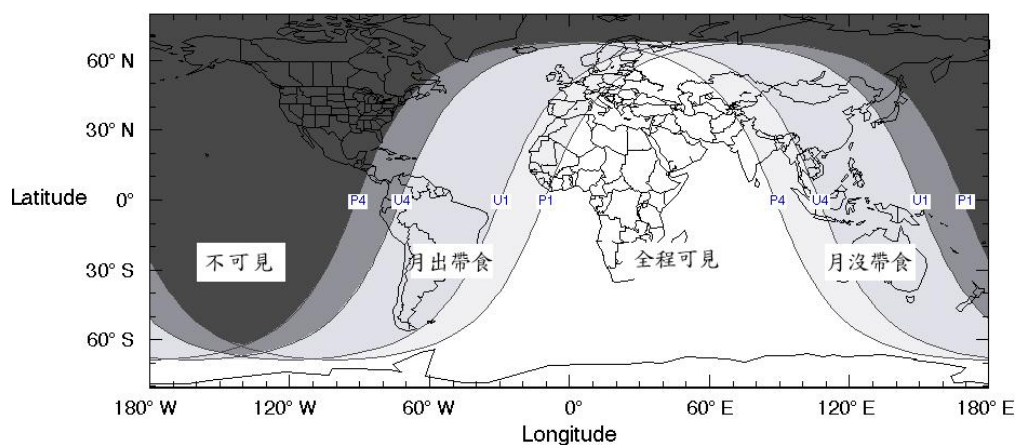
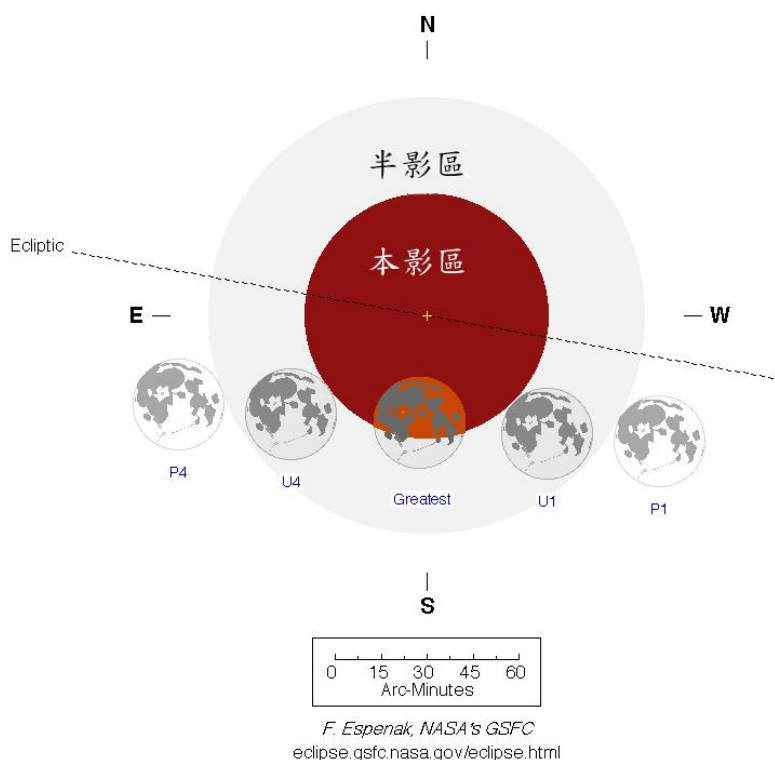
|    | 日  | 時  | 分  | 秒  |
|----|----|----|----|----|
| P1 | 16 | 18 | 43 | 53 |
| U1 | 16 | 20 | 01 | 43 |
| U4 | 16 | 22 | 59 | 39 |
| P4 | 17 | 00 | 17 | 36 |

※ 臺灣本地預報

臺灣地區可見月沒帶食，本影食 1 時 14.5 分，半影食 2 時 33.8 分，食分 0.658。

|      | 時間 |    |      | 位置    |      |
|------|----|----|------|-------|------|
|      | 日  | 時  | 分    | 方位角   | 仰角   |
| 半影食始 | 17 | 02 | 42.1 | 224.4 | 27.0 |
| 初虧   | 17 | 04 | 01.3 | 236.9 | 13.5 |
| 月沒   | 17 | 05 | 16   | 245.6 | ---- |

# 2019年7月17日 月偏食



## (五) 12月26日日環食 (臺灣可見偏食)

※ 食的要素 (世界時 UT, 採  $\Delta T = 76.7s$ ; 赤道地心座標觀點)

日心、月心黃經合: 12月26日 05<sup>h</sup>14<sup>m</sup>26.7<sup>s</sup>

食甚時日、月位置:

|        | 太陽  | 月球  |
|--------|---|---|
| 赤經     | 18 <sup>h</sup> 17 <sup>m</sup> 56.6 <sup>s</sup> | 18 <sup>h</sup> 18 <sup>m</sup> 03.6 <sup>s</sup> |
| 赤緯     | -23°22' 19.3"                                     | -22°58' 50.6"                                     |
| 視半徑    | 00°16' 15.7"                                      | 00°15' 33.0"                                      |
| 赤道地平視差 | 00°00' 08.9"                                      | 00°57' 04.1"                                      |

※ 全球食的現象與發生時間 (世界時 UT, 採  $\Delta T = 76.7s$ ; 赤道地心座標觀點)

本次日環食最大食分 0.9701, 全食歷時 3 分 39.5 秒, 食帶寬 117.9 公里。

日環食帶從沙烏地阿拉伯始、印度、馬來半島, 至婆羅洲止。臺灣可見偏食。

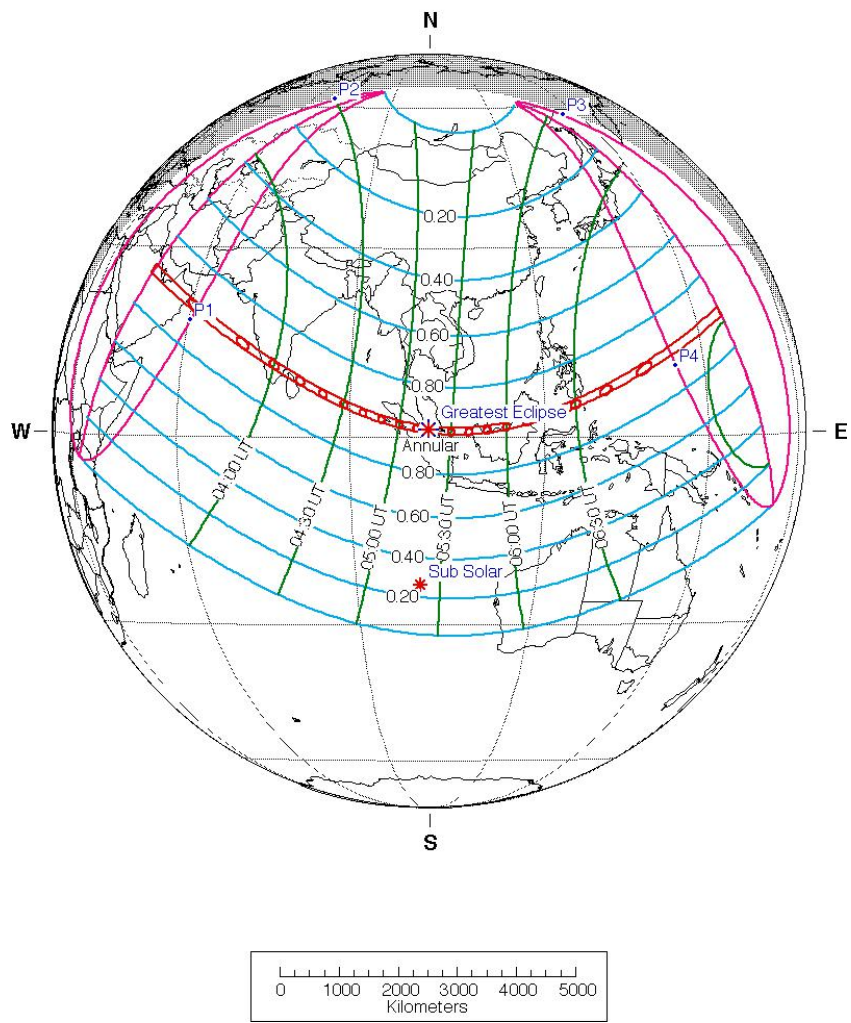
|    | 日  | 時  | 分  | 秒    |
|----|----|----|----|------|
| P1 | 26 | 02 | 29 | 43.5 |
| P2 | 26 | 05 | 01 | 17.1 |
| P3 | 26 | 05 | 33 | 58.4 |
| P4 | 26 | 08 | 05 | 36.1 |

※ 臺灣本地預報

臺灣位於偏食帶, 經歷時間約 2 時 47 分 30.6 秒, 食分 0.447, 被遮蔽的日面面積約 33.0%。

|    | 時間 |    |      | 位置    |      |
|----|----|----|------|-------|------|
|    | 時  | 分  | 秒    | 方位角   | 仰角   |
| 初虧 | 12 | 44 | 38.8 | 195.2 | 40.0 |
| 食甚 | 14 | 14 | 48.6 | 218.0 | 30.8 |
| 復圓 | 15 | 32 | 09.4 | 231.9 | 18.3 |

# 2019年12月26日 日環食



## 流星群預測

本表主要參考國際流星組織（IMO）公佈於 <http://www.imo.net> 的預測資料，表中各欄的參數意義為：

- 1 流星群名稱：以輻射點所在處之星座或亮星命名。有些名稱為舊名，如「象限儀座流星群」即現今所稱之「天龍座  $\iota$  流星群」，但其輻射點已漂移至牧夫座頭部；「天龍座  $\gamma$  流星群 (Draconid)」又稱為「Giacobini」。
- 2 來源天體：造成此流星群的彗星或小行星。
- 3 發生期間：此流星群發生的期間範圍。
- 4 極大期：預測可能發生流星數量最多的日期（UT）。
- 5 輻射點：地面所見流星群飛行軌跡似可匯集至一點，稱為輻射點。由於地球繞日公轉影響，輻射點會隨時間漂移；此處所列之輻射點乃以極大期時的位置為準。
- 6 速度：流星進入大氣層的速度，分佈範圍從 11km/s 到 72km/s；40km/s 約為中等。
- 7 亮度指標（population index,  $r$ ）：各流星群的亮度分佈， $r=2.0-2.5$  表示此流星群中的流星比平均值亮， $r>3.0$  者表比平均值暗。
- 8 ZHR（Zenithal Hourly Rate）：當天氣非常晴朗、輻射點在天頂、且肉眼可見星等達 6.5 等時的預測每小時流星出現率。如見「+」出現，表示預測之 ZHR 值大於所列數字，但無法確定上限。
- 9 紅色字體為 ZHR 大於 20 的流星群。

### 2019 年流星群預測表

| 流星群名稱         | 來源天體                 | 出現期間          | 極大期   |    | 輻射點 |     | 速度<br>km/s | 亮度<br>指標 | ZHR  | 備註 |
|---------------|----------------------|---------------|-------|----|-----|-----|------------|----------|------|----|
|               |                      |               | 日期    | 月齡 | 赤經° | 赤緯° |            |          |      |    |
| 象限儀座          | C/1490Y1             | 12.28 ~ 01.12 | 01.04 | 28 | 230 | +49 | 41         | 2.1      | 110  |    |
| 半人馬座 $\alpha$ |                      | 01.31 ~ 02.20 | 02.08 | 4  | 210 | -59 | 58         | 2.0      | 6    |    |
| 矩尺座 $\gamma$  |                      | 02.25 ~ 03.28 | 03.15 | 9  | 239 | -50 | 58         | 2.0      | 6    |    |
| 天琴座           | C/Thatcher           | 04.14 ~ 04.30 | 04.23 | 18 | 271 | +34 | 49         | 2.1      | 18   |    |
| 船尾座 $\pi$     | 26P/Grigg-Skjellerup | 04.15 ~ 04.28 | 04.24 | 19 | 110 | -45 | 18         | 2.0      | Var. |    |
| 寶瓶座 $\eta$    | 1P/Halley            | 04.19 ~ 05.28 | 05.06 | 2  | 338 | -01 | 66         | 2.4      | 50   |    |
| 天琴座 $\eta$    | C/1983 H1            | 05.03 ~ 05.14 | 05.09 | 5  | 287 | +44 | 43         | 3.0      | 3    |    |
| 6 月牧夫座        | 7P/Pons-Winnecke     | 06.22 ~ 07.02 | 06.27 | 24 | 224 | +48 | 18         | 2.2      | Var. |    |

2019 年流星群預測表 (續)

| 流星群名稱   | 來源天體                     | 出現期間          | 極大期   |    | 輻射點 |     | 速度<br>km/s | 亮度<br>指標 | ZHR  | 備註                        |
|---------|--------------------------|---------------|-------|----|-----|-----|------------|----------|------|---------------------------|
|         |                          |               | 日期    | 月齡 | 赤經° | 赤緯° |            |          |      |                           |
| 南魚座     |                          | 07.15 ~ 08.10 | 07.28 | 26 | 341 | -30 | 35         | 3.2      | 5    | 流星暗，<br>路徑長，<br>慢         |
| 寶瓶座 δ 南 | 96P/<br>Machholz 2       | 07.12 ~ 08.23 | 07.30 | 28 | 340 | -16 | 41         | 2.5      | 25   | 流星暗且<br>慢                 |
| 摩羯座 α   | 72P/Dennin<br>g-Fujikawa | 07.03 ~ 08.15 | 07.30 | 28 | 307 | -10 | 23         | 2.5      | 5    | 流星慢而<br>亮，有時<br>出現火流<br>星 |
| 英仙座     | 109P/Swift<br>-Tuttle    | 07.17 ~ 08.24 | 08.13 | 12 | 48  | +58 | 59         | 2.2      | 110  |                           |
| 天鵝座 κ   |                          | 08.03 ~ 08.25 | 08.18 | 17 | 286 | +59 | 25         | 3.0      | 3    |                           |
| 御夫座 α   | C/Kiess                  | 08.28 ~ 09.05 | 09.01 | 2  | 91  | +39 | 66         | 2.5      | 6    | 流星暗但<br>速度快               |
| 9 月英仙座  |                          | 09.05 ~ 09.21 | 09.10 | 11 | 48  | +40 | 64         | 3.0      | 5    | 流星暗但<br>速度快               |
| 天龍座     | 21P/Giacob<br>ini-Zinner | 10.06 ~ 10.10 | 10.09 | 11 | 262 | +54 | 20         | 2.6      | 10   |                           |
| 金牛座南    | 2P/Encke                 | 09.10 ~ 11.20 | 10.10 | 12 | 32  | +09 | 27         | 2.3      | 5    | 流星亮且<br>慢                 |
| 御夫座 δ   |                          | 10.10 ~ 10.18 | 10.11 | 13 | 84  | +44 | 64         | 3.0      | 2    |                           |
| 雙子座 ε   | C/Ikeya                  | 10.14 ~ 10.27 | 10.19 | 21 | 102 | +27 | 70         | 3.0      | 3    |                           |
| 獵戶座     | 1P/Halley                | 10.02 ~ 11.07 | 10.22 | 14 | 95  | +16 | 66         | 2.5      | 20   |                           |
| 小獅座     | C/1739 K1                | 10.19 ~ 10.27 | 10.25 | 27 | 162 | +37 | 62         | 3.0      | 2    |                           |
| 金牛座北    | 2P/Encke                 | 10.20 ~ 12.10 | 11.13 | 16 | 58  | +22 | 29         | 2.3      | 5    | 流星亮且<br>慢                 |
| 獅子座     | 55P/Temple<br>-Tuttle    | 11.06 ~ 11.30 | 11.18 | 21 | 152 | +22 | 71         | 2.5      | 15   |                           |
| 麒麟座 α   |                          | 11.15 ~ 11.25 | 11.22 | 25 | 117 | +01 | 65         | 2.4      | Var. |                           |
| 鳳凰座     | D/Blanpain               | 11.28 ~ 12.09 | 12.02 | 6  | 18  | -53 | 18         | 2.8      | Var. |                           |
| 船尾/船帆座  |                          | 12.01 ~ 12.15 | 12.07 | 11 | 123 | -45 | 40         | 2.9      | 10   | 流星昏暗<br>但偶有火<br>球         |
| 麒麟座     |                          | 12.05 ~ 12.20 | 12.09 | 13 | 100 | +08 | 41         | 3.0      | 2    |                           |
| 長蛇座 σ   |                          | 12.03 ~ 12.15 | 12.12 | 16 | 127 | +02 | 58         | 3.0      | 3    |                           |
| 雙子座     | MP3200                   | 12.04 ~ 12.17 | 12.14 | 18 | 112 | +33 | 35         | 2.6      | 140  |                           |
| 后髮座     |                          | 12.12 ~ 12.23 | 12.16 | 20 | 175 | +18 | 65         | 3.0      | 3    |                           |
| 12 月小獅座 |                          | 12.05 ~ 12.04 | 12.20 | 24 | 161 | +30 | 64         | 3.0      | 5    |                           |
| 小熊座     | 8P/Tuttle                | 12.17 ~ 12.26 | 12.23 | 27 | 217 | +76 | 33         | 3.0      | 10   |                           |

## 2019 年通過近日點彗星表

| 彗星名稱                     | 過近日點日期 (UT) |         | 近日點距離<br>q (AU) | 離心率<br>e | 近日點<br>引數 $\omega$<br>( $^{\circ}$ ) | 昇交點<br>黃經 $\Omega$<br>( $^{\circ}$ ) | 軌道<br>傾角 i<br>( $^{\circ}$ ) |
|--------------------------|-------------|---------|-----------------|----------|--------------------------------------|--------------------------------------|------------------------------|
|                          | 月           | 日       |                 |          |                                      |                                      |                              |
| C/2018 R5 (Lemmon)       | 1           | 9.9496  | 3.6213          | 0.8414   | 178.0046                             | 171.1421                             | 103.7570                     |
| 239P/LINEAR              | 1           | 10.1559 | 1.6495          | 0.6311   | 220.3776                             | 255.9082                             | 11.3055                      |
| 374P/Larson              | 1           | 10.8801 | 2.6766          | 0.4623   | 51.5943                              | 7.9362                               | 10.7582                      |
| C/2018 A3 (ATLAS)        | 1           | 12.8648 | 3.2767          | 0.9933   | 86.4254                              | 194.2782                             | 139.5615                     |
| 171P/Spahr               | 1           | 13.7169 | 1.7723          | 0.5020   | 347.1505                             | 101.6965                             | 21.9328                      |
| C/2017 M4 (ATLAS)        | 1           | 18.3178 | 3.2517          | 1.0014   | 167.6507                             | 65.8673                              | 105.6581                     |
| 131P/Mueller             | 1           | 24.2447 | 2.4175          | 0.3432   | 179.0826                             | 214.1919                             | 7.3539                       |
| 223P/Skiff               | 1           | 27.2796 | 2.4309          | 0.4153   | 37.8263                              | 346.7936                             | 27.0150                      |
| C/2017 B3 (LINEAR)       | 2           | 2.4524  | 3.9212          | 1.0022   | 284.7391                             | 2.1799                               | 54.1787                      |
| 123P/West-Hartley        | 2           | 5.0970  | 2.1269          | 0.4487   | 103.0039                             | 46.5000                              | 15.3596                      |
| P/1996 R2 (Lagerkvist)   | 2           | 11.4611 | 2.5903          | 0.3134   | 333.2892                             | 40.0499                              | 2.6010                       |
| 149P/Mueller             | 2           | 16.9555 | 2.6336          | 0.3898   | 43.7860                              | 145.2341                             | 29.7711                      |
| C/2018 P5 (PANSTARRS)    | 2           | 25.9019 | 4.5764          | 0.6406   | 131.5873                             | 216.2450                             | 7.2567                       |
| C/2010 U3 (Boattini)     | 2           | 26.6099 | 8.4455          | 0.9989   | 88.0841                              | 43.0707                              | 55.5120                      |
| P/2012 O1 (McNaught)     | 3           | 2.2820  | 1.4353          | 0.5944   | 238.1766                             | 91.9859                              | 7.4332                       |
| 29P/Schwassmann-Wachmann | 3           | 8.2680  | 5.7668          | 0.0427   | 47.8046                              | 312.4010                             | 9.3695                       |
| 69P/Taylor               | 3           | 18.3008 | 2.2833          | 0.4133   | 343.5793                             | 104.8319                             | 22.0315                      |
| 78P/Gehrels              | 4           | 2.7158  | 2.0138          | 0.4615   | 192.6908                             | 210.5478                             | 6.2488                       |
| 232P/Hill                | 4           | 6.6206  | 2.9845          | 0.3349   | 53.5565                              | 56.0308                              | 14.6308                      |
| 373P/Rinner              | 4           | 9.1901  | 2.3134          | 0.3925   | 221.2260                             | 231.9580                             | 13.7578                      |
| P/2014 C1 (TOSTAS)       | 4           | 13.2523 | 1.6846          | 0.4464   | 24.1343                              | 167.8495                             | 2.6808                       |
| P/2017 U3 (PANSTARRS)    | 4           | 21.4899 | 4.4444          | 0.0995   | 297.4156                             | 165.1329                             | 15.9075                      |
| C/2016 X1 (Lemmon)       | 4           | 29.9129 | 7.5639          | 0.9963   | 224.5730                             | 256.4253                             | 26.4550                      |
| 138P/Shoemaker-Levy      | 5           | 2.7728  | 1.7028          | 0.5300   | 95.6157                              | 309.3332                             | 10.0898                      |
| 186P/Garradd             | 5           | 4.9255  | 4.3895          | 0.1231   | 283.7131                             | 327.1588                             | 28.4083                      |
| P/2012 O2 (McNaught)     | 5           | 6.0672  | 1.6914          | 0.5330   | 183.3530                             | 120.6951                             | 24.4826                      |
| 222P/LINEAR              | 6           | 5.0169  | 0.8280          | 0.7144   | 346.2008                             | 6.8384                               | 5.0965                       |
| C/2018 R3 (Lemmon)       | 6           | 7.1578  | 1.2903          | 0.9992   | 112.8817                             | 324.6258                             | 69.6987                      |
| 209P/LINEAR              | 6           | 12.8000 | 0.9676          | 0.6733   | 152.4902                             | 62.7718                              | 21.2587                      |
| 231P/LINEAR-NEAT         | 6           | 14.0632 | 3.0226          | 0.2478   | 42.7130                              | 133.0283                             | 12.3331                      |
| P/2000 R2 (LINEAR)       | 6           | 17.2401 | 1.6233          | 0.5317   | 176.4196                             | 160.3395                             | 11.6831                      |
| 261P/Larson              | 6           | 18.5574 | 2.0137          | 0.4228   | 67.0697                              | 291.1678                             | 6.0751                       |
| P/1999 RO28 (LONEOS)     | 6           | 25.9637 | 1.1247          | 0.6720   | 231.2173                             | 137.9171                             | 7.5626                       |
| 31P/Schwassmann-Wachmann | 7           | 6.1432  | 3.4253          | 0.1932   | 18.3582                              | 114.1120                             | 4.5466                       |
| C/2018 A6 (Gibbs)        | 7           | 14.2454 | 3.0181          | 0.8034   | 264.5128                             | 340.3841                             | 76.9544                      |
| P/2007 T4 (Gibbs)        | 7           | 23.6912 | 2.0048          | 0.6180   | 42.4419                              | 37.0585                              | 23.8603                      |
| 200P/Larsen              | 7           | 28.4683 | 3.2973          | 0.3315   | 133.9700                             | 234.8016                             | 12.1058                      |
| P/2006 F4 (Spacewatch)   | 8           | 2.7759  | 2.3340          | 0.3380   | 31.1568                              | 184.0328                             | 12.3883                      |



## 2019 年通過近日點彗星表 (續)

| 彗星名稱                           | 過近日點日期 (UT) |         | 近日點距離<br>q (AU) | 離心率<br>e | 近日點引數 $\omega$<br>( $^{\circ}$ ) | 昇交點黃經 $\Omega$<br>( $^{\circ}$ ) | 軌道傾角 i<br>( $^{\circ}$ ) |
|--------------------------------|-------------|---------|-----------------|----------|----------------------------------|----------------------------------|--------------------------|
|                                | 月           | 日       |                 |          |                                  |                                  |                          |
| 264P/Larsen                    | 8           | 4.8852  | 2.4387          | 0.3737   | 346.6049                         | 220.9037                         | 25.1506                  |
| 168P/Hergenrother              | 8           | 5.0958  | 1.3592          | 0.6207   | 14.9306                          | 355.5061                         | 21.6121                  |
| 163P/NEAT                      | 8           | 5.2987  | 2.0664          | 0.4520   | 349.7224                         | 102.0950                         | 12.7075                  |
| P/2012 K3 (Gibbs)              | 8           | 17.6456 | 2.0881          | 0.4239   | 172.1683                         | 125.8440                         | 13.1907                  |
| P/1999 R1 (SOHO)               | 8           | 31.3444 | 0.0504          | 0.9799   | 55.8718                          | 352.6095                         | 11.5331                  |
| 322P/SOHO                      | 8           | 31.3833 | 0.0504          | 0.9799   | 56.0286                          | 352.4088                         | 11.5546                  |
| 260P/McNaught                  | 9           | 9.8449  | 1.4172          | 0.6091   | 18.2677                          | 349.4254                         | 15.0524                  |
| C/2018 KJ3 (Lemmon)            | 9           | 9.9205  | 3.6271          | 0.9962   | 217.7055                         | 91.5865                          | 136.6691                 |
| P/2008 Y1 (Boattini)           | 9           | 10.5890 | 1.2681          | 0.7361   | 162.8018                         | 259.3361                         | 8.9185                   |
| P/2010 U2 (Hill)               | 9           | 15.3605 | 2.5676          | 0.4008   | 44.3506                          | 357.0819                         | 16.8285                  |
| P/2000 S4                      | 9           | 26.4974 | 2.2661          | 0.6818   | 173.0164                         | 173.8284                         | 28.3743                  |
| P/2005 GF8 (LONEOS)            | 9           | 30.7105 | 2.8310          | 0.5164   | 285.3922                         | 314.9085                         | 1.1924                   |
| 175P/Hergenrother              | 9           | 30.7220 | 1.9464          | 0.4323   | 56.1684                          | 123.5356                         | 6.0767                   |
| P/2008 Y12 (SOHO)              | 10          | 9.7574  | 0.0676          | 0.9780   | 144.3655                         | 309.8046                         | 23.6109                  |
| P/2014 U2 (Kowalski)           | 10          | 11.3339 | 1.1174          | 0.6155   | 37.4496                          | 354.3438                         | 7.2816                   |
| P/2009 SK280 (Spacewatch-Hill) | 10          | 23.7537 | 4.2089          | 0.1194   | 327.9401                         | 36.4143                          | 16.7999                  |
| P/2006 S1 (Christensen)        | 10          | 25.3915 | 1.4174          | 0.5999   | 133.6562                         | 207.9130                         | 12.3343                  |
| 76P/West-Kohoutek-Ikemura      | 10          | 26.1917 | 1.6047          | 0.5381   | 0.0427                           | 84.1265                          | 30.4572                  |
| 68P/Klemola                    | 11          | 9.0329  | 1.7915          | 0.6381   | 153.0534                         | 175.1759                         | 11.1206                  |
| C/2018 N2 (ASASSN)             | 11          | 11.2276 | 3.1260          | 0.9987   | 24.3954                          | 25.2669                          | 77.5322                  |
| P/2003 F2 (NEAT)               | 11          | 11.8004 | 2.9704          | 0.5423   | 191.7797                         | 359.0979                         | 11.6041                  |
| 215P/NEAT                      | 11          | 14.8491 | 3.6060          | 0.1698   | 261.5367                         | 56.7243                          | 10.5869                  |
| 155P/Shoemaker                 | 11          | 15.2300 | 1.8013          | 0.7266   | 14.6895                          | 97.2020                          | 6.3958                   |
| 294P/LINEAR                    | 11          | 29.6813 | 1.3004          | 0.5943   | 235.5123                         | 312.6096                         | 18.2129                  |
| P/2013 T2 (Schwartz)           | 11          | 30.3148 | 1.7384          | 0.5020   | 345.3519                         | 0.9450                           | 9.4667                   |
| 160P/LINEAR                    | 12          | 2.2023  | 1.7860          | 0.5269   | 12.5421                          | 333.4970                         | 15.6140                  |
| P/2006 H1 (McNaught)           | 12          | 7.8514  | 2.4196          | 0.5809   | 309.3051                         | 0.0234                           | 12.8192                  |
| 289P/Blanpain                  | 12          | 21.0502 | 0.9597          | 0.6849   | 9.8185                           | 68.9300                          | 5.8980                   |

## 2019 年月掩星表

月掩星是最常見的一種天象，透過對此種現象的研究，天文學家可以確知月球在天空中運行的狀況。但是月球的赤道地平視差約為  $1^\circ$ ，而月球的視直徑約只有  $0.5^\circ$ ，所以月掩星現象的觀測與日食相似，不僅有地區限制，而且各地見到的情形也都有差別。

利用國際掩星組織 ( The International Occultation Timing Association, IOTA ) 所提供的程式 ( Occultations V4.0.9 )，計算編列出臺北市 ( 天文館所在地東經  $121^\circ 31' 5''$ 、北緯  $25^\circ 05' 44''$  ) 能觀測的掩星狀況，供小型望遠鏡觀測參考。表中各欄位說明如下：

時間：使用地方時。

現象：月球與被掩蔽星體的狀況，D 代表掩入，R 代表復出，M 表示在掠掩最高點時不見，小寫字母表示較不易觀測。若有第二個字母者表示為雙星，可能會有兩次相連的掩入或復出，觀測時要特別注意。

編號：分 3 種格式；4 位數者為 ZC 星表；5 位數或 6 位數者為 SAO 星表；6 位數前有 X 字母者為 XZ 編號。

星等：被掩星體的光度，此處僅列出亮度在 7.0 等 ( 含 ) 以內的亮星。

月相：月球明亮部份與可見半球的面積比，並以 +、- 表示相位的增減，E 表示月食。

高度：月球中心與地平面的角距離，詳見月球表之說明。

方位：月球中心與地面正北方的角距離，詳見月球表之說明。

尖頂角：月球平面中心量取被掩天體至月球邊緣明暗交界處的角度。以亮緣為負，暗緣為正，並標示南北方向，其值介於  $\pm 90$  度之間。

位置角：由月球平面中心量取被掩天體與月緣北點間的角度，被掩天體在月緣正東方時為  $90$  度，正西方為  $270$  度。

位置：以 2000.0 天球赤道座標 ( 赤經、赤緯 ) 標示被掩天體的位置。

時間修正參數：觀測地點每相距 500 公尺，時間約有 1 秒的偏差；因此，若在臺北市立天文科學教育館以外的地區進行月掩星觀測時，需將月掩星時間根據觀測地點的地理經緯度加以修正，修正公式為

$$T = T_0 + A (\lambda - \lambda_0) + B (\varphi - \varphi_0)$$

其中 A 為經度修正參數，B 為緯度修正參數， $T_0$  為表中的預測時間， $\lambda$ 、 $\varphi$  為觀測地點的地理經緯度， $\lambda_0$ 、 $\varphi_0$  則為天文館的地理經緯度。經度的表示以東半球為 +，以西半球為 -；緯度的表示以北半球為 +，南半球為 -；兩者均須以「度」計算。

## 月掩星表(一)

| 日期   | 時間         | 現象 | 恆星編號  | 星等  | 月相  | 高度 | 方位  | 尖頂<br>角 PA | 位置角<br>CA | A    | B    | 赤  | 經  | 赤    | 緯         |
|------|------------|----|-------|-----|-----|----|-----|------------|-----------|------|------|----|----|------|-----------|
| 月日   | 時分秒        |    |       |     |     | °  | °   | °          | °         | m/°  | m/°  | h  | m  | s    | ° ' "     |
| 1 2  | 7 3 16     | d  | 2223S | 3.9 | 15- | 43 | 145 | 53         | -35N      | 4.9  | 4.3  | 15 | 35 | 31.6 | -14 47 22 |
| 1 2  | 7 38 35.6  | R  | 2223S | 3.9 | 15- | 47 | 156 | 5          | 12N       | -1.1 | -5.7 | 15 | 35 | 31.6 | -14 47 22 |
| 1 3  | 8 19 43.9  | r  | 2361  | 4.2 | 9-  | 43 | 156 | 236        | 42S       | 4.3  | 2.9  | 16 | 27 | 1.4  | -18 27 23 |
| 1 9  | 16 17 21   | m  | 3190S | 2.9 | 9+  | 41 | 216 | 332        | -13N      | 9.9  | 9.9  | 21 | 47 | 2.4  | -16 7 38  |
| 1 11 | 13 18 55.5 | d  | 3428S | 5   | 22+ | 39 | 128 | 87         | 73S       | 2.2  | 1    | 23 | 18 | 57.7 | -9 36 39  |
| 1 15 | 15 38 32.4 | D  | 364   | 4.3 | 61+ | 43 | 102 | 107        | 53S       | 2.2  | 0.1  | 2  | 28 | 9.5  | 8 27 36   |
| 1 17 | 2 4 10     | m  | 1702  | 4   | 82- | 63 | 130 | 31         | -11N      | 9.9  | 9.9  | 11 | 45 | 51.6 | 6 31 46   |
| 1 17 | 21 25 24.6 | D  | 648S  | 3.8 | 82+ | 75 | 242 | 40         | 53N       | 2.1  | 2.3  | 4  | 22 | 56.1 | 17 32 33  |
| 1 17 | 21 57 10.9 | D  | 653S  | 4.8 | 82+ | 69 | 254 | 79         | 88S       | 2.4  | 0.1  | 4  | 24 | 5.8  | 17 26 39  |
| 1 17 | 22 38 9.2  | R  | 648S  | 3.8 | 82+ | 60 | 262 | 288        | -60N      | 2.2  | -1.6 | 4  | 22 | 56.1 | 17 32 33  |
| 1 17 | 23 21 14.1 | r  | 653S  | 4.8 | 82+ | 50 | 268 | 253        | -86S      | 1.8  | 0    | 4  | 24 | 5.8  | 17 26 39  |
| 1 18 | 19 58 33.9 | D  | 798p  | 6.2 | 90+ | 69 | 100 | 94         | 78S       | 2.4  | 0.3  | 5  | 20 | 56.6 | 19 48 52  |
| 1 18 | 20 5 37    | m  | 796k  | 6.7 | 90+ | 71 | 102 | 163        | 9S        | 9.9  | 9.9  | 5  | 20 | 18.3 | 19 34 42  |
| 1 21 | 21 31 37.3 | r  | 1282  | 6.6 | 0-  | 49 | 88  | 297        | 70N       | 1.7  | -0.4 | 8  | 35 | 19.4 | 19 35 24  |
| 1 22 | 20 45 5.9  | R  | 1418c | 5.7 | 97- | 24 | 83  | 283        | 90N       | 0.7  | 0.3  | 9  | 37 | 2.6  | 16 26 17  |
| 1 25 | 1 16 47.4  | d  | 3963P | 6.9 | 83+ | 25 | 279 | 40         | 52N       | 1.1  | 1.3  | 4  | 29 | 30.4 | 17 51 47  |
| 1 25 | 3 25 1.3   | r  | 1312p | 6.8 | 0-  | 51 | 270 | 268        | 78S       | 1.7  | -0.6 | 8  | 45 | 29.6 | 18 49 3   |
| 1 27 | 6 42 23.4  | r  | 2072  | 6.6 | 49- | 53 | 199 | 241        | 42S       | 4.4  | 1.9  | 14 | 28 | 32   | -10 0 15  |
| 1 28 | 7 38 35.6  | R  | 2223S | 3.9 | 15- | 47 | 156 | 5          | 12N       | -1.1 | -5.7 | 15 | 35 | 31.6 | -14 47 22 |
| 2 10 | 18 4 10.7  | D  | 210D  | 6.6 | 25+ | 53 | 239 | 16         | 34N       | 0.9  | 3.2  | 1  | 26 | 53.6 | 3 32 8    |
| 2 11 | 20 58 1.3  | D  | 464   | 6.8 | 35+ | 28 | 266 | 100        | 62S       | 1.1  | -1.4 | 2  | 18 | 41.6 | 8 10 51   |
| 2 14 | 17 28 7.4  | d  | 730W  | 5.1 | 66+ | 66 | 99  | 57         | 65N       | 1.7  | 1.9  | 4  | 51 | 22.5 | 18 50 23  |
| 2 14 | 18 54 9.5  | r  | 730W  | 5.1 | 66+ | 83 | 149 | 263        | -89N      | 2.7  | 0.4  | 4  | 51 | 22.5 | 18 50 23  |
| 2 16 | 18 35 39   | M  | 1051D | 6.6 | 86+ | 56 | 89  | 173        | 11S       | 9.9  | 9.9  | 6  | 54 | 21.3 | 21 9 41   |
| 2 20 | 2 34 10.2  | d  | 1086c | 6.4 | 87+ | 19 | 285 | 80         | 74N       | 0.5  | -0.5 | 7  | 10 | 6.7  | 21 14 49  |
| 2 21 | 1 0 31.2   | R  | 2128  | 5.8 | 68- | 27 | 119 | 265        | 70S       | 1.5  | 1.1  | 14 | 54 | 22.9 | -11 53 54 |
| 2 23 | 23 25 46.2 | r  | 2005  | 7   | 78- | 20 | 108 | 261        | 64S       | 1.1  | 1.3  | 13 | 58 | 59.9 | -6 55 31  |
| 2 26 | 5 2 11.4   | D  | 2271c | 4.1 | 56- | 48 | 171 | 176        | -16S      | 0.2  | -4.4 | 15 | 53 | 49.5 | -16 43 45 |
| 2 26 | 5 47 59.6  | R  | 2271c | 4.1 | 56- | 48 | 188 | 234        | 43S       | 4.3  | 2.5  | 15 | 53 | 49.5 | -16 43 45 |
| 2 27 | 4 44 14.3  | R  | 2408  | 6.6 | 46- | 41 | 151 | 320        | 47N       | 1.5  | -1.5 | 16 | 45 | 30.2 | -19 8 13  |
| 2 28 | 8 42 3.5   | r  | 2547c | 4.9 | 35- | 38 | 208 | 226        | 44S       | 2.4  | 1.7  | 17 | 43 | 25.8 | -21 40 59 |
| 3 10 | 20 44 42   | d  | 306   | 6.8 | 13+ | 4  | 276 | 155        | 11S       | 9.9  | 9.9  | 2  | 5  | 48.5 | 7 1 42    |
| 3 13 | 0 22 57.1  | D  | 1312p | 6.8 | 83+ | 43 | 273 | 131        | 65S       | 0.7  | -2   | 8  | 45 | 29.6 | 18 49 3   |
| 3 13 | 20 1 16    | D  | 697p  | 6.5 | 39+ | 50 | 270 | 50         | 57N       | 1.9  | 1.2  | 4  | 37 | 14.8 | 18 32 35  |
| 3 14 | 19 38 13.2 | D  | 837   | 6.2 | 50+ | 67 | 264 | 117        | 60S       | 2.3  | -2   | 5  | 33 | 38.8 | 20 28 27  |
| 3 17 | 18 11 57.8 | D  | 1282  | 6.6 | 82+ | 53 | 90  | 112        | 83S       | 1.9  | -0.3 | 8  | 35 | 19.4 | 19 35 24  |
| 3 17 | 20 20 2    | D  | 1287k | 6.7 | 82+ | 80 | 125 | 181        | 15S       | 9.9  | 9.9  | 8  | 37 | 46.8 | 19 16 2   |
| 3 17 | 20 53 37.3 | D  | 1293p | 6.8 | 83+ | 85 | 175 | 80         | 64N       | 2.8  | 0.6  | 8  | 39 | 50.7 | 19 32 27  |
| 3 17 | 21 14 44.2 | D  | 1297p | 6.8 | 83+ | 83 | 218 | 112        | 84S       | 2.3  | -1.1 | 8  | 40 | 20.1 | 19 20 56  |
| 3 17 | 21 19 1.5  | D  | 1299p | 6.3 | 83+ | 82 | 225 | 69         | 53N       | 3    | 1.1  | 8  | 40 | 27   | 19 32 41  |
| 3 17 | 21 46 47   | D  | 1303k | 6.8 | 83+ | 77 | 248 | 46         | 31N       | 4    | 3.6  | 8  | 40 | 56.3 | 19 34 49  |

## 月掩星表(二)

| 日期   | 時間         | 現象 | 恆星編號  | 星等  | 月相  | 高度 | 方位  | 尖頂角 | 位置角  | A    | B    | 赤 經 |    |      | 赤 緯 |    |    |
|------|------------|----|-------|-----|-----|----|-----|-----|------|------|------|-----|----|------|-----|----|----|
| 月 日  | 時 分 秒      |    |       |     |     |    | °   | °   | °    | m/°  | m/°  | h   | m  | s    | °   | '  | "  |
| 3 18 | 6 1 48.5   | R  | 2498S | 4.4 | 63- | 42 | 199 | 271 | 88S  | 2.8  | -0.4 | 17  | 21 | 0.4  | -21 | 6  | 47 |
| 3 18 | 18 17 2.3  | D  | 1418c | 5.7 | 90+ | 40 | 89  | 127 | 74S  | 1.4  | -0.8 | 9   | 37 | 2.6  | 16  | 26 | 17 |
| 3 23 | 2 14 7.1   | D  | 1576  | 5.3 | 97+ | 41 | 262 | 181 | 30S  | -0.6 | -4.4 | 10  | 49 | 15.4 | 10  | 32 | 43 |
| 3 23 | 23 14 19.9 | r  | 2072  | 6.6 | 90- | 33 | 122 | 238 | 46S  | 2.8  | 3.4  | 14  | 28 | 32   | -10 | 0  | 15 |
| 3 25 | 4 56 12    | R  | 2785  | 6.9 | 43- | 37 | 150 | 266 | 87N  | 2.6  | 0.7  | 19  | 6  | 58.3 | -22 | 29 | 51 |
| 3 29 | 4 25 13    | d  | 2498S | 4.4 | 63- | 43 | 169 | 115 | -69S | 2.5  | -0.7 | 17  | 21 | 0.4  | -21 | 6  | 47 |
| 3 29 | 5 14 59    | m  | 2361  | 4.2 | 72- | 44 | 202 | 17  | -10N | 9.9  | 9.9  | 16  | 27 | 1.4  | -18 | 27 | 23 |
| 4 3  | 9 35 46.6  | r  | 3428S | 5.0 | 5-  | 53 | 158 | 199 | 52S  | 1.3  | 3.2  | 23  | 18 | 57.7 | -9  | 36 | 39 |
| 4 7  | 19 18 18.7 | D  | 393c  | 6.7 | 4+  | 8  | 278 | 21  | 28N  | 0.6  | 2.3  | 2   | 39 | 3.5  | 10  | 38 | 13 |
| 4 9  | 19 54 30   | M  | 648S  | 3.8 | 16+ | 24 | 279 | 173 | 1S   | 9.9  | 9.9  | 4   | 22 | 56.1 | 17  | 32 | 33 |
| 4 9  | 20 42 13.5 | D  | 658S  | 4.3 | 17+ | 14 | 284 | 81  | 87N  | 0.3  | -0.5 | 4   | 25 | 29.4 | 17  | 55 | 41 |
| 4 10 | 18 57 11.6 | D  | 790P  | 6.8 | 25+ | 49 | 273 | 134 | 43S  | 1.2  | -3.4 | 5   | 17 | 31.2 | 20  | 7  | 55 |
| 4 10 | 19 58 10.7 | D  | 793p  | 6.2 | 25+ | 35 | 278 | 139 | 38S  | 0.3  | -3.4 | 5   | 19 | 14.7 | 20  | 8  | 5  |
| 4 14 | 20 7 53    | D  | 1383c | 6.6 | 69+ | 81 | 218 | 108 | 89N  | 2.4  | -1   | 9   | 18 | 58.8 | 17  | 42 | 19 |
| 4 15 | 19 47 46.2 | D  | 1504  | 5.4 | 79+ | 74 | 131 | 165 | 38S  | 1.1  | -3.8 | 10  | 16 | 40.7 | 13  | 43 | 42 |
| 4 17 | 2 20 19.5  | R  | 2425c | 5.9 | 87- | 44 | 171 | 228 | 45S  | 4.2  | 3    | 16  | 53 | 25.2 | -20 | 24 | 56 |
| 4 20 | 20 43 3.1  | R  | 2128  | 5.8 | 98- | 18 | 113 | 325 | 35N  | 0.2  | -1.1 | 14  | 54 | 22.9 | -11 | 53 | 54 |
| 4 21 | 22 25 0    | d  | 2271c | 4.1 | 94- | 25 | 124 | 123 | -63S | 0.8  | -0.3 | 15  | 53 | 49.5 | -16 | 43 | 45 |
| 4 21 | 23 39 8.9  | R  | 2271c | 4.1 | 94- | 37 | 139 | 291 | 74N  | 1.7  | -0.2 | 15  | 53 | 49.5 | -16 | 43 | 45 |
| 4 23 | 23 2 49.3  | R  | 2547c | 4.9 | 80- | 10 | 119 | 279 | 81N  | 0.6  | 0.5  | 17  | 43 | 25.8 | -21 | 40 | 59 |
| 5 7  | 20 5 44.9  | D  | 760C  | 6.6 | 7+  | 7  | 289 | 102 | 78S  | -0.2 | -1.1 | 5   | 5  | 32.1 | 19  | 48 | 25 |
| 5 14 | 15 27 58.7 | d  | 1702  | 4.0 | 76+ | 20 | 92  | 110 | 84N  | 0.6  | 0.1  | 11  | 45 | 51.6 | 6   | 31 | 46 |
| 5 15 | 1 29 43.3  | R  | 2509d | 5.8 | 96- | 44 | 181 | 309 | 50N  | 2.4  | -1.5 | 17  | 24 | 42   | -21 | 26 | 29 |
| 5 19 | 2 26 40    | m  | 18c   | 5.8 | 30- | 8  | 100 | 158 | 4S   | 9.9  | 9.9  | 0   | 10 | 18.9 | -5  | 14 | 55 |
| 5 20 | 22 47 9.1  | R  | 2498S | 4.4 | 96- | 30 | 137 | 323 | 36N  | 0.8  | -1.3 | 17  | 21 | 0.4  | -21 | 6  | 47 |
| 5 27 | 3 6 6      | d  | 3078c | 4.9 | 67- | 39 | 148 | 121 | -43S | 2.8  | -1   | 21  | 4  | 24.3 | -19 | 51 | 18 |
| 5 29 | 2 0 10.9   | R  | 3197  | 6.4 | 58- | 23 | 123 | 294 | 46N  | 1.4  | -0.1 | 21  | 50 | 13   | -16 | 50 | 42 |
| 5 31 | 4 14 16.3  | R  | 3078c | 4.9 | 67- | 44 | 168 | 206 | 42S  | 2    | 3.1  | 21  | 4  | 24.3 | -19 | 51 | 18 |
| 6 13 | 20 6 46.5  | D  | 2043c | 6.5 | 84+ | 55 | 163 | 110 | 86N  | 2.4  | -0.6 | 14  | 16 | 48.7 | -8  | 53 | 4  |
| 6 13 | 20 36 49.8 | D  | 2047  | 6.6 | 84+ | 56 | 176 | 117 | 86S  | 2.2  | -1   | 14  | 17 | 22.6 | -9  | 1  | 22 |
| 6 14 | 23 44 11.7 | d  | 2180  | 6.8 | 92+ | 40 | 221 | 121 | 80S  | 2    | -1.6 | 15  | 14 | 18.8 | -14 | 12 | 34 |
| 6 15 | 23 36 54.7 | d  | 穀神星   | 7.4 | 97+ | 44 | 203 | 164 | 31S  | 1.5  | -4   | 16  | 7  | 29.7 | -18 | 8  | 15 |
| 6 16 | 0 9 3.1    | R  | 穀神星   | 7.4 | 97+ | 40 | 212 | 87  | -27S | 18   | -6   | 16  | 7  | 29.7 | -18 | 8  | 15 |
| 6 21 | 3 45 39.4  | R  | 726c  | 7.0 | 5-  | 3  | 71  | 229 | 63S  | -0.5 | 1.6  | 4   | 48 | 42.1 | 18  | 42 | 34 |
| 6 28 | 2 15 33    | R  | 2754  | 5.9 | 98- | 39 | 201 | 247 | 71S  | 2.4  | 0.5  | 18  | 56 | 0.7  | -23 | 10 | 26 |
| 6 28 | 4 46 8.7   | R  | 730W  | 5.1 | 5-  | 15 | 76  | 210 | 44S  | -0.4 | 2.3  | 4   | 51 | 22.5 | 18  | 50 | 23 |
| 7 1  | 3 47 26    | R  | 208p  | 7.0 | 36- | 38 | 107 | 319 | 18N  | 6.3  | -7.2 | 1   | 25 | 40.7 | 2   | 58 | 19 |
| 7 4  | 13 4 33.2  | D  | 火星    | 1.8 | 3+  | 84 | 134 | 103 | 86S  | 2.7  | -0.6 | 8   | 14 | 45.6 | 21  | 2  | 34 |
| 7 4  | 14 36 19.4 | R  | 火星    | 1.8 | 3+  | 72 | 261 | 285 | -85N | 2.3  | -1.1 | 8   | 14 | 45.6 | 21  | 2  | 34 |

## 月掩星表(三)

| 日期   | 時間         | 現象 | 恆星編號  | 星等  | 月相  | 高度 | 方位  | 尖頂角 | 位置角  | A    | B    | 赤 經 |    |      | 赤 緯 |    |    |
|------|------------|----|-------|-----|-----|----|-----|-----|------|------|------|-----|----|------|-----|----|----|
| 月 日  | 時 分 秒      |    |       |     |     |    | °   | °   | °    | m/°  | m/°  | h   | m  | s    | °   | '  | "  |
| 7 13 | 0 24 39    | D  | 2271c | 4.1 | 82+ | 19 | 240 | 20  | 6N   | 9.9  | 9.9  | 15  | 53 | 49.5 | -16 | 43 | 45 |
| 7 13 | 20 18 49.7 | D  | 2401S | 5.6 | 89+ | 43 | 163 | 156 | 35S  | 1.2  | -2.5 | 16  | 41 | 53.7 | -19 | 55 | 28 |
| 7 14 | 19 41 17.5 | d  | 2529S | 6.5 | 94+ | 32 | 141 | 173 | 12S  | -0.7 | -4.3 | 17  | 35 | 18.5 | -22 | 2  | 38 |
| 7 14 | 21 27 22.7 | D  | 2535c | 6.3 | 95+ | 42 | 168 | 79  | 74N  | 3    | 0.7  | 17  | 38 | 44.9 | -21 | 54 | 46 |
| 7 16 | 1 28 8.2   | d  | 2549c | 6.6 | 95+ | 23 | 230 | 111 | 73S  | 1.8  | -1.5 | 17  | 44 | 24   | -22 | 11 | 42 |
| 7 20 | 0 34 59    | r  | 2271c | 4.1 | 82+ | 17 | 242 | 4   | -11N | 9.9  | 9.9  | 15  | 53 | 49.5 | -16 | 43 | 45 |
| 7 22 | 2 25 45    | R  | 793p  | 6.2 | 14- | 3  | 69  | 255 | 81S  | -0.3 | 1    | 5   | 19 | 14.7 | 20  | 8  | 5  |
| 7 23 | 1 36 11.1  | d  | 2709  | 6.7 | 99+ | 29 | 221 | 142 | 35S  | 3.3  | -3.8 | 18  | 39 | 2.1  | -23 | 10 | 56 |
| 7 24 | 5 6 42     | r  | 808c  | 6.8 | 14- | 37 | 82  | 258 | 84S  | 0.9  | 1.2  | 5   | 25 | 10.4 | 20  | 35 | 1  |
| 7 26 | 4 40 12.9  | R  | 984c  | 6.5 | 7-  | 19 | 74  | 192 | 12S  | -1.3 | 4.4  | 6   | 25 | 42.7 | 21  | 38 | 42 |
| 7 27 | 3 45 16.4  | R  | 658S  | 4.3 | 22- | 31 | 83  | 286 | 63N  | 1.2  | 0.3  | 4   | 25 | 29.4 | 17  | 55 | 41 |
| 7 28 | 2 28 48.8  | R  | 648S  | 3.8 | 23- | 14 | 77  | 255 | 87S  | 0.1  | 1.2  | 4   | 22 | 56.1 | 17  | 32 | 33 |
| 7 28 | 2 47 23.4  | R  | 653S  | 4.8 | 23- | 18 | 79  | 211 | 42S  | -0.3 | 2.4  | 4   | 24 | 5.8  | 17  | 26 | 39 |
| 7 28 | 3 32 21.8  | R  | 3358  | 6.9 | 87- | 52 | 195 | 222 | 60S  | 1.8  | 1.7  | 22  | 54 | 7.1  | -12 | 11 | 26 |
| 7 29 | 2 56 2.7   | d  | 658S  | 4.3 | 23- | 20 | 79  | 29  | -41N | -0.3 | 2.4  | 4   | 25 | 29.4 | 17  | 55 | 41 |
| 7 29 | 11 28 37.4 | D  | 847c  | 3.0 | 12- | 57 | 271 | 107 | -68S | 1.8  | -1.5 | 5   | 37 | 38.7 | 21  | 8  | 33 |
| 7 29 | 12 42 2.7  | R  | 847c  | 3.0 | 12- | 41 | 277 | 250 | 74S  | 1.5  | 0    | 5   | 37 | 38.7 | 21  | 8  | 33 |
| 7 30 | 4 17 53    | M  | 663p  | 6.9 | 22- | 38 | 86  | 336 | 13N  | 9.9  | 9.9  | 4   | 27 | 4.9  | 18  | 12 | 27 |
| 8 4  | 10 38 58.2 | d  | 1702  | 4.0 | 13+ | 27 | 96  | 153 | 46S  | 0.7  | -1.7 | 11  | 45 | 51.6 | 6   | 31 | 46 |
| 8 5  | 20 35 1.9  | D  | 1856D | 6.8 | 26+ | 18 | 260 | 72  | 51N  | 0.8  | -0.3 | 12  | 56 | 26.6 | 0   | 57 | 17 |
| 8 10 | 22 1 27.9  | D  | 2509d | 5.8 | 78+ | 36 | 214 | 49  | 45N  | 2.1  | 1.3  | 17  | 24 | 42   | -21 | 26 | 29 |
| 8 12 | 18 45 47.4 | d  | 2793p | 6.7 | 92+ | 26 | 135 | 144 | 29S  | 0.7  | -1.6 | 19  | 8  | 44.4 | -23 | 11 | 25 |
| 8 17 | 3 16 56    | M  | 1059c | 6.9 | 18- | 18 | 73  | 352 | 14N  | 9.9  | 9.9  | 6   | 58 | 11.8 | 22  | 28 | 33 |
| 8 18 | 22 18 57.3 | R  | 443   | 4.6 | 91- | 25 | 110 | 194 | 29S  | 0.7  | 3.6  | 0   | 5  | 20.1 | -5  | 42 | 27 |
| 8 22 | 4 40 29.6  | R  | 905c  | 6.9 | 27- | 49 | 85  | 228 | 49S  | 0.9  | 2.3  | 5   | 59 | 39.6 | 21  | 36 | 15 |
| 8 25 | 1 6 34     | M  | 464c  | 6.1 | 59- | 33 | 90  | 332 | 14N  | 9.9  | 9.9  | 3   | 11 | 21.9 | 13  | 2  | 52 |
| 8 25 | 1 8 51.8   | R  | 736   | 6.4 | 38- | 15 | 75  | 288 | 65N  | 0.5  | 0.3  | 4   | 54 | 58.4 | 19  | 29 | 7  |
| 8 25 | 5 38 42.7  | r  | 610S  | 6.1 | 47- | 82 | 152 | 285 | 64N  | 3.5  | -0.9 | 4   | 7  | 59.4 | 17  | 20 | 24 |
| 8 25 | 9 12 21.3  | r  | 765c  | 5.3 | 36- | 57 | 269 | 273 | 81N  | 2    | -0.8 | 5   | 7  | 48.4 | 20  | 25 | 6  |
| 9 1  | 12 0 13    | m  | 1773w | 5.0 | 5+  | 58 | 130 | 33  | 20N  | 9.9  | 9.9  | 12  | 20 | 21   | 3   | 18 | 45 |
| 9 5  | 18 38 54.6 | D  | 2316  | 6.4 | 43+ | 41 | 209 | 118 | 72S  | 2.3  | -1.5 | 16  | 9  | 55.3 | -18 | 20 | 26 |
| 9 5  | 21 32 36.8 | D  | 2331p | 6.3 | 43+ | 13 | 242 | 105 | 85S  | 1    | -1.3 | 16  | 14 | 39.2 | -18 | 32 | 8  |
| 9 7  | 19 57 29.5 | D  | 2595S | 5.7 | 64+ | 40 | 200 | 94  | 86S  | 2.7  | -0.5 | 18  | 1  | 54.4 | -22 | 46 | 49 |
| 9 7  | 20 46 48.5 | D  | 2604p | 6.7 | 64+ | 35 | 212 | 78  | 78N  | 2.3  | -0.2 | 18  | 3  | 1.7  | -22 | 43 | 7  |
| 9 8  | 19 38 30.2 | D  | 2754  | 5.9 | 73+ | 42 | 179 | 72  | 78N  | 3    | 0.7  | 18  | 56 | 0.7  | -23 | 10 | 26 |
| 9 16 | 1 41 24.4  | r  | 1277w | 5.3 | 22- | 1  | 68  | 285 | 89S  | -0.1 | 0.3  | 8   | 32 | 42.5 | 20  | 26 | 28 |
| 9 17 | 21 48 38.4 | r  | 306   | 6.8 | 89- | 24 | 93  | 254 | 87S  | 0.7  | 1.4  | 2   | 5  | 48.5 | 7   | 1  | 42 |
| 9 18 | 2 37 14    | M  | 847c  | 3.0 | 53- | 50 | 86  | 162 | -16S | 9.9  | 9.9  | 5   | 37 | 38.7 | 21  | 8  | 33 |
| 9 18 | 3 24 28.1  | R  | 210D  | 6.6 | 94- | 57 | 234 | 244 | 76S  | 2.2  | 0.7  | 1   | 26 | 53.6 | 3   | 32 | 8  |
| 9 18 | 4 11 8.3   | R  | 1152c | 7.0 | 31- | 46 | 83  | 311 | 59N  | 2.1  | -1.3 | 7   | 37 | 40.2 | 22  | 20 | 24 |

## 月掩星表(四)

| 日期    | 時間         | 現象 | 恆星編號  | 星等  | 月相  | 高度 | 方位  | 尖頂角 | 位置角  | A    | B    | 赤 經 |    |      | 赤 緯 |    |    |
|-------|------------|----|-------|-----|-----|----|-----|-----|------|------|------|-----|----|------|-----|----|----|
| 月 日   | 時 分 秒      |    |       |     |     |    | °   | °   | °    | m/°  | m/°  | h   | m  | s    | °   | '  | "  |
| 9 20  | 5 20 30.1  | R  | 1304p | 6.8 | 20- | 48 | 87  | 320 | 56N  | 1.9  | -1.8 | 8   | 41 | 15.3 | 20  | 28 | 37 |
| 9 20  | 23 54 25.7 | R  | 697p  | 6.5 | 64- | 25 | 80  | 190 | 17S  | -0.8 | 3.7  | 4   | 37 | 14.8 | 18  | 32 | 35 |
| 9 24  | 4 45 56.9  | R  | 851c  | 6.4 | 52- | 79 | 104 | 294 | 64N  | 3.2  | -1.2 | 5   | 39 | 27.1 | 21  | 45 | 47 |
| 10 5  | 19 10 2.9  | D  | 2706  | 5.8 | 47+ | 37 | 207 | 102 | 75S  | 2.7  | -0.9 | 18  | 38 | 30.7 | -23 | 30 | 18 |
| 10 5  | 20 1 52.1  | D  | 2709  | 6.7 | 48+ | 31 | 219 | 19  | 23N  | 0.2  | 3.8  | 18  | 39 | 2.1  | -23 | 10 | 56 |
| 10 8  | 0 41 12.6  | R  | 5102D | 6.1 | 69- | 41 | 81  | 270 | 87S  | 1.3  | 0.8  | 6   | 14 | 52.6 | 22  | 30 | 24 |
| 10 10 | 20 54 28.8 | D  | 3358  | 6.9 | 90+ | 52 | 164 | 72  | 79S  | 2.8  | 1    | 22  | 54 | 7.1  | -12 | 11 | 26 |
| 10 14 | 3 59 6.2   | R  | 668S  | 3.5 | 85- | 71 | 257 | 310 | 44N  | 3.3  | -4.1 | 4   | 28 | 37   | 19  | 10 | 50 |
| 10 14 | 5 24 4.4   | R  | 1755  | 6.9 | 7-  | 23 | 96  | 285 | 73S  | 0.7  | 0.3  | 12  | 11 | 40.2 | 4   | 3  | 21 |
| 10 15 | 20 48 29   | m  | 393c  | 6.7 | 97- | 29 | 91  | 331 | 25N  | 9.9  | 9.9  | 2   | 39 | 3.5  | 10  | 38 | 13 |
| 10 15 | 22 44 35.5 | r  | 398c  | 6.5 | 97- | 55 | 108 | 200 | 24S  | 0.5  | 3.3  | 2   | 42 | 0.1  | 10  | 32 | 41 |
| 10 15 | 23 27 7.5  | R  | 401c  | 6.3 | 97- | 63 | 118 | 224 | 49S  | 1.5  | 2.3  | 2   | 42 | 28.9 | 10  | 44 | 30 |
| 10 17 | 22 51 4.7  | r  | 643K  | 6.8 | 86- | 38 | 86  | 304 | 50N  | 2.4  | -1   | 4   | 21 | 32.3 | 18  | 25 | 3  |
| 10 18 | 3 9 0.3    | D  | 668S  | 3.5 | 86- | 81 | 231 | 13  | -19N | 1.3  | 5.4  | 4   | 28 | 37   | 19  | 10 | 50 |
| 10 19 | 22 8 33.6  | r  | 928   | 5.9 | 70- | 8  | 69  | 265 | 83S  | -0.1 | 0.9  | 6   | 9  | 32.4 | 22  | 11 | 25 |
| 10 19 | 23 35 3.5  | D  | 946D  | 3.5 | 69- | 26 | 76  | 63  | -61N | 0.2  | 1.6  | 6   | 14 | 52.7 | 22  | 30 | 24 |
| 10 20 | 0 41 12.6  | R  | 946D  | 3.5 | 69- | 41 | 81  | 270 | 87S  | 1.3  | 0.8  | 6   | 14 | 52.7 | 22  | 30 | 24 |
| 10 26 | 5 10 33    | M  | 976S  | 2.9 | 68- | 79 | 259 | 179 | -4S  | 9.9  | 9.9  | 6   | 22 | 57.6 | 22  | 30 | 49 |
| 11 1  | 16 10 26.3 | d  | 2630w | 5.0 | 21+ | 40 | 194 | 154 | 24S  | 2.9  | -4   | 18  | 11 | 43.3 | -23 | 42 | 4  |
| 11 4  | 22 11 54   | D  | 3078c | 4.9 | 51+ | 15 | 239 | 56  | 72N  | 0.5  | 0.3  | 21  | 4  | 24.3 | -19 | 51 | 18 |
| 11 8  | 16 48 55.2 | d  | 443   | 4.6 | 84+ | 24 | 109 | 92  | 59S  | 1.2  | 0.9  | 0   | 5  | 20.1 | -5  | 42 | 27 |
| 11 8  | 17 57 54.1 | r  | 443   | 4.6 | 84+ | 38 | 120 | 211 | -60S | 1.2  | 2.8  | 0   | 5  | 20.1 | -5  | 42 | 27 |
| 11 13 | 21 24 27.1 | r  | 600c  | 6.6 | 99- | 46 | 90  | 301 | 64N  | 2.9  | -1   | 4   | 4  | 39.6 | 17  | 31 | 3  |
| 11 18 | 1 19 50.8  | R  | 911c  | 6.4 | 90- | 76 | 98  | 214 | 33S  | 1.7  | 3.6  | 6   | 1  | 41.6 | 22  | 24 | 4  |
| 11 18 | 23 16 59.8 | r  | 1329p | 6.8 | 63- | 12 | 73  | 257 | 62S  | 0    | 1.2  | 8   | 53 | 55.3 | 19  | 58 | 2  |
| 11 22 | 4 11 41.1  | R  | 1215  | 6.8 | 72- | 87 | 176 | 268 | 76S  | 2.8  | 0.1  | 8   | 3  | 50.5 | 22  | 4  | 15 |
| 11 26 | 6 17 48    | M  | 1224  | 5.3 | 71- | 62 | 269 | 198 | 6S   | 9.9  | 9.9  | 8   | 7  | 45.9 | 21  | 34 | 55 |
| 12 1  | 0 11 50.7  | D  | 210D  | 6.6 | 79+ | 30 | 259 | 74  | 80S  | 1.2  | -0.2 | 1   | 26 | 53.6 | 3   | 32 | 8  |
| 12 2  | 17 50 44.6 | D  | 3150  | 6.6 | 32+ | 43 | 203 | 134 | 29S  | 6.6  | -5.7 | 21  | 29 | 59.6 | -19 | 8  | 52 |
| 12 8  | 18 10 34.5 | D  | 306   | 6.8 | 86+ | 47 | 108 | 88  | 67S  | 2.1  | 0.9  | 2   | 5  | 48.5 | 7   | 1  | 42 |
| 12 14 | 23 40 41   | m  | 1161  | 5.9 | 93- | 57 | 86  | 359 | 8N   | 9.9  | 9.9  | 7   | 40 | 58.5 | 23  | 1  | 7  |
| 12 19 | 8 59 36.7  | d  | 1702  | 4.0 | 52- | 41 | 256 | 105 | -82N | 1.4  | -1.3 | 11  | 45 | 51.6 | 6   | 31 | 46 |
| 12 19 | 10 4 35.4  | R  | 1702  | 4.0 | 52- | 27 | 264 | 316 | 67N  | 0.5  | -2   | 11  | 45 | 51.6 | 6   | 31 | 46 |
| 12 22 | 4 56 10.2  | R  | 2043c | 6.5 | 21- | 32 | 119 | 302 | 80N  | 1    | -0.4 | 14  | 16 | 48.7 | -8  | 53 | 4  |
| 12 22 | 5 33 6.4   | r  | 8771  | 6.8 | 97- | 32 | 283 | 312 | 53N  | 0.2  | -2.2 | 6   | 49 | 8.6  | 23  | 12 | 7  |
| 12 25 | 3 49 56.8  | R  | 1036  | 6.5 | 97- | 54 | 276 | 330 | 35N  | 0.7  | -4   | 6   | 46 | 10.4 | 23  | 22 | 16 |
| 12 27 | 5 21 1.1   | R  | 2047  | 6.6 | 21- | 36 | 124 | 293 | 89N  | 1.4  | -0.2 | 14  | 17 | 22.6 | -9  | 1  | 22 |

## 常用天文常數

本表摘錄部分常用天文常數，其單位係依據國際標準單位 (International System of Units, SI) 所定：長度單位為公尺 (meter, m)，質量單位為公斤 (kilogram, kg)，時間單位為秒 (SI second, s)。

| 定義常數   |                                 |
|--------|---------------------------------|
| 高斯重力常數 | $k = 0.01720209895$             |
| 光速     | $c = 299792458 \text{ ms}^{-1}$ |

| 主要常數與推導常數       |   |
|-----------------|---|
| 天文單位            | $AU = c \tau_A$<br>$= 1.49597870 \times 10^{11} \text{ m}$                        |
| 天文單位光行時間        | $\tau_A = 499.004782 \text{ s}$   |
| 地球赤道半徑          | $a_e = 6378140 \text{ m}$   |
| 地球扁平係數          | $f = 0.00335281$  |
| 地球形狀力學因子        | $J_2 = 0.00108263$  |
| 地心重力常數          | $GE = 3.986005 \times 10^{14} \text{ m}^3 \text{ s}^{-2}$                         |
| 日心重力常數          | $GS = A^3 k^2 / D^2$<br>$= 1.327124421 \times 10^{20} \text{ m}^3 \text{ s}^{-2}$ |
| 萬有引力常數          | $G = 6.67428 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$          |
| 月球地球質量比         | $\mu = 0.01230002$  |
| 太陽地球質量比         | $S/E = 332946.050895$   |
| 黃經一般歲差(J2000.0) | $p_A = 5029''.0966$   |
| 黃道傾角(J2000.0)   | $\epsilon_0 = 23^\circ 26' 21''.448$  |
| 章動常數(J2000.0)   | $N = 9''.2025$  |
| 太陽視差            | $\pi_\odot = 8''.794148$  |
| 光行差常數(J2000.0)  | $\kappa = 20''.49552$   |
| 光年              | $ly = 9.46053 \times 10^{15} \text{ m}$   |
| 秒差距             | $pc = 3.085678 \times 10^{16} \text{ m}$  |

| 2018.5  |  |
|---------|--|
| 一般歲差    | $p = 0^\circ .0139703$                                       |
| 赤經歲差    | $m = 0^\circ .0128131$                                       |
| 赤緯歲差    | $n = 0^\circ .0055673$                                       |
| 自轉軸黃經   | $\Pi = +174^\circ .9632$                                     |
| 黃道面回轉速度 | $\pi = +0^\circ .0001305$                                    |
| 黃道傾角    | $\epsilon_A = 23^\circ .438056$<br>$= 23^\circ 26' 21''.406$ |

## 地球 常用天文常數 ( 太陽 )

### 地球

|                  |   |
|------------------|---|
| 質量               | $5.9742 \times 10^{24}$ kg                    |
| 質量比(太陽/地球)       | 332964.0                                      |
| 赤道半徑             | 6378.140 km                                   |
| 極半徑              | 6356.755 km                                   |
| 扁平率              | 0.00335281                                    |
| 平均密度             | $5.515 \text{ gcm}^{-3}$                      |
| 反射能              | 0.367   |
| 北極方向(J2000.0)：赤經 | 19h03m  |
| 赤緯               | $63^{\circ} 58'$                              |
| 自轉週期             | 23h 56m 04.0990s 平均太陽時                        |
| 自轉速度(赤道表面)       | $465.1 \text{ ms}^{-1}$                       |
| 自轉角速度            | $7.2921151 \times 10^{-5} \text{ rad s}^{-1}$ |
| 平均太陽日            | 1.00273791 平均恆星日                              |
|                  | 24h 03m 56.5554s 平均恆星時                        |
| 平均恆星日            | 0.99726957 平均太陽日                              |
|                  | 23h 56m 04.0990s 平均太陽時                        |
| 公轉平均運動           | $0.985609^{\circ} / \text{天}$                 |
| 太陽年              | 365.242190 日                                  |
| 恆星年              | 365.256364 日                                  |
| 近點年              | 365.259636 日                                  |
| 食年               | 346.620077 日                                  |

### 太陽

|                      |   |
|----------------------|---|
| 質量                   | $1.9891 \times 10^{30}$ kg                  |
| 赤道半徑                 | 696,000 km                                  |
| 平均密度                 | $1.41 \text{ gcm}^{-3}$                     |
| 自轉週期：對恆星             | 25.38 日                                     |
| 對地球                  | 27.28 日                                     |
| 標準太陽運動(J2000.0)向點：赤經 | $18^{\text{h}} 05^{\text{m}}$               |
| 赤緯                   | $+29^{\circ}$                               |
| 標準太陽運動(J2000.0)速度：   | $19 \text{ kms}^{-1}$                       |
| 位置(距銀河中心)            | ~30,000 光年                                  |
| 表面重力                 | $274 \text{ ms}^{-2}$                       |
| 脫離速度                 | $618 \text{ kms}^{-1}$                      |
| 平均視半徑                | $959'' . 64$                                |
| 實視星等                 | -26.74 等                                    |
| 實視絕對星等               | +4.83 等                                     |
| 色指數(B-V)             | +0.65                                       |
| 光譜型式                 | G2 V  |
| 表面有效溫度               | 5780 K                                      |
| 總輻射量                 | $3.83 \times 10^{26} \text{ Js}^{-1}$       |
| 太陽常數                 | $1.96 \text{ cal cm}^{-2} \text{ min}^{-1}$ |



# 月球

## 常用天文常數 ( 銀河 )

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**月球**


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|             |                            |
|-------------|----------------------------|
| 質量          | $7.3483 \times 10^{22}$ kg |
| 質量比(月球/地球)  | 0.01230002                 |
| 半徑          | 1738 km                    |
| 平均視半徑       | 932".59                    |
| 反射能         | 0.12                       |
| 朔望月         | 29.530589 日                |
| 恆星月         | 27.321622 日                |
| 交點月         | 27.212221 日                |
| 分點月         | 27.321582 日                |
| 近點月         | 27.554550 日                |
| 沙羅週期        | 6585.781 日                 |
| 章(19年7閏)    | 6939.602 日                 |
| 軌道長半徑       | 384400 km                  |
| 軌道離心率       | 0.0549005                  |
| 軌道傾角(對黃道)   | $5^{\circ} 08' 47''$       |
| 平均月球赤道與黃道夾角 | $1^{\circ} 32' 33''$       |
| 平均赤道地平視差    | $57' 02''.6$               |
| 中心差(一近點月)   | $6^{\circ} 17' 19''.6$     |
| 出差(31.812天) | $1^{\circ} 16' 26''.5$     |
| 二均差(0.5朔望月) | $39' 29''.9$               |
| 年差(一近點年)    | $11' 06''.4$               |
| 月角差(一朔望月)   | $2' 05''.2$                |
| 近點順行週期      | 8.8472 年                   |
| 交點逆行週期      | 18.6126 年                  |

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**銀河系**


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|                      |  |
|----------------------|--|
| 總質量                  | $\sim 2 \times 10^{11}$ 太陽質量   |
| 厚度                   | 核心部分 15,000 光年<br>太陽近旁 5,000 光年  |
| 有效直徑                 | 圓盤部份 100,000 光年<br>銀暈部份 150,000 光年   |
| 物質密度(太陽近旁)           | $1.0 \times 10^{-23}$ gcm <sup>-3</sup>  |
| 銀河中心(J2000.0) : 赤經   | $17^{\text{h}} 45.6^{\text{m}}$  |
| 赤緯                   | $-28^{\circ} 56'$  |
| 銀河北極(J2000.0) : 赤經   | $12^{\text{h}} 51.4^{\text{m}}$  |
| 赤緯                   | $+27^{\circ} 08'$  |
| 對赤道傾角(J2000.0)       | $62^{\circ} 52'$   |
| 回轉速度(太陽近旁)           | $220 \text{ kms}^{-1}$   |
| 對赤道昇交點(J2000.0) : 赤經 | $18^{\text{h}} 51.4^{\text{m}}$  |
| 銀經                   | $32^{\circ} 56'$   |
| 奧特(Oort)常數           | A = $+15 \text{ kms}^{-1} \text{ kpc}^{-1}$<br>B = $-10 \text{ kms}^{-1} \text{ kpc}^{-1}$ |

## 太陽、月球、行星、矮行星物理常數表

| 星名  | 赤道半徑   |        | 扁平率    | 赤道重力<br>地球 = 1 | 體積<br>地球 = 1 | 質量<br>地球 = 1 | 密度<br>( $\text{gcm}^{-3}$ ) | 自轉週期<br>(地球日) | 赤道傾角<br>° | 衛星<br>數目 |
|-----|--------|--------|--------|----------------|--------------|--------------|-----------------------------|---------------|-----------|----------|
|     | 公里     | 地球=1   |        |                |              |              |                             |               |           |          |
| 太陽  | 696000 | 109.13 | 0.     | 28.01          | 1304000      | 332946       | 1.44                        | 25.3800       | 7.25      | —        |
| 月球  | 1738   | 0.27   | 3 軸不等  | 0.17           | 0.0203       | 0.012        | 3.34                        | 27.3217       | 6.67      | —        |
| 水星  | 2440   | 0.38   | 0.     | 0.38           | 0.056        | 0.055        | 5.43                        | 58.6500       | ~0        | 0        |
| 金星  | 6052   | 0.95   | 0.     | 0.91           | 0.857        | 0.815        | 5.24                        | 243.02 R      | 177.4     | 0        |
| 地球  | 6378   | 1.00   | 0.0034 | 1.00           | 1.000        | 1.000        | 5.52                        | 0.9973        | 23.44     | 1        |
| 火星  | 3397   | 0.53   | 0.0052 | 0.38           | 0.151        | 0.107        | 3.93                        | 1.026         | 25.19     | 2        |
| 木星  | 71492  | 11.19  | 0.0648 | 2.37           | 1321.000     | 317.832      | 1.33                        | 0.414         | 3.08      | 79       |
| 土星  | 60268  | 9.41   | 0.1076 | 0.94           | 755.000      | 95.16        | 0.69                        | 0.444         | 26.7      | 62       |
| 天王星 | 25559  | 4.01   | 0.023  | 0.89           | 63.000       | 14.54        | 1.27                        | 0.718R        | 97.9      | 27       |
| 海王星 | 24764  | 3.88   | 0.017  | 1.11           | 58.000       | 17.15        | 1.64                        | 0.671         | 27.8      | 14       |
| 冥王星 | 1187   | 0.19   | <1 %   | 0.06           | 0.006        | 0.0023       | 1.9                         | 6.39 R        | 120.0     | 5        |
| 穀神星 | 473    | 0.07   | 3 軸不等  | 0.03           | 0.003        | ~0.0001      | 2.2                         | 0.3781        | 10.6      | 0        |
| 閱神星 | 1163   | 0.18   | ---    | ~0.06          | ---          | ~0.0028      | 2.3                         | ~1            | ---       | 1        |
| 鳥神星 | 750    | 0.12   | ---    | ~0.10          | ---          | ~0.0007      | ~2                          | 0.3           | 28.96     | 0        |
| 妊神星 | ~700   | 0.15   | 3 軸不等  | ---            | ---          | ~0.0007      | ~3                          | 0.16          | ---       | 2        |

## 行星、矮行星軌道常數表

| 星名  | 平均日<br>距<br>AU | 離心率    | 軌道傾<br>角<br>° | 恆星週<br>期<br>太陽年 | 會合週<br>期<br>太陽日 | 反射率  | 最大光<br>度 | 最高溫<br>k | 最低溫<br>k |
|-----|----------------|--------|---------------|-----------------|-----------------|------|----------|----------|----------|
|     |                |        |               |                 |                 |      |          |          |          |
| 金星  | 0.7233         | 0.0068 | 3.395         | 0.6152          | 584.0           | 0.59 | -4.7     | 726      |          |
| 地球  | 1.0000         | 0.0167 | 0.000         | 1.0000          | ---             | 0.39 | ---      | 310      | 260      |
| 火星  | 1.5237         | 0.0934 | 1.850         | 1.8809          | 779.9           | 0.16 | -3.0     | 240      | 190      |
| 木星  | 5.2026         | 0.0485 | 1.303         | 11.8620         | 398.9           | 0.44 | -2.8     | 120      |          |
| 土星  | 9.5549         | 0.0555 | 2.489         | 29.458          | 378.1           | 0.46 | -0.5     | 88       |          |
| 天王星 | 19.2184        | 0.0463 | 0.773         | 84.022          | 369.6           | 0.56 | +5.3     | 59       |          |
| 海王星 | 30.1104        | 0.0090 | 1.770         | 164.774         | 367.5           | 0.51 | +7.8     | 48       |          |
| 冥王星 | 39.5403        | 0.2490 | 17.145        | 247.796         | 366.7           | ~0.5 | +13.6    | 37       |          |
| 穀神星 | 2.7656         | 0.0789 | 10.587        | 4.60            | 466.6           | 0.09 | +6.4     | 168      |          |
| 閱神星 | 68.0           | 0.442  | 44.19         | 557             | ---             | 0.96 | +18.7    | 43       |          |
| 鳥神星 | 45.791         | 0.159  | 28.96         | 309.88          | ---             | 0.81 | +16.7    | ~35      |          |
| 妊神星 | 43.218         | 0.191  | 28.19         | 2834            | ---             | 0.7  | +17.3    | <50      |          |

## 行星的環系統

本表參考自美國航太總署戈德太空中心資料<http://nssdc.gsfc.nasa.gov/planetary/>

| 行星           | 環的名稱             | 距 離               |             | 反照率<br>Albedo            | Optical Depth      | 寬 度<br>(km) |                      |        |
|--------------|------------------|-------------------|-------------|--------------------------|--------------------|-------------|----------------------|--------|
|              |                  | (km)              | (R/Rs)      |                          |                    |             |                      |        |
| 木星           | Halo             | 100,000 - 122,000 | 1.40 - 1.71 | ~0.015                   | $3 \times 10^{-6}$ | 22800       |                      |        |
|              | Main             | 122,000 - 129,000 | 1.71 - 1.81 |                          | $5 \times 10^{-6}$ | 6400        |                      |        |
|              | Amalthea Ring    | 129,200 - 182,000 | 1.81 - 2.55 |                          | $1 \times 10^{-7}$ | 85000       |                      |        |
|              | Thebe Ring       | 182,000 - 224,900 | 2.55 - 3.15 |                          | $1 \times 10^{-7}$ |             |                      |        |
|              | Thebe Extension  | 221,900 - 280,00  | 3.10 - 3.92 |                          | $1 \times 10^{-7}$ |             |                      |        |
| 土星           | D inner edge     | 66,900            | 1.11        | 0.12 - 0.30              | 0.05 - 0.10        | 7540        |                      |        |
|              | D outer edge     | 74,510            | 1.236       |                          |                    |             |                      |        |
|              | C inner edge     | 74,658            | 1.239       |                          |                    |             |                      |        |
|              | Titan ringlet    | 77,871            | 1.292       |                          |                    |             |                      |        |
|              | Maxwell gap      | 87,491            | 1.452       |                          |                    |             | 270                  |        |
|              | C outer edge     | 92,000            | 1.527       |                          |                    | 0.2         | 0.12                 |        |
|              | B inner edge     | 92,000            | 1.527       |                          |                    | 0.4 - 0.6   | 0.4 - 2.5            | 25580  |
|              | B outer edge     | 117,580           | 1.951       |                          |                    |             | 1.8                  |        |
|              | Cassini division |                   |             |                          |                    | 0.2 - 0.4   | 0.05 - 0.15          |        |
|              | A inner edge     | 122,170           | 2.027       |                          |                    | 0.4 - 0.6   | 0.4 - 1.0            | 11405  |
|              | Encke gap        | 133,589           | 2.216       |                          |                    |             |                      | 328    |
|              | Keeler gap       | 136,530           | 2.265       |                          |                    |             |                      | 35     |
|              | A outer edge     | 136,775           | 2.269       |                          |                    | 0.4 - 0.6   | 0.6                  |        |
|              | F ring center    | 140,180           | 2.326       |                          |                    | 0.6         | 0.1                  | <3     |
|              | G inner edge     | 170,000           | 2.82        |                          |                    | $10^5$      | $1.0 \times 10^{-6}$ | ?      |
|              | G outer edge     | 175,000           | 2.9         |                          |                    |             |                      |        |
|              | E inner edge     | 181,000           | 3           |                          |                    | $10^7$      | $1.5 \times 10^{-5}$ | 302000 |
| E outer edge | 483,000          | 8                 | $10^7$      |                          |                    |             |                      |        |
| 天王星          | 6                | 41,837            | 1.637       | $\sim 15 \times 10^{-3}$ | $\sim 0.3$         | 1.5         |                      |        |
|              | 5                | 42,234            | 1.652       | $\sim 15 \times 10^{-3}$ | $\sim 0.5$         | $\sim 2$    |                      |        |
|              | 4                | 42,571            | 1.666       | $\sim 15 \times 10^{-3}$ | $\sim 0.3$         | $\sim 2$    |                      |        |
|              | Alpha            | 44,718            | 1.75        | $\sim 15 \times 10^{-3}$ | $\sim 0.4$         | 4-10        |                      |        |
|              | Beta             | 45,661            | 1.786       | $\sim 15 \times 10^{-3}$ | $\sim 0.3$         | 5-11        |                      |        |
|              | Eta              | 47,176            | 1.834       | $\sim 15 \times 10^{-3}$ | $\sim 0.4-$        | 1.6         |                      |        |
|              | Gamma            | 47,627            | 1.863       | $\sim 15 \times 10^{-3}$ | $\sim 0.3+$        | 1-4         |                      |        |
|              | Delta            | 48,300            | 1.9         | $\sim 15 \times 10^{-3}$ | $\sim 0.5$         | 3-7         |                      |        |
|              | Lambda           | 50,024            | 1.957       | $\sim 15 \times 10^{-3}$ | $\sim 0.1$         | $\sim 2$    |                      |        |
|              | Epsilon          | 51,149            | 2.006       | $\sim 18 \times 10^{-3}$ | 0.5-2.3            | 20-96       |                      |        |
|              | v (R/2003 U 2)   | 67,300            | 2.633       |                          | 0.000006           | 3800        |                      |        |
|              | μ (R/2003 U 1)   | 97,700            | 3.823       |                          | 0.000008           | 17,000      |                      |        |
|              | 1986U2R *        | 26 840-34 890     |             |                          |                    | 800         |                      |        |

2019 天文常數與天體資料表

|     |                      |         |       |                          |          |       |
|-----|----------------------|---------|-------|--------------------------|----------|-------|
| 海王星 | Galle (1989N3R)      | ~41,900 | 1.692 | $\sim 15 \times 10^{-3}$ | ~0.00008 | ~2000 |
|     | LeVerrier (1989N2R)  | ~53,200 | 2.148 | $\sim 15 \times 10^{-3}$ | ~0.002   | ~110  |
|     | Lassell (1989N4R*)   | ~53,200 | 2.148 | $\sim 15 \times 10^{-3}$ | ~0.00015 | ~4000 |
|     | Arago (1989N4R*)     | ~57,200 | 2.31  |                          |          | <~100 |
|     | Unnamed (indistinct) | 61,950  | 2.501 |                          |          |       |
|     | Adams (1989N1R)      | 62,933  | 2.541 | $\sim 15 \times 10^{-3}$ | ~0.0045  | ~50   |
|     | Arcs in Adams Ring:  |         |       |                          |          |       |
|     | Courage              | 62,933  | 2.541 |                          | 0.12     | ~15   |
|     | Liberté              | 62,933  | 2.541 |                          | 0.12     | ~15   |
|     | Egalité 1            | 62,933  | 2.541 | $\sim 40 \times 10^{-3}$ | 0.12     | ~15   |
|     | Egalité 2            | 62,933  | 2.541 | $\sim 40 \times 10^{-3}$ | 0.12     | ~15   |
|     | Fraternité           | 62,933  | 2.541 |                          | 0.12     | ~15   |

# 行星的衛星表(一)

本表列出國際天文聯合會 Minor Planet Center (MPC)公佈的 8 大行星的衛星資料，並加入參考美國海軍天文臺天文年鑑資料及美國航太總署戈德太空中心資料整理，依行星軌道的先後次序與衛星編號的順序排列。本表不包括矮行星的衛星、小行星的衛星與曾經被觀測但尚未確認的部份。

| 編號及名稱            |                  | 發現年代     | 軌道半徑<br>( $10^3$ km) | 公轉週期<br>(天) | 衛星質量<br>(衛星 / 行星)      | 衛星半徑<br>(Km)                   | 視亮度   |
|------------------|------------------|----------|----------------------|-------------|------------------------|--------------------------------|-------|
| 月球               | Moon             |          | 384.4                | 27.321661   | 0.012300371            | 1737.4                         | -12.7 |
| 火衛               | I Phobos         | 1877     | 9.376                | 0.31891011  | $1.672 \times 10^{-8}$ | $13.4 \times 11.2 \times 9.2$  | 11.9  |
|                  | II Deimos        | 1877     | 23.458               | 1.2624408   | $2.43 \times 10^{-9}$  | $7.5 \times 6.1 \times 5.2$    | 13.0  |
| 木衛               | I Io             | 1610     | 421.8                | 1.76913776  | $4.704 \times 10^{-5}$ | $1829 \times 1819 \times 1816$ | 5.0   |
|                  | II Europa        | 1610     | 671.1                | 3.55118155  | $2.528 \times 10^{-5}$ | $1564 \times 1561 \times 1561$ | 5.3   |
|                  | III Ganymede     | 1610     | 1070.4               | 7.15455325  | $7.805 \times 10^{-5}$ | 2632.3                         | 4.6   |
|                  | IV Callisto      | 1610     | 1882.7               | 16.689017   | $5.667 \times 10^{-5}$ | 2409.3                         | 5.7   |
|                  | V Amalthea       | 1892     | 181.4                | 0.4981798   | $1.1 \times 10^{-9}$   | $125 \times 73 \times 64$      | 14.1  |
|                  | VI Himalia       | 1904     | 11461                | 250.56      | $2.2 \times 10^{-9}$   | 85                             | 14.6  |
|                  | VII Elara        | 1905     | 11741                | 259.64      | $4.58 \times 10^{-10}$ | 40                             | 16.3  |
|                  | VIII Pasiphae    | 1908     | 23624                | 743.63 R    | $1.58 \times 10^{-10}$ | 18:                            | 17.0  |
|                  | IX Sinope        | 1914     | 23939                | 758.90 R    | $3.95 \times 10^{-11}$ | 14:                            | 18.1  |
|                  | X Lysithea       | 1938     | 11717                | 259.2       | $3.31 \times 10^{-11}$ | 12:                            | 18.3  |
|                  | X I Carme        | 1938     | 23404                | 734.17 R    | $6.94 \times 10^{-11}$ | 15:                            | 17.6  |
|                  | X II Ananke      | 1951     | 21276                | 629.77 R    | $1.58 \times 10^{-11}$ | 10:                            | 18.8  |
|                  | X III Leda       | 1974     | 11165                | 240.92      | $5.76 \times 10^{-12}$ | 5:                             | 19.0  |
|                  | X IV Thebe       | 1979     | 221.9                | 0.675       | $7.89 \times 10^{-10}$ | $58 \times 49 \times 42$       | 16.0  |
|                  | X V Adrastea     | 1979     | 129                  | 0.298       | $3.95 \times 10^{-12}$ | $10 \times 8 \times 7$         | 18.7  |
|                  | X VI Metis       | 1979     | 128                  | 0.295       | $6.31 \times 10^{-11}$ | $30 \times 20 \times 17$       | 17.5  |
|                  | XV II Callirrhoe | 1999     | 24596.24             | 736 R       |                        | 3.5:                           | 20.7  |
|                  | XVIII Themisto   | 1975     | 7450                 | 130         |                        | 2:                             | 20.3  |
|                  | XIX Megaclite    | 2000     | 23439.08             | 734.1 R     |                        | 2:                             | 22.1  |
|                  | XX Taygete       | 2000     | 21671.85             | 650.1 R     |                        | 2:                             | 22.9  |
|                  | XXI Chaldene     | 2000     | 20299.46             | 591.7 R     |                        | 1.5:                           | 22.5  |
|                  | XX II Harpalyke  | 2000     | 20917.72             | 617.3 R     |                        | 1.5:                           | 22.2  |
|                  | XXIII Kalyke     | 2000     | 24135.61             | 767 R       |                        | 2:                             | 21.8  |
|                  | XXIV Iocaste     | 2000     | 20642.86             | 606.3 R     |                        | 2:                             | 22.5  |
|                  | XXV Erinome      | 2000     | 21867.75             | 661.1 R     |                        | 1.5:                           | 22.8  |
|                  | XXVI Isonoe      | 2000     | 22804.7              | 704.9 R     |                        | 1.5:                           | 22.5  |
|                  | XXV II Praxidike | 2000     | 21098.1              | 624.6 R     |                        | 2.5:                           | 22.5  |
|                  | XXVIII Autonoe   | 2001     | 24413.09             | 778.0 R     |                        | 1.5:                           | 22.0  |
| XXIX Thyone      | 2001             | 20769.9  | 610.0 R              |             | 1.5:                   | 22.3                           |       |
| XXX Hermippe     | 2001             | 21047.99 | 624.6 R              |             | 2:                     | 22.1                           |       |
| XXXI Aitne       | 2001             | 22274.41 | 679.3 R              |             | 1.5:                   | 22.7                           |       |
| XXX II Eurydome  | 2001             | 23830.94 | 752.4 R              |             | 1.5:                   | 22.7                           |       |
| XXXIII Euanthe   | 2001             | 20983.14 | 620.9 R              |             | 1.5:                   | 22.8                           |       |
| XXXIV Euporie    | 2001             | 19509.12 | 555.2 R              |             | 1:                     | 23.1                           |       |
| XXXV Orthosie    | 2001             | 20849.89 | 613.6 R              |             | 1:                     | 23.1                           |       |
| XXXVI Sponde     | 2001             | 22548.24 | 690.3 R              |             | 1:                     | 23.0                           |       |
| XXXV II Kale     | 2001             | 22300.64 | 679.4 R              |             | 1:                     | 23.0                           |       |
| XXXVIII Pasithee | 2001             | 23780.14 | 748.76 R             |             | 1:                     | 23.2                           |       |
| XXXIX Hegemone   | 2003             | 23006.33 | 715 R                |             | 1.5:                   | 22.8                           |       |
| XL Mneme         | 2003             | 20500.28 | 599.65 R             |             | 1:                     | 23.3                           |       |
| XLI Aoede        | 2003             | 23743.83 | 747 R                |             | 2:                     | 22.5                           |       |
| XL II Thelxinoe  | 2003             | 21316.68 | 635.82 R             |             | 1:                     | 23.4                           |       |

## 行星的衛星表(二)

| 編號及名稱 |             |             | 發現年代     | 軌道半徑<br>( $10^3$ km) | 公轉週期<br>(天) | 衛星質量<br>(衛星 / 行星)       | 衛星半徑<br>(Km)                      | 視亮度  |
|-------|-------------|-------------|----------|----------------------|-------------|-------------------------|-----------------------------------|------|
| 木衛    | XLIII       | Arche       | 2002     | 23765.12             | 748.7 R     |                         | 1.5:                              | 22.8 |
|       | XLIV        | Kallichore  | 2003     | 22335.35             | 681.94 R    |                         | 1:                                | 23.7 |
|       | XLV         | Helike      | 2003     | 20540.27             | 601.40 R    |                         | 2:                                | 22.6 |
|       | XLVI        | Carp0       | 2003     | 17056.04             | 455.07      |                         | 1.5:                              | 23.0 |
|       | XLVII       | Eukelade    | 2003     | 23485.28             | 735.27 R    |                         | 2:                                | 22.6 |
|       | XLVIII      | Cyllene     | 2003     | 23544.84             | 737.80 R    |                         | 1:                                | 23.2 |
|       | XLIX        | Kore        | 2003     | 24974.03             | 807.20 R    |                         | 1:                                | 23.6 |
|       | L           | Herse       | 2003     | 22134306             | 672.75 R    |                         | 2                                 |      |
|       | LI          | S/2010 J 1  | 2010     | 23314335             | 724.34 R    |                         | 2                                 |      |
|       | LII         | S/2010 J 2  | 2010     | 20307150             | 588.36 R    |                         | 1                                 |      |
|       | LIII        | Dia         | 2001     | 12570424             | 287.93 R    |                         | 4                                 |      |
|       | LIV         | S/2016 J 1  | 2016     | 20595483             | 603.83 R    |                         | 3                                 |      |
|       | LV          | S/2003 J 18 | 2003     | 20219648             | 587.38 R    |                         | 2                                 |      |
|       | LVI         | S/2011 J 2  | 2011     | 23400981             | 731.32 R    |                         | 1                                 |      |
|       | LVII        | S/2003 J 5  | 2003     | 23973926             | 758.34 R    |                         | 4                                 |      |
|       | LVIII       | S/2003 J 15 | 2003     | 22720999             | 699.68 R    |                         | 2                                 |      |
|       | LIX         | S/2017 J 1  | 2017     | 23483978             | 734.15 R    |                         | 2                                 |      |
|       | LX          | S/2003 J 3  | 2003     | 19621780             | 561.52 R    |                         | 2                                 |      |
|       | LXI         | S/2003 J 19 | 2003     | 22696750             | 698.55 R    |                         | 2                                 |      |
|       | LXII        | Valetudo    | 2016     | 18928095             | 532         |                         | 1                                 |      |
|       | LXIII       | S/2017 J 2  | 2017     | 23240957             | 723.83 R    |                         | 2                                 |      |
|       | LXIV        | S/2017 J 3  | 2017     | 20639315             | 605.76 R    |                         | 2                                 |      |
|       | LXV         | S/2017 J 4  | 2017     | 11494801             | 251.77 R    |                         | 2                                 |      |
|       | LXVI        | S/2017 J 5  | 2017     | 23169389             | 720.49 R    |                         | 2                                 |      |
|       | LXVII       | S/2017 J 6  | 2017     | 22394682             | 684.66 R    |                         | 2                                 |      |
|       | LXVIII      | S/2017 J 7  | 2017     | 20571458             | 602.77 R    |                         | 2                                 |      |
|       | LXIX        | S/2017 J 8  | 2017     | 23174446             | 720.73 R    |                         | 1                                 |      |
|       | LXX         | S/2017 J 9  | 2017     | 21429955             | 640.90 R    |                         | 2                                 |      |
|       | LXXI        | S/2018 J 1  | 2018     | 11453004             | 250.40      |                         | 2                                 |      |
|       | LXXII       | S/2011 J 1  | 2011     | 22401817             | 694.98 R    |                         | 1                                 |      |
|       |             | S/2003 J 12 | 2003     | 17739539             | 482.69 R    |                         | 1                                 |      |
|       |             | S/2003 J 16 | 2003     | 20743779             | 610.36 R    |                         | 2                                 |      |
|       | S/2003 J 10 | 2003        | 22730813 | 700.13 R             |             | 2                       |                                   |      |
|       | S/2003 J 23 | 2004        | 22739654 | 700.54 R             |             | 2                       |                                   |      |
|       | S/2003 J 4  | 2003        | 23570790 | 739.29 R             |             | 2                       |                                   |      |
|       | S/2003 J 9  | 2003        | 23857808 | 752.84 R             |             | 1                       |                                   |      |
|       | S/2003 J 2  | 2003        | 28570410 | 981.55 R             |             | 2                       |                                   |      |
| 土衛    | I           | Mimas       | 1789     | 185.539              | 0.942421952 | $6.61 \times 10^{-8}$   | $207.8 \times 196.7 \times 190.6$ | 12.8 |
|       | II          | Enceladus   | 1789     | 238.037              | 1.37021892  | $1.9 \times 10^{-7}$    | $256.6 \times 251.4 \times 248.3$ | 11.8 |
|       | III         | Tethys      | 1684     | 294.672              | 1.887802533 | $1.09 \times 10^{-6}$   | $538.4 \times 528.3 \times 526.3$ | 10.3 |
|       | IV          | Dione       | 1684     | 377.415              | 2.736915569 | $1.93 \times 10^{-6}$   | $563.4 \times 561.3 \times 559.6$ | 10.4 |
|       | V           | Rhea        | 1672     | 527.068              | 4.51750271  | $4.06 \times 10^{-6}$   | $765.0 \times 763.1 \times 762.4$ | 9.7  |
|       | VI          | Titan       | 1655     | 1221.865             | 15.9454484  | $2.366 \times 10^{-4}$  | 2574.73                           | 8.4  |
|       | VII         | Hyperion    | 1848     | 1500.934             | 21.2766581  | $1 \times 10^{-8}$      | $180.1 \times 133.0 \times 102.7$ | 14.4 |
|       | VIII        | Iapetus     | 1671     | 3560.851             | 79.331115   | $3.177 \times 10^{-6}$  | $745.7 \times 745.7 \times 712.1$ | 11.0 |
|       | IX          | Phoebe      | 1898     | 12893.24             | 546.414 R   | $1.454 \times 10^{-8}$  | $109.4 \times 108.5 \times 101.8$ | 16.7 |
|       | X           | Janus       | 1980S1   | 151.46               | 0.695       | $3.338 \times 10^{-9}$  | $101.5 \times 92.5 \times 76.3$   | 14.4 |
|       | X I         | Epimetheus  | 1980S3   | 151.41               | 0.694       | $9.263 \times 10^{-10}$ | $64.9 \times 57.0 \times 53.1$    | 15.6 |
|       | X II        | Helene      | 1980S6   | 377.4                | 2.74        | $4.48 \times 10^{-11}$  | $21.7 \times 19.1 \times 13.0$    | 18.4 |
|       | X III       | Telesto     | 1980S13  | 294.66               | 1.888       | $1.265 \times 10^{-11}$ | $16.3 \times 11.8 \times 10.0$    | 18.5 |
|       | X IV        | Calypso     | 1980S25  | 294.66               | 1.888       | $6.325 \times 10^{-12}$ | $15.1 \times 11.5 \times 7.0$     | 18.7 |
|       | X V         | Atlas       | 1980S28  | 137.67               | 0.602       | $1.161 \times 10^{-11}$ | $20.4 \times 17.7 \times 9.4$     | 19.0 |
|       | X VI        | Prometheus  | 1980S27  | 139.38               | 0.613       | $2.806 \times 10^{-10}$ | $67.8 \times 39.7 \times 29.7$    | 15.8 |

## 行星的衛星表(三)

| 編號及名稱 | 發現年代              | 軌道半徑<br>( $10^3$ km) | 公轉週期<br>(天) | 衛星質量<br>(衛星 / 行星) | 衛星半徑<br>(Km)              | 視亮度                            |      |
|-------|-------------------|----------------------|-------------|-------------------|---------------------------|--------------------------------|------|
| 土衛    | XVII Pandora      | 1980S26              | 141.72      | 0.629             | $2.412 \times 10^{(-10)}$ | $52.0 \times 40.5 \times 32.0$ | 16.4 |
|       | XVIII Pan         | 1981S13              | 133.6       | 0.575             | $8.707 \times 10^{(-12)}$ | $17.2 \times 15.7 \times 10.4$ | 19.4 |
|       | XIX Ymir          | 2000S1               | 23130       | 1315 R            |                           | 10:                            | 21.9 |
|       | XX Paaliaq        | 2000S2               | 15198       | 687               |                           | 13:                            | 21.2 |
|       | XXI Tarvos        | 2000S4               | 18239       | 926               |                           | 7:                             | 23.0 |
|       | XXII Ijiraq       | 2000S6               | 11442       | 451               |                           | 6:                             | 22.6 |
|       | XXIII Suttungr    | 2000S12              | 19465       | 1017 R            |                           | 4:                             | 23.9 |
|       | XXIV Kiviuq       | 2000S5               | 11365       | 449               |                           | 8:                             | 22.6 |
|       | XXV Mundilfari    | 2000S9               | 18722       | 952 R             |                           | 3:                             | 23.8 |
|       | XXVI Albiorix     | 2000S11              | 16394       | 783               |                           | 16:                            | 20.5 |
|       | XXVII Skathi      | 2000S8               | 15641       | 728 R             |                           | 4:                             | 23.6 |
|       | XXVIII Erriapus   | 2000S10              | 17604       | 871               |                           | 5:                             | 23.3 |
|       | XXIX Siarnaq      | 2000S3               | 17531       | 896               |                           | 21:                            | 20.1 |
|       | XXX Thrymr        | 2000S7               | 20219       | 1092 R            |                           | 4:                             | 23.9 |
|       | XXXI Narvi        | 2003S1               | 18719       | 956 R             |                           | 2.5:                           | 23.8 |
|       | XXXII Methone     | 2004S1               | 194.44      | 1.01              |                           | 1.6                            | 25.1 |
|       | XXXIII Pallene    | 2004S2               | 212.28      | 1.154             |                           | $2.9 \times 2.8 \times 2.0$    | 24.5 |
|       | XXXIV Polydeuces  | 2004S5               | 377.2       | 2.737             |                           | $1.5 \times 1.2 \times 1.0$    | 24.8 |
|       | XXXV Daphnis      | 2005S1               | 136.5       | 0.594             | $1.478 \times 10^{(-13)}$ | $4.3 \times 4.1 \times 3.2$    | 23.4 |
|       | XXXVI Aegir       | 2004S10              | 19614       | 1026 R            |                           | 3:                             | 24.4 |
|       | XXXVII Bebhionn   | 2004S11              | 17119       | 835               |                           | 3:                             | 24.1 |
|       | XXXVIII Bergelmir | 2004S15              | 19372       | 1007 R            |                           | 3:                             | 24.2 |
|       | XXXIX Bestla      | 2004S18              | 19959       | 1053 R            |                           | 3.5:                           | 23.8 |
|       | XL Farbauti       | 2004S9               | 20291       | 1079 R            |                           | 2.5:                           | 24.7 |
|       | XLI Fenrir        | 2004S16              | 22611       | 1269 R            |                           | 2:                             | 25.0 |
|       | XLII Fornjot      | 2004S8               | 23609       | 1354 R            |                           | 3:                             | 24.6 |
|       | XLIII Hati        | 2004S14              | 20304       | 1080 R            |                           | 3:                             | 24.4 |
|       | XLIV Hyrrokkin    | 2004S19              | 18437       | 932 R             |                           | 4:                             | 23.5 |
|       | XLV Kari          | 2006S2               | 22089       | 1231 R            |                           | 3.5:                           | 23.9 |
|       | XLVI Loge         | 2006S5               | 23058       | 1311 R            |                           | 3:                             | 24.6 |
|       | XLVII Skoll       | 2006S8               | 17665       | 878 R             |                           | 3:                             | 24.5 |
|       | XLVIII Surtur     | 2006S7               | 22704       | 1297 R            |                           | 2.5:                           | 24.8 |
|       | XLIX Anthe        | 2007S4               | 197.7       | 1.0365            |                           | 1:                             | 26 : |
|       | L Jarnsaxa        | 2006S6               | 18811       | 965 R             |                           | 2.5:                           | 24.7 |
|       | LI Greip          | 2006S4               | 18206       | 921 R             |                           | 3:                             | 24.4 |
|       | LII Tarqeq        | 2007S1               | 18009       | 888               |                           | 3.5:                           | 23.9 |
|       | LIII Aegaeon      | 2008S1               | 167.5       | 0.808             |                           | 0.25:                          | 24.5 |
|       |                   | 2004S7               | 21,000      | 1140R             |                           | 3:                             | 24.8 |
|       |                   | 2004S12              | 19,890      | 1046R             |                           | 3:                             | 24.5 |
|       |                   | 2004S13              | 18,400      | 933R              |                           | 3:                             | 25.2 |
|       |                   | 2006S1               | 19,450      | 986R              |                           | 2:                             | 24.6 |
|       |                   | 2004S17              | 18,980      | 1015R             |                           | 3:                             | 24.6 |
|       |                   | 2006S3               | 22,100      | 1227R             |                           | 3:                             | 24.4 |
|       |                   | 2007S2               | 16,730      | 808R              |                           | 3:                             | 24.9 |
|       |                   | 2007S3               | 18,980      | 978R              |                           | 3:                             | 24.5 |
|       |                   | 2009S1               | 117         | 0.4715            |                           | 0.3                            | 28   |

## 行星的衛星表(四)

| 編號及名稱  |           |           | 發現年代    | 軌道半徑<br>( $10^3$ km) | 公轉週期<br>(天)  | 衛星質量<br>(衛星 / 行星)      | 衛星半徑<br>(Km)                      | 視亮度  |
|--------|-----------|-----------|---------|----------------------|--------------|------------------------|-----------------------------------|------|
| 天衛     | I         | Ariel     | 1851    | 190.9                | 2.52037952   | $1.56 \times 10^{-5}$  | $581.1 \times 577.9 \times 577.7$ | 13.2 |
|        | II        | Umbriel   | 1851    | 266                  | 4.14417646   | $1.35 \times 10^{-5}$  | 584.7                             | 14.0 |
|        | III       | Titania   | 1787    | 436.3                | 8.70586693   | $4.06 \times 10^{-5}$  | 788.9                             | 13.0 |
|        | IV        | Oberon    | 1787    | 583.5                | 13.4632342   | $3.47 \times 10^{-5}$  | 761.4                             | 13.2 |
|        | V         | Miranda   | 1948    | 129.9                | 1.413479408  | $0.08 \times 10^{-5}$  | $240.4 \times 234.2 \times 232.9$ | 15.3 |
|        | VI        | Cordelia  | 1986U7  | 49.8                 | 0.335033842  | $5.18 \times 10^{-10}$ | 12.5:                             | 23.1 |
|        | VII       | Ophelia   | 1986U8  | 53.8                 | 0.376400393  | $6.21 \times 10^{-10}$ | 15:                               | 22.8 |
|        | VIII      | Bianca    | 1986U9  | 59.2                 | 0.434578986  | $1.07 \times 10^{-9}$  | 22.5:                             | 22.0 |
|        | IX        | Cressida  | 1986U3  | 61.8                 | 0.463569601  | $3.95 \times 10^{-9}$  | 32.5:                             | 21.1 |
|        | X         | Desdemona | 1986U6  | 62.7                 | 0.473649597  | $2.05 \times 10^{-9}$  | 30:                               | 21.5 |
|        | X I       | Juliet    | 1986U2  | 64.4                 | 0.493065489  | $6.42 \times 10^{-9}$  | 42.5:                             | 20.6 |
|        | X II      | Portia    | 1986U1  | 66.1                 | 0.51319592   | $1.92 \times 10^{-8}$  | 55:                               | 19.9 |
|        | X III     | Rosalind  | 1986U4  | 69.9                 | 0.558459529  | $2.93 \times 10^{-9}$  | 30:                               | 21.3 |
|        | X IV      | Belinda   | 1986U5  | 75.3                 | 0.62352747   | $4.11 \times 10^{-9}$  | 34:                               | 21.0 |
|        | X V       | Puck      | 1985U1  | 86                   | 0.761832871  | $3.33 \times 10^{-8}$  | 77.5:                             | 19.2 |
|        | X VI      | Caliban   | 1997U1  | 7231                 | 579.73 R     | $8.45 \times 10^{-9}$  | 30:                               | 22.4 |
|        | XV II     | Sycorax   | 1997U2  | 12179                | 1288.38 R    | $6.19 \times 10^{-8}$  | 60:                               | 20.8 |
|        | XVIII     | Prospero  | 1999U3  | 16277                | 1978.37 R    | 15:                    | 23.2                              |      |
|        | XIX       | Setebos   | 1999U1  | 17420                | 2225.08 R    | 17.5:                  | 23.3                              |      |
|        | XX        | Stephano  | 1999U2  | 8007                 | 677.47 R     | 10:                    | 24.1                              |      |
|        | XXI       | Trinculo  | 2001U1  | 8505                 | 749.40 R     | 7:                     | 25.4                              |      |
|        | XX II     | Francisco | 1986U10 | 4283                 | 267.09 R     | 7:                     | 25.0                              |      |
|        | XXIII     | Margaret  | 2001U2  | 14147                | 1661         | 7.5:                   | 25.2                              |      |
| XXIV   | Ferdinand | 2001U3    | 20430   | 2790.03 R            | 8:           | 25.1                   |                                   |      |
| XXV    | Perdita   | 2003U1    | 76.417  | 0.638                | 13.3         | 24.0                   |                                   |      |
| XXVI   | Mab       | 2003U2    | 97.736  | 0.923                | 12:          | 25.4                   |                                   |      |
| XXV II | Cupid     | 2003U3    | 74.392  | 0.613                | 8.9          | 25.9                   |                                   |      |
| 海衛     | I         | Triton    | 1846    | 354.759              | 5.87685407 R | $2.089 \times 10^{-4}$ | 1353                              | 13.0 |
|        | II        | Nereid    | 1949    | 5513.818             | 360.134      | $3.01 \times 10^{-7}$  | 170                               | 19.7 |
|        | III       | Naiad     | 1989N6  | 48.227               | 0.2944       | $1.901 \times 10^{-9}$ | 29                                | 23.9 |
|        | IV        | Thalassa  | 1989N5  | 50.075               | 0.3115       | $3.656 \times 10^{-9}$ | 41                                | 23.3 |
|        | V         | Despina   | 1989N3  | 52.526               | 0.33466      | $2.05 \times 10^{-8}$  | 74                                | 22.0 |
|        | VI        | Galatea   | 1989N4  | 61.953               | 0.42875      | $3.66 \times 10^{-8}$  | 79                                | 21.9 |
|        | VII       | Larissa   | 1989N2  | 73.548               | 0.55465      | $4.83 \times 10^{-8}$  | 96                                | 21.5 |
|        | VIII      | Proteus   | 1989N1  | 117.646              | 1.122        | $4.914 \times 10^{-7}$ | $218 \times 208 \times 201$       | 19.8 |
|        | IX        | Halimede  | 2002N1  | 15728                | 1881.038     | 25:                    | 24.5                              |      |
|        | X I       | Sao       | 2002N3  | 22422                | 2914.695     | 13.5:                  | 25.4                              |      |
|        | X II      | Laomedeia | 2002N4  | 23571                | 3166.718     | 16.5:                  | 25.4                              |      |
|        | X III     | Neso      | 2003N1  | 48387                | 9737.565     | 21.5:                  | 24.6                              |      |
|        |           |           | 2004N1  | 105.3                | 0.950        | 18:                    | 26.5                              |      |

- 註：1. 衛星若不為球形，則列出其三軸之長。  
 2. 視亮度係當行星位在衝時的視星等。  
 3. R 表示為逆向公轉的衛星。



## 主要小行星表 ( 編號 1 ~ 100 )

本表依據國際天文聯合會轄下 Minor Planet Center (MPC)公佈的資料以及美國航太總署加州噴射推進實驗室 JPL 的 small Body database 數據，並參考 Wikipedia 網站資料與 Lutz D. Schmadel 所著”*Dictionary of Minor Planet Names*”( Third Revised and Enlarged edition, Springer, 1997 ) 彙整，依小行星的編號次序排列。

### 小 行 星 表

| 編號 | 名稱<br>發現者<br>發現日期  | 質量<br>kg              | 大小<br>km    | 自轉<br>週期<br>(日) | 近日點<br>日距<br>AU | 軌道<br>離心<br>率 | 公轉<br>週期<br>(日) | 軌道<br>傾角<br>° |
|----|--|-----------------------|-------------|-----------------|-----------------|---------------|-----------------|---------------|
| 1  | 穀神星 Ceres<br>Giuseppe Piazzi (義大利)<br>1801.01.01                     | 9.43×10 <sup>20</sup> | 487.3       | 0.378           | 2.547           | 0.079         | 1680.5          | 10.59         |
| 2  | 智神星 Pallas<br>Heinrich Wilhelm Matthäus Olbers<br>(德國)<br>1802.03.28 | 2.11×10 <sup>20</sup> | 582×556×500 | 0.326           | 2.132           | 0.231         | 1686.04         | 34.84         |
| 3  | 婚神星 Juno<br>Karl Ludwig Harding (德國)<br>1804.09.01                   | 2.67×10 <sup>19</sup> | 320×267×200 | 0.300           | 1.988           | 0.256         | 1595.4          | 12.97         |
| 4  | 灶神星 Vesta<br>Heinrich Wilhelm Matthäus Olbers<br>(德國)<br>1807.03.29  | 2.67×10 <sup>20</sup> | 578×560×458 | 0.223           | 2.151           | 0.089         | 1325.15         | 7.14          |
| 5  | 義神星 Astraea<br>Karl Ludwig Hencke (德國)<br>1845.12.08                 | 2.9×10 <sup>18</sup>  | 167×123×82  | 0.700           | 2.077           | 0.193         | 1507.68         | 5.37          |
| 6  | 韶神星 Hebe<br>Karl Ludwig Hencke (德國)<br>1847.07.01                    | 1.28×10 <sup>19</sup> | 205×185×170 | 0.303           | 1.937           | 0.202         | 1379.76         | 14.75         |
| 7  | 虹神星 Iris<br>John Russell Hind (英國)<br>1847.08.13                     | 1.36×10 <sup>19</sup> | 240×200×200 | 0.296           | 1.833           | 0.231         | 1345.38         | 5.53          |
| 8  | 花神星 Flora<br>John Russell Hind (英國)<br>1847.10.18                    | 8.47×10 <sup>18</sup> | 136×136×113 | 0.533           | 1.858           | 0.156         | 1193.55         | 5.89          |
| 9  | 穎神星 Metis<br>Andrew Graham (愛爾蘭)<br>1848.04.25                       | 1.47×10 <sup>19</sup> | 222×182×130 | 0.212           | 2.096           | 0.122         | 1346.82         | 5.58          |
| 10 | 健神星 Hygiea<br>Annibale de Gasparis (義大利)<br>1849.04.12               | 8.6×10 <sup>19</sup>  | 500×385×350 | 1.151           | 2.763           | 0.119         | 2029.78         | 3.84          |
| 11 | 海妖星 Parthenope<br>Annibale de Gasparis (義大利)<br>1850.05.11           | 6.15×10 <sup>18</sup> | 153.3       | 0.393           | 2.208           | 0.100         | 1402.89         | 4.62          |
| 12 | 凱神星 Victoria<br>John Russell Hind (英國)<br>1850.09.13                 | 1.5×10 <sup>18</sup>  | 112.8       | 0.361           | 1.819           | 0.221         | 1302.43         | 8.36          |
| 13 | 芙女星 Egeria<br>Annibale de Gasparis (義大利)<br>1850.11.02               | 1.63×10 <sup>19</sup> | 207.6       | 0.294           | 2.358           | 0.085         | 1509.98         | 16.54         |
| 14 | 司寧星 Irene<br>John Russell Hind (英國)<br>1851.05.19                    | 8.2×10 <sup>18</sup>  | 167×153×139 | 0.628           | 2.150           | 0.168         | 1518.18         | 9.11          |
| 15 | 司法星 Eunomia<br>Annibale de Gasparis (義大利)<br>1851.07.29              | 3.12×10 <sup>19</sup> | 357×255×212 | 0.254           | 2.149           | 0.187         | 1569.69         | 11.74         |

## 小行星表 (續)

| 編號 | 名稱<br>發現者<br>發現日期  | 質量<br>kg                       | 大小<br>km    | 自轉<br>週期<br>(日) | 近日點<br>日距<br>AU | 軌道<br>離心<br>率 | 公轉<br>週期<br>(日) | 軌道<br>傾角<br>° |
|----|--|--------------------------------|-------------|-----------------|-----------------|---------------|-----------------|---------------|
| 16 | 靈神星 Psyche<br>Annibale de Gasparis (義大利)<br>1852.03.17                 | $2.19 \times 10^{19}$          | 240×185×145 | 0.175           | 2.513           | 0.140         | 1823.12         | 3.10          |
| 17 | 海女星 Thetis<br>Karl Theodor Robert Luther (德國)<br>1852.04.17            | $1.2 \times 10^{18}$           | 90          | 0.511           | 2.139           | 0.134         | 1418.03         | 5.58          |
| 18 | 司曲星 Melpomene<br>John Russell Hind (英國)<br>1852.06.24                  | $3.0 \times 10^{18}$           | 170×155×129 | 0.482           | 1.795           | 0.218         | 1270.55         | 10.13         |
| 19 | 命神星 Fortuna<br>John Russell Hind (英國)<br>1852.08.22                    | $1.27 \times 10^{19}$          | 225×205×195 | 0.310           | 2.052           | 0.159         | 1393.38         | 1.57          |
| 20 | 王后星 Massalia<br>Annibale de Gasparis (義大利)<br>1852.09.19               | $5.67 \times 10^{18}$          | 160×145×132 | 0.337           | 2.064           | 0.143         | 1365.26         | 0.71          |
| 21 | 司琴星 Lutetia<br>Hermann Mayer Salomon<br>Goldschmidt (德國)<br>1852.11.15 | $2.57 \times 10^{18}$          | 132×101×76  | 0.340           | 2.036           | 0.164         | 1387.90         | 3.06          |
| 22 | 司賦星 Kalliope<br>John Russell Hind (英國)<br>1852.11.16                   | $8.16 \times 10^{18}$          | 235×144×124 | 0.173           | 2.614           | 0.102         | 1814.3          | 13.70         |
| 23 | 司劇星 Thalia<br>John Russell Hind (英國)<br>1852.12.15                     | $1.3 \times 10^{18}$           | 107.5       | 0.513           | 2.015           | 0.233         | 1555.67         | 10.15         |
| 24 | 司理星 Themis<br>Annibale de Gasparis (義大利)<br>1853.04.05                 | $1.13 \times 10^{19}$          | 198         | 0.349           | 2.719           | 0.131         | 2021            | 0.76          |
| 25 | 福后星 Phocaea<br>Jean Chacornac (法國)<br>1853.04.06                       | $4.4 \times 10^{17}$           | 75.1        | 0.414           | 1.787           | 0.255         | 1357.94         | 21.58         |
| 26 | 冥后星 Proserpina<br>Karl Theodor Robert Luther (德國)<br>1853.05.05        | $9.0 \times 10^{17}$           | 95.1        | 0.442           | 2.425           | 0.087         | 1581.18         | 3.56          |
| 27 | 司簫星 Euterpe<br>John Russell Hind (英國)<br>1853.11.08                    | $9.3 \times 10^{17}$           | 124×75      | 0.434           | 1.945           | 0.172         | 1314.17         | 1.58          |
| 28 | 戰神星 Bellona<br>Karl Theodor Robert Luther (德國)<br>1854.03.01           | $1.9 \times 10^{18}$           | 120.9       | 0.654           | 2.366           | 0.148         | 1691.36         | 9.40          |
| 29 | 海后星 Amphitrite<br>Albert Marth (德國)<br>1854.03.01                      | $1.0 \times 10^{19}$           | 212.2       | 0.225           | 2.369           | 0.073         | 1491.01         | 6.10          |
| 30 | 司天星 Urania<br>John Russell Hind (英國)<br>1854.07.22                     | $1.1 \times 10^{18}$           | 100.15      | 0.570           | 2.068           | 0.126         | 1330.02         | 2.10          |
| 31 | 麗神星 Euphrosyne<br>James Ferguson (美國)<br>1854.09.01                    | $\sim 1.69 \times 10^{19}$     | 255.9       | 0.231           | 2.438           | 0.226         | 2041.59         | 26.32         |
| 32 | 果神星 Pomona<br>Hermann Mayer Salomon<br>Goldschmidt (德國)<br>1854.10.26  | $\sim 5.5 \times 10^{17}$      | 80.8        | 0.394           | 2.373           | 0.083         | 1520.60         | 5.53          |
| 33 | 司瑟星 Polyhymnia<br>Jean Chacornac (法國)<br>1854.10.28                    | $1.3-18.0$<br>$\times 10^{17}$ | 50-120      | 0.775           | 1.897           | 0.338         | 1771.20         | 1.87          |
| 34 | 巫神星 Circe<br>Jean Chacornac (法國)<br>1855.04.06                         | $\sim 1.5 \times 10^{18}$      | 113.5       | 0.506           | 2.394           | 0.109         | 1607.33         | 5.50          |

## 小行星表 (續)

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|----|---|---------------------------|----------|-----------------|-----------------|---------------|-----------------|---------------|
| 35 | 沉神星 Leukothea<br>Karl Theodor Robert Luther (德國)<br>1855.04.19          | $\sim 1.1 \times 10^{18}$ | 103.1    | 1.3             | 2.307           | 0.228         | 1887.98         | 7.94          |
| 36 | 馳神星 Atalante<br>Hermann Mayer Salomon<br>Goldschmidt (德國)<br>1855.10.05 | $\sim 1.2 \times 10^{18}$ | 105.6    | 0.414           | 1.913           | 0.303         | 1662.83         | 18.43         |
| 37 | 忠神星 Fides<br>Karl Theodor Robert Luther (德國)<br>1855.10.05              | $1.3 \times 10^{18}$      | 108.3    | 0.306           | 2.175           | 0.177         | 1567.87         | 3.07          |
| 38 | 卵神星 Leda<br>Jean Chacornac (法國)<br>1856.01.12                           | $1.6 \times 10^{18}$      | 115.9    | 0.535           | 2.328           | 0.152         | 1659.72<br>5    | 6.96          |
| 39 | 喜神星 Laetitia<br>Jean Chacornac (法國)<br>1856.02.08                       | $\sim 3.5 \times 10^{18}$ | 149.5    | 0.214           | 2.452           | 0.114         | 1682.71         | 10.38         |
| 40 | 諧神星 Harmonia<br>Hermann Mayer Salomon<br>Goldschmidt (德國)<br>1856.03.31 | $\sim 1.3 \times 10^{18}$ | 107.6    | 0.371           | 2.163           | 0.046         | 1247.51         | 4.26          |
| 41 | 桂神星 Daphne<br>Hermann Mayer Salomon<br>Goldschmidt (德國)<br>1856.05.22   | $5.5 \times 10^{18}$      | 174.0    | ?               | 2.014           | 0.272         | 1679.62         | 15.77         |
| 42 | 育神星 Isis<br>Norman Robert Pogson (英國)<br>1856.05.23                     | $1.1 \times 10^{18}$      | 100.2    | ?               | 1.898           | 0.223         | 1393.74         | 8.53          |
| 43 | 愛女星 Ariadne<br>Norman Robert Pogson (英國)<br>1857.04.15                  | $\sim 4.0 \times 10^{17}$ | 95×60×50 | 0.240           | 1.834           | 0.168         | 1194.77         | 3.46          |
| 44 | 侍神星 Nysa<br>Hermann Mayer Salomon<br>Goldschmidt (德國)<br>1857.05.27     | $3.7 \times 10^{17}$      | 70.6     | 0.268           | 2.062           | 0.149         | 1377.61         | 3.70          |
| 45 | 香女星 Eugenia<br>Hermann Mayer Salomon<br>Goldschmidt (德國)<br>1857.06.27  | $5.8 \times 10^{18}$      | 214.6    | 0.238           | 2.497           | 0.082         | 1638.7          | 6.61          |
| 46 | 司祭星 Hestia<br>Norman Robert Pogson (英國)<br>1857.08.16                   | $2.0 \times 10^{18}$      | 124.1    | ?               | 2.091           | 0.172         | 1465.96         | 2.34          |
| 47 | 仁神星 Aglaja<br>Karl Theodor Robert Luther (德國)<br>1857.09.15             | $2.1 \times 10^{18}$      | 127.0    | ?               | 2.488           | 0.135         | 1782.96         | 4.99          |
| 48 | 昏神星 Doris<br>Hermann Mayer Salomon<br>Goldschmidt (德國)<br>1857.09.19    | $1.1 \times 10^{19}$      | 221.8    | ?               | 2.877           | 0.075         | 2003.45         | 6.55          |
| 49 | 牧神星 Pales<br>Hermann Mayer Salomon<br>Goldschmidt (德國)<br>1857.09.19    | $3.5 \times 10^{18}$      | 149.8    | ?               | 2.366           | 0.233         | 1979.34         | 3.18          |
| 50 | 貞女星 Virginia<br>James Ferguson (美國)<br>1857.10.04                       | $1.0 \times 10^{18}$      | 99.8     | 0.596           | 1.894           | 0.285         | 1576.68         | 2.83          |
| 51 | 禽神星 Nemausa<br>A. Laurent (法國)<br>1858.01.22                            | $3.4 \times 10^{18}$      | 147.9    | ?               | 2.208           | 0.066         | 1328.85         | 9.97          |

## 小行星表 (續)

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|----|--|-------------------------|-------------|-----------------|-----------------|---------------|-----------------|---------------|
| 52 | 歐女星 Europa<br>Hermann Mayer Salomon<br>Goldschmidt (德國)<br>1858.02.04            | $5.2 \times 10^{19}$    | 360×315×240 | 0.235           | 2.785           | 0.102         | 1994.63         | 7.47          |
| 53 | 島神星 Kalypso<br>Karl Theodor Robert Luther (德國)<br>1858.04.04                     | $1.6 \times 10^{18}$    | 115.4       | ?               | 2.086           | 0.204         | 1548.74         | 5.15          |
| 54 | 哲女星 Alexandra<br>Hermann Mayer Salomon<br>Goldschmidt (德國)<br>1858.09.10         | $\sim 5 \times 10^{18}$ | 165.8       | ?               | 2.179           | 0.196         | 1631.62         | 11.80         |
| 55 | 禍神星 Pandora<br>George Mary Searle (美國)<br>1858.09.10                             | $3.1 \times 10^{17}$    | 66.7        | ?               | 2.359           | 0.145         | 1673.24         | 7.19          |
| 56 | 中神星 Melete<br>Hermann Mayer Salomon<br>Goldschmidt (德國)<br>1857.09.09            | $1.5 \times 10^{18}$    | 113.2       | ?               | 1.977           | 0.238         | 1526.84         | 8.07          |
| 57 | 龍女星 Mnemosyne<br>Karl Theodor Robert Luther (德國)<br>1859.09.22                   | $1.5 \times 10^{18}$    | 112.6       | ?               | 2.777           | 0.118         | 2041.06         | 15.20         |
| 58 | 協神星 Concordia<br>Karl Theodor Robert Luther (德國)<br>1860.03.24                   | $8.5 \times 10^{17}$    | 93.4        | ?               | 2.583           | 0.043         | 1620.95         | 5.06          |
| 59 | 乾神星 Elpis<br>Jean Chacornac (法國)<br>1860.09.12                                   | $4.7 \times 10^{18}$    | 164.8       | ?               | 2.398           | 0.117         | 1634.36         | 8.63          |
| 60 | 司音星 Echo<br>James Ferguson (美國)<br>1860.09.14                                    | $2.3 \times 10^{17}$    | 60.2        | ?               | 1.958           | 0.182         | 1353.00         | 3.60          |
| 61 | 囚神星 Danaë<br>Hermann Mayer Salomon<br>Goldschmidt (德國)<br>1860.09.09             | $3.2 \times 10^{17}$    | 82.0        | 0.477           | 2.482           | 0.168         | 1881.03         | 18.22         |
| 62 | 效神星 Erato<br>Otto Leberecht Lesser、<br>Wilhelm Julius Forster (德國)<br>1860.09.14 | $9.1 \times 10^{17}$    | 95.4        | ?               | 2.566           | 0.178         | 2015.18         | 2.22          |
| 63 | 澳女星 Ausonia<br>Annibale de Gasparis (義大利)<br>1861.02.10                          | $1.1 \times 10^{18}$    | 103.1       | ?               | 2.094           | 0.126         | 1354.02         | 5.79          |
| 64 | 神女星 Angelina<br>Ernst Wilhelm Leberecht Tempel<br>(德國)<br>1861.03.04             | ?                       | 48×53       | 0.365           | 2.352           | 0.124         | 1606.45         | 1.31          |
| 65 | 原神星 Cybele<br>Ernst Wilhelm Leberecht Tempel<br>(德國)<br>1861.03.08               | $1.4 \times 10^{19}$    | 237.3       | ?               | 3.073           | 0.105         | 2323.52         | 3.55          |
| 66 | 光神星 Maja<br>Horace Parnell Tuttle (美國)<br>1861.04.09                             | $4.0 \times 10^{17}$    | 72.8        | ?               | 2.186           | 0.173         | 1571.11         | 3.05          |
| 67 | 亞女星 Asia<br>Norman Robert Pogson (英國)<br>1861.04.17                              | $2.1 \times 10^{17}$    | 58.1        | ?               | 1.973           | 0.185         | 1376.05         | 6.03          |
| 68 | 明神星 Leto<br>Karl Theodor Robert Luther (德國)<br>1861.04.29                        | $1.9 \times 10^{18}$    | 122.6       | ?               | 2.267           | 0.185         | 1695.67         | 7.97          |

## 小行星表 (續)

| 編號 | 名稱<br>發現者<br>發現日期   | 質量<br>kg    | 大小<br>km    | 自轉<br>週期<br>(日) | 近日點<br>日距<br>AU | 軌道<br>離心<br>率 | 公轉<br>週期<br>(日) | 軌道<br>傾角<br>° |
|----|---|-------------|-------------|-----------------|-----------------|---------------|-----------------|---------------|
| 69 | 夕神星 Hesperia<br>Giovanni Virginio Schiaparelli<br>(義大利)<br>1861.04.26     | ?           | 138.13      | 0.236           | 2.489           | 0.165         | ~1879           | 8.59          |
| 70 | 蟹神星 Panopaea<br>Hermann Mayer Salomon<br>Goldschmidt (德國)<br>1861.05.05   | 1.9×10(18)  | 122.2       | ?               | 2.142           | 0.181         | 1545.72         | 11.59         |
| 71 | 司石星 Niobe<br>Karl Theodor Robert Luther (德國)<br>1861.08.13                | 6.1×10(17)  | 83.4        | ?               | 2.269           | 0.177         | 1670.46         | 23.26         |
| 72 | 期女星 Feronia<br>Christian Heinrich Friedrich<br>Peters (德國)<br>1861.05.29  | 6.7×10(17)  | 86.1        | ?               | 1.993           | 0.121         | 1246.12         | 5.42          |
| 73 | 芥神星 Klytia<br>Horace Parnell Tuttle (美國)<br>1862.04.07                    | 9.2×10(16)  | 44.4        | ?               | 2.554           | 0.042         | 1589.25         | 2.37          |
| 74 | 巫女星 Galatea<br>Ernst Wilhelm Leberecht Tempel<br>(德國)<br>1862.08.29       | 1.8×10(18)  | 118.7       | ?               | 2.112           | 0.240         | 1691.66         | 4.08          |
| 75 | 獄神星 Eurydike<br>Christian Heinrich Friedrich<br>Peters (德國)<br>1862.09.22 | 1.8×10(17)  | 55.7        | ?               | 1.858           | 0.305         | 1596.69         | 5.00          |
| 76 | 舒女星 Freia<br>Heinrich Louis d'Arrest (德國)<br>1862.10.21                   | 6.5×10(18)  | 183.7       | ?               | 2.860           | 0.163         | 2307.98         | 2.12          |
| 77 | 寒神星 Frigga<br>Christian Heinrich Friedrich<br>Peters (德國)<br>1862.11.12   | 3.5×10(17)  | 69.2        | ?               | 2.314           | 0.133         | 1592.27         | 2.43          |
| 78 | 月神星 Diana<br>Karl Theodor Robert Luther (德國)<br>1863.03.15                | 1.8×10(18)  | 120.6       | ?               | 2.077           | 0.207         | 1548.92         | 8.69          |
| 79 | 配女星 Eurynome<br>James Craig Watson (美國)<br>1863.09.14                     | 3.1×10(17)  | 66.5        | ?               | 1.976           | 0.192         | 1396.29         | 4.62          |
| 80 | 賦神星 Sappho<br>Norman Robert Pogson (英國)<br>1864.05.02                     | 5.0×10(17)  | 78.4        | ?               | 1.837           | 0.200         | 1271.35         | 8.66          |
| 81 | 司舞星 Terpsichore<br>Ernst Wilhelm Leberecht Tempel<br>(德國)<br>1864.09.30   | 1.8×10(18)  | 119.1       | ?               | 2.254           | 0.211         | 1761.65         | 7.81          |
| 82 | 怨女星 Alkmene<br>Karl Theodor Robert Luther (德國)<br>1864.11.27              | 2.4×10(17)  | 61.0        | ?               | 2.141           | 0.224         | 1674.80         | 2.83          |
| 83 | 欣女星 Beatrix<br>Annibale de Gasparis (義大利)<br>1865.04.26                   | 5.6×10(17)  | 81.4        | ?               | 2.233           | 0.082         | 1385.04         | 4.97          |
| 84 | 史神星 Klio<br>Karl Theodor Robert Luther (德國)<br>1865.08.25                 | 5.2×10(17)  | 79.2        | ?               | 1.804           | 0.236         | 1325.96         | 9.33          |
| 85 | 犢神星 Io<br>Christian Heinrich Friedrich<br>Peters (德國)<br>1865.09.19       | ~3.4×10(18) | 180×160×160 | 0.286           | 2.141           | 0.193         | 1578.08         | 11.97         |

## 小行星表 (續)

| 編號  | 名稱<br>發現者<br>發現日期   | 質量<br>kg                  | 大小<br>km                    | 自轉<br>週期<br>(日) | 近日點<br>日距<br>AU | 軌道<br>離心<br>率 | 公轉<br>週期<br>(日) | 軌道<br>傾角<br>° |
|-----|---|---------------------------|-----------------------------|-----------------|-----------------|---------------|-----------------|---------------|
| 86  | 化女星 Semele<br>Friedrich Tietjen (德國)<br>1866.01.04                      | $1.8 \times 10^{18}$      | 120.6                       | ?               | 2.467           | 0.208         | 2007.37         | 4.82          |
| 87  | 林神星 Sylvia<br>Norman Robert Pogson (英國)<br>1866.05.16                   | $1.478 \times 10^{19}$    | $384 \times 264 \times 232$ | 0.216           | 3.213           | 0.080         | 2381.70         | 10.86         |
| 88  | 盡女星 Thisbe<br>Christian Heinrich Friedrich<br>Peters (德國)<br>1866.06.15 | $8.5 \times 10^{18}$      | 232                         | ?               | 2.312           | 0.165         | 1681.71         | 5.22          |
| 89  | 淫神星 Julia<br>Édouard Jean-Marie Stephan (法國)<br>1866.08.06              | $3.6 \times 10^{18}$      | 151.5                       | ?               | 2.081           | 0.184         | 1487.23         | 16.14         |
| 90  | 休神星 Antiope<br>Karl Theodor Robert Luther (德國)<br>1866.10.01            | $8.3 \times 10^{17}$      | $93 \times 87 \times 83.6$  | 0.687           | 2.661           | 0.157         | 2046.9          | 2.22          |
| 91  | 河神星 Aegina<br>Édouard Jean-Marie Stephan (法國)<br>1866.11.04             | $1.4 \times 10^{18}$      | 109.8                       | ?               | 2.318           | 0.105         | 1523.54         | 2.11          |
| 92  | 波女星 Undina<br>Christian Heinrich Friedrich<br>Peters (德國)<br>1867.07.07 | $2.1 \times 10^{18}$      | 126.4                       | ?               | 2.869           | 0.101         | 2081.09         | 9.92          |
| 93  | 慧神星 Minerva<br>James Craig Watson (美國)<br>1867.08.24                    | $2.9 \times 10^{18}$      | 141.0                       | ?               | 2.364           | 0.142         | 1669.54         | 8.56          |
| 94  | 彩神星 Aurora<br>James Craig Watson (美國)<br>1867.09.06                     | $9.0 \times 10^{18}$      | 204.9                       | ?               | 2.883           | 0.087         | 2050.83         | 7.97          |
| 95  | 源神星 Arethusa<br>Karl Theodor Robert Luther (德國)<br>1867.11.23           | $2.6 \times 10^{18}$      | 136.0                       | ?               | 2.611           | 0.149         | 1962.56         | 13.00         |
| 96  | 輝神星 Aegle<br>Jérôme Eugène Coggia (法國)<br>1868.02.17                    | $5.1 \times 10^{18}$      | 169.9                       | 0.576           | 2.655           | 0.132         | 1952.71         | 15.94         |
| 97  | 紡神星 Klotho<br>Ernst Wilhelm Leberecht Tempel<br>(德國)<br>1868.02.17      | $5.9 \times 10^{17}$      | 82.8                        | ?               | 1.983           | 0.257         | 1592.03         | 11.78         |
| 98  | 佳女星 Ianthe<br>Christian Heinrich Friedrich<br>Peters (德國)<br>1868.04.18 | $1.2 \times 10^{18}$      | 104.5                       | ?               | 2.176           | 0.190         | 1606.67         | 15.61         |
| 99  | 泰神星 Dike<br>Alphonse Louis Nicolas Borrelly<br>(法國)<br>1868.05.28       | $\sim 3.9 \times 10^{17}$ | 71.9                        | 0.431           | 2.139           | 0.197         | 1587.81         | 13.86         |
| 100 | 權神星 Hekate<br>James Craig Watson (美國)<br>1868.07.11                     | $\sim 1.0 \times 10^{18}$ | 89                          | 0.556           | 2.584           | 0.165         | 1987.64         | 6.43          |

## 週期彗星表

週期彗星表資料取自 IAU 公布的資料及 Gary W. Kronk、Seiichi Yoshida 的網站。已經發現公佈了 374 顆。命名規則依國際天文聯合會 (IAU) 1994 年 8 月 24 日在荷蘭海牙舉行大會修改，自 1995 年開始使用。擇要摘錄其規則如下：

名稱：新發現彗星的名字包含發現的年份，並以大寫英文字母次序標示發現的時段，與小行星標示法相同，以半個月為單位，且略過字母 I；及依數字順序標示新彗星在該時段內被宣佈發現的順序。

保留用發現者的名字為彗星命名的傳統。例如海爾—波普彗星是在 1995 年 7 月 23 日發現，且為七月下半月第一顆被確認的彗星，發現人是海爾 (Hale) 與波普 (Bopp)，因此被命名為 C/Hale-Bopp,1995 O1。

軌道週期性質：在名字前加標示，A/表示小行星被誤認為彗星；P 表示週期彗星，指週期小於 200 年，或有不只一次的近日點通過確認；C/表示非週期彗星；X/表示無法算出有意義的軌道；D/則表示已消失的週期彗星。

彗星被觀測到回歸 (或是經由觀測通過遠日點確定其週期性)，則 P 或 D/前將冠上官方序號 (如 1P1682 Q1 = 哈雷彗星)，序號由 IAU 小行星中心 (MPC) 指定。若彗星碎成好幾個，則在名字後面加上 -A, -B, ... 來區分每個碎核。

年份：若彗星已消失又重新被發現，將列出兩個發現年份，並在彗星名稱中加入新發現者之名。

### 週期彗星表 (一)

| 彗星名稱                      | 發現年份   | 上次回歸年份 | 下次回歸年份 | 週期 (年) |
|---------------------------|--------|--------|--------|--------|
| 1P Halley (哈雷)            | 240 BC | 1986   | 2061   | 76.01  |
| 2P Encke (恩克)             | 1786   | 2017   | 2020   | 3.30   |
| 3D Biela (比拉)             | 1772   | 1852   | 已分裂    | 6.62   |
| 4P Faye (法葉)              | 1843   | 2014   | 2021   | 7.51   |
| 5D Brorsen (布羅森)          | 1846   | 1879   | 消失     | 5.46   |
| 6P d'Arrest (德亞瑞司特)       | 1851   | 2015   | 2022   | 6.54   |
| 7P Pons-Winnecke (龐士-溫尼克) | 1819   | 2015   | 2022   | 6.36   |
| 8P Tuttle (塔托)            | 1790   | 2008   | 2021   | 13.61  |
| 9P Tempel 1 (譚普一號)        | 1867   | 2016   | 2022   | 5.52   |
| 10P Tempel 2 (譚普二號)       | 1873   | 2015   | 2021   | 5.47   |
| 11P Tempel-Swift-LINEAR   | 1869   | 2014   | 2020   | 6.37   |
| 12P Pons-Brooks (龐士-布魯克斯) | 1812   | 1954   | 2024   | 70.92  |
| 13P Olbers (歐爾伯)          | 1815   | 1956   | 2024   | 69.56  |
| 14P Wolf (沃爾夫)            | 1884   | 2017   | 2026   | 8.74   |
| 15P Finlay (范拉)           | 1886   | 2014   | 2021   | 6.51   |
| 16P Brooks 2 (布魯克斯二號)     | 1889   | 2014   | 2020   | 6.14   |

## 週期彗星表(二)

| 彗星名稱                           | 發現年份 | 上次回歸年份 | 下次回歸年份 | 週期(年)  |
|--------------------------------|------|--------|--------|--------|
| 17P Holmes (荷瑪)                | 1892 | 2014   | 2021   | 6.89   |
| 18D Perrine-Mrkos (珮倫-馬寇斯)     | 1896 | 1968   | 消失?    | 6.72   |
| 19P Borrelly (布洛利)             | 1904 | 2015   | 2022   | 6.85   |
| 20D Westphal                   | 1852 | 1913   | 消失?    | 61.86  |
| 21P Giacobini-Zinner           | 1900 | 2018   | 2025   | 6.62   |
| 22P Kopff (卡普夫)                | 1906 | 2015   | 2022   | 6.44   |
| 23P Brorsen-Metcalf            | 1847 | 1989   | 2059   | 70.54  |
| 24P Schumacher                 | 1911 | 2017   | 2025   | 8.25   |
| 25D Neujmin 2                  | 1916 | 1927   | Lost   | 5.43   |
| 26P Grigg-Skjellerup           | 1902 | 2018   | 2023   | 5.11   |
| 27P Crommelin (克羅瑪林)           | 1818 | 2011   | 2038   | 27.41  |
| 28P Neujmin 1                  | 1913 | 2002   | 2021   | 18.19  |
| 29P Schwassmann-Wachmann 1     | 1927 | 2004   | 2019   | 14.65  |
| 30P Reinmuth 1 (雷睦斯一號)         | 1928 | 2017   | 2024   | 7.32   |
| 31P Schwassmann-Wachmann 2     | 1929 | 2018   | 2027   | 8.72   |
| 32P Comas Solá                 | 1926 | 2014   | 2023   | 8.78   |
| 33P Daniel (丹尼爾)               | 1909 | 2016   | 2024   | 8.10   |
| 34D Gale (蓋爾)                  | 1927 | 1938   | 消失     | 10.99  |
| 35P Herschel-Rigollet          | 1788 | 1939   | 2092   | 154.91 |
| 36P Whipple (惠普)               | 1933 | 2011   | 2019   | 8.51   |
| 37P Forbes (佛畢斯)               | 1929 | 2017   | 2024   | 6.35   |
| 38P Stephan-Oterma (史蒂芬-奧特瑪)   | 1867 | 2018   | 2056   | 37.71  |
| 39P Oterma (奧特瑪)               | 1942 | 2002   | 2023   | 19.49  |
| 40P Väisälä 1                  | 1939 | 2014   | 2025   | 10.83  |
| 41P Tuttle-Giacobini-Kresak    | 1858 | 2016   | 2022   | 5.42   |
| 42P Neujmin 3                  | 1929 | 2015   | 2026   | 10.70  |
| 43P Wolf-Harrington (沃爾夫-哈靈頓)  | 1924 | 2016   | 2023   | 6.45   |
| 44P Reinmuth 2 (雷睦斯二號)         | 1947 | 2015   | 2022   | 7.07   |
| 45P Honda-Mrkos-Pajdusakova    | 1948 | 2016   | 2021   | 5.25   |
| 46P Wirtanen (沃塔南)             | 1948 | 2018   | 2023   | 5.44   |
| 47P Ashbrook-Jackson           | 1948 | 2017   | 2025   | 8.34   |
| 48P Johnson (詹森)               | 1949 | 2018   | 2025   | 6.96   |
| 49P Arend-Rigaux               | 1951 | 2017   | 2023   | 6.61   |
| 50P Arend (阿蘭德)                | 1951 | 2016   | 2024   | 8.26   |
| 51P Harrington (哈靈頓)           | 1953 | 2015   | 2022   | 7.13   |
| 52P Harrington-Abell (哈靈頓-阿貝爾) | 1955 | 2014   | 2020   | 7.54   |
| 53P Van Biesbroeck             | 1954 | 2016   | 2028   | 12.52  |
| 54P de Vico-Swift-NEAT         | 1844 | 2017   | 2024   | 7.37   |
| 55P Tempel-Tuttle (譚普-塔托)      | 1865 | 1998   | 2031   | 33.22  |
| 56P Slaughter-Burnham          | 1958 | 2016   | 2027   | 11.55  |



## 週期彗星表(三)

| 彗星名稱                         | 發現年份 | 上次回歸年份 | 下次回歸年份 | 週期(年) |
|------------------------------|------|--------|--------|-------|
| 57P du Toit-Neujmin-Delporte | 1941 | 2015   | 2022   | 6.41  |
| 58P Jackson-Neujmin          | 1936 | 2012   | 2020   | 8.24  |
| 59P Kearns-Kwee              | 1963 | 2018   | 2028   | 9.51  |
| 60P Tsuchinshan 2 (紫金山二號)    | 1965 | 2018   | 2025   | 6.78  |
| 61P Shajn-Schaldach          | 1949 | 2015   | 2022   | 7.05  |
| 62P Tsuchinshan 1 (紫金山一號)    | 1965 | 2011   | 2017   | 6.63  |
| 63P Wild 1 (威德一號)            | 1960 | 2013   | 2026   | 13.24 |
| 64P Swift-Gehrels (史威福-喬瑞斯)  | 1889 | 2018   | 2027   | 9.34  |
| 65P Gunn                     | 1970 | 2016   | 2023   | 6.80  |
| 66P du Toit                  | 1944 | 2018   | 2033   | 14.70 |
| 67P Churyumov-Gerasimenko    | 1969 | 2015   | 2022   | 6.45  |
| 68P Klemola                  | 1965 | 2009   | 2019   | 10.83 |
| 69P Taylor (泰勒)              | 1915 | 2018   | 2025   | 6.95  |
| 70P Kojima                   | 1970 | 2014   | 2021   | 7.06  |
| 71P Clark (克拉克)              | 1973 | 2016   | 2022   | 5.52  |
| 72P Denning-Fujikawa         | 1881 | 2014   | 2023   | 9.01  |
| 73P Schwassmann-Wachmann 3   | 1930 | 2016   | 2022   | 5.36  |
| 74P Smirnova-Chernykh        | 1975 | 2018   | 2027   | 8.53  |
| 75P Kohoutek (科胡特克)          | 1975 | 2014   | 2021   | 6.65  |
| 76P West-Kohoutek-Ikemura    | 1975 | 2013   | 2019   | 6.48  |
| 77P Longmore (隆莫)            | 1975 | 2016   | 2023   | 6.83  |
| 78P Gehrels 2 (喬瑞斯二號)        | 1973 | 2012   | 2019   | 7.23  |
| 79P du Toit-Hartley          | 1945 | 2018   | 2023   | 5.06  |
| 80P Peters-Hartley (彼得-哈德利)  | 1846 | 2014   | 2022   | 8.12  |
| 81P Wild 2 (威德二號)            | 1978 | 2016   | 2022   | 6.40  |
| 82P Gehrels 3 (喬瑞斯三號)        | 1975 | 2018   | 2026   | 8.45  |
| 83P Russell 1 (羅素一號)         | 1979 | 2013   | 2019   | 6.10  |
| 84P Giclas                   | 1978 | 2013   | 2020   | 6.97  |
| 85P Boethin (波辛)             | 1975 | 1986   | 2020   | 11.23 |
| 86P Wild 3 (威德三號)            | 1980 | 2015   | 2022   | 6.93  |
| 87P Bus (柏斯)                 | 1981 | 2013   | 2020   | 6.51  |
| 88P Howell (侯威爾)             | 1981 | 2015   | 2020   | 5.49  |
| 89P Russell 2 (羅素二號)         | 1980 | 2016   | 2023   | 7.40  |
| 90P Gehrels 1 (喬瑞斯一號)        | 1972 | 2002   | 2017   | 14.84 |
| 91P Russell 3 (羅素三號)         | 1983 | 2013   | 2021   | 7.67  |
| 92P Sanguin                  | 1977 | 2015   | 2027   | 12.44 |
| 93P Lovas 1 (洛伐一號)           | 1980 | 1998   | 2017   | 9.14  |
| 94P Russell 4 (羅素四號)         | 1984 | 2016   | 2023   | 6.58  |
| 95P Chiron (查龍)              | 1977 | 1996   | 2046   | 50.73 |
| 96P Machholz 1 (梅克賀茲一號)      | 1986 | 2012   | 2017   | 5.24  |

## 週期彗星表(四)

| 彗星名稱                             | 發現年份 | 上次回歸年份 | 下次回歸年份 | 週期(年)  |
|----------------------------------|------|--------|--------|--------|
| 97P Metcalf-Brewington           | 1906 | 2011   | 2021   | 10.53  |
| 98P Takamizawa (高見澤)             | 1984 | 2013   | 2021   | 7.40   |
| 99P Kowal 1 (柯瓦一號)               | 1977 | 2007   | 2022   | 15.09  |
| 100P Hartley 1 (哈德利一號)           | 1985 | 2015   | 2021   | 6.29   |
| 101P Chernykh                    | 1977 | 2005   | 2020   | 13.92  |
| 102P Shoemaker 1 (休梅克一號)         | 1984 | 2013   | 2020   | 7.23   |
| 103P Hartley 2 (哈德利二號)           | 1986 | 2016   | 2022   | 6.40   |
| 104P Kowal 2 (柯瓦二號)              | 1979 | 2016   | 2022   | 6.18   |
| 105P Singer Brewster             | 1986 | 2018   | 2024   | 6.47   |
| 106P Schuster                    | 1977 | 2014   | 2021   | 7.31   |
| 107P Wilson-Harrington (威爾森-哈靈頓) | 1949 | 2018   | 2022   | 4.30   |
| 108P Ciffréo                     | 1985 | 2014   | 2021   | 7.26   |
| 109P Swift-Tuttle (史威福-塔托)       | 1862 | 1992   | 2126   | 135.01 |
| 110P Hartley 3 (哈德利三號)           | 1988 | 2014   | 2021   | 6.89   |
| 111P Helin-Roman-Crockett        | 1989 | 2013   | 2021   | 8.12   |
| 112P Urata-Nijima                | 1986 | 2013   | 2020   | 6.67   |
| 113P Spitaler (史匹塔勒)             | 1890 | 2015   | 2022   | 7.09   |
| 114P Wiseman-Skiff (威茲曼-史基福)     | 1986 | 2013   | 2020   | 6.68   |
| 115P Maury (莫利)                  | 1985 | 2011   | 2020   | 8.79   |
| 116P Wild 4 (威德四號)               | 1990 | 2016   | 2023   | 6.48   |
| 117P Helin-Roman-Alu 1           | 1989 | 2014   | 2022   | 8.24   |
| 118P Shoemaker-Levy 4 (休梅克-李威四號) | 1991 | 2016   | 2023   | 6.45   |
| 119P Parker-Hartley (派克-哈德利)     | 1989 | 2014   | 2023   | 8.89   |
| 120P Mueller 1 (謬勒一號)            | 1987 | 2013   | 2021   | 8.43   |
| 121P Shoemaker-Holt 2 (休梅克-霍德二號) | 1989 | 2013   | 2021   | 8.01   |
| 122P de Vico (迪維斯)               | 1846 | 1995   | 2069   | 74.41  |
| 123P West-Hartley (威斯特-哈德利)      | 1989 | 2018   | 2025   | 7.58   |
| 124P Mrkos (馬寇斯)                 | 1991 | 2014   | 2020   | 5.75   |
| 125P Spacewatch (天空守望者)          | 1991 | 2018   | 2023   | 5.53   |
| 126P IRAS (紅外線天文衛星)              | 1983 | 2010   | 2023   | 13.29  |
| 127P Holt-Olmstead (霍德-歐姆斯特)     | 1990 | 2016   | 2022   | 6.39   |
| 128P Shoemaker-Holt 1 (休梅克-霍德一號) | 1987 | 2017   | 2027   | 9.59   |
| 129P Shoemaker-Levy 3 (休梅克-李威三號) | 1991 | 2014   | 2021   | 7.23   |
| 130P McNaught-Hughes             | 1991 | 2017   | 2023   | 6.67   |
| 131P Mueller 2 (謬勒二號)            | 1990 | 2012   | 2019   | 7.07   |
| 132P Helin-Roman-Alu 2           | 1989 | 2014   | 2022   | 8.28   |
| 133P Elst-Pizarro                | 1996 | 2018   | 2023   | 5.61   |
| 134P Kowal-Vavrova               | 1983 | 2014   | 2030   | 15.6   |
| 135P Shoemaker-Levy 8 (休梅克-李威八號) | 1992 | 2014   | 2022   | 7.49   |
| 136P Mueller 3 (謬勒三號)            | 1990 | 2016   | 2025   | 8.57   |

## 週期彗星表 (五)

| 彗星名稱                             | 發現年份 | 上次回歸年份 | 下次回歸年份 | 週期(年)  |
|----------------------------------|------|--------|--------|--------|
| 137P Shoemaker-Levy 2 (休梅克-李威二號) | 1990 | 2018   | 2027   | 9.55   |
| 138P Shoemaker-Levy 7 (休梅克-李威七號) | 1991 | 2012   | 2019   | 6.91   |
| 139P Väisälä-Oterma              | 1939 | 2017   | 2027   | 9.60   |
| 140P Bowell-Skiff (包威爾-史基福)      | 1983 | 2015   | 2021   | 16.18  |
| 141P Machholz 2 (梅克賀茲二號)         | 1994 | 2015   | 2020   | 5.23   |
| 142P Ge-Wang (葛-汪)               | 1988 | 2010   | 2022   | 11.17  |
| 143P Kowal-Mrkos (柯瓦-馬寇斯)        | 1984 | 2018   | 2027   | 8.92   |
| 144P Kushida (串田)                | 1994 | 2016   | 2023   | 7.60   |
| 145P Shoemaker-Levy 5 (休梅克-李威五號) | 1991 | 2017   | 2025   | 8.39   |
| 146P Shoemaker-LINEAR            | 1984 | 2016   | 2024   | 8.08   |
| 147P Kushida-Muramatsu (串田-村松)   | 1993 | 2016   | 2023   | 7.43   |
| 148P Anderson-LINEAR             | 1963 | 2015   | 2022   | 7.07   |
| 149P Mueller 4 (繆勒四號)            | 1992 | 2010   | 2019   | 9.01   |
| 150P LONEOS                      | 2000 | 2016   | 2024   | 7.68   |
| 151P Helin                       | 1987 | 2015   | 2029   | 14.06  |
| 152P Helin-Lawrence              | 1993 | 2012   | 2021   | 9.52   |
| 153P Ikeya-Zhang (池谷-張)          | 2002 | 2002   | 2362   | 364.46 |
| 154P Brewington                  | 1992 | 2013   | 2024   | 10.66  |
| 155P Shoemaker 3                 | 1986 | 2002   | 2019   | 17.10  |
| 156P Russell-LINEAR              | 1986 | 2014   | 2022   | 6.83   |
| 157P Tritton                     | 1978 | 2016   | 2022   | 6.45   |
| 158P Kowal- LINEAR               | 2002 | 2012   | 2023   | 10.29  |
| 159P LONEOS                      | 2003 | 2018   | 2032   | 14.31  |
| 160P LINEAR                      | 2004 | 2012   | 2019   | 7.95   |
| 161P Hartley-IRAS                | 1983 | 2005   | 2026   | 21.50  |
| 162P Siding Spring               | 2004 | 2015   | 2020   | 5.32   |
| 163P NEAT                        | 2004 | 2012   | 2019   | 7.30   |
| 164P Christensen                 | 2004 | 2018   | 2025   | 6.91   |
| 165P LINEAR                      | 2000 | 2000   | 2075   | 76.41  |
| 166P NEAT                        | 2001 | 2002   | 2053   | 51.89  |
| 167P CINEOS                      | 2004 | 2001   | 2066   | 64.78  |
| 168P Hergenrother                | 1998 | 2012   | 2019   | 6.92   |
| 169P NEAT                        | 2002 | 2018   | 2022   | 4.21   |
| 170P Christensen                 | 2005 | 2014   | 2023   | 8.61   |
| 171P Spahr                       | 1998 | 2012   | 2019   | 6.62   |
| 172P Yeung                       | 2002 | 2017   | 2024   | 6.58   |
| 173P Mueller                     | 1993 | 2008   | 2021   | 13.62  |
| 174P Echeclus                    | 2000 | 2015   | 2050   | 35.34  |
| 175P Hergenrother                | 2000 | 2013   | 2020   | 6.62   |
| 176P LINEAR                      | 1999 | 2016   | 2022   | 5.71   |

## 週期彗星表(六)

| 彗星名稱                  | 發現年份 | 上次回歸年份 | 下次回歸年份 | 週期(年)  |
|-----------------------|------|--------|--------|--------|
| 177P Barnard (巴納德)    | 1889 | 2006   | 2127   | 119.56 |
| 178P Hug-Bell         | 1999 | 2013   | 2020   | 7.06   |
| 179P Jedicke          | 1995 | 2007   | 2022   | 14.35  |
| 180P NEAT             | 2001 | 2015   | 2023   | 7.53   |
| 181P Shoemaker-Levy 6 | 1991 | 2014   | 2021   | 7.52   |
| 182P LONEOS           | 2001 | 2017   | 2023   | 5.02   |
| 183P Korlevic-Juric   | 1999 | 2017   | 2027   | 9.56   |
| 184P Lovas            | 1986 | 2013   | 2020   | 6.62   |
| 185P Petriew          | 2001 | 2018   | 2023   | 5.47   |
| 186P Garradd          | 2007 | 2008   | 2019   | 10.64  |
| 187P LINEAR           | 1998 | 2018   | 2028   | 9.40   |
| 188P LINEAR-Mueller   | 1998 | 2017   | 2026   | 9.13   |
| 189P NEAT             | 2002 | 2017   | 2023   | 4.98   |
| 190P Mueller          | 1998 | 2016   | 2025   | 8.73   |
| 191P McNaught         | 2007 | 2014   | 2021   | 6.64   |
| 192P Shoemaker-Levy 1 | 1990 | 2007   | 2024   | 16.38  |
| 193P LINEAR-NEAT      | 2001 | 2014   | 2021   | 6.74   |
| 194P LINEAR           | 2000 | 2016   | 2024   | 8.04   |
| 195P Hill             | 1993 | 2009   | 2025   | 16.49  |
| 196P Tichy            | 2000 | 2015   | 2022   | 7.34   |
| 197P Linear           | 2003 | 2018   | 2023   | 4.85   |
| 198P ODAS             | 1998 | 2018   | 2025   | 6.78   |
| 199P Shoemaker 4      | 1994 | 2009   | 2023   | 14.58  |
| 200P Larsen           | 1997 | 2008   | 2019   | 10.87  |
| 201P LONEOS           | 2001 | 2015   | 2022   | 6.45   |
| 202P Scotti           | 2001 | 2016   | 2023   | 7.34   |
| 203P Kovlevic         | 1999 | 2010   | 2020   | 10.02  |
| 204P LINEAR-NEAT      | 2001 | 2015   | 2022   | 7.02   |
| 205P Giacobini        | 1896 | 2015   | 2022   | 6.66   |
| 206P Barnard-Boattini | 1892 | 2014   | 2020   | 5.83   |
| 207P NEAT             | 2001 | 2016   | 2024   | 7.67   |
| 208P McMillan         | 2000 | 2016   | 2024   | 8.11   |
| 209P LINEAR           | 2004 | 2014   | 2019   | 5.04   |
| 210P Christensen      | 2003 | 2014   | 2020   | 5.65   |
| 211P Hill             | 2009 | 2016   | 2024   | 6.73   |
| 212P NEAT             | 2000 | 2016   | 2024   | 7.79   |
| 213P Van Ness         | 2005 | 2017   | 2024   | 6.33   |
| 214P LINEAR           | 2002 | 22015  | 2022   | 6.85   |
| 215P NEAT             | 2002 | 2018   | 2026   | 8.17   |
| 216P LINEAR           | 2001 | 2016   | 2024   | 7.66   |

## 週期彗星表(七)

| 彗星名稱                        | 發現年份 | 上次回歸年份 | 下次回歸年份 | 週期(年) |
|-----------------------------|------|--------|--------|-------|
| 217P LINEAR                 | 2001 | 2016   | 2024   | 7.83  |
| 218P LINEAR                 | 2003 | 2015   | 2021   | 6.10  |
| 219P LINEAR                 | 2002 | 2017   | 2024   | 6.99  |
| 220P MacNaught              | 2004 | 2015   | 2021   | 5.50  |
| 221P LINEAR                 | 2002 | 2015   | 2021   | 6.49  |
| 222P LINEAR                 | 2004 | 2014   | 2019   | 4.83  |
| 223P Skiff                  | 2002 | 2010   | 2019   | 8.45  |
| 224P LINEAR-NEAT            | 2003 | 2016   | 2022   | 6.29  |
| 225P LINEAR                 | 2002 | 2016   | 2023   | 6.96  |
| 226P Pigott-LINEAR-Kowalski | 1783 | 2016   | 2023   | 7.30  |
| 227P Catalina-LINEAR        | 2003 | 2003   | 2010   | 6.80  |
| 228P LINEAR                 | 2003 | 2011   | 2019   | 8.51  |
| 229P Gibbs                  | 2009 | 2017   | 2024   | 7.77  |
| 230P LINEAR                 | 2002 | 2015   | 2021   | 6.27  |
| 231P LINEAR-NEAT            | 2003 | 2011   | 2019   | 8.08  |
| 232P Hill                   | 1999 | 2009   | 2019   | 9.49  |
| 233P La Sagra               | 2010 | 2015   | 2020   | 5.29  |
| 234P LINEAR                 | 2002 | 2017   | 2025   | 7.48  |
| 235P LINEAR                 | 2002 | 2018   | 2026   | 8.01  |
| 236P LINEAR                 | 2003 | 2017   | 2024   | 7.21  |
| 237P LINEAR                 | 2002 | 2017   | 2024   | 7.21  |
| 238P Read                   | 2005 | 2017   | 2023   | 5.63  |
| 239P LINEAR                 | 2000 | 2009   | 2019   | 9.40  |
| 240P NEAT                   | 2003 | 2018   | 2025   | 7.59  |
| 241P LINEAR                 | 1999 | 2010   | 2021   | 10.67 |
| 242P Spahr                  | 1999 | 2012   | 2025   | 13.15 |
| 243P NEAT                   | 2003 | 2018   | 2026   | 7.50  |
| 244P Scotti                 | 2000 | 2013   | 2023   | 10.80 |
| 245P WISE                   | 2010 | 2018   | 2026   | 8.02  |
| 246P NEAT                   | 2005 | 2013   | 2021   | 8.04  |
| 247P LINEAR                 | 2003 | 2018   | 2026   | 7.89  |
| 248P Gibbs                  | 2011 | 1996   | 2025   | 14.6  |
| 249P LINEAR                 | 2006 | 2015   | 2020   | 4.63  |
| 250P Larson                 | 2010 | 2018   | 2025   | 7.21  |
| 251P LINEAR                 | 2004 | 2017   | 2023   | 6.52  |
| 252P LINEAR                 | 2000 | 2015   | 2020   | 5.36  |
| 253P PanSTARRS              | 2011 | 2018   | 2024   | 6.47  |
| 254P McNaught               | 2010 | 2010   | 2020   | 10.1  |
| 255P Levy                   | 2006 | 2017   | 2023   | 5.25  |
| 256P LINEAR                 | 2003 | 2013   | 2023   | 9.96  |

## 週期彗星表(八)

| 彗星名稱                   | 發現年份 | 上次回歸年份 | 下次回歸年份 | 週期(年) |
|------------------------|------|--------|--------|-------|
| 257P Catalina          | 2006 | 2013   | 2020   | 7.27  |
| 258P PanSTARRS         | 2011 | 2011   | 2020   | 9.23  |
| 259P Garradd           | 2008 | 2017   | 2022   | 4.50  |
| 260P McNaught          | 2005 | 2012   | 2019   | 7.10  |
| 261P Larson            | 2005 | 2012   | 2019   | 6.80  |
| 262P McNaught-Russell  | 1994 | 2012   | 2030   | 18.25 |
| 263P Gibbs             | 2006 | 2017   | 2022   | 5.27  |
| 264P Larson            | 2004 | 2018   | 2025   | 7.68  |
| 265P LINEAR            | 2003 | 2012   | 2021   | 8.77  |
| 266P Christensen       | 2007 | 2013   | 2020   | 6.64  |
| 267P LONEOS            | 2006 | 2018   | 2024   | 5.96  |
| 268P Bernardi          | 2005 | 2015   | 2020   | 9.76  |
| 269P Jedicke           | 1995 | 2014   | 2034   | 19.8  |
| 270P Gehrels           | 1996 | 2013   | 2031   | 18.0  |
| 271P van Houten-Lemmon | 1996 | 2013   | 2031   | 18.4  |
| 272P NEAT              | 2003 | 2013   | 2022   | 9.36  |
| 273P Pons-Gambart      | 1827 | 2012   | 2200   | 188   |
| 274P Tombaugh-Tenagra  | 1940 | 2013   | 2022   | 9.11  |
| 275P Hermann           | 1999 | 2012   | 2026   | 13.8  |
| 276P Vorobjov          | 2012 | 2013   | 2025   | 12.5  |
| 277P LINEAR            | 2005 | 2013   | 2021   | 7.59  |
| 278P McNaught          | 2006 | 2013   | 2020   | 7.12  |
| 279P La Sagra          | 2009 | 2016   | 2023   | 6.76  |
| 280P Larsen            | 2004 | 2013   | 2023   | 9.63  |
| 281P MOSS              | 2012 | 2012   | 2023   | 10.7  |
| 282P 2003 BM80         | 2004 | 2013   | 2021   | 8.76  |
| 283P Spacewatch        | 2013 | 2013   | 2021   | 8.4   |
| 284P McNaught          | 2007 | 2014   | 2021   | 7.04  |
| 285P LINEAR            | 2003 | 2013   | 2023   | 9.52  |
| 286P Christensen       | 2005 | 2014   | 2022   | 8.37  |
| 287P Christensen       | 2006 | 2014   | 2023   | 8.54  |
| 288P 2006 VW139        | 2006 | 2016   | 2021   | 5.33  |
| 289P Blanpain          | 1819 | 2014   | 2019   | 5.18  |
| 290P Jager             | 1999 | 2014   | 2029   | 15.2  |
| 291P NEAT              | 2004 | 2013   | 2023   | 9.71  |
| 292P Li                | 1998 | 2014   | 2029   | 15.1  |
| 293P Spacewatch        | 2007 | 2014   | 2021   | 6.94  |
| 294P LINEAR            | 2008 | 2014   | 2020   | 5.71  |
| 295P LINEAR            | 2002 | 2014   | 2026   | 12.3  |
| 296P Garradd           | 2007 | 2014   | 2020   | 6.55  |

## 週期彗星表(九)

| 彗星名稱                     | 發現年份 | 上次回歸年份 | 下次回歸年份 | 週期(年) |
|--------------------------|------|--------|--------|-------|
| 297P Beshore             | 2008 | 2014   | 2020   | 6.39  |
| 298P Christensen         | 2007 | 2013   | 2020   | 6.80  |
| 299P Catalina-PANSTARRS  | 2006 | 2015   | 2024   | 9.18  |
| 300P Catalina            | 2005 | 2018   | 2022   | 4.42  |
| 301P LINEAR—NEAT         | 2001 | 2014   | 2028   | 13.7  |
| 302P Lemmon-PANSTARRS    | 2014 | 2016   | 2025   | 8.86  |
| 303P NEAT                | 2003 | 2014   | 2026   | 11.4  |
| 304P Ory                 | 2008 | 2014   | 2020   | 5.84  |
| 305P Skiff               | 2004 | 2014   | 2025   | 9.91  |
| 306P LINEAR              | 2003 | 2014   | 2020   | 5.48  |
| 307P LINEAR              | 2000 | 2014   | 2028   | 14.0  |
| 308P Lagerkvist-Carsenty | 1998 | 2015   | 2032   | 17.3  |
| 309P LINEAR              | 2005 | 2015   | 2024   | 9.4   |
| 310P Hill                | 2006 | 2015   | 2023   | 8.5   |
| 311P PANSTARRS           | 2013 | 2017   | 2020   | 3.2   |
| 312P NEAT                | 2001 | 2014   | 2020   | 6.4   |
| 313P Gibbs               | 2014 | 2014   | 2020   | 5.6   |
| 314P Montani             | 1997 | 1916   | 2035   | 19.4  |
| 315P LONEOS              | 2005 | 2016   | 2027   | 10.7  |
| 316P LONEOS-Christensen  | 2006 | 2015   | 2024   | 9.0   |
| 317P WISE                | 2010 | 2015   | 2020   | 5.1   |
| 318P McNaught-Hartley    | 1994 | 2015   | 2036   | 20.6  |
| 319P Catalina-McNaught   | 2008 | 2015   | 2022   | 6.8   |
| 320P McNaught            | 2004 | 2015   | 2021   | 5.5   |
| 321P SOHO                | 2008 | 2016   | 2020   | 3.8   |
| 322P SOHO                | 1999 | 2015   | 2019   | 4.0   |
| 323P SOHO                | 2008 | 2016   | 2020   | 4.2   |
| 324P La Sagra            | 2010 | 2015   | 2021   | 5.5   |
| 325P Yang-Gao            | 2009 | 2015   | 2022   | 6.6   |
| 326P Hill                | 2007 | 2015   | 2023   | 8.2   |
| 327P Van Ness            | 2002 | 2015   | 2022   | 6.7   |
| 328P LONEOS-Tucker       | 1998 | 2015   | 2024   | 8.6   |
| 329P LINEAR-Catalina     | 2004 | 2015   | 2027   | 11.9  |
| 330P Catalina            | 1999 | 2016   | 2033   | 16.9  |
| 331P Gibbs               | 2005 | 2015   | 2020   | 5.2   |
| 332P Ikeya-Murakami      | 2010 | 2016   | 2022   | 5.4   |
| 333P LINEAR              | 2007 | 2016   | 2025   | 8.7   |
| 334P NEAT                | 2000 | 2017   | 2034   | 16.7  |
| 335P Gibbs               | 2009 | 2015   | 2022   | 6.8   |
| 336P McNaught            | 2006 | 2016   | 2027   | 11.3  |

## 週期彗星表(十)

| 彗星名稱                   | 發現年份 | 上次回歸年份 | 下次回歸年份 | 週期(年) |
|------------------------|------|--------|--------|-------|
| 337P WISE              | 2010 | 2016   | 2022   | 6.0   |
| 338P Gibbs             | 2009 | 2016   | 2023   | 7.1   |
| 339P McNaught          | 2009 | 2016   | 2023   | 7.7   |
| 340P Boattini          | 2008 | 2016   | 2025   | 8.8   |
| 341P Gibbs             | 2007 | 2016   | 2025   | 8.9   |
| 342P SOHO              | 2011 | 2017   | 2023   | 5.3   |
| 343P NEAT-LONEOS       | 2004 | 2017   | 2030   | 12.8  |
| 344P Read              | 1951 | 2016   | 2027   | 10.8  |
| 345P LINEAR            | 2008 | 2016   | 2025   | 8.4   |
| 346P Catalina          | 1998 | 2017   | 2027   | 9.5   |
| 347P PanSTARRS         | 2016 | 2009   | 2023   | 6.9   |
| 348P PanSTARRS         | 2016 | 2016   | 2022   | 5.6   |
| 349P Lemmon            | 2010 | 2017   | 2024   | 6.8   |
| 350P McNaught          | 2009 | 2018   | 2024   | 8.4   |
| 351P Wiegert-PanSTARRS | 2015 | 2006   | 2024   | 9.3   |
| 352P Skiff             | 2000 | 2017   | 2034   | 17.1  |
| 353P McNaught          | 2009 | 2017   | 2025   | 8.5   |
| 354P LINEAR            | 2009 | 2016   | 2020   | 3.5   |
| 355P LINEAR-NEAT       | 2004 | 2017   | 2024   | 6.5   |
| 356P WISE              | 2009 | 2017   | 2026   | 8.5   |
| 357P Hill              | 2008 | 2018   | 2027   | 9.5   |
| 358P PanSTARRS         | 2012 | 2018   | 2023   | 5.6   |
| 359P LONEOS            | 2007 | 2017   | 2027   | 10.0  |
| 360P WISE              | 2010 | 2017   | 2024   | 7.1   |
| 361P Spacewatch        | 2007 | 2017   | 2028   | 11.0  |
| 362P 2008 GO98         | 2008 | 2016   | 2024   | 7.9   |
| 363P Lemmon            | 2011 | 2018   | 2024   | 6.3   |
| 364P PanSTARRS         | 2013 | 2018   | 2023   | 4.9   |
| 365P PanSTARRS         | 2012 | 2018   | 2024   | 5.7   |
| 366P Spacewatch        | 2005 | 2018   | 2024   | 6.6   |
| 367P Catalina          | 2011 | 2018   | 2024   | 6.6   |
| 368P NEAT              | 2005 | 2018   | 2031   | 13.0  |
| 369P Hill              | 2009 | 2018   | 2027   | 9.2   |
| 370P NEAT              | 2002 | 2018   | 2034   | 16.4  |
| 371P Spacewatch        | 2001 | 2018   | 2027   | 8.6   |
| 372P McNaught          | 2009 | 2018   | 2028   | 9.5   |
| 373P Rinner            | 2011 |        | 2019   | 7.4   |
| 374P Larson            | 2007 |        | 2019   | 11.1  |



## 認識星座

星座，只是天空上看似位置相近的星星，將其連結成一個人物或日常生活用品等的形狀，讓人方便記憶星星的位置。實際上星座中的每一顆星星與地球的真實距離差異甚大，有些甚至不屬於我們銀河系中的天體。

單從書本上或星座圖中所得到的知識與圖像，並不能使我們真正的認識星座。只有經常不斷的練習反復觀賞、辨認，才能熟悉天上的星座。因為全天 88 個星座一年中是輪流出現在天空中，所以要認識星座並不能一個晚上就達到目的，而必須四季經常地觀測，才能熟記不忘。坊間許多認識星座的書中都能找到認識星座的方法，年鑑不再贅述，只提供幾點容易被忽略的小技巧，希望對讀者有所幫助。

### ※選擇有月光（光害）的夜晚：

初學者應挑選一個天氣狀況不是最佳的夜晚開始認星，因為在天氣晴朗而有月光的夜晚或有天空薄雲的狀況下，會因為月光的遮蔽作用，將暗星隱藏起來，剩下的就是星座中較亮的主星，也就是在認識星座時應該先認識的星星。都市的燈光或稀薄的雲層，也能達到『月明星稀』的效果，但太厚的雲層或正立在街燈下都會過度遮蔽星光，妨礙認星的學習。臺北市雖然是被公認為光害嚴重，但對初學認星的人士卻是好的地點，只要不是站在水銀燈下，晴朗無雲的夜晚都是認識星星的好日子。

### ※從北天開始：

我們居住在北半球，所以北極附近的星座一年四季都在地平線以上，入夜之後幾乎都能找到。因此以北天的星座為基準來尋找其他星座會很方便。例如北斗七星（屬於大熊座）在春夏兩季都能見到，仙后座在秋冬兩季也都能看見。先認識這兩個星座，則在其他適合觀星的夜晚，都能很容易地找出其他星座，再一一學習認識。

### ※由大的星座認起：

大的星座通常都有亮星在內，而這些亮星就是明顯的特徵，可以做為該星座的指標。再加上大的星座通常都有神話故事可供參考，有助於形狀的辨識與記憶。因此認識這些星座後較不容易忘記。小的星座則多由暗星組成，既不易尋找，也難以確認位置與形狀，會造成初學者的挫折與倦怠而喪失學習的興趣。

### ※參考天文曆表確定行星的位置：

行星對初學者而言是造成相當困擾的天體，因為它們會在天球上不停的移動位置，因此星座圖、星座盤都不會標示行星位置；但行星的亮度常凌駕一般的恆星之上，一個星座中若有行星存在，這顆行星經常會成為這個星座中很明顯的天體，甚至會成為星座中最亮的天體。這常使得星座的形象無法正確呈現，初學者也就難以辨認這個星座。因此要先查閱天文年鑑或天文年曆，明瞭當天在要認識的星座中是否有行星存在，才能順利的辨認這個星座。

最後建議讀者在初次觀星時，能請具有經驗、認識星座的朋友從旁指導，這將能更快速有效地帶領您進入美好的星空世界。

## 星 座 表

| 中天日期<br>月 日<br>(20時) | 星座名稱<br>(裸眼可見星數) | 英文名稱           | 縮寫  | 中天日期<br>月 日<br>(20時) | 星座名稱<br>(裸眼可見星數) | 英文名稱                | 縮寫  |
|----------------------|------------------|----------------|-----|----------------------|------------------|---------------------|-----|
| 1 6                  | 英仙座 (122)        | Perseus        | Per | 7 13                 | 小熊座 (28)         | Ursa Minor          | UMi |
| 6                    | 時鐘座 (21)         | Horologium     | Hor | 13                   | 北冕座 (29)         | Corona Borealis     | CrB |
| 14                   | 波江座 (146)        | Eridanus       | Eri | 13                   | 南三角座 (22)        | Triangulum Australe | TrA |
| 14                   | 網罟座 (19)         | Reticulum      | Ret | 18                   | 矩尺座 (32)         | Norma               | Nor |
| 24                   | 金牛座+ (171)       | Taurus         | Tau | 18                   | 天燕座* (27)        | Apus                | Aps |
| 29                   | 雕具座 (15)         | Caelum         | Cae | 23                   | 天蠍座+ (126)       | Scorpius            | Sco |
| 31                   | 劍魚座 (21)         | Dorado         | Dor | 8 2                  | 天龍座 (154)        | Draco               | Dra |
| 2 5                  | 獵戶座 (155)        | Orion          | Ori | 5                    | 武仙座 (181)        | Hercules            | Her |
| 6                    | 天兔座 (58)         | Lepus          | Lep | 5                    | 蛇夫座 (115)        | Ophiuchus           | Oph |
| 8                    | 繪架座 (32)         | Pictor         | Pic | 5                    | 天壇座 (47)         | Ara                 | Ara |
| 10                   | 鹿豹座 (22)         | Camelopardalis | Cam | 17                   | 巨蛇座(尾)(24)       | Serpens Cauda       | Ser |
| 10                   | 天鴿座 (56)         | Columba        | Col | 25                   | 盾牌座 (20)         | Scutum              | Sct |
| 10                   | 山案座* (22)        | Mensa          | Men | 25                   | 南冕座 (29)         | Corona Australis    | CrA |
| 15                   | 御夫座 (102)        | Auriga         | Aur | 29                   | 天琴座 (53)         | Lyra                | Lyr |
| 26                   | 大犬座 (122)        | Canis Major    | CMa | 9 2                  | 人馬座+ (152)       | Sagittarius         | Sgr |
| 3 3                  | 雙子座+ (96)        | Gemini         | Gem | 2                    | 望遠鏡座 (52)        | Telescopium         | Tel |
| 3                    | 麒麟座 (95)         | Monoceros      | Mon | 5                    | 孔雀座 (55)         | Pavo                | Pav |
| 11                   | 小犬座 (32)         | Canis Minor    | CMi | 10                   | 天鷹座 (87)         | Aquila              | Aql |
| 13                   | 船尾座 (181)        | Puppis         | Pup | 12                   | 天箭座 (20)         | Sagitta             | Sge |
| 13                   | 飛魚座# (23)        | Volans         | Vol | 20                   | 狐狸座 (53)         | Vulpecula           | Vul |
| 16                   | 天貓座 (74)         | Lynx           | Lyn | 25                   | 天鵝座 (191)        | Cygnus              | Cyg |
| 26                   | 巨蟹座+ (71)        | Cancer         | Cnc | 26                   | 海豚座 (25)         | Delphinus           | Del |
| 28                   | 船底座 (148)        | Carina         | Car | 30                   | 摩羯座+ (65)        | Capricornus         | Cap |
| 31                   | 羅盤座 (26)         | Pyxis          | Pyx | 30                   | 顯微鏡座 (29)        | Microscopium        | Mic |
| 4 10                 | 船帆座 (146)        | Vela           | Vel | 10 2                 | 南極座* (43)        | Octans              | Oct |
| 17                   | 唧筒座 (23)         | Antlia         | Ant | 5                    | 小馬座 (10)         | Equuleus            | Equ |
| 20                   | 六分儀座 (21)        | Sextans        | Sex | 7                    | 印第安座 (25)        | Indus               | Ind |
| 22                   | 小獅座 (26)         | Leo Minor      | LMi | 17                   | 仙王座 (118)        | Cepheus             | Cep |
| 25                   | 獅子座+ (96)        | Leo            | Leo | 17                   | 南魚座 (29)         | Piscis Austrinus    | PsA |
| 25                   | 長蛇座 (164)        | Hydra          | Hya | 22                   | 寶瓶座+ (113)       | Aquarius            | Aqr |
| 28                   | 蝮蛇座* (22)        | Chamaeleon     | Cha | 22                   | 天鶴座 (44)         | Grus                | Gru |
| 5 3                  | 大熊座 (151)        | Ursa Major     | UMa | 24                   | 蜥虎座 (49)         | Lacerta             | Lac |
| 8                    | 巨爵座 (22)         | Crater         | Crt | 25                   | 飛馬座 (118)        | Pegasus             | Peg |
| 23                   | 烏鴉座 (24)         | Corvus         | Crv | 11 13                | 杜鵑座 (33)         | Tucana              | Tuc |
| 23                   | 南十字座 (40)        | CruX           | Cru | 22                   | 雙魚座+ (95)        | Pisces              | Psc |
| 26                   | 蒼蠅座# (41)        | Musca          | Mus | 25                   | 玉夫座 (39)         | Sculptor            | Scl |
| 26                   | 后髮座 (48)         | Coma Berenices | Com | 27                   | 仙女座 (108)        | Andromeda           | And |
| 6 2                  | 獵犬座 (126)        | Canes Venatici | CVn | 12 2                 | 仙后座 (106)        | Cassiopeia          | Cas |
| 7                    | 室女座+ (126)       | Virgo          | Vir | 2                    | 鳳凰座 (48)         | Phoenix             | Phe |
| 7                    | 半人馬座 (190)       | Centaurus      | Cen | 13                   | 鯨魚座 (128)        | Cetus               | Cet |
| 26                   | 牧夫座 (114)        | Bootes         | Boo | 17                   | 三角座 (22)         | Triangulum          | Tri |
| 30                   | 圓規座 (29)         | Circinus       | Cir | 23                   | 天爐座 (36)         | Fornax              | For |
| 7 3                  | 豺狼座 (82)         | Lupus          | Lup | 25                   | 白羊座+ (66)        | Aries               | Ari |
| 6                    | 天秤座+ (63)        | Libra          | Lib | 27                   | 水蛇座 (164)        | Hydrus              | Hyi |
| 12                   | 巨蛇座(頭)(56)       | Serpens Caput  | Ser |                      |                  |                     |     |

註：+ 黃道星座；\* 臺灣地區完全看不見的星座；# 臺灣北部看不見、南部可見部分的星座。

## 恆星固有星名對照表 (一)

| 星 名                                | 略 稱                         | 星 座 | 中 國 星 名        |
|------------------------------------|-----------------------------|-----|----------------|
| Acarnar,Achenar,Achernar           | $\alpha$ Eri                | 波 江 | 水 委 一          |
| Acrab,Aakrab schemali              | $\beta$ Sco                 | 天 蠍 | 房 宿 四          |
| Acrux                              | $\alpha$ Cru                | 南十字 | 十字架二           |
| Adara,Adhara,Adard                 | $\epsilon$ CMa              | 大 犬 | 弧 矢 七          |
| Albireo                            | $\beta$ Cyg                 | 天 鵝 | 輦道增七           |
| Alchiba                            | $\alpha$ Crv                | 烏 鴉 | 右轄             |
| Alcor                              | $\zeta$ (80) UMa            | 大 熊 | 輔 (開陽伴星)       |
| Alcyone                            | $\eta$ Tau                  | 金 牛 | 昴宿六            |
| Aldebaran                          | $\alpha$ Tau                | 金 牛 | 畢 宿 五          |
| Alderamin                          | $\alpha$ Cep                | 仙 王 | 天 鉤 五          |
| Algedi                             | $\alpha^1$ & $\alpha^2$ Cap | 摩 羯 | 牛 宿 二          |
| Algeiba                            | $\gamma$ Leo                | 獅 子 | 軒轅十二           |
| Algenib                            | $\gamma$ Pen                | 飛 馬 | 壁 宿 一          |
| Algol                              | $\beta$ Per                 | 英 仙 | 大 陵 五          |
| Algorab                            | $\delta$ Crv                | 烏 鴉 | 軫 宿 三          |
| Alhena                             | $\gamma$ Gem                | 雙 子 | 井宿三            |
| Alioth                             | $\epsilon$ UMa              | 大 熊 | 玉衡 (北斗五)       |
| Alkaid                             | $\eta$ UMa                  | 大 熊 | 搖光 (北斗七)       |
| Alkalurops                         | $\mu$ Boo                   | 牧 夫 | 七公六            |
| Alkes                              | $\alpha$ Crt                | 巨 爵 | 翼宿一            |
| Almach,Almak,Almaak,Almaac,Almaack | $\gamma$ And                | 仙 女 | 天大將軍一          |
| Almair                             | $\zeta$ Cen                 | 半人馬 | 庫樓一            |
| Alnilam                            | $\epsilon$ Ori              | 獵 戶 | 參宿二            |
| Alnitah, Alnitak                   | $\zeta$ Ori                 | 獵 戶 | 參宿一            |
| Alphard                            | $\alpha$ Hya                | 長 蛇 | 星宿一            |
| Alphecca                           | $\alpha$ CrB                | 北 冕 | 貫索四            |
| Alpheratz                          | $\alpha$ And                | 仙 女 | 壁宿二            |
| Alphirk                            | $\beta$ Cep                 | 仙 王 | 上衛增一 (紫微左垣)    |
| Alrai                              | $\gamma$ Cep                | 仙 王 | 少衛增八 (紫微左垣)    |
| Alruccabah                         | $\alpha$ UMi                | 小 熊 | 勾陳一            |
| Alshain                            | $\beta$ Aql                 | 天 鷹 | 河鼓一            |
| Altair                             | $\alpha$ Aql                | 天 鷹 | 河鼓二 (牛郎星, 牽牛星) |
| Alwaid                             | $\beta$ Dra                 | 天 龍 | 天棓三            |
| Ancha                              | $\theta$ Aqr                | 寶 瓶 | 泣 二            |
| Antares                            | $\alpha$ Sco                | 天 蠍 | 心宿二            |
| Arcturus                           | $\alpha$ Boo                | 牧 夫 | 大 角            |
| Arided                             | $\alpha$ Cyg                | 天 鵝 | 天津四            |
| Arneb                              | $\alpha$ Lep                | 天 兔 | 厠 一            |
| Asellus, Austrinus                 | $\delta$ Cnc                | 巨 蟹 | 鬼宿三            |
| Asterope                           | 21 Tau                      | 金 牛 | 昴宿三            |
| Atlas                              | 27 Tau                      | 金 牛 | 昴宿七            |
| Azimech                            | $\alpha$ Vir                | 室 女 | 角宿一            |

## 恆星固有星名對照表 (二)

| 星名                     | 略稱                                  | 星座 | 中國星名         |
|------------------------|-------------------------------------|----|--------------|
| Baten Kaitos           | ξ Cet                               | 鯨魚 | 天倉四          |
| Bellatrix              | γ Ori                               | 獵戶 | 參宿五          |
| Benetnasch             | η UMa                               | 大熊 | 搖光 (北斗七)     |
| Betelgeuse             | α Ori                               | 獵戶 | 參宿四          |
| Canopus                | α Car                               | 船底 | 老人           |
| Capella                | α Aur                               | 御夫 | 五車二          |
| Caph, Chaph            | β Cas                               | 仙后 | 王良一          |
| Castor                 | α Gem                               | 雙子 | 北河二          |
| Celaeno                | 16 Tau                              | 金牛 | 昴宿增六         |
| Cor Caroli             | α CVn                               | 獵犬 | 常陳一          |
| Cor Hydrae             | α Hya                               | 長蛇 | 星宿一          |
| Cor Leonis             | α Leo                               | 獅子 | 軒轅十四         |
| Cor Scorpii            | α Sco                               | 天蠍 | 心宿二          |
| Cor serpentis          | α Ser                               | 蛇夫 | 蜀 (天市右垣七)    |
| Cursa                  | β Eri                               | 波江 | 玉井三          |
| Dabin Major            | β Cap                               | 摩羯 | 牛宿一          |
| Dabin Minor            | 16B Cap                             | 摩羯 | 牛宿增十二        |
| Demon star             | β Per                               | 英仙 | 大陵五          |
| Deneb                  | α Cyg                               | 天鵝 | 天津四          |
| Deneb Algiedi          | δ Cap                               | 摩羯 | 壘壁陣四         |
| Denebola               | β Leo                               | 獅子 | 五帝座一         |
| Diphda                 | β Cet                               | 鯨魚 | 土司空          |
| Dubhe                  | α UMa                               | 大熊 | 天樞 (北斗一)     |
| Electra                | 17 Tau                              | 金牛 | 昴宿一          |
| El Nath                | β Tau                               | 金牛 | 五車五 (與御夫座共用) |
| Enif, Eniph            | ε Peg                               | 飛馬 | 危宿三          |
| Errai                  | γ Cep                               | 仙王 | 少衛增八 (紫微左垣)  |
| Etamin                 | γ Dra                               | 天龍 | 天棊四          |
| Fom                    | ε Peg                               | 飛馬 | 危宿三          |
| Fomalhaut              | α PsA                               | 南魚 | 北落師門         |
| Gemma                  | α CrB                               | 北冕 | 貫索四          |
| Gredi, Prima & Secunda | α <sup>1</sup> & α <sup>2</sup> Cap | 摩羯 | 牛宿增六, 牛宿二    |
| Gomeisa                | β CMi                               | 小犬 | 南河二          |
| Hamal                  | α Ari                               | 白羊 | 婁宿三          |
| Homam                  | ξ Peg                               | 飛馬 | 雷電一          |
| Hyades                 | (Cluster)                           | 金牛 | 畢宿星團         |
| Iclarkrau              | δ Sco                               | 天蠍 | 房宿三          |
| Izar                   | ε Boo                               | 牧夫 | 梗河一          |
| Kaitain                | α Psc                               | 雙魚 | 外屏七          |
| Kaus Australis         | ε Sgr                               | 人馬 | 箕宿三          |
| Kaus Borealis          | λ Sgr                               | 人馬 | 斗宿二          |

## 恆星固有星名對照表 (三)

| 星名                   | 略稱                | 星座 | 中國星名      |
|----------------------|-------------------|----|-----------|
| Kaus Media           | $\delta$ Sgr      | 人馬 | 箕宿二       |
| Kelb al Rai          | $\beta$ Oph       | 蛇夫 | 宗正一       |
| Kochab,Kochah        | $\beta$ UMi       | 小熊 | 帝(北極二)    |
| Kornephoros          | $\beta$ Her       | 武仙 | 河中(天市右垣一) |
| Kursa                | $\beta$ Eri       | 波江 | 玉井三       |
| Maia                 | 20 Tau            | 金牛 | 昴宿四       |
| Markab               | $\alpha$ Peg      | 飛馬 | 室宿一       |
| Marsik               | $\chi$ Her        | 武仙 | 晉增一       |
| Mebsuta              | $\varepsilon$ Gem | 雙子 | 井宿五       |
| Megrez               | $\delta$ UMa      | 大熊 | 天權(北斗四)   |
| Mekab                | $\alpha$ Cet      | 鯨魚 | 天困一       |
| Menkalinan           | $\beta$ Aur       | 御夫 | 五車三       |
| Menkar,Menkab        | $\alpha$ Cet      | 鯨魚 | 天困一       |
| Merak                | $\beta$ UMa       | 大熊 | 天璇(北斗二)   |
| Merope               | 23 Tau            | 金牛 | 昴宿五       |
| Mesarthim            | $\gamma$ Ari      | 白羊 | 婁宿二       |
| Mintaka              | $\delta$ Ori      | 獵戶 | 參宿三       |
| Mira                 | $\circ$ Cet       | 鯨魚 | 萋藁增二      |
| Mirach               | $\beta$ And       | 仙女 | 奎宿九       |
| Mirfak               | $\alpha$ Per      | 英仙 | 天船三       |
| Mirzam               | $\beta$ CMa       | 大犬 | 軍市一       |
| Mizar                | $\beta$ And       | 仙女 | 奎宿九       |
|                      | $\zeta$ UMa       | 大熊 | 開陽(北斗六)   |
|                      | $\varepsilon$ Boo | 牧夫 | 梗河一       |
| Muphrid              | $\eta$ Boo        | 牧夫 | 右攝提一      |
| Nashira              | $\gamma$ Cap      | 摩羯 | 壘壁陣三      |
| Nushaba              | $\gamma$ Sgr      | 人馬 | 箕宿一       |
| Nath                 | $\beta$ Tau       | 金牛 | 五車五       |
| Nekkar               | $\beta$ Boo       | 牧夫 | 七公增五      |
| Okda                 | $\alpha$ Psc      | 雙魚 | 外屏七       |
| Phact,Phad,Phaet     | $\alpha$ Col      | 天鵠 | 丈人一       |
| Phecda,Phegda,Phekda | $\gamma$ UMa      | 大熊 | 天璣(北斗三)   |
| Pleiades             | (Cluster)         | 金牛 | 昴宿星團      |
| Pleione              | 28 Tau            | 金牛 | 昴宿增十二     |
| Polaris              | $\alpha$ UMi      | 小熊 | 勾陳一(北極星)  |
| Pollux               | $\beta$ Gem       | 雙子 | 北河三       |
| Prima Giedi          | $\alpha^1$ Cap    | 摩羯 | 牛宿增六      |
| Praesepe             | (Cluster)         | 巨蟹 | 積尸氣(蜂巢星團) |
| Procyon              | $\alpha$ CMi      | 小犬 | 南河三       |
| Pulcherrima          | $\varepsilon$ Boo | 牧夫 | 梗河一       |
| Qubanelgenubi        | $\alpha$ Lib      | 天秤 | 氏宿一       |
| Ras Algethi          | $\alpha$ Her      | 武仙 | 帝座        |

## 恆星固有星名對照表 (四)

| 星名              | 略稱             | 星座  | 中國星名        |
|-----------------|----------------|-----|-------------|
| Ras Alhague     | $\alpha$ Oph   | 蛇夫  | 候           |
| Rastaban        | $\gamma$ Dra   | 天龍  | 天棊四         |
| Regulus         | $\alpha$ Leo   | 獅子  | 軒轅十四        |
| Rigel           | $\beta$ Ori    | 獵戶  | 參宿七         |
| Rigil Kent      | $\alpha$ Cen   | 半人馬 | 南門二         |
| Rotanev         | $\beta$ Del    | 海豚  | 瓠瓜四         |
| Ruchbah         | $\delta$ Cas   | 仙后  | 閣道三         |
| Sadachbia       | $\gamma$ Aqr   | 寶瓶  | 墳墓二         |
| Sadalmelik      | $\alpha$ Aqr   | 寶瓶  | 危宿一         |
| Sadalsud        | $\beta$ Aqr    | 寶瓶  | 虛宿一         |
| Scheat          | $\beta$ Peg    | 飛馬  | 室宿二         |
| Schedar         | $\alpha$ Cas   | 仙后  | 王良四         |
| Secunda Giedi   | $\alpha^2$ Cap | 摩羯  | 牛宿二         |
| Sheliak         | $\beta$ Lyr    | 天琴  | 漸臺二         |
| Sheratan        | $\beta$ Ari    | 白羊  | 婁宿一         |
| Sirius          | $\alpha$ CMa   | 大犬  | 天狼          |
| Sirrah          | $\alpha$ And   | 仙女  | 壁宿二         |
| Situla          | $\kappa$ Aqr   | 寶瓶  | 虛梁三         |
| Skat            | $\delta$ Aqr   | 寶瓶  | 羽林軍二十六      |
| Spica           | $\alpha$ Vir   | 室女  | 角宿一         |
| Sulaphat        | $\gamma$ Lyr   | 天琴  | 漸臺三         |
| Svalocin        | $\alpha$ Del   | 海豚  | 瓠瓜一         |
| Talitha         | $\iota$ UMa    | 大熊  | 上臺一         |
| Tarazed         | $\gamma$ Aql   | 天鷹  | 河鼓三         |
| Taygeta         | 19 Tau         | 金牛  | 昴宿二         |
| Thuban          | $\alpha$ Dra   | 天龍  | 右樞 (紫微右垣一)  |
| Unukalhay       | $\alpha$ Ser   | 巨蛇  | 蜀 (天市右垣七)   |
| Vega            | $\alpha$ Lyr   | 天琴  | 織女 (織女一)    |
| Vindemiatrix    | $\epsilon$ Vir | 室女  | 東次將 (太微左垣四) |
| Wasat           | $\delta$ Gem   | 雙子  | 天二          |
| Yed             | $\delta$ Oph   | 蛇夫  | 梁 (天市右垣九)   |
| Zaurak          | $\gamma^1$ Eri | 波江  | 天苑一         |
| Zavijava        | $\beta$ Vir    | 室女  | 右執法         |
| Zawijah         | $\beta$ Vir    | 室女  | 右執法 (太微右垣一) |
| Zozca, Zosma    | $\delta$ Leo   | 獅子  | 西上相 (太微右垣五) |
| Zuben el Genubi | $\alpha$ Lib   | 天秤  | 氏宿一         |
| “el Harkrabi    | $\gamma$ Lib   | 天秤  | 氏宿三         |
| “el Chamali     | $\beta$ Lib    | 天秤  | 氏宿四         |
| Zubenesch       | $\beta$ Lib    | 天秤  | 氏宿四         |

## 主要恆星表 (一)

| 星名                      | 2000.0 |        |              | 實視<br>星等<br>(等) | 色 旨 數      |            | 光 譜 型            | 自 行                          |                              | 距 離<br>(光年) | 視 線<br>速 度<br>(km/s) |
|-------------------------|--------|--------|--------------|-----------------|------------|------------|------------------|------------------------------|------------------------------|-------------|----------------------|
|                         | 赤<br>h | 經<br>m | 赤 緯<br>° ' " |                 | B-V<br>(等) | U-B<br>(等) |                  | 1000 $\mu$ $\alpha$<br>( " ) | 1000 $\mu$ $\delta$<br>( " ) |             |                      |
| $\alpha$ And            | 00     | 08.4   | +29 05       | 2.1             | -0.11      | -0.46      | B8IVp            | + 136                        | - 163                        | 97          | -12B                 |
| $\beta$ Cas             | 00     | 09.2   | +59 09       | 2.3             | +0.34      | +0.11      | F2III-IV         | + 523                        | - 180                        | 54          | +11B                 |
| $\gamma$ Peg            | 00     | 13.2   | +15 11       | 2.8             | -0.23      | -0.87      | B2IV             | + 5                          | - 8                          | 330         | + 4B                 |
| $\beta$ Hyi             | 00     | 25.8   | -77 15       | 2.8             | +0.62      | +0.11      | G2IV             | +2220                        | + 324                        | 24          | +23                  |
| $\alpha$ Phe            | 00     | 26.3   | -42 18       | 2.4             | +1.09      | +0.88      | K0III            | + 233                        | - 354                        | 77          | +75B                 |
| $\alpha$ Cas            | 00     | 40.5   | +56 32       | 2.2             | +1.17      | +1.13      | K0IIIa           | + 50                         | - 32                         | 230         | - 4V?                |
| $\beta$ Cet             | 00     | 43.6   | -17 59       | 2.0             | +1.02      | +0.87      | K0III            | + 233                        | + 33                         | 96          | +13                  |
| $\gamma$ Cas            | 00     | 56.7   | +60 43       | 1.6v            | -0.15      | -1.08      | B0IVe            | + 26                         | - 4                          | 800         | - 7B                 |
| $\beta$ And             | 01     | 09.7   | +35 37       | 2.1             | +1.58      | +1.96      | M0IIIa           | + 176                        | - 112                        | 200         | + 3V                 |
| $\delta$ Cas            | 01     | 25.8   | +60 14       | 2.7             | +0.13      | +0.12      | A5III-IVv        | + 297                        | - 49                         | 99          | + 7B                 |
| $\alpha$ Eri $\epsilon$ | 01     | 37.7   | -57 14       | 0.5             | -0.16      | -0.66      | B3Vpe            | + 88                         | - 40                         | 140         | +16V                 |
| $\beta$ Ari             | 01     | 54.6   | +20 48       | 2.6             | +0.13      | +0.10      | A5V              | + 96                         | - 109                        | 60          | - 2B                 |
| $\alpha$ Hyi            | 01     | 58.8   | -61 34       | 2.9             | +0.28      | +0.14      | F0V              | + 263                        | + 27                         | 71          | + 1V                 |
| $\gamma$ And            | 02     | 03.9   | +42 20       | 2.2d            | +1.17      | +0.87      | K3- II b+B8V+A0V | + 43                         | - 51                         | 350         | -12B                 |
| $\alpha$ Ari            | 02     | 07.2   | +23 28       | 2.0             | +1.15      | +1.12      | K2IIIab          | + 191                        | - 146                        | 66          | -14B                 |
| $\beta$ Tri             | 02     | 09.5   | +34 59       | 3.0             | +0.14      | +0.10      | A5III            | + 149                        | - 39                         | 120         | +10B                 |
| $\circ$ Cet&            | 02     | 19.3   | -02 59       | 2.0v            | +1.42      | +1.09      | M7IIIe           | + 10                         | - 239                        | 500:        | +64V                 |
| $\alpha$ UMi●           | 02     | 31.8   | +89 16       | 2.0             | +0.60      | +0.38      | F7: I b- II v    | + 44                         | - 12                         | 430         | -17B                 |
| $\alpha$ Cet            | 03     | 02.3   | +04 05       | 2.5             | +1.64      | +1.94      | M1.5IIIa         | - 12                         | - 79                         | 220         | -26                  |
| $\gamma$ Per            | 03     | 04.8   | +53 30       | 2.9             | +0.70      | +0.45      | G8III+A2V        | + 1                          | - 4                          | 260         | + 3B                 |
| $\beta$ Per○            | 03     | 08.2   | +40 57       | 2.1v            | -0.05      | -0.37      | B8V+G            | + 2                          | - 1                          | 93          | + 4B                 |
| $\alpha$ Per            | 03     | 24.3   | +49 52       | 1.8             | +0.48      | +0.37      | F5 I b           | + 24                         | - 26                         | 500         | - 2V                 |
| $\delta$ Per            | 03     | 42.9   | +47 47       | 3.0             | -0.13      | -0.51      | B5III            | + 24                         | - 42                         | 500         | + 4B                 |
| $\eta$ Tau              | 03     | 47.5   | +24 06       | 2.9d            | -0.09      | -0.34      | B7III e          | + 19                         | - 43                         | 250         | +10V?                |
| $\zeta$ Per             | 03     | 54.1   | +31 53       | 2.8             | +0.12      | -0.77      | B1 I b           | + 4                          | - 9                          | 1200        | +20B                 |
| $\epsilon$ Per          | 03     | 57.9   | +40 01       | 2.9             | -0.18      | -0.99      | B0.5V+A2V        | + 13                         | - 24                         | 500         | + 1B                 |
| $\gamma$ Eri            | 03     | 58.0   | -13 31       | 2.9             | +1.59      | +1.96      | M0.5III          | + 61                         | - 111                        | 220         | +62                  |
| $\alpha$ Tau■           | 04     | 35.9   | +16 31       | 0.8             | +1.54      | +1.90      | K5III            | + 63                         | - 189                        | 65          | +54B                 |
| $\iota$ Aur             | 04     | 57.0   | +33 10       | 2.7             | +1.53      | +1.78      | K3 II            | + 4                          | - 19                         | 250         | +18                  |
| $\epsilon$ Aur          | 05     | 02.0   | +43 49       | 2.9v            | +0.54      | +0.33      | F0 I ae          | 0                            | - 2                          | 1900        | - 3B                 |
| $\beta$ Eri             | 05     | 07.8   | -05 05       | 2.8             | +0.13      | +0.10      | A3III            | - 83                         | - 75                         | 89          | - 9                  |
| $\beta$ Ori□            | 05     | 14.5   | -08 12       | 0.1             | -0.03      | -0.66      | B8 I ae:         | +2                           | - 1                          | 700         | +21B                 |
| $\alpha$ Aur□           | 05     | 16.7   | +46 00       | 0.1d            | +0.80      | +0.44      | G5IIIe+G0III     | + 76                         | - 427                        | 42          | +30B                 |
| $\gamma$ Ori            | 05     | 25.1   | +06 21       | 1.6             | -0.22      | -0.87      | B2III            | - 9                          | - 13                         | 240         | +18B?                |
| $\beta$ Tau             | 05     | 26.3   | +28 36       | 1.7             | -0.13      | -0.49      | B7III            | + 23                         | - 174                        | 130         | + 9V                 |
| $\beta$ Lep             | 05     | 28.2   | -20 46       | 2.8             | +0.82      | +0.46      | G5 II            | - 5                          | - 86                         | 160         | -14                  |
| $\delta$ Ori            | 05     | 32.0   | -00 18       | 2.2             | -0.22      | -1.05      | B0III+09V        | + 2                          | + 1                          | 1500        | +16B                 |
| $\alpha$ Lep            | 05     | 32.7   | -17 49       | 2.6             | +0.21      | +0.23      | F0 I b           | + 3                          | + 2                          | 900         | +24                  |
| $\iota$ Ori             | 05     | 35.4   | -05 55       | 2.8             | -0.24      | -1.08      | O9III            | + 2                          | - 1                          | 1500        | +22B                 |
| $\epsilon$ Ori          | 05     | 36.2   | -01 12       | 1.7             | -0.19      | -1.04      | B0 I ae          | + 1                          | - 1                          | 1300        | +26B                 |
| $\zeta$ Tau             | 05     | 37.6   | +21 09       | 2.9dv           | -0.19      | -0.67      | B4IIIpe          | + 2                          | - 18                         | 500         | +20B                 |
| $\alpha$ Col            | 05     | 39.6   | -34 04       | 2.6             | -0.12      | -0.46      | B7IVe            | 0                            | - 24                         | 270         | +35V?                |
| $\zeta$ Ori             | 05     | 40.8   | -01 57       | 1.8d            | -0.21      | -1.07      | O9.5 I be+B2III  | + 4                          | + 3                          | 1300        | +18B                 |
| $\kappa$ Ori            | 05     | 47.8   | -09 40       | 2.1             | -0.17      | -1.03      | B0.5 I av        | + 2                          | - 1                          | 1500        | +21V?                |
| $\alpha$ Ori□           | 05     | 55.2   | +07 24       | 0.4v            | +1.85      | +2.06      | M1-2 I a- I ab   | + 27                         | + 11                         | 500         | +21B                 |

$\epsilon$ Achernar 水委一 & Mira 蒭藁增二 ●Polaris 北極星 ○Algol 大陵五 ■Aldebaran 畢宿五 □Rigel 參宿七

□Capella 五車二 □Betelgeuse 參宿四

## 主要恆星表 (二)

| 星名                     | 2000.0  |            | 實視<br>星等<br>(等) | 色 旨 數      |            | 光 譜 型                  | 自 行                      |                            | 距 離<br>(光年) | 視 線<br>速 度<br>(km/s) |
|------------------------|---------|------------|-----------------|------------|------------|------------------------|--------------------------|----------------------------|-------------|----------------------|
|                        | 赤<br>h  | 經 緯<br>m ° |                 | B-V<br>(等) | U-B<br>(等) |                        | 10 μ <sub>s</sub><br>(") | 1000 μ <sub>s</sub><br>(") |             |                      |
| β Aur                  | 05 59.5 | +44 57     | 1.9             | +0.03      | +0.05      | A2IV                   | - 56                     | -1                         | 82          | -18B                 |
| θ Aur                  | 05 59.7 | +37 13     | 2.6             | -0.08      | -0.18      | A0p                    | + 42                     | - 74                       | 170         | +30B                 |
| ζ CMa                  | 06 20.3 | -30 04     | 3.0             | -0.19      | -0.72      | B2.5V                  | + 8                      | + 4                        | 340         | +32B                 |
| β CMa                  | 06 22.7 | -17 57     | 2.0             | -0.23      | -0.98      | B1 II-III              | - 3                      | 0                          | 700         | +34B                 |
| μ Gem                  | 06 23.0 | +22 31     | 2.9             | +1.6       | +1.85      | M3IIIab                | + 57                     | - 109                      | 230         | +55                  |
| α Car <sup>ε</sup>     | 06 24.0 | -52 42     | -0.7            | +0.15      | +0.10      | F0 II                  | + 20                     | + 24                       | 310         | +21                  |
| γ Gem                  | 06 37.7 | +16 24     | 1.9             | +0.00      | +0.04      | A0IV                   | - 2                      | - 67                       | 100         | -13B                 |
| ε Gem                  | 06 43.9 | +25 08     | 3.0             | +1.40      | +1.46      | G8 I b                 | - 6                      | - 13                       | 700         | +10B                 |
| α CMa <sup>&amp;</sup> | 06 45.1 | -16 43     | -1.5            | +0.00      | -0.05      | A1 V <sub>m</sub>      | - 546                    | -1223                      | 8.6         | - 8B                 |
| τ Pup                  | 06 49.9 | -50 37     | 2.9             | +1.20      | +1.21      | K1III                  | + 34                     | - 66                       | 180         | +36B                 |
| ε CMa                  | 06 58.6 | -28 58     | 1.5             | -0.21      | -0.93      | B2 II                  | + 3                      | + 2                        | 430         | +27                  |
| ο CMa                  | 07 03.0 | -23 50     | 3.0             | -0.08      | -0.80      | B3 I ab                | - 2                      | + 4                        | 2200        | +48B                 |
| δ CMa                  | 07 08.4 | -26 24     | 1.8             | +0.68      | +0.54      | F8 I a                 | - 3                      | + 3                        | 2800        | +34B                 |
| π Pup                  | 07 17.1 | -37 06     | 2.7             | +1.62      | +1.24      | K3 I b                 | - 11                     | + 7                        | 800         | +16                  |
| η CMa                  | 07 24.1 | -29 18     | 2.4             | -0.08      | -0.72      | B5 I a                 | - 4                      | + 7                        | 2400        | +41V                 |
| β CMi                  | 07 27.1 | +08 17     | 2.9             | -0.09      | -0.28      | B8 V <sub>e</sub>      | - 50                     | - 38                       | 170         | +22B                 |
| α Gem●                 | 07 34.6 | +31 53     | 1.6d            | +0.04      | +0.02      | A1 V+A2 V <sub>m</sub> | - 206                    | -148                       | 52          | - 1B                 |
| α CMi○                 | 07 39.3 | +05 14     | 0.4             | +0.42      | +0.02      | F5IV-V                 | - 717                    | -1035                      | 11          | - 3B                 |
| β Gem■                 | 07 45.3 | +28 02     | 1.1             | +1.00      | +0.85      | K0IIIb                 | - 626                    | - 46                       | 34          | + 3V                 |
| ζ Pup                  | 08 03.6 | -40 00     | 2.3             | -0.26      | -1.11      | O5 I af                | - 31                     | + 17                       | 1500        | -24V?                |
| ρ Pup                  | 08 07.5 | -24 18     | 2.8             | +0.43      | +0.19      | F6 II <sub>p</sub>     | - 83                     | + 46                       | 63          | +46B                 |
| γ Vel                  | 08 09.5 | -47 21     | 1.7dv           | -0.22      | -0.99      | WC8+07.5e+B1IV         | - 6                      | + 10                       | 1000:       | +35B                 |
| ε Car                  | 08 22.5 | -59 31     | 1.9             | +1.28      | +0.19      | K3III+B2: V            | - 25                     | + 23                       | 630         | + 2                  |
| δ Vel                  | 08 44.7 | -54 43     | 2.0             | +0.04      | +0.07      | A1 V                   | + 29                     | - 104                      | 80          | + 2V?                |
| λ Vel                  | 09 08.0 | -43 26     | 2.2             | +1.66      | +1.81      | K4 I b-II              | - 23                     | + 14                       | 570         | +18                  |
| β Car                  | 09 13.2 | -69 43     | 1.7             | +0.00      | +0.03      | A2IV                   | - 158                    | + 109                      | 110         | - 5V?                |
| ι Car                  | 09 17.1 | -59 17     | 2.3             | +0.18      | +0.16      | A8 I b                 | - 19                     | + 13                       | 690         | +13                  |
| κ Vel                  | 09 22.1 | -55 01     | 2.5             | -0.18      | -0.75      | B2IV-V                 | - 11                     | + 11                       | 350         | +22B                 |
| α Hya                  | 09 27.6 | -08 40     | 2.0             | +1.44      | +1.72      | K3 II-III              | - 14                     | + 33                       | 180         | - 4V?                |
| ε Leo                  | 09 45.8 | +23 46     | 3.0             | +0.80      | +0.47      | G1 II                  | - 46                     | - 10                       | 250         | + 4V?                |
| ν Car                  | 09 47.1 | -65 04     | 3.0             | +0.27      | +0.13      | A8 I b                 | - 12                     | + 5                        | 1000        | +14                  |
| α Leo□                 | 10 08.4 | +11 58     | 1.3             | -0.11      | -0.36      | B7 V                   | - 249                    | + 5                        | 77          | + 6B                 |
| γ Leo                  | 10 20.0 | +19 51     | 1.9d            | +1.15      | +1.00      | K1-IIIb+G7III          | + 311                    | - 153                      | 130         | -37B                 |
| θ Car                  | 10 43.0 | -64 24     | 2.8             | -0.22      | -1.01      | B0 V <sub>p</sub>      | - 19                     | + 12                       | 440         | +24B                 |
| μ Vel                  | 10 46.8 | -49 25     | 2.7             | +0.90      | +0.57      | G5III+G2 V             | + 63                     | - 54                       | 120         | + 6B                 |
| β UMa                  | 11 01.8 | +56 23     | 2.4             | -0.02      | +0.01      | A1 V                   | + 82                     | + 34                       | 79          | -12B                 |
| α UMa                  | 11 03.7 | +61 45     | 1.8d            | +1.07      | +0.92      | K0IIIa+F0 V            | - 136                    | - 35                       | 120         | - 9B                 |
| ψ UMa                  | 11 09.7 | +44 30     | 3.0             | +1.14      | +1.11      | K1III                  | - 62                     | - 27                       | 150         | - 4                  |
| δ Leo                  | 11 14.1 | +20 31     | 2.6             | +0.12      | +0.12      | A4 V                   | + 143                    | - 130                      | 58          | -20V                 |
| β Leo                  | 11 49.1 | +14 34     | 2.1             | +0.09      | +0.07      | A3 V                   | - 499                    | - 114                      | 36          | + 0V                 |
| γ UMa                  | 11 53.8 | +53 42     | 2.4             | +0.00      | +0.02      | A0 V <sub>e</sub>      | + 108                    | + 11                       | 84          | -13B                 |
| δ Cen                  | 12 08.4 | -50 43     | 2.6v            | -0.12      | -0.90      | B2IV <sub>ne</sub>     | - 48                     | - 6                        | 390         | +11V                 |
| ε Crv                  | 12 10.1 | -22 37     | 3.0             | +1.33      | +1.47      | K2.5III                | - 72                     | + 11                       | 300         | + 5                  |
| δ Cru                  | 12 15.1 | -58 45     | 2.8             | -0.23      | -0.91      | B2IV                   | - 37                     | - 11                       | 360         | +22V?                |
| γ Crv                  | 12 15.8 | -17 33     | 2.6             | -0.11      | -0.34      | B8III <sub>p</sub>     | - 160                    | + 22                       | 160         | - 4B                 |

ε<sup>r</sup>Canopus 老人星 & Sirius 天狼 ● Castor 北河二 ○ Procyon 南河三 ■ Pollux 北河三 □ Regulus 軒轅十四



## 主要恆星表 (三)

| 星名                      | 2000.0  |        |            | 實視<br>星等<br>(等) | 色 旨 數      |                 | 光 譜 型 | 自 行                        |                            | 距 離<br>(光年) | 視 線<br>速 度<br>(km/s) |
|-------------------------|---------|--------|------------|-----------------|------------|-----------------|-------|----------------------------|----------------------------|-------------|----------------------|
|                         | 赤<br>h  | 經<br>m | 赤 緯<br>° ′ |                 | B-V<br>(等) | U-B<br>(等)      |       | 1000 $\mu_{\alpha}$<br>(") | 1000 $\mu_{\delta}$<br>(") |             |                      |
| $\alpha$ Cru            | 12 26.6 | -63 06 | 0.8d       | -0.26           | -0.96      | B0.5IV+B1V      | - 35  | - 15                       | 320                        | -11B        |                      |
| $\delta$ Crv            | 12 29.9 | -16 31 | 2.9        | -0.05           | -0.09      | B9.5V           | - 210 | - 139                      | 88                         | + 9V        |                      |
| $\gamma$ Cru            | 12 31.2 | -57 07 | 1.6        | +1.59           | +1.78      | M3.5III         | + 28  | - 264                      | 88                         | +21         |                      |
| $\beta$ Crv             | 12 34.4 | -23 24 | 2.7        | +0.89           | +0.60      | G5II            | + 1   | - 56                       | 140                        | - 8         |                      |
| $\alpha$ Mus            | 12 37.2 | -69 08 | 2.7        | -0.20           | -0.83      | B2IV-V          | - 40  | - 12                       | 300                        | +13V        |                      |
| $\gamma$ Cen            | 12 41.5 | -48 58 | 2.2d       | -0.01           | -0.01      | A1IV            | - 187 | - 1                        | 130                        | - 6B        |                      |
| $\gamma$ Vir            | 12 41.7 | -01 27 | 2.8d       | +0.36           | -0.03      | F0V+F0V         | - 617 | + 61                       | 39                         | -20B        |                      |
| $\beta$ Cru             | 12 47.7 | -59 41 | 1.3        | -0.23           | -1.00      | B0.5III         | - 48  | - 13                       | 350                        | +16B        |                      |
| $\epsilon$ UMa          | 12 54.0 | +55 58 | 1.8        | -0.02           | +0.02      | A0p             | + 112 | - 9                        | 81                         | - 9B?       |                      |
| $\alpha$ CVn            | 12 56.0 | +38 19 | 2.8d       | -0.09           | -0.31      | A0p+F0V         | - 233 | + 55                       | 110                        | - 3V        |                      |
| $\epsilon$ Vir          | 13 02.2 | +10 58 | 2.8        | +0.94           | +0.73      | G8IIIab         | - 275 | + 20                       | 100                        | -14         |                      |
| $\gamma$ Hya            | 13 18.9 | -23 10 | 3.0        | +0.92           | +0.66      | G8IIIa          | + 68  | - 41                       | 130                        | - 5V?       |                      |
| $\iota$ Cen             | 13 20.6 | -36 43 | 2.8        | +0.04           | +0.03      | A2V             | - 341 | - 88                       | 59                         | + 0         |                      |
| $\zeta$ UMa             | 13 23.9 | +54 56 | 2.3d       | +0.04           | +0.04      | A1Vp+A1m        | + 121 | - 22                       | 78                         | - 6B        |                      |
| $\alpha$ Vir $\epsilon$ | 13 25.2 | -11 10 | 1.0        | -0.23           | -0.93      | B1III-IV+B2V    | - 43  | - 32                       | 260                        | + 1B        |                      |
| $\epsilon$ Cen          | 13 39.9 | -53 28 | 2.3        | -0.22           | -0.92      | B1III           | - 15  | - 13                       | 370                        | + 3         |                      |
| $\eta$ UMa              | 13 47.5 | +49 19 | 1.9        | -0.19           | -0.67      | B3V             | - 121 | - 16                       | 100                        | -11B?       |                      |
| $\mu$ Cen               | 13 49.6 | -42 28 | 2.9v       | -0.17           | -0.72      | B2IV-Ve         | - 24  | - 19                       | 450                        | + 9B        |                      |
| $\eta$ Boo              | 13 54.7 | +18 24 | 2.7        | +0.58           | +0.20      | G0IV            | - 61  | - 358                      | 37                         | + 0B        |                      |
| $\zeta$ Cen             | 13 55.5 | -47 17 | 2.6        | -0.22           | -0.92      | B2.5IV          | - 57  | - 45                       | 380                        | + 7B        |                      |
| $\beta$ Cen             | 14 03.8 | -60 22 | 0.6        | -0.23           | -0.98      | B1III           | - 34  | - 25                       | 530                        | + 6B        |                      |
| $\theta$ Cen            | 14 06.7 | -36 22 | 2.1        | +1.01           | +0.87      | K0IIIb          | - 519 | - 518                      | 61                         | + 1         |                      |
| $\alpha$ Boo $\&$       | 14 15.7 | +19 11 | -0.0       | +1.23           | +1.27      | K1IIIb          | -1093 | -1999                      | 37                         | - 5V?       |                      |
| $\gamma$ Boo            | 14 32.1 | +38 18 | 3.0d       | +0.19           | +0.12      | A7III           | - 116 | + 152                      | 85                         | -37V        |                      |
| $\eta$ Cen              | 14 35.5 | -42 09 | 2.3        | -0.19           | -0.83      | B1.5Vne         | - 35  | - 32                       | 310                        | + 0B        |                      |
| $\alpha$ Cen            | 14 39.6 | -60 50 | -0.3d      | +0.75           | +0.38      | G2V+K1V         | -3678 | +482                       | 4.4                        | -25B        |                      |
| $\alpha$ Lup            | 14 41.9 | -47 23 | 2.3        | -0.20           | -0.89      | B1.5III         | - 21  | - 24                       | 600                        | + 5B        |                      |
| $\epsilon$ Boo          | 14 45.0 | +27 04 | 2.4d       | +0.97           | +0.73      | K0II-III+A2V    | - 51  | + 20                       | 210                        | -17V        |                      |
| $\beta$ UMi             | 14 50.7 | +74 09 | 2.1        | +1.47           | +1.78      | K4III           | - 32  | + 12                       | 130                        | +17V        |                      |
| $\alpha_2$ Lib          | 14 50.9 | -16 03 | 2.8d       | +0.15           | +0.09      | A3IV            | - 106 | - 69                       | 77                         | -10B        |                      |
| $\beta$ Lup             | 14 58.5 | -43 08 | 2.7        | -0.22           | -0.87      | B2III           | - 34  | - 38                       | 600                        | + 0B        |                      |
| $\beta$ Lib             | 15 17.0 | -09 23 | 2.6        | -0.11           | -0.36      | B8V             | - 96  | - 21                       | 160                        | -35B        |                      |
| $\gamma$ TrA            | 15 18.9 | -68 41 | 2.9        | +0.00           | -0.02      | A1V             | - 66  | - 32                       | 180                        | - 3V        |                      |
| $\alpha$ CrB            | 15 34.7 | +26 43 | 2.2        | -0.02           | -0.02      | A0V             | + 120 | - 89                       | 75                         | + 2B        |                      |
| $\gamma$ Lup            | 15 35.1 | -41 10 | 2.8d       | -0.20           | -0.82      | B2IV            | - 16  | - 26                       | 600                        | + 2V        |                      |
| $\alpha$ Ser            | 15 44.3 | +06 26 | 2.7        | +1.17           | +1.24      | K2IIIb          | + 135 | + 44                       | 73                         | + 3V?       |                      |
| $\beta$ TrA             | 15 55.1 | -63 26 | 2.8        | +0.29           | +0.05      | F2III           | - 188 | - 402                      | 40                         | + 0         |                      |
| $\pi$ Sco               | 15 58.8 | -26 07 | 2.9d       | -0.19           | -0.91      | B1V+B2V         | - 12  | - 26                       | 600                        | - 3B        |                      |
| $\delta$ Sco            | 16 00.3 | -22 37 | 2.3d       | -0.12           | -0.91      | B0.3IV          | - 9   | - 37                       | 600                        | - 7B        |                      |
| $\beta$ Sco             | 16 05.4 | -19 48 | 2.5d       | -0.06           | -0.85      | B1V+B2V         | - 7   | - 25                       | 600                        | - 1B        |                      |
| $\delta$ Oph            | 16 14.3 | -03 42 | 2.7        | +1.58           | +1.96      | M0.5III         | - 46  | - 143                      | 170                        | -20V        |                      |
| $\sigma$ Sco            | 16 21.2 | -25 36 | 2.9d       | +0.13           | -0.70      | B2III+09.5V     | - 10  | - 18                       | 500                        | + 3B        |                      |
| $\eta$ Dra              | 16 24.0 | +61 31 | 2.7        | +0.91           | +0.70      | G8IIIab         | - 17  | + 57                       | 88                         | -14B?       |                      |
| $\alpha$ Sco●           | 16 29.4 | -26 26 | 1.0v       | +1.83           | +1.34      | M1.5Iab-Ib+B4Ve | - 10  | - 23                       | 500                        | - 3B        |                      |
| $\beta$ Her             | 16 30.2 | +21 29 | 2.8        | +0.94           | +0.69      | G7IIIa          | - 98  | - 14                       | 150                        | -26B        |                      |
| $\tau$ Sco              | 16 35.9 | -28 13 | 2.8        | -0.25           | -1.03      | B0V             | - 9   | - 23                       | 600                        | + 2V        |                      |

$\epsilon$ Spica 角宿一  $\&$ Arcturus 大角 ●Antares 心宿二

## 主要恆星表 (四)

| 星名                  | 2000.0  |            | 實視<br>星等<br>(等) | 色 旨 數      |            | 光 譜 型              | 自 行                      |                            | 距 離<br>(光年) | 視 線<br>速 度<br>(km/s) |
|---------------------|---------|------------|-----------------|------------|------------|--------------------|--------------------------|----------------------------|-------------|----------------------|
|                     | 赤<br>h  | 經 緯<br>m ° |                 | B-V<br>(等) | U-B<br>(等) |                    | 10 μ <sub>s</sub><br>(") | 1000 μ <sub>s</sub><br>(") |             |                      |
| ζ Oph               | 16 37.2 | -10 34     | 2.6             | +0.02      | -0.86      | O9.5Vn             | + 13                     | + 25                       | 460         | -15V                 |
| ζ Her               | 16 41.3 | +31 36     | 2.8d            | +0.65      | +0.21      | G0IV               | - 463                    | + 345                      | 35          | -70B                 |
| α TrA               | 16 48.7 | -69 02     | 1.9             | +1.44      | +1.56      | K2 II b-IIIa       | + 18                     | - 33                       | 410         | - 3                  |
| ε Sco               | 16 50.2 | -34 18     | 2.3             | +1.15      | +1.27      | K2.5III            | - 612                    | - 256                      | 65          | - 3                  |
| η Oph               | 17 10.4 | -15 43     | 2.4d            | +0.06      | +0.09      | A2V                | + 41                     | + 98                       | 84          | - 1B                 |
| β Ara               | 17 25.3 | -55 32     | 2.8             | +1.46      | +1.56      | K3 I b-II a        | - 8                      | - 25                       | 600         | + 0                  |
| β Dra               | 17 30.4 | +52 18     | 2.8             | +0.98      | +0.64      | G2 I b-II a        | - 16                     | + 12                       | 360         | -20V                 |
| ν Sco               | 17 30.8 | -37 18     | 2.7             | -0.22      | -0.82      | B2IV               | - 4                      | - 29                       | 520         | + 8B                 |
| α Ara               | 17 31.8 | -49 53     | 2.9             | -0.17      | -0.69      | B2Vne              | - 31                     | - 67                       | 240         | + 0B                 |
| λ Sco               | 17 33.6 | -37 06     | 1.6             | -0.22      | -0.89      | B2IV+B             | - 9                      | - 30                       | 300         | - 3B                 |
| α Oph               | 17 34.9 | +12 34     | 2.1             | +0.15      | +0.10      | A5III              | + 110                    | - 223                      | 47          | +13B?                |
| θ Sco               | 17 37.3 | -43 00     | 1.9             | +0.40      | +0.22      | F1 II              | + 6                      | - 1                        | 270         | + 1                  |
| κ Sco               | 17 42.5 | -39 02     | 2.4             | -0.22      | -0.89      | B1.5III            | - 6                      | - 26                       | 600         | -14B                 |
| β Oph               | 17 43.5 | +04 34     | 2.8             | +1.16      | +1.24      | K2III              | - 41                     | + 159                      | 82          | -12V                 |
| ι <sub>1</sub> Sco  | 17 47.6 | -40 08     | 3.0             | +0.51      | +0.27      | F2 I ae            | 0                        | - 6                        | 5000:       | -28B                 |
| γ Dra               | 17 56.6 | +51 29     | 2.2             | +1.52      | +1.87      | K5III              | - 9                      | - 23                       | 150         | -28                  |
| γ <sub>2</sub> Sgr  | 18 05.8 | -30 25     | 3.0             | +1.00      | +0.77      | K0III              | - 56                     | - 182                      | 96          | +22B                 |
| δ Sgr               | 18 21.0 | -29 50     | 2.7             | +1.38      | +1.55      | K3IIIa             | + 30                     | - 26                       | 300         | -20                  |
| ε Sgr               | 18 24.2 | -34 23     | 1.8             | -0.03      | -0.13      | B9.5III            | - 40                     | - 124                      | 140         | -15                  |
| λ Sgr               | 18 28.0 | -25 25     | 2.8             | +1.04      | +0.89      | K1IIIb             | - 45                     | - 186                      | 77          | -43                  |
| α Lyra <sup>ε</sup> | 18 36.9 | +38 47     | 0.0             | -0.00      | -0.01      | A0V a              | + 201                    | + 287                      | 25          | -14V                 |
| σ Sgr               | 18 55.3 | -26 18     | 2.0             | -0.22      | -0.75      | B2.5V              | + 14                     | - 53                       | 220         | -11V                 |
| ζ Sgr               | 19 02.6 | -29 53     | 2.6d            | +0.08      | +0.06      | A2III+A4IV         | - 14                     | + 4                        | 89          | +22B                 |
| ζ Aql               | 19 05.4 | +13 52     | 3.0             | +0.01      | -0.01      | A0V n              | - 7                      | - 95                       | 83          | -25B                 |
| π Sgr               | 19 09.8 | -21 01     | 2.9d            | +0.35      | +0.22      | F2 II              | - 1                      | - 37                       | 440         | -10                  |
| β Cyg               | 19 30.7 | +27 58     | 2.9d            | +0.86      | +0.22      | K3 II +B0.5V+B8V e | - 7                      | - 6                        | 380         | -24V                 |
| δ Cyg               | 19 45.0 | +45 08     | 2.9d            | -0.03      | -0.10      | B9.5IV+F1 V        | + 43                     | + 48                       | 170         | -20B                 |
| γ Aql               | 19 46.3 | +10 37     | 2.7             | +1.52      | +1.68      | K3 II              | + 16                     | - 3                        | 270         | - 2V                 |
| α Aql&              | 19 50.8 | +08 52     | 0.8             | +0.22      | +0.08      | A7V                | + 537                    | + 386                      | 17          | -26                  |
| γ Cyg               | 20 22.2 | +40 15     | 2.2             | +0.68      | +0.53      | F8 I b             | + 2                      | - 1                        | 600         | - 8                  |
| α Pav               | 20 25.6 | -56 44     | 1.9             | -0.20      | -0.71      | B2IV               | + 8                      | - 86                       | 180         | + 2B                 |
| α Cyg●              | 20 41.4 | +45 17     | 1.3             | +0.09      | -0.24      | A2 I ae            | + 2                      | + 2                        | 1800        | - 5V                 |
| ε Cyg               | 20 46.2 | +33 58     | 2.5             | +1.03      | +0.87      | K0III              | + 356                    | + 330                      | 72          | -11B                 |
| α Cep               | 21 18.6 | +62 35     | 2.4             | +0.22      | +0.11      | A7V                | + 150                    | + 48                       | 49          | -10V                 |
| β Aqr               | 21 31.6 | -05 34     | 2.9             | +0.83      | +0.56      | G0 I b             | + 23                     | - 7                        | 800         | + 7                  |
| ε Peg               | 21 44.2 | +09 53     | 2.4v            | +1.53      | +1.70      | K2 I b             | + 30                     | + 1                        | 500         | + 5V                 |
| δ Cap               | 21 47.0 | -16 08     | 2.8dv           | +0.29      | +0.09      | Amv                | + 263                    | - 296                      | 39          | - 6B                 |
| γ Gru               | 21 53.9 | -37 22     | 3.0             | -0.12      | -0.37      | B8III              | + 96                     | - 12                       | 200         | - 2V?                |
| α Aqr               | 22 05.8 | -00 19     | 3.0             | +0.98      | +0.74      | G2 I b             | + 18                     | - 10                       | 800         | + 8V?                |
| α Gru               | 22 08.2 | -46 58     | 1.7             | -0.13      | -0.47      | B7IV               | + 128                    | - 148                      | 100         | +12                  |
| α Tuc               | 22 18.5 | -60 16     | 2.9             | +1.39      | +1.54      | K3III              | - 71                     | - 38                       | 200         | +42B                 |
| β Gru               | 22 42.7 | -46 53     | 2.0v            | +1.60      | +1.67      | M5III              | + 136                    | - 5                        | 170         | + 2                  |
| η Peg               | 22 43.0 | +30 13     | 2.9             | +0.86      | +0.55      | G2 II -III+F0 V    | + 13                     | - 26                       | 210         | + 4B                 |
| α PsA○              | 22 57.6 | -29 37     | 1.2             | +0.09      | +0.08      | A3V                | + 329                    | - 164                      | 25          | + 7                  |
| β Peg               | 23 03.8 | +28 05     | 2.3v            | +1.67      | +1.96      | M2.5 II -III       | + 188                    | + 138                      | 200         | + 9V                 |
| α Peg               | 23 04.8 | +15 12     | 2.5             | -0.04      | -0.05      | B9V                | + 61                     | - 43                       | 140         | - 4B                 |

ε Vega 織女 & Altair 牛郎 ● Deneb 天津四 ○ Fomalhaut 北落師門

## 近 距 恆 星 表

本表列舉離地球最近的前 100 顆恆星，其中部分星為雙星或多重星系統，因此表列星數多於 100。來源係參考美國喬治亞州立大學(Georgia State University, U.S.A.)公布資料。星名以慣用名稱優先，無慣用名稱者代以星表編號，其中 GJ 為 Gliese 與 Jahreiss 所編近距星表 (Nearby Stars Catalog, 1991)。

| 排<br>序 | 星 名<br>(或星表編號)   | 位置 (2000.0) |     |      |                    |             | 視差<br>" | 距離<br>(光年) | 光譜型   | 自行運動   |        | 視<br>星等 | 絕對<br>星等 |       |
|--------|------------------|-------------|-----|------|--------------------|-------------|---------|------------|-------|--------|--------|---------|----------|-------|
|        |                  | 赤<br>經      | 赤 緯 |      | 移<br>動<br>量<br>"/年 | 方<br>向<br>° |         |            |       |        |        |         |          |       |
|        |                  | h           | m   | s    | °                  | '           | "       |            |       |        |        |         |          |       |
|        | Sun              | --          | --  | --   | --                 | --          | --      | -----      |       |        |        |         |          |       |
| 1      | Proxima Centauri | 14          | 29  | 43   | -62                | 40          | 46      | 0.77199    | 4.22  | M5.5 V | 3.853  | 281.5   | 11.09    | 15.53 |
|        | alpha Centauri A | 14          | 39  | 36.5 | -60                | 50          | 2       | 0.74723    | 4.36  | G2 V   | 3.71   | 277.5   | 0.01     | 4.38  |
|        | alpha Centauri B | 14          | 39  | 35.1 | -60                | 50          | 14      | 0.74723    | 4.36  | K0 V   | 3.724  | 284.8   | 1.34     | 5.71  |
| 2      | Barnard's Star   | 17          | 57  | 48.5 | 4                  | 41          | 36      | 0.54698    | 5.96  | M4.0 V | 10.358 | 355.6   | 9.53     | 13.22 |
| 3      | Wolf 359         | 10          | 56  | 29.2 | 7                  | 0           | 53      | 0.4191     | 7.78  | M6.0 V | 4.696  | 234.6   | 13.44    | 16.55 |
| 4      | Lalande 21185    | 11          | 3   | 20.2 | 35                 | 58          | 12      | 0.39342    | 8.29  | M2.0 V | 4.802  | 186.9   | 7.47     | 10.44 |
| 5      | Sirius           | 6           | 45  | 8.9  | -16                | 42          | 58      | 0.38002    | 8.58  | A1 V   | 1.339  | 204.1   | -1.43    | 1.47  |
|        | Sirius B         | 6           | 45  | 8.9  | -16                | 42          | 58      | 0.38002    | 8.58  | DA2    | 1.339  | 204.1   | 8.44     | 11.34 |
| 6      | UV Ceti          | 1           | 39  | 1.3  | -17                | 57          | 1       | 0.3737     | 8.72  | M5.5 V | 3.368  | 80.4    | 12.54    | 15.4  |
|        | BL Ceti          | 1           | 39  | 1.3  | -17                | 57          | 1       | 0.3737     | 8.72  | M6.0 V | 3.368  | 80.4    | 12.99    | 15.85 |
| 7      | Ross 154         | 18          | 49  | 49.4 | -23                | 50          | 10      | 0.3369     | 9.68  | M3.5 V | 0.666  | 106.8   | 10.43    | 13.07 |
| 8      | Ross 248         | 23          | 41  | 54.7 | 44                 | 10          | 30      | 0.316      | 10.32 | M5.5 V | 1.617  | 177     | 12.29    | 14.79 |
| 9      | epsilon Eridani  | 3           | 32  | 55.8 | -9                 | 27          | 30      | 0.30999    | 10.52 | K2 V   | 0.977  | 271.1   | 3.73     | 6.19  |
|        | Planet ?         | 3           | 32  | 55.8 | -9                 | 27          | 30      | 0.30999    | 10.52 |        | 0.977  | 271.1   | ---      | ---   |
| 10     | Lacaille 9352    | 23          | 5   | 52   | -35                | 51          | 11      | 0.30364    | 10.74 | M1.5 V | 6.896  | 78.9    | 7.34     | 9.75  |
| 11     | Ross 128         | 11          | 47  | 44.4 | 0                  | 48          | 16      | 0.29872    | 10.91 | M4.0 V | 1.361  | 153.6   | 11.13    | 13.51 |
| 12     | EZ Aquarii A     | 22          | 38  | 33.4 | -15                | 18          | 7       | 0.2895     | 11.26 | M5.0 V | 3.254  | 46.6    | 13.33    | 15.64 |
|        | EZ Aquarii B     | 22          | 38  | 33.4 | -15                | 18          | 7       | 0.2895     | 11.26 | -----  | 3.254  | 46.6    | 13.27    | 15.58 |
|        | EZ Aquarii C     | 22          | 38  | 33.4 | -15                | 18          | 7       | 0.2895     | 11.26 | -----  | 3.254  | 46.6    | 14.03    | 16.34 |
| 13     | Procyon          | 7           | 39  | 18.1 | 5                  | 13          | 30      | 0.28605    | 11.40 | F5IV-V | 1.259  | 214.7   | 0.38     | 2.66  |
|        | Procyon B        | 7           | 39  | 18.1 | 5                  | 13          | 30      | 0.28605    | 11.40 | DA     | 1.259  | 214.7   | 10.7     | 12.98 |
| 14     | 61 Cygni A       | 21          | 6   | 53.9 | 38                 | 44          | 58      | 0.28604    | 11.40 | K5.0 V | 5.281  | 51.9    | 5.21     | 7.49  |
|        | 61 Cygni B       | 21          | 6   | 55.3 | 38                 | 44          | 31      | 0.28604    | 11.40 | K7.0 V | 5.172  | 52.6    | 6.03     | 8.31  |
| 15     | GJ 725 A         | 18          | 42  | 46.7 | 59                 | 37          | 49      | 0.283      | 11.52 | M3.0 V | 2.238  | 323.6   | 8.9      | 11.16 |
|        | GJ 725 B         | 18          | 42  | 46.9 | 59                 | 37          | 37      | 0.283      | 11.52 | M3.5 V | 2.313  | 323     | 9.69     | 11.95 |
| 16     | GX Andromedae    | 0           | 18  | 22.9 | 44                 | 1           | 23      | 0.28059    | 11.62 | M1.5 V | 2.918  | 81.9    | 8.08     | 10.32 |
|        | GQ Andromedae    | 0           | 18  | 22.9 | 44                 | 1           | 23      | 0.28059    | 11.62 | M3.5 V | 2.918  | 81.9    | 11.06    | 13.3  |
| 17     | epsilon Indi A   | 22          | 3   | 21.7 | -56                | 47          | 10      | 0.27584    | 11.82 | K5 Ve  | 4.704  | 122.7   | 4.69     | 6.89  |
|        | epsilon Indi B   | 22          | 4   | 10.5 | -56                | 46          | 58      | 0.27584    | 11.82 | T1.0   | 4.823  | 121.1   | ---      | ---   |
|        | epsilon Indi C   | 22          | 4   | 10.5 | -56                | 46          | 58      | 0.27584    | 11.82 | T6.0   | 4.823  | 121.1   | ---      | ---   |
| 18     | DX Cancri        | 8           | 29  | 49.5 | 26                 | 46          | 37      | 0.2758     | 11.82 | M6.5 V | 1.29   | 242.2   | 14.78    | 16.98 |
| 19     | tau Ceti         | 1           | 44  | 4.1  | -15                | 56          | 15      | 0.27439    | 11.88 | G8 Vp  | 1.922  | 296.4   | 3.49     | 5.68  |
| 20     | GJ 1061          | 3           | 36  | 0    | -44                | 30          | 46      | 0.27069    | 12.04 | M5.5 V | 0.814  | 117.3   | 13.03    | 15.19 |
| 21     | YZ Ceti          | 1           | 12  | 30.6 | -16                | 59          | 57      | 0.26884    | 12.13 | M4.5 V | 1.372  | 61.9    | 12.02    | 14.17 |
| 22     | Luyten's Star    | 7           | 27  | 24.5 | 5                  | 13          | 33      | 0.26376    | 12.36 | M3.5 V | 3.738  | 171.2   | 9.86     | 11.97 |
| 23     | SO 0253-1652     | 2           | 55  | 10.6 | 16                 | 17          | 1       | 0.26008    | 12.53 | M7.0 V | 5.098  | 138.1   | 15.4     | 17.49 |
| 24     | Kapteyn's Star   | 5           | 11  | 40.6 | -45                | 1           | 6       | 0.25527    | 12.77 | M1.5 V | 8.67   | 131.4   | 8.84     | 10.87 |
| 25     | SCR 1845-6357    | 18          | 45  | 2.6  | -63                | 57          | 52      | 0.25394    | 12.84 | M8.5 V | 2.669  | 76      | 17.39    | 19.41 |

## 近距恆星表 (續)

| 排序 | 星名<br>(或星表編號)     | 位置 (2000.0) |        |        | 視差<br>"   | 距離<br>(光年) | 光譜型   | 自行運動   |          | 視<br>星等 | 絕對<br>星等 |            |
|----|-------------------|-------------|--------|--------|-----------|------------|-------|--------|----------|---------|----------|------------|
|    |                   | 赤<br>h      | 經<br>m | 緯<br>s |           |            |       | 赤<br>° | 緯<br>' " |         |          | 移動量<br>"/年 |
| 26 | AX Microscopium   | 21          | 17     | 15.3   | -38 52 3  | 0.25343    | 12.86 | M0.0 V | 3.455    | 250.6   | 6.67     | 8.69       |
| 27 | Kruger 60 A       | 22          | 27     | 59.5   | 57 41 45  | 0.24806    | 13.14 | M3.0 V | 0.99     | 241.6   | 9.79     | 11.76      |
|    | Kruger 60 B       | 22          | 27     | 59.5   | 57 41 45  | 0.24806    | 13.14 | M4.0 V | 0.99     | 241.6   | 11.41    | 13.38      |
| 28 | DEN 1048-3956     | 10          | 48     | 14.7   | -39 56 6  | 0.24771    | 13.16 | M8.5 V | 1.53     | 229.2   | 17.29    | 19.28      |
| 29 | Ross 614 A        | 6           | 29     | 23.4   | -2 48 50  | 0.24434    | 13.34 | M4.5 V | 0.93     | 131.7   | 11.15    | 13.09      |
|    | Ross 614 B        | 6           | 29     | 23.4   | -2 48 50  | 0.24434    | 13.34 | -----  | 0.93     | 131.7   | 14.23    | 16.17      |
| 30 | Wolf 1061         | 16          | 30     | 18.1   | -12 39 45 | 0.23601    | 13.81 | M3.0 V | 1.189    | 184.5   | 10.07    | 11.93      |
| 31 | WD 0046+051       | 0           | 49     | 9.9    | 5 23 19   | 0.23188    | 14.06 | DZ7    | 2.978    | 155.5   | 12.38    | 14.21      |
| 32 | GJ 1              | 0           | 5      | 24.4   | -37 21 27 | 0.2292     | 14.22 | M3.0 V | 6.1      | 112.5   | 8.55     | 10.35      |
| 33 | Wolf 424 A        | 12          | 33     | 17.2   | 9 1 15    | 0.2279     | 14.30 | M5.5 V | 1.811    | 277.4   | 13.18    | 14.97      |
|    | Wolf 424 B        | 12          | 33     | 17.2   | 9 1 15    | 0.2279     | 14.30 | -----  | 1.811    | 277.4   | 13.17    | 14.96      |
| 34 | TZ Arietis        | 2           | 0      | 13.2   | 13 3 8    | 0.2248     | 14.50 | M4.5 V | 2.097    | 147.8   | 12.27    | 14.03      |
| 35 | GJ 687            | 17          | 36     | 25.9   | 68 20 21  | 0.22049    | 14.79 | M3.0 V | 1.309    | 194.2   | 9.17     | 10.89      |
| 36 | LHS 292           | 10          | 48     | 12.6   | -11 20 14 | 0.2203     | 14.80 | M6.5 V | 1.644    | 158.5   | 15.6     | 17.32      |
| 37 | GJ 674            | 17          | 28     | 39.9   | -46 53 43 | 0.22025    | 14.80 | M3.0 V | 1.05     | 146.9   | 9.38     | 11.09      |
| 38 | G 208-044 A       | 19          | 53     | 54.2   | 44 24 55  | 0.2202     | 14.80 | M5.5 V | 0.731    | 143.1   | 13.46    | 15.17      |
|    | G 208-045         | 19          | 53     | 55.2   | 44 24 56  | 0.2202     | 14.80 | M6.0 V | 0.731    | 143.1   | 14.01    | 15.72      |
|    | G 208-044 B       | 19          | 53     | 54.2   | 44 24 55  | 0.2202     | 14.80 | -----  | 0.731    | 143.1   | 16.75    | 18.46      |
| 39 | WD 1142-645       | 11          | 45     | 42.9   | -64 50 29 | 0.21657    | 15.05 | DQ6    | 2.688    | 97.4    | 11.5     | 13.18      |
| 40 | GJ 1002           | 0           | 6      | 43.8   | -7 32 22  | 0.213      | 15.31 | M5.5 V | 2.041    | 203.6   | 13.76    | 15.4       |
| 41 | ROSS 780          | 22          | 53     | 16.7   | -14 15 49 | 0.21259    | 15.33 | M3.5 V | 1.174    | 125.1   | 10.17    | 11.81      |
|    | Planet ?          | 22          | 53     | 16.7   | -14 15 49 | 0.21259    | 15.33 | ---    | 1.174    | 125.1   | ---      | ---        |
|    | Planet ?          | 22          | 53     | 16.7   | -14 15 49 | 0.21259    | 15.33 | ---    | 1.174    | 125.1   | ---      | ---        |
| 42 | GJ 412 A          | 11          | 5      | 28.6   | 43 31 36  | 0.20602    | 15.82 | M1.0 V | 4.511    | 282.1   | 8.77     | 10.34      |
|    | GJ 412 B          | 11          | 5      | 30.4   | 43 31 18  | 0.20602    | 15.82 | M5.5 V | 4.531    | 281.9   | 14.48    | 16.05      |
| 43 | GJ 380            | 10          | 11     | 22.1   | 49 27 15  | 0.20581    | 15.84 | K7.0 V | 1.452    | 249.7   | 6.59     | 8.16       |
| 44 | GJ 388            | 10          | 19     | 36.4   | 19 52 10  | 0.2046     | 15.93 | M3.0 V | 0.506    | 264     | 9.32     | 10.87      |
| 45 | LHS 288           | 10          | 44     | 31.8   | -61 11 38 | 0.20456    | 15.94 | M5.5 V | 1.657    | 348.1   | 13.92    | 15.66      |
| 46 | GJ 832            | 21          | 33     | 34     | -49 0 32  | 0.20278    | 16.08 | M3.0 V | 0.819    | 183.2   | 8.66     | 10.2       |
| 47 | LP 944-020        | 3           | 39     | 35.2   | -35 25 41 | 0.2014     | 16.19 | M9.0 V | 0.439    | 47.6    | 18.5     | 20.02      |
| 48 | GJ 682            | 17          | 37     | 3.7    | -44 19 9  | 0.19965    | 16.33 | M4.5 V | 1.176    | 217.1   | 10.95    | 12.45      |
| 49 | omicron 2 Eridani | 4           | 15     | 16.3   | -7 39 10  | 0.199      | 16.38 | K1 Ve  | 4.088    | 213.2   | 4.43     | 5.92       |
|    | GJ 166 A          | 4           | 15     | 22     | -7 39 35  | 0.199      | 16.38 | DA4    | 4.073    | 212.4   | 9.52     | 11.01      |
|    | GJ 166 B          | 4           | 15     | 22     | -7 39 35  | 0.199      | 16.38 | M4.5 V | 4.073    | 212.4   | 11.19    | 12.68      |
| 50 | EV Lacertae       | 22          | 46     | 49.7   | 44 20 2   | 0.19804    | 16.46 | M3.5 V | 0.841    | 236.9   | 10.22    | 11.7       |
| 51 | 70 Ophiuchi A     | 18          | 5      | 27.3   | 2 30 0    | 0.19596    | 16.64 | K0 Ve  | 0.971    | 172.6   | 4.2      | 5.66       |
|    | 70 Ophiuchi B     | 18          | 5      | 27.3   | 2 30 0    | 0.19596    | 16.64 | K5 Ve  | 0.971    | 172.6   | 6.05     | 7.51       |
| 52 | Altair            | 19          | 50     | 47     | 8 52 6    | 0.19497    | 16.72 | A7IV-V | 0.661    | 54.3    | 0.77     | 2.22       |
| 53 | GJ 1116 A         | 8           | 58     | 14.9   | 19 45 43  | 0.1912     | 17.05 | M5.5 V | 0.874    | 267.7   | 14.06    | 15.47      |
|    | GJ 1116 B         | 8           | 58     | 14.9   | 19 45 49  | 0.1912     | 17.05 | -----  | 0.874    | 267.7   | 14.92    | 16.33      |
| 54 | G 099-049         | 6           | 0      | 3.6    | 2 42 20   | 0.1893     | 17.22 | M3.5 V | 0.241    | 108     | 11.33    | 12.68      |
| 55 | GJ 445            | 11          | 47     | 41.4   | 78 41 28  | 0.18584    | 17.54 | M3.5 V | 0.885    | 57.1    | 10.79    | 12.14      |
| 56 | GJ 1005 A         | 0           | 15     | 28.1   | -16 8 2   | 0.18582    | 17.54 | M4.0 V | 0.955    | 130.3   | 11.58    | 12.93      |
|    | GJ 1005 B         | 0           | 15     | 28.1   | -16 8 2   | 0.18582    | 17.54 | -----  | 0.955    | 130.3   | 14.33    | 15.68      |
| 57 | Wolf 498          | 13          | 45     | 43.8   | 14 53 29  | 0.18421    | 17.70 | M1.5 V | 2.298    | 129.3   | 8.46     | 9.79       |
| 58 | LHS 1723          | 5           | 1      | 57     | -6 56 47  | 0.18421    | 17.70 | M4.5 V | 0.786    | 226.7   | 12.15    | 13.46      |

## 近距恆星表 (續)

| 排序 | 星名<br>(或星表編號)     | 位置 (2000.0) |    |      |     |    | 視差<br>" | 距離<br>(光年) | 光譜型   | 自行運動       |         | 視<br>星等 | 絕對<br>星等 |       |
|----|-------------------|-------------|----|------|-----|----|---------|------------|-------|------------|---------|---------|----------|-------|
|    |                   | 赤經          |    |      | 赤緯  |    |         |            |       | 移動量<br>"/年 | 方向<br>° |         |          |       |
|    |                   | h           | m  | s    | °   | '  |         |            |       |            |         |         |          | "     |
| 59 | LP 816-060        | 20          | 52 | 33   | -16 | 58 | 29      | 0.18215    | 17.90 | m          | 0.308   | 275.7   | 11.41    | 12.71 |
| 60 | GJ 169.1 A        | 4           | 31 | 11.8 | 58  | 58 | 38      | 0.18063    | 18.05 | M4.0 V     | 2.427   | 147.6   | 11.04    | 12.32 |
|    | GJ 169.1 B        | 4           | 31 | 11.8 | 58  | 58 | 38      | 0.18063    | 18.05 | DC5        | 2.427   | 147.6   | 12.44    | 13.72 |
| 61 | GJ 251            | 6           | 54 | 49   | 33  | 16 | 5       | 0.17958    | 18.15 | M3.0 V     | 0.831   | 241.3   | 10.02    | 11.29 |
| 62 | 2MA 1835+3259     | 18          | 35 | 37.9 | 32  | 59 | 54      | 0.1765     | 18.47 | M8.5 V     | 0.759   | 186.1   | 18.27    | 19.5  |
| 63 | Wolf 1453         | 5           | 31 | 27.4 | -3  | 40 | 38      | 0.17517    | 18.61 | M1.5 V     | 2.228   | 160     | 7.95     | 9.17  |
| 64 | 2MA 0415-0935     | 4           | 15 | 19   | -9  | 35 | 0       | 0.17434    | 18.70 | T8.5V      | 2.255   | 76.5    | ---      | ---   |
| 65 | Sigma Draconis    | 19          | 32 | 21.6 | 69  | 39 | 40      | 0.17359    | 18.78 | K0 V       | 1.839   | 161     | 4.68     | 5.88  |
| 66 | GJ 229 A          | 6           | 10 | 34.6 | -21 | 51 | 53      | 0.17317    | 18.83 | M1.0 V     | 0.727   | 190.9   | 8.12     | 9.31  |
|    | GJ 229 B          | 6           | 10 | 34.6 | -21 | 51 | 53      | 0.17317    | 18.83 | T6.0 V     | 0.727   | 190.9   | ---      | ---   |
| 67 | GJ 693            | 17          | 46 | 34.2 | -57 | 19 | 9       | 0.17169    | 18.99 | M4.0 V     | 1.756   | 219.6   | 10.75    | 11.92 |
| 68 | Wolf 1055         | 19          | 16 | 55.3 | 5   | 10 | 8       | 0.17101    | 19.06 | M3.0 V     | 1.452   | 203.5   | 9.11     | 10.28 |
|    | van Biesbroeck 10 | 19          | 16 | 58.3 | 5   | 9  | 1       | 0.17101    | 19.06 | M8.0 V     | 1.461   | 203.1   | 17.5     | 18.67 |
| 69 | Ross 47           | 5           | 42 | 9.3  | 12  | 29 | 22      | 0.17037    | 19.13 | M4.0 V     | 2.542   | 128.2   | 11.51    | 12.67 |
| 70 | GJ 570 A          | 14          | 57 | 28   | -21 | 24 | 56      | 0.16985    | 19.19 | K5 Ve      | 2.012   | 149.1   | 5.75     | 6.9   |
|    | GJ 570 B          | 14          | 57 | 26.5 | -21 | 24 | 41      | 0.16985    | 19.19 | M1.0 V     | 1.937   | 149.4   | 8.28     | 9.43  |
|    | GJ 570 C          | 14          | 57 | 26.5 | -21 | 24 | 41      | 0.16985    | 19.19 | -----      | 1.937   | 149.4   | 10.05    | 11.2  |
|    | GJ 570 D          | 14          | 57 | 15   | -21 | 21 | 50      | 0.16985    | 19.19 | T8.0 V     | 2.012   | 149.1   | ---      | ---   |
| 71 | GJ 908            | 23          | 49 | 12.5 | 2   | 24 | 4       | 0.16851    | 19.35 | M1.0 V     | 1.388   | 134.2   | 8.99     | 10.12 |
| 72 | eta Cassiopei A   | 0           | 49 | 6.3  | 57  | 48 | 55      | 0.16838    | 19.36 | G3 V       | 1.223   | 117.2   | 3.45     | 4.58  |
|    | eta Cassiopei B   | 0           | 49 | 6.3  | 57  | 48 | 55      | 0.16838    | 19.36 | K7.0 V     | 1.223   | 117.2   | 7.51     | 8.64  |
| 73 | GJ 588            | 15          | 32 | 12.9 | -41 | 16 | 32      | 0.16836    | 19.36 | M3.0 V     | 1.564   | 228.9   | 9.31     | 10.44 |
| 74 | GJ 754            | 19          | 20 | 48   | -45 | 33 | 27      | 0.1679     | 19.42 | M4.5 V     | 2.945   | 167.3   | 12.23    | 13.45 |
| 75 | GJ 285            | 7           | 44 | 40.2 | 3   | 33 | 9       | 0.16754    | 19.46 | M4.0 V     | 0.568   | 217.4   | 11.19    | 12.31 |
| 76 | 36 Ophiuchi A     | 17          | 15 | 21   | -26 | 36 | 10      | 0.16751    | 19.46 | HK1 Ve     | 1.238   | 202.5   | 5.07     | 6.19  |
|    | 36 Ophiuchi B     | 17          | 15 | 21   | -26 | 36 | 10      | 0.16751    | 19.46 | K1 Ve      | 1.238   | 202.5   | 5.08     | 6.2   |
|    | 36 Ophiuchi C     | 17          | 16 | 13.4 | -26 | 32 | 46      | 0.16751    | 19.46 | K5 Ve      | 1.222   | 203.1   | 6.33     | 7.45  |
| 77 | GJ 783 A          | 20          | 11 | 11.9 | -36 | 6  | 4       | 0.16533    | 19.72 | K3 V       | 1.64    | 163.8   | 5.32     | 6.41  |
|    | GJ 783 B          | 20          | 11 | 11.9 | -36 | 6  | 4       | 0.16533    | 19.72 | M4.0 V     | 1.64    | 163.8   | 11.5     | 12.59 |
| 78 | 82 Eridani        | 3           | 19 | 55.6 | -43 | 4  | 11      | 0.16501    | 19.76 | G5 V       | 3.124   | 76.6    | 4.26     | 5.35  |
| 79 | GJ 1221           | 17          | 48 | 6.7  | 70  | 52 | 29      | 0.1647     | 19.79 | DXP9       | 1.651   | 311     | 14.12    | 15.2  |
| 80 | Delta Pavonis     | 20          | 8  | 43.6 | -66 | 10 | 55      | 0.16378    | 19.90 | G8 V       | 1.656   | 133     | 3.56     | 4.63  |
| 81 | QY Aurigae A      | 7           | 10 | 1.8  | 38  | 31 | 46      | 0.16293    | 20.01 | M4.5 V     | 1.045   | 204.9   | 12.05    | 13.11 |
|    | QY Aurigae B      | 7           | 10 | 1.8  | 38  | 31 | 46      | 0.16293    | 20.01 | -----      | 1.045   | 204.9   | 12.45    | 13.51 |
| 82 | HN Librae         | 14          | 34 | 16.8 | -12 | 31 | 10      | 0.16286    | 20.02 | M3.5 V     | 0.694   | 329     | 11.31    | 12.37 |
| 83 | 2MA 0937+2931     | 9           | 37 | 34   | 29  | 31 |         | 0.16284    | 20.02 | T6.0 V     | 1.622   | 143.1   | ---      | ---   |
| 84 | GJ 338 A          | 9           | 14 | 22.8 | 52  | 41 | 12      | 0.16213    | 20.11 | M0.0 V     | 1.634   | 249.8   | 7.62     | 8.67  |
|    | GJ 338 B          | 9           | 14 | 24.7 | 52  | 41 | 11      | 0.16213    | 20.11 | K7.0 V     | 1.684   | 247.1   | 7.71     | 8.76  |
| 85 | GJ 784            | 20          | 13 | 53.4 | -45 | 9  | 50      | 0.16118    | 20.23 | M0.0 V     | 0.794   | 101.6   | 7.96     | 9     |
| 86 | Wolf 562          | 15          | 19 | 26.8 | -7  | 43 | 20      | 0.15929    | 20.47 | M2.5 V     | 1.229   | 265.4   | 10.56    | 11.57 |
| 87 | LHS 2090          | 9           | 0  | 23.6 | 21  | 50 | 5       | 0.15902    | 20.50 | M6.0 V     | 0.771   | 221.1   |          |       |
| 88 | GJ 896 A          | 23          | 31 | 52.2 | 19  | 56 | 14      | 0.15772    | 20.67 | M3.5 V     | 0.558   | 96.4    | 10.26    | 11.25 |
| 88 | GJ 896 B          | 23          | 31 | 52.2 | 19  | 56 | 14      | 0.15772    | 20.67 | M4.5 V     | 0.558   | 96.4    | 12.4     | 13.39 |
| 89 | LHS 337           | 12          | 38 | 49.1 | -38 | 22 | 54      | 0.15648    | 20.83 | M4.0 V     | 1.462   | 206.6   | ---      | ---   |
| 90 | GJ 661 A          | 17          | 12 | 7.9  | 45  | 39 | 57      | 0.15632    | 20.85 | M3.0 V     | 1.625   | 168.4   | 9.93     | 10.9  |
|    | GJ 661 B          | 17          | 12 | 7.9  | 45  | 39 | 57      | 0.15632    | 20.85 | -----      | 1.625   | 168.4   | 10.35    | 11.32 |
| 91 | LHS 3003          | 14          | 56 | 38.5 | -28 | 9  | 51      | 0.1563     | 20.86 | M7.0 V     | 0.965   | 210.1   | 17.05    | 18.02 |

## 近距恆星表 (續)

| 排序  | 星名<br>(或星表編號)    | 位置 (2000.0) |    |      |     |    |    | 視差<br>" | 距離<br>(光年) | 光譜型     | 自行運動       |         | 視<br>星等 | 絕對<br>星等 |
|-----|------------------|-------------|----|------|-----|----|----|---------|------------|---------|------------|---------|---------|----------|
|     |                  | 赤經          |    |      | 赤緯  |    |    |         |            |         | 移動量<br>"/年 | 方向<br>° |         |          |
|     |                  | h           | m  | s    | °   | '  | "  |         |            |         |            |         |         |          |
| 92  | G 180-060        | 16          | 31 | 18.4 | 40  | 51 | 54 | 0.156   | 20.90      | m+      | 0.358      | 330     | 14.79   | 15.76    |
| 93  | WD 0552-041      | 5           | 55 | 9.7  | -4  | 10 | 17 | 0.155   | 21.03      | DZ9     | 2.377      | 166.6   | 14.45   | 15.4     |
| 94  | Wolf 630 A       | 16          | 55 | 28.8 | -8  | 20 | 11 | 0.15497 | 21.04      | HM2.5 V | 1.208      | 223.3   | 9.72    | 10.67    |
|     | Wolf 630 B       | 16          | 55 | 28.8 | -8  | 20 | 11 | 0.15497 | 21.04      | -----   | 1.208      | 223.3   | 10.54   | 11.49    |
|     | van Biesbroeck 8 | 16          | 55 | 35.8 | -8  | 23 | 40 | 0.15497 | 21.04      | M7.0 V  | 1.19       | 222.5   | 16.8    | 17.75    |
|     | Wolf 630 C       | 16          | 55 | 28.8 | -8  | 20 | 11 | 0.15497 | 21.04      | -----   | 1.208      | 223.3   | 10.63   | 11.58    |
|     | Wolf 629         | 16          | 55 | 25.2 | -8  | 19 | 21 | 0.15497 | 21.04      | M3.5 V  | 1.21       | 222.3   | 11.74   | 12.69    |
| 95  | GJ 892           | 23          | 13 | 17   | 57  | 10 | 6  | 0.15341 | 21.25      | K3 V    | 2.095      | 81.9    | 5.56    | 6.49     |
| 96  | GJ 1128          | 9           | 42 | 46.4 | -68 | 53 | 6  | 0.15305 | 21.30      | M4.5 V  | 1.121      | 365.7   | ---     | ---      |
| 97  | GL Virginis      | 12          | 19 | 0.3  | 11  | 7  | 31 | 0.1529  | 21.32      | M5.0 V  | 1.301      | 279.1   | 13.8    | 14.72    |
| 98  | GJ 625           | 16          | 25 | 24.6 | 54  | 18 | 15 | 0.15179 | 21.48      | M1.5 V  | 0.465      | 111.5   | 10.1    | 11.01    |
| 99  | Ross 104         | 11          | 0  | 4.3  | 22  | 49 | 59 | 0.15016 | 21.71      | M2.5 V  | 0.51       | 236.7   | 10.02   | 10.9     |
| 100 | Ross 775 A       | 21          | 29 | 36.8 | 17  | 38 | 36 | 0.14825 | 21.99      | M3.5 V  | 1.076      | 69.5    | 11.06   | 11.91    |
| 100 | Ross 775 B       | 21          | 29 | 36.8 | 17  | 38 | 36 | 0.14825 | 21.99      | -----   | 1.076      | 69.5    | 11.06   | 11.91    |

## 梅西爾星表 ( The Messier Catalogue )

梅西爾星表是梅西爾為了便於搜尋彗星而編製的，是最早的一份非恆星星表。原始表中僅有 103 個不同類型的天體，後來增加至 110 個，其中 M40 為雙星，而 M102 疑與 M101 重複，故實際上只有 108 個屬於雲氣團、星團及星系的天體。這些不同天體的分類，屬於銀河系內者有：

*D*=瀾散星雲，*G*=球狀星團，*P*=行星狀星雲，*O*=疏散星團

其他星系依哈伯分類法的類型：

*E*=橢圓星系，*S*=螺旋星系，*I*=不規則星系

| M  | NGC<br>.IC | 赤經(2000.0)<br>h m | 赤緯(2000.0)<br>° ‘ | 所在<br>星座 | 其他名稱                    | 視直徑<br>(‘×’) | 距離<br>10 <sup>3</sup> 光年 | 視星等 | 分類 |
|----|------------|-------------------|-------------------|----------|-------------------------|--------------|--------------------------|-----|----|
| 1  | 1952       | 5 34.5            | +22 1             | 金牛座      | 蟹狀星雲                    | 6 × 4        | 6.3                      | 8.4 | D  |
| 2  | 7089       | 21 33.5           | - 0 49            | 寶瓶座      |                         | 13           | 37.5                     | 6.5 | G  |
| 3  | 5272       | 13 42.5           | +28 23            | 獵犬座      |                         | 16           | 33.9                     | 6.4 | G  |
| 4  | 6121       | 16 23.6           | -26 32            | 天蠍座      |                         | 26           | 7.2                      | 5.9 | G  |
| 5  | 5904       | 15 18.6           | + 2 5             | 巨蛇座      |                         | 17           | 24.5                     | 5.8 | G  |
| 6  | 6405       | 17 40.1           | -32 13            | 天蠍座      | 蝴蝶星團                    | 15           | 1.6                      | 4.2 | O  |
| 7  | 6475       | 17 53.9           | -34 49            | 天蠍座      | 托勒密星團、<br>蠍尾星團          | 80           | 0.8                      | 3.3 | O  |
| 8  | 6523       | 18 3.8            | -24 23            | 人馬座      | 礁湖星雲                    | 90 × 40      | 5.2                      | 5.8 | D  |
| 9  | 6333       | 17 19.2           | -18 31            | 蛇夫座      |                         | 9            | 25.8                     | 7.9 | G  |
| 10 | 6254       | 16 57.1           | - 4 6             | 蛇夫座      |                         | 15           | 14.3                     | 6.6 | G  |
| 11 | 6705       | 18 51.1           | - 6 16            | 盾牌座      | 野鴨星團                    | 14           | 6                        | 5.8 | O  |
| 12 | 6218       | 16 47.2           | - 1 57            | 蛇夫座      |                         | 15           | 16                       | 6.6 | G  |
| 13 | 6205       | 16 41.7           | +36 28            | 武仙座      | 武仙座球狀星<br>團             | 17           | 25.1                     | 5.9 | G  |
| 14 | 6402       | 17 37.6           | - 3 15            | 蛇夫座      |                         | 12           | 30.3                     | 7.6 | G  |
| 15 | 7078       | 21 30.0           | +12 10            | 飛馬座      |                         | 12           | 33.6                     | 6.4 | G  |
| 16 | 6611       | 18 18.8           | -13 47            | 巨蛇座      | 老鷹星雲                    | 35           | 7                        | 6.0 | O  |
| 17 | 6618       | 18 20.8           | -16 11            | 人馬座      | 奧米伽星雲、<br>天鵝星雲、<br>馬蹄星雲 | 46 × 37      | 5                        | 7.0 | D  |
| 18 | 6613       | 18 19.9           | -17 8             | 人馬座      |                         | 9            | 4.9                      | 6.9 | O  |
| 19 | 6273       | 17 2.6            | -26 16            | 蛇夫座      |                         | 14           | 28                       | 7.2 | G  |
| 20 | 6514       | 18 2.3            | -23 2             | 人馬座      | 三裂星雲                    | 29 × 27      | 5.2                      | 6.3 | D  |
| 21 | 6531       | 18 4.6            | -22 30            | 人馬座      |                         | 13           | 4.25                     | 5.9 | O  |
| 22 | 6656       | 18 36.4           | -23 54            | 人馬座      |                         | 24           | 10.4                     | 5.1 | G  |
| 23 | 6494       | 17 56.8           | -19 1             | 人馬座      |                         | 27           | 2.15                     | 5.5 | O  |
| 24 | 6603       | 18 18.4           | -18 25            | 人馬座      | Delle<br>Caustiche      | 90           | 10                       | 4.5 | O  |
| 25 | IC4725     | 18 31.6           | -19 15            | 人馬座      |                         | 32           | 2                        | 4.6 | O  |
| 26 | 6694       | 18 45.2           | - 9 24            | 盾牌座      |                         | 15           | 5                        | 8.0 | O  |
| 27 | 6853       | 19 59.6           | +22 43            | 狐狸座      | 啞鈴星雲                    | 8 × 4        | 1.25                     | 8.1 | P1 |
| 28 | 6626       | 18 24.5           | -24 52            | 人馬座      |                         | 11           | 18.3                     | 6.9 | G  |

## 梅西爾星表 ( The Messier Catalogue ) ( 續 )

| M  | NGC<br>,IC | 赤經(2000.0)<br>h m | 赤緯(2000.0)<br>° ‘ | 所在<br>星座 | 其他名稱                   | 視直徑<br>(‘×’) | 距離<br>10 <sup>3</sup> 光年 | 視星等 | 分類 |
|----|------------|-------------------|-------------------|----------|------------------------|--------------|--------------------------|-----|----|
| 29 | 6913       | 20 23.9           | +38 32            | 天鵝座      |                        | 7            | 4                        | 6.6 | 0  |
| 30 | 7099       | 21 40.4           | -23 11            | 摩羯座      |                        | 11           | 26.1                     | 7.5 | G  |
| 31 | 224        | 0 42.7            | +41 16            | 仙女座      | 仙女座星系                  | 178 × 63     | 2900                     | 3.4 | S  |
| 32 | 221        | 0 42.7            | +40 52            | 仙女座      |                        | 14 × 11      | 2900                     | 8.2 | E  |
| 33 | 598        | 1 33.9            | +30 39            | 三角座      | 風車星系、<br>三角座星系         | 62 × 39      | 3000                     | 5.7 | S  |
| 34 | 1039       | 2 42.0            | +42 47            | 英仙座      |                        | 35           | 1.4                      | 5.2 | 0  |
| 35 | 2168       | 6 8.9             | +24 20            | 雙子座      |                        | 28           | 2.8                      | 5.1 | 0  |
| 36 | 1960       | 5 36.1            | +34 8             | 御夫座      |                        | 12           | 4.1                      | 6.0 | 0  |
| 37 | 2099       | 5 52.4            | +32 33            | 御夫座      |                        | 24           | 4.4                      | 5.6 | 0  |
| 38 | 1912       | 5 28.7            | +35 50            | 御夫座      |                        | 21           | 4.2                      | 6.4 | 0  |
| 39 | 7092       | 21 32.2           | +48 26            | 天鵝座      |                        | 32           | 0.825                    | 4.6 | 0  |
| 40 | 雙星         | 12 22.4           | +58 5             | 大熊座      |                        | —            | 0.51                     | 8.0 | —  |
| 41 | 2287       | 6 46.0            | -20 44            | 大犬座      |                        | 38           | 2.3                      | 4.5 | 0  |
| 42 | 1976       | 5 35.4            | - 5 27            | 獵戶座      | 獵戶星雲                   | 66 × 60      | 1.3                      | 4.0 | D  |
| 43 | 1982       | 5 35.6            | - 5 16            | 獵戶座      | De Mairan's<br>Nebula, | 20 × 15      | 1.3                      | 9.0 | D  |
| 44 | 2632       | 8 40.1            | +19 59            | 巨蟹座      | 蜂巢星團、<br>鬼宿星團          | 95           | 0.577                    | 3.1 | 0  |
| 45 | 昴宿         | 3 47.0            | +24 7             | 金牛座      | 昴宿星團                   | 110          | 0.44                     | 1.2 | 0  |
| 46 | 2437       | 7 41.8            | -14 49            | 船尾座      |                        | 27           | 5.4                      | 6.1 | 0  |
| 47 | 2422       | 7 36.6            | -14 30            | 船尾座      |                        | 30           | 1.6                      | 4.4 | 0  |
| 48 | 2548       | 8 13.8            | - 5 48            | 長蛇座      |                        | 54           | 1.5                      | 5.8 | 0  |
| 49 | 4472       | 12 29.8           | + 8 0             | 室女座      |                        | 9 × 7        | 60000                    | 8.4 | E  |
| 50 | 2323       | 7 3.2             | - 8 20            | 麒麟座      |                        | 16           | 3.2                      | 5.9 | 0  |
| 51 | 5194-5     | 13 29.9           | +47 12            | 獵犬座      | 渦狀星系                   | 11 × 8       | 37000                    | 8.1 | S  |
| 52 | 7654       | 23 24.2           | +61 35            | 仙后座      |                        | 13           | 5                        | 6.9 | 0  |
| 53 | 5024       | 13 12.9           | +18 10            | 后髮座      |                        | 13           | 58                       | 7.7 | G  |
| 54 | 6715       | 18 55.1           | -30 29            | 人馬座      |                        | 9            | 87.4                     | 7.7 | G  |
| 55 | 6809       | 19 40.0           | -30 58            | 人馬座      |                        | 19           | 17.3                     | 7.0 | G  |
| 56 | 6779       | 19 16.6           | +30 11            | 天琴座      |                        | 7            | 32.9                     | 8.2 | G  |
| 57 | 6720       | 18 53.6           | +33 2             | 天琴座      | 環狀星雲                   | 1            | 2.3                      | 9.0 | P  |
| 58 | 4579       | 12 37.7           | +11 49            | 室女座      |                        | 5 × 4        | 60000                    | 9.8 | S  |
| 59 | 4621       | 12 42.0           | +11 39            | 室女座      |                        | 5 × 3        | 60000                    | 9.8 | E  |
| 60 | 4649       | 12 43.7           | +11 33            | 室女座      |                        | 7 × 6        | 60000                    | 9.8 | E  |
| 61 | 4303       | 12 21.9           | + 4 28            | 室女座      |                        | 6 × 5        | 60000                    | 9.7 | S  |
| 62 | 6266       | 17 1.2            | -30 7             | 蛇夫座      |                        | 14           | 22.5                     | 6.6 | G  |
| 63 | 5055       | 13 15.8           | +42 2             | 獵犬座      | 向日葵星系                  | 12 × 8       | 37000                    | 8.6 | S  |
| 64 | 4826       | 12 56.7           | +21 41            | 后髮座      | 黑眼星系、<br>睡美人星系         | 9 × 5        | 19000                    | 8.5 | S  |
| 65 | 3623       | 11 18.9           | +13 5             | 獅子座      |                        | 10 × 3       | 35000                    | 9.3 | S  |
| 66 | 3627       | 11 20.2           | +12 59            | 獅子座      |                        | 9 × 4        | 35000                    | 9.0 | S  |
| 67 | 2682       | 8 50.4            | +11 49            | 巨蟹座      |                        | 30           | 2.7                      | 6.9 | 0  |
| 68 | 4590       | 12 39.5           | -26 45            | 長蛇座      |                        | 12           | 33.3                     | 8.2 | G  |



## 梅西爾星表 ( The Messier Catalogue ) ( 續 )

| M   | NGC<br>IC | 赤經(2000.0) |      | 赤緯(2000.0) |    | 所在<br>星座 | 其他名稱  | 視直徑<br>(' × ') | 距離<br>10 <sup>3</sup> 光年 | 視星等  | 分類     |
|-----|-----------|------------|------|------------|----|----------|-------|----------------|--------------------------|------|--------|
|     |           | h          | m    | °          | '  |          |       |                |                          |      |        |
| 69  | 6637      | 18         | 31.4 | -32        | 21 | 人馬座      |       | 7              | 29.7                     | 7.7  | G      |
| 70  | 6681      | 18         | 43.2 | -32        | 18 | 人馬座      |       | 8              | 29.3                     | 8.1  | G      |
| 71  | 6838      | 19         | 53.8 | +18        | 47 | 天箭座      |       | 7              | 13                       | 8.3  | G      |
| 72  | 6981      | 20         | 53.5 | -12        | 32 | 寶瓶座      |       | 6              | 55.4                     | 9.4  | G      |
| 73  | 6994      | 20         | 58.9 | -12        | 38 | 寶瓶座      |       |                | 2.5                      | 9.0  | O      |
| 74  | 628       | 1          | 36.7 | +15        | 47 | 雙魚座      |       | 10 × 9         | 35000                    | 9.2  | S      |
| 75  | 6864      | 20         | 6.1  | -21        | 55 | 人馬座      |       | 6              | 67.5                     | 8.6  | G      |
| 76  | 650-1     | 1          | 42.4 | +51        | 34 | 英仙座      | 小啞鈴星雲 | 2 × 1          | 3.4                      | 11.5 | P      |
| 77  | 1068      | 2          | 42.7 | - 0        | 1  | 鯨魚座      |       | 7 × 6          | 60000                    | 8.8  | S      |
| 78  | 2068      | 5          | 46.7 | + 0        | 3  | 獵戶座      |       | 8 × 6          | 1.6                      | 8.0  | D      |
| 79  | 1904      | 5          | 24.5 | -24        | 33 | 天兔座      |       | 9              | 42.1                     | 8.0  | G      |
| 80  | 6093      | 16         | 17.0 | -22        | 59 | 天蠍座      |       | 9              | 32.6                     | 7.2  | G      |
| 81  | 3031      | 9          | 55.6 | +69        | 4  | 大熊座      | 波德星系  | 26 × 14        | 12000                    | 6.8  | S      |
| 82  | 3034      | 9          | 55.8 | +69        | 41 | 大熊座      | 雪茄星系  | 11 × 5         | 12000                    | 8.4  | I      |
| 83  | 5236      | 13         | 37.0 | -29        | 52 | 長蛇座      | 南風車星系 | 11 × 10        | 15000                    | 7.6  | S      |
| 84  | 4374      | 12         | 25.1 | +12        | 53 | 室女座      |       | 5 × 4          | 60000                    | 9.3  | E      |
| 85  | 4382      | 12         | 25.4 | +18        | 11 | 后髮座      |       | 7 × 5          | 60000                    | 9.2  | E      |
| 86  | 4406      | 12         | 26.2 | +12        | 57 | 室女座      |       | 7 × 6          | 60000                    | 9.2  | E      |
| 87  | 4486      | 12         | 30.8 | +12        | 24 | 室女座      |       | 7              | 60000                    | 8.6  | E      |
| 88  | 4501      | 12         | 32.0 | +14        | 25 | 后髮座      |       | 7 × 4          | 60000                    | 9.5  | S      |
| 89  | 4552      | 12         | 35.7 | +12        | 33 | 室女座      |       | 4              | 60000                    | 9.8  | E      |
| 90  | 4569      | 12         | 36.8 | +13        | 10 | 室女座      |       | 10 × 5         | 60000                    | 9.5  | S      |
| 91  | 4548      | 12         | 35.4 | +14        | 30 | 后髮座      |       | 5 × 4          | 60000                    | 10.2 | S      |
| 92  | 6341      | 17         | 17.1 | +43        | 8  | 武仙座      |       | 11             | 26.7                     | 6.5  | G      |
| 93  | 2447      | 7          | 44.6 | -23        | 52 | 船尾座      |       | 22             | 3.6                      | 6.2  | O      |
| 94  | 4736      | 12         | 50.9 | +41        | 7  | 獵犬座      |       | 11 × 9         | 14500                    | 8.1  | S      |
| 95  | 3351      | 10         | 44.0 | +11        | 42 | 獅子座      |       | 7 × 5          | 38000                    | 9.7  | S      |
| 96  | 3368      | 10         | 46.8 | +11        | 49 | 獅子座      |       | 7 × 5          | 38000                    | 9.2  | S      |
| 97  | 3587      | 11         | 14.8 | +55        | 1  | 大熊座      | 貓頭鷹星雲 | 3              | 2.6                      | 11.2 | P      |
| 98  | 4192      | 12         | 13.8 | +14        | 54 | 后髮座      |       | 10 × 3         | 60000                    | 10.1 | S      |
| 99  | 4254      | 12         | 18.8 | +14        | 25 | 后髮座      |       | 5              | 60000                    | 9.8  | S      |
| 100 | 4321      | 12         | 22.9 | +15        | 49 | 后髮座      |       | 7 × 6          | 60000                    | 9.4  | S      |
| 101 | 5457      | 14         | 3.2  | +54        | 21 | 大熊座      | 風車星系  | 27 × 26        | 27000                    | 7.7  | S      |
| 102 | —         | —          | —    | —          | —  | —        | —     | —              | —                        | —    | =M101? |
| 103 | 581       | 1          | 33.2 | +60        | 42 | 仙后座      |       | 6              | 8.5                      | 7.4  | O      |
| 104 | 4594      | 12         | 40.0 | -11        | 37 | 室女座      | 草帽星系  | 9 × 4          | 50000                    | 8.3  | S      |
| 105 | 3379      | 10         | 47.8 | +12        | 35 | 獅子座      |       | 4 × 4          | 38000                    | 9.3  | E      |
| 106 | 4258      | 12         | 19.0 | +47        | 18 | 獵犬座      |       | 18 × 8         | 25000                    | 8.3  | S      |
| 107 | 6171      | 16         | 32.5 | -13        | 3  | 蛇夫座      |       | 10             | 20.9                     | 8.1  | G      |
| 108 | 3556      | 11         | 11.5 | +55        | 40 | 大熊座      |       | 8 × 2          | 45000                    | 10.0 | S      |
| 109 | 3992      | 11         | 57.6 | +53        | 23 | 大熊座      |       | 8 × 5          | 55000                    | 9.8  | S      |
| 110 | 205       | 0          | 40.4 | +41        | 41 | 仙女座      |       | 17 × 10        | 2900                     | 8.0  | E      |

# 目視雙聯星 ( Visual Binary Stars )

肉眼可見、彼此間存在物理關係的雙星系統

| 恆星名稱    | 赤經<br>(2000.0) |      | 赤緯<br>(2000.0) |    | 視星等  |      | 周<br>期<br>年 | 離心<br>率 | 軌道位置 (2000.0) |          | 視差<br>" |
|---------|----------------|------|----------------|----|------|------|-------------|---------|---------------|----------|---------|
|         | h              | m    | °              | '  |      |      |             |         | 角距離<br>"      | 位置角<br>° |         |
| 仙后座 η   | 0              | 49.1 | +57            | 49 | 3.5  | 7.5  | 480.        | 0.50    | 12.85         | 317d     | 0.176   |
| 雙魚座 α   | 2              | 2.0  | + 2            | 46 | 4.2  | 5.2  | 933.        | 0.70    | 1.83          | 272r     | 0.005   |
| 英仙座 θ   | 2              | 44.2 | +49            | 14 | 4.1  | 9.9  | 2720.       | 0.13    | 20.04         | 304d     | 0.082   |
| 天爐座 α   | 3              | 12.1 | -28            | 59 | 3.9  | 6.5  | 314.        | 0.76    | 5.06          | 299d     | 0.075   |
| 玉夫座 α   | 5              | 16.7 | +46            | 0  | 0.6  | 1.1  | 0.285       | 0.00    | 0.05          | 52r      | 0.080   |
| 獵戶座 σ   | 5              | 38.7 | - 2            | 36 | 4.1  | 5.1  | 170.        | 0.07    | 0.24          | 115r     | 0.007   |
| 獵戶座 μ   | 6              | 2.4  | + 9            | 39 | 4.4  | 6.0  | 17.5        | 0.76    | 0.11          | 30r      | 0.028   |
| 大犬座 α   | 6              | 45.1 | -16            | 43 | -1.5 | 8.5  | 50.1        | 0.59    | 4.60          | 150r     | 0.378   |
| 雙子座 δ   | 7              | 20.1 | +21            | 59 | 3.6  | 8.2  | 1200.       | 0.11    | 5.77          | 225d     | 0.061   |
| 雙子座 α   | 7              | 34.6 | +31            | 53 | 1.9  | 2.9  | 511.        | 0.36    | 3.98          | 67r      | 0.067   |
| 小犬座 α   | 7              | 39.3 | + 5            | 14 | 0.4  | 10.3 | 40.7        | 0.40    | 4.64          | 76d      | 0.292   |
| 長蛇座 ε   | 8              | 46.8 | + 6            | 25 | 3.8  | 4.7  | 15.1        | 0.67    | 0.25          | 203d     | 0.027   |
| HR 3579 | 9              | 0.6  | +41            | 47 | 4.1  | 6.2  | 21.9        | 0.15    | 0.60          | 46r      | 0.069   |
| 大熊座 κ   | 9              | 3.6  | +47            | 9  | 4.2  | 4.4  | 70.1        | 0.04    | 0.13          | 264r     | 0.016   |
| 船帆座 φ   | 9              | 30.7 | -40            | 28 | 4.1  | 4.6  | 34.0        | 0.44    | 0.53          | 264d     | 0.065   |
| 獅子座 γ   | 10             | 20.0 | +19            | 50 | 2.6  | 3.8  | 619.        | 0.84    | 4.41          | 125d     | 0.022   |
| HR 4167 | 10             | 37.3 | -48            | 14 | 4.2  | 5.1  | 16.3        | 0.73    | 0.30          | 231r     | 0.040   |
| 船帆座 μ   | 10             | 46.8 | -49            | 25 | 2.7  | 6.4  | 116.        | 0.79    | 2.50          | 58d      | 0.022   |
| 大熊座 α   | 11             | 3.7  | +61            | 45 | 1.9  | 4.8  | 44.4        | 0.40    | 0.36          | 162r     | 0.038   |
| 大熊座 ζ   | 11             | 18.2 | +31            | 32 | 4.4  | 4.9  | 59.8        | 0.41    | 1.77          | 273r     | 0.137   |
| 獅子座 ι   | 11             | 23.9 | +10            | 32 | 4.0  | 6.7  | 192.        | 0.55    | 1.72          | 116r     | 0.052   |
| 半人馬 γ   | 12             | 41.5 | -48            | 58 | 2.9  | 2.9  | 84.5        | 0.79    | 1.00          | 347r     | 0.016   |
| 室女座 γ   | 12             | 41.7 | - 1            | 27 | 3.7  | 3.7  | 171.        | 0.88    | 1.84          | 267r     | 0.099   |
| 蒼蠅座 β   | 12             | 46.3 | -68            | 6  | 3.7  | 4.0  | 383.        | 0.53    | 1.29          | 43d      | 0.015   |
| HR 5089 | 13             | 31.0 | -39            | 24 | 4.5  | 4.7  | 78.7        | 0.46    | 0.21          | 75r      | 0.012   |
| 半人馬 α   | 14             | 39.6 | -60            | 50 | -0.0 | 1.3  | 79.9        | 0.52    | 14.14         | 222d     | 0.750   |
| 牧夫座 ζ   | 14             | 41.1 | +13            | 44 | 4.4  | 4.8  | 123.        | 0.96    | 0.80          | 300r     | 0.009   |
| 豺狼座 γ   | 15             | 35.1 | -41            | 10 | 3.5  | 3.6  | 147.        | 0.49    | 0.67          | 274r     | 0.008   |
| 北冕座 γ   | 15             | 42.7 | +26            | 18 | 4.1  | 5.5  | 91.0        | 0.42    | 0.76          | 114r     | 0.033   |
| 天蠍座 ξ   | 16             | 4.4  | -11            | 22 | 4.8  | 5.1  | 45.7        | 0.74    | 0.39          | 308d     | 0.048   |
| 天蠍座 α   | 16             | 29.4 | -26            | 26 | 1.0  | 5.5  | 878.        | 0.10    | 2.59          | 274d     | 0.024   |
| 蛇夫座 λ   | 16             | 30.9 | + 1            | 59 | 4.2  | 5.2  | 130.        | 0.62    | 1.54          | 30d      | 0.010   |
| 武仙座 ζ   | 16             | 41.3 | +31            | 36 | 2.9  | 5.5  | 34.5        | 0.46    | 0.75          | 13r      | 0.102   |
| 蛇夫座 η   | 17             | 10.4 | -15            | 43 | 3.0  | 3.5  | 88.0        | 0.84    | 0.60          | 244r     | 0.052   |
| 蛇夫座 70  | 18             | 5.5  | + 2            | 30 | 4.2  | 6.0  | 88.1        | 0.50    | 3.79          | 148r     | 0.201   |
| 人馬座 ζ   | 19             | 2.6  | -29            | 53 | 3.2  | 3.4  | 21.1        | 0.21    | 0.34          | 224r     | 0.025   |
| 天鵝座 δ   | 19             | 45.0 | +45            | 8  | 2.9  | 6.3  | 828.        | 0.49    | 2.50          | 222r     | 0.030   |
| 海豚座 β   | 20             | 37.5 | +14            | 36 | 4.0  | 4.9  | 26.7        | 0.35    | 0.57          | 343d     | 0.028   |
| 天鵝座 τ   | 21             | 14.8 | +38            | 3  | 3.8  | 6.4  | 49.9        | 0.25    | 0.77          | 306r     | 0.055   |
| 寶瓶座 ξ   | 22             | 28.8 | - 0            | 1  | 4.4  | 4.6  | 856.        | 0.50    | 2.10          | 192r     | 0.022   |

# 雙 星 ( Double Stars )

看起來位置相近的星，彼此間不一定有物理關係

本表資料參考自美國海軍天文臺出版天文年鑑內容

| 編號<br>BS=HR No. | 赤 經 |    |    | 赤 緯 |    |    | 角距離<br>" | 主星<br>視亮度 | 兩 星<br>視亮度差 |
|-----------------|-----|----|----|-----|----|----|----------|-----------|-------------|
|                 | h   | m  | s  | °   | '  | "  |          |           |             |
| 126             | 0   | 32 | 10 | -62 | 53 | 2  | 27.1     | 4.28      | 0.23        |
| 154             | 0   | 37 | 36 | +33 | 47 | 37 | 35.9     | 4.36      | 2.72        |
| 361             | 1   | 14 | 26 | +7  | 38 | 47 | 22.7     | 5.22      | 0.93        |
| 382             | 1   | 20 | 57 | +58 | 18 | 8  | 135.3    | 5.07      | 1.97        |
| 531             | 1   | 50 | 15 | -10 | 37 | 12 | 184.7    | 4.69      | 2.12        |
| 596             | 2   | 2  | 45 | +2  | 49 | 42 | 1.8      | 4.10      | 1.07        |
| 603             | 2   | 4  | 44 | +42 | 23 | 38 | 9.5      | 2.31      | 2.71        |
| 681             | 2   | 20 | 2  | -2  | 55 | 1  | 123.3    | 6.65      | 2.94        |
| 897             | 2   | 58 | 46 | -40 | 15 | 4  | 8.4      | 3.20      | 0.92        |
| 1279            | 4   | 8  | 28 | +15 | 11 | 53 | 3.8      | 6.11      | 2.66        |
| 1387            | 4   | 26 | 11 | +22 | 19 | 25 | 339.7    | 4.22      | 1.07        |
| 1412            | 4   | 29 | 26 | +15 | 53 | 59 | 336.7    | 3.41      | 0.53        |
| 1497            | 4   | 43 | 3  | +22 | 58 | 54 | 62.7     | 4.24      | 2.78        |
| 1856            | 5   | 30 | 32 | -47 | 4  | 6  | 198.3    | 5.52      | 1.16        |
| 1879            | 5   | 35 | 53 | +9  | 56 | 32 | 4.9      | 3.51      | 1.94        |
| 1931            | 5   | 39 | 26 | -2  | 35 | 36 | 12.1     | 3.73      | 2.83        |
| 1931            | 5   | 39 | 26 | -2  | 35 | 36 | 37.0     | 3.73      | 2.61        |
| 1983            | 5   | 45 | 2  | -22 | 26 | 41 | 95.6     | 3.64      | 2.64        |
| 2298            | 6   | 24 | 29 | +4  | 35 | 6  | 12.2     | 4.42      | 2.22        |
| 2736            | 7   | 8  | 38 | -70 | 31 | 15 | 14.4     | 3.86      | 1.57        |
| 2891            | 7   | 35 | 27 | +31 | 51 | 27 | 4.9      | 1.93      | 1.04        |
| 3223            | 8   | 7  | 58 | -68 | 39 | 24 | 6.0      | 4.38      | 2.93        |
| 3207            | 8   | 9  | 57 | -47 | 22 | 37 | 40.3     | 1.79      | 2.35        |
| 3315            | 8   | 25 | 39 | -24 | 5  | 26 | 40.9     | 5.48      | 2.95        |
| 3475            | 8   | 47 | 31 | +28 | 42 | 35 | 30.5     | 4.13      | 1.86        |
| 3582            | 8   | 57 | 18 | -59 | 16 | 54 | 40.1     | 4.87      | 1.71        |
| 3890            | 9   | 47 | 26 | -65 | 8  | 6  | 4.9      | 3.02      | 2.98        |
| 4031            | 10  | 17 | 26 | +23 | 20 | 59 | 333.8    | 3.46      | 2.57        |
| 4057            | 10  | 20 | 43 | +19 | 46 | 22 | 4.6      | 2.37      | 1.30        |
| 4180            | 10  | 39 | 51 | -55 | 40 | 26 | 51.7     | 4.38      | 1.68        |
| 4191            | 10  | 44 | 20 | +46 | 7  | 57 | 288.4    | 5.21      | 2.14        |
| 4203            | 10  | 46 | 37 | +30 | 36 | 39 | 195.5    | 5.34      | 2.44        |
| 4203            | 10  | 46 | 37 | +30 | 36 | 39 | 424.6    | 5.34      | 2.97        |
| 4257            | 10  | 54 | 3  | -58 | 55 | 30 | 159.4    | 3.88      | 2.35        |
| 4259            | 10  | 56 | 21 | +24 | 40 | 39 | 6.5      | 4.48      | 1.82        |
| 4314            | 11  | 5  | 59 | -27 | 22 | 0  | 18.0     | 4.92      | 0.20        |
| 4369            | 11  | 17 | 39 | -7  | 12 | 31 | 53.5     | 6.15      | 2.07        |
| 4418            | 11  | 28 | 38 | +2  | 46 | 54 | 88.7     | 5.05      | 2.42        |
| 4621            | 12  | 9  | 4  | -50 | 47 | 51 | 269.1    | 2.51      | 1.91        |
| 4730            | 12  | 27 | 22 | -63 | 10 | 26 | 4.0      | 1.25      | 0.30        |
| 4792            | 12  | 35 | 48 | +18 | 18 | 10 | 19.9     | 5.11      | 1.22        |
| 4898            | 12  | 55 | 24 | -57 | 15 | 3  | 34.6     | 3.94      | 1.01        |
| 4915            | 12  | 56 | 39 | +38 | 14 | 45 | 19.2     | 2.85      | 2.67        |

## 雙星 ( Double Stars ) ( 續 )

| 編號<br>BS=HR No. | 赤 經 |    |    | 赤 緯 |    |    | 角距離<br>" | 主星<br>視亮度 | 兩星<br>視亮度差 |
|-----------------|-----|----|----|-----|----|----|----------|-----------|------------|
|                 | h   | m  | s  | °   | '  | "  |          |           |            |
| 4993            | 13  | 16 | 11 | -67 | 57 | 57 | 58.4     | 4.76      | 2.48       |
| 5035            | 13  | 23 | 31 | -61 | 3  | 31 | 60.7     | 4.51      | 1.66       |
| 5054            | 13  | 24 | 28 | +54 | 51 | 19 | 14.5     | 2.23      | 1.65       |
| 5054            | 13  | 24 | 28 | +54 | 51 | 19 | 706.1    | 2.23      | 1.78       |
| 5085            | 13  | 28 | 57 | +59 | 52 | 35 | 181.7    | 5.46      | 2.73       |
| 5171            | 13  | 48 | 8  | -62 | 39 | 24 | 7.1      | 7.19      | 2.71       |
| 5350            | 14  | 16 | 39 | +51 | 18 | 19 | 38.7     | 4.76      | 2.63       |
| 5460            | 14  | 40 | 31 | -60 | 53 | 25 | 4.6      | -0.01     | 1.34       |
| 5459            | 14  | 40 | 32 | -60 | 53 | 25 | 4.6      | 1.33      | 1.34       |
| 5506            | 14  | 45 | 35 | +27 | 1  | 4  | 2.8      | 2.58      | 2.23       |
| 5531            | 14  | 51 | 38 | -16 | 5  | 50 | 231.1    | 2.74      | 2.45       |
| 5646            | 15  | 12 | 53 | -48 | 47 | 17 | 26.5     | 3.83      | 1.69       |
| 5683            | 15  | 19 | 29 | -47 | 55 | 26 | 23.1     | 4.99      | 1.35       |
| 5733            | 15  | 25 | 0  | +37 | 19 | 49 | 107.7    | 4.33      | 2.76       |
| 5789            | 15  | 35 | 27 | +10 | 29 | 40 | 4.0      | 4.17      | 0.99       |
| 5984            | 16  | 6  | 13 | -19 | 50 | 29 | 13.5     | 2.59      | 1.93       |
| 5985            | 16  | 6  | 14 | -19 | 50 | 16 | 13.5     | 4.52      | 1.93       |
| 6008            | 16  | 8  | 41 | +17 | 0  | 42 | 27.1     | 5.10      | 1.11       |
| 6027            | 16  | 12 | 47 | -19 | 29 | 41 | 41.2     | 4.21      | 2.39       |
| 6077            | 16  | 20 | 24 | -30 | 56 | 18 | 23.4     | 5.55      | 1.33       |
| 6020            | 16  | 22 | 24 | -78 | 43 | 38 | 103.3    | 4.90      | 0.51       |
| 6115            | 16  | 28 | 11 | -47 | 35 | 4  | 22.9     | 4.51      | 1.61       |
| 6406            | 17  | 15 | 16 | +14 | 22 | 33 | 4.6      | 3.48      | 1.92       |
| 6555            | 17  | 32 | 32 | +55 | 9  | 51 | 62.5     | 4.87      | 0.03       |
| 6636            | 17  | 41 | 42 | +72 | 8  | 31 | 29.6     | 4.60      | 0.99       |
| 6752            | 18  | 6  | 8  | +2  | 29 | 54 | 6.1      | 4.22      | 1.95       |
| 7056            | 18  | 45 | 14 | +37 | 37 | 12 | 43.7     | 4.34      | 1.28       |
| 7141            | 18  | 56 | 53 | +4  | 13 | 19 | 22.4     | 4.59      | 0.34       |
| 7405            | 19  | 29 | 16 | +24 | 41 | 35 | 426.8    | 4.61      | 1.32       |
| 7417            | 19  | 31 | 16 | +27 | 59 | 19 | 34.3     | 3.19      | 1.49       |
| 7476            | 19  | 41 | 30 | -16 | 15 | 41 | 45.3     | 5.42      | 2.23       |
| 7503            | 19  | 42 | 11 | +50 | 33 | 25 | 39.7     | 6.00      | 0.23       |
| 7582            | 19  | 48 | 7  | +70 | 18 | 8  | 3.0      | 4.01      | 2.86       |
| 7735            | 20  | 14 | 3  | +46 | 46 | 58 | 333.8    | 3.93      | 0.90       |
| 7754            | 20  | 18 | 48 | -12 | 30 | 8  | 381.2    | 3.67      | 0.67       |
| 7776            | 20  | 21 | 46 | -14 | 44 | 16 | 206.0    | 3.15      | 2.93       |
| 7948            | 20  | 47 | 17 | +16 | 10 | 25 | 9.0      | 4.36      | 0.67       |
| 8085            | 21  | 7  | 30 | +38 | 48 | 59 | 31.5     | 5.20      | 0.85       |
| 8086            | 21  | 7  | 32 | +38 | 48 | 31 | 31.5     | 6.05      | 0.85       |
| 8097            | 21  | 10 | 60 | +10 | 11 | 12 | 334.6    | 4.70      | 1.36       |
| 8140            | 21  | 20 | 49 | -53 | 23 | 31 | 7.2      | 4.50      | 2.43       |
| 8417            | 22  | 4  | 11 | +64 | 41 | 39 | 8.4      | 4.45      | 1.95       |
| 8559            | 22  | 29 | 32 | +0  | 2  | 58 | 2.2      | 4.34      | 0.15       |
| 8571            | 22  | 29 | 41 | +58 | 29 | 4  | 40.7     | 4.21      | 1.90       |
| 8576            | 22  | 32 | 16 | -32 | 16 | 35 | 30.9     | 4.28      | 2.84       |

## 銀河系球狀星團表

本表列舉本銀河系中已觀測的 150 個球狀星團，資料參考自加拿大 McMaster 大學 William E. Harris 2003 年的研究結果（原發表於 AJ, 112, 1487; 1996 年）。

前三欄為星團的名稱及所在星座，第 4~9 欄為星團中心的赤道座標（J 2000 春分點標準），第 10 欄為視半徑（採用 Tidal radius），第 11 欄為視亮度，第 12 欄為與太陽的距離，第 13 欄為光譜型。

| 名稱        | 所在星座   | 赤<br>h | 經<br>m | 緯<br>s | 赤<br>° | 緯<br>' | 緯<br>" | 視半徑<br>' | 視亮度   | 距離<br>kpc | 光譜型   |      |
|-----------|--------|--------|--------|--------|--------|--------|--------|----------|-------|-----------|-------|------|
| NGC 104   | 47 Tuc | 杜鵑座    | 0      | 24     | 5      | -72    | 4      | 51       | 42.86 | 3.95      | 4.5   | G4   |
| NGC 288   |        | 玉夫座    | 0      | 52     | 48     | -26    | 35     | 24       | 12.94 | 8.09      | 8.8   |      |
| NGC 362   |        | 杜鵑座    | 1      | 3      | 14     | -70    | 50     | 54       | 16.11 | 6.40      | 8.5   | F9   |
| Whiting 1 |        | 鯨魚座    | 2      | 2      | 57     | -3     | 15     | 10       | 1.2   | 15.3      | 98.1  |      |
| NGC 1261  |        | 時鐘座    | 3      | 12     | 15     | -55    | 13     | 1        | 7.28  | 8.29      | 16.4  | F7   |
| Pal 1     |        | 仙王座    | 3      | 33     | 23     | +79    | 34     | 50       | 8.96  | 13.18     | 10.9  |      |
| AM 1      | E 1    | 時鐘座    | 3      | 55     | 3      | -49    | 36     | 52       | 1.92  | 15.72     | 121.9 |      |
| Eridanus  |        | 波江座    | 4      | 24     | 45     | -21    | 11     | 13       | 3.17  | 14.70     | 90.2  |      |
| Pal 2     |        | 御夫座    | 4      | 46     | 6      | +31    | 22     | 51       | 6.76  | 13.04     | 27.6  |      |
| NGC 1851  |        | 天鵝座    | 5      | 14     | 6      | -40    | 2      | 50       | 11.70 | 7.14      | 12.1  | F7   |
| NGC 1904  | M 79   | 豺狼座    | 5      | 24     | 11     | -24    | 31     | 27       | 8.34  | 7.73      | 12.9  | F5   |
| NGC 2298  |        | 船尾座    | 6      | 48     | 59     | -36    | 0      | 19       | 6.48  | 9.29      | 10.7  | F5   |
| NGC 2419  |        | 天貓座    | 7      | 38     | 9      | +38    | 52     | 55       | 8.74  | 10.39     | 84.2  | F5   |
| Kosopov 2 |        | 雙子座    | 7      | 58     | 17     | +26    | 15     | 18       |       |           |       |      |
| Pyxis     |        | 羅盤座    | 9      | 7      | 58     | -37    | 13     | 17       | 6.18  | 12.90     | 39.7  |      |
| NGC 2808  |        | 船底座    | 9      | 12     | 3      | -64    | 51     | 47       | 15.55 | 6.20      | 9.6   | F7   |
| E 3       |        | 蠍座     | 9      | 20     | 59     | -77    | 16     | 57       | 10.52 | 11.35     | 4.3   |      |
| Pal 3     |        | 六分儀座   | 10     | 5      | 31     | +0     | 4      | 17       | 4.81  | 14.26     | 92.7  |      |
| NGC 3201  |        | 船帆座    | 10     | 17     | 37     | -46    | 24     | 40       | 28.45 | 6.75      | 5.0   | F6   |
| Pal 4     |        | 大熊座    | 11     | 29     | 17     | +28    | 58     | 25       | 3.33  | 14.20     | 109.2 |      |
| Kosopov 2 |        | 室女座    | 11     | 59     | 18     | +12    | 15     | 36       |       |           |       |      |
| NGC 4147  |        | 后髮座    | 12     | 10     | 6      | +18    | 32     | 31       | 6.31  | 10.32     | 19.3  | F2/3 |
| NGC 4372  |        | 蒼蠅座    | 12     | 25     | 45     | -72    | 39     | 33       | 34.82 | 7.24      | 5.8   | F5   |
| Rup 106   |        | 半人馬座   | 12     | 38     | 40     | -51    | 9      | 1        | 5.03  | 10.90     | 21.2  |      |
| NGC 4590  | M 68   | 長蛇座    | 12     | 39     | 28     | -26    | 44     | 34       | 30.34 | 7.84      | 10.2  | F2/3 |
| NGC 4833  |        | 蒼蠅座    | 12     | 59     | 35     | -70    | 52     | 29       | 17.85 | 6.91      | 6.5   | F3   |
| NGC 5024  | M 53   | 后髮座    | 13     | 12     | 55     | +18    | 10     | 9        | 21.75 | 7.61      | 17.8  | F6   |
| NGC 5053  |        | 后髮座    | 13     | 16     | 27     | +17    | 41     | 53       | 13.67 | 9.47      | 16.4  |      |
| NGC 5139  | ω Cen  | 半人馬座   | 13     | 26     | 46     | -47    | 28     | 37       | 57.03 | 3.68      | 5.3   | F5   |
| NGC 5272  | M 3    | 獵犬座    | 13     | 42     | 11     | +28    | 22     | 32       | 38.19 | 6.19      | 10.4  | F6   |
| NGC 5286  |        | 半人馬座   | 13     | 46     | 27     | -51    | 22     | 24       | 8.36  | 7.34      | 11.0  | F5   |
| AM 4      |        | 長蛇座    | 13     | 55     | 50     | -27    | 10     | 22       | 1.32  | 15.90     | 29.9  |      |
| NGC 5466  |        | 牧夫座    | 14     | 5      | 27     | +28    | 32     | 4        | 34.24 | 9.04      | 15.9  |      |
| NGC 5634  |        | 室女座    | 14     | 29     | 37     | -5     | 58     | 35       | 8.36  | 9.47      | 25.2  | F3/4 |
| NGC 5694  |        | 長蛇座    | 14     | 39     | 37     | -26    | 32     | 18       | 4.29  | 10.17     | 34.7  | F4   |
| IC 4499   |        | 天燕座    | 15     | 0      | 19     | -82    | 12     | 49       | 12.35 | 9.76      | 18.9  |      |
| NGC 5824  |        | 豺狼座    | 15     | 3      | 59     | -33    | 4      | 4        | 15.50 | 9.09      | 32.0  | F4   |
| Pal 5     |        | 巨蛇座    | 15     | 16     | 5      | -0     | 6      | 41       | 16.28 | 11.75     | 23.2  |      |
| NGC 5897  |        | 天秤座    | 15     | 17     | 25     | -21    | 0      | 37       | 12.07 | 8.53      | 12.4  | F7   |
| NGC 5904  | M 5    | 巨蛇座    | 15     | 18     | 34     | +2     | 4      | 58       | 28.40 | 5.65      | 7.5   | F7   |

## 球狀星團表 (續)

| 名稱       | 所在星座            | 赤 經 |    |    | 赤 緯 |    |    | 視半徑<br>′ | 視星等   | 距離<br>kpc | 光譜型  |
|----------|-----------------|-----|----|----|-----|----|----|----------|-------|-----------|------|
|          |                 | h   | m  | s  | °   | ′  | ″  |          |       |           |      |
| NGC 5927 |                 | 15  | 28 | 1  | -50 | 40 | 22 | 16.68    | 8.01  | 7.6       | G2   |
| NGC 5946 |                 | 15  | 35 | 29 | -50 | 39 | 34 | 24.03    | 9.61  | 10.6      | F7/8 |
| BH 176   |                 | 15  | 39 | 7  | -50 | 3  | 2  |          | 14.00 | 15.6      |      |
| NGC 5986 |                 | 15  | 46 | 4  | -37 | 47 | 10 | 10.52    | 7.52  | 10.4      | F5   |
| Lynga 7  |                 | 16  | 11 | 3  | -55 | 18 | 52 |          |       | 7.2       |      |
| Pa1 14   | AvdB            | 16  | 11 | 5  | +14 | 57 | 29 | 5.26     | 14.74 | 73.9      |      |
| NGC 6093 | M 80            | 16  | 17 | 3  | -22 | 58 | 30 | 13.28    | 7.33  | 10.0      | F6   |
| NGC 6121 | M 4             | 16  | 23 | 36 | -26 | 31 | 31 | 32.49    | 5.63  | 2.2       | F8   |
| NGC 6101 |                 | 16  | 25 | 49 | -72 | 12 | 6  | 7.27     | 9.16  | 15.3      | F5:  |
| NGC 6144 |                 | 16  | 27 | 14 | -26 | 1  | 29 | 33.25    | 9.01  | 8.5       | F5/6 |
| NGC 6139 |                 | 16  | 27 | 40 | -38 | 50 | 56 | 8.52     | 8.99  | 10.1      | F6/7 |
| Terzan 3 |                 | 16  | 28 | 40 | -35 | 21 | 13 | 5.91     | 12.00 | 7.5       |      |
| NGC 6171 | M 107           | 16  | 32 | 32 | -13 | 3  | 13 | 17.44    | 7.93  | 6.4       | G0   |
| 1636-283 | ES0452<br>-SC11 | 16  | 39 | 26 | -28 | 23 | 52 |          | 12.00 | 7.8       |      |
| NGC 6205 | M 13            | 16  | 41 | 42 | +36 | 27 | 37 | 25.18    | 5.78  | 7.7       | F6   |
| NGC 6229 |                 | 16  | 46 | 59 | +47 | 31 | 40 | 5.38     | 9.39  | 30.4      | F7   |
| NGC 6218 | M 12            | 16  | 47 | 15 | -1  | 56 | 52 | 17.60    | 6.70  | 4.9       | F8   |
| NGC 6235 |                 | 16  | 53 | 25 | -22 | 10 | 38 | 7.61     | 9.97  | 11.4      | F9:  |
| NGC 6254 | M 10            | 16  | 57 | 9  | -4  | 5  | 58 | 21.48    | 6.60  | 4.4       | F3   |
| NGC 6256 |                 | 16  | 59 | 33 | -37 | 7  | 17 | 7.59     | 11.29 | 8.4       |      |
| Pa1 15   |                 | 17  | 0  | 2  | -0  | 32 | 31 | 4.99     | 14.00 | 44.6      |      |
| NGC 6266 | M 62            | 17  | 1  | 13 | -30 | 6  | 49 | 8.97     | 6.45  | 6.9       | F9:  |
| NGC 6273 | M 19            | 17  | 2  | 38 | -26 | 16 | 5  | 14.50    | 6.77  | 8.6       | F7   |
| NGC 6284 |                 | 17  | 4  | 29 | -24 | 45 | 53 | 23.08    | 8.83  | 15.3      | F9   |
| NGC 6287 |                 | 17  | 5  | 9  | -22 | 42 | 29 | 10.51    | 9.35  | 9.3       | F5   |
| NGC 6293 |                 | 17  | 10 | 10 | -26 | 34 | 55 | 14.23    | 8.22  | 8.8       | F3   |
| NGC 6304 |                 | 17  | 14 | 32 | -29 | 27 | 44 | 13.25    | 8.22  | 6.0       | G3   |
| NGC 6316 |                 | 17  | 16 | 37 | -28 | 8  | 24 | 5.93     | 8.43  | 11.0      | G2   |
| NGC 6341 | M 92            | 17  | 17 | 7  | +43 | 8  | 11 | 15.17    | 6.44  | 8.2       | F2   |
| NGC 6325 |                 | 17  | 17 | 59 | -23 | 45 | 57 | 9.49     | 10.33 | 8.0       | G0   |
| NGC 6333 | M 9             | 17  | 19 | 12 | -18 | 30 | 59 | 8.16     | 7.72  | 7.9       | F5/6 |
| NGC 6342 |                 | 17  | 21 | 10 | -19 | 35 | 14 | 14.86    | 9.66  | 8.6       | G3/4 |
| NGC 6356 |                 | 17  | 23 | 35 | -17 | 48 | 47 | 7.97     | 8.25  | 15.2      | G3   |
| NGC 6355 |                 | 17  | 23 | 59 | -26 | 21 | 13 | 15.18    | 9.14  | 9.5       | G0   |
| NGC 6352 |                 | 17  | 25 | 29 | -48 | 25 | 22 | 10.51    | 7.96  | 5.7       | G4   |
| IC 1257  |                 | 17  | 27 | 9  | -7  | 5  | 35 |          | 13.10 | 25.0      |      |
| Terzan 2 | HP 3            | 17  | 27 | 33 | -30 | 48 | 8  | 10.12    | 14.29 | 8.7       |      |
| NGC 6366 |                 | 17  | 27 | 44 | -5  | 4  | 36 | 15.20    | 9.20  | 3.6       |      |
| Terzan 4 | HP 4            | 17  | 30 | 39 | -31 | 35 | 44 |          | 16.00 | 9.1       |      |
| HP 1     | BH 229          | 17  | 31 | 5  | -29 | 58 | 54 | 8.22     | 11.59 | 14.1      |      |
| NGC 6362 |                 | 17  | 31 | 55 | -67 | 2  | 53 | 16.67    | 7.73  | 7.6       | G3   |
| Liller 1 |                 | 17  | 33 | 25 | -33 | 23 | 20 | 12.57    | 16.77 | 9.6       |      |
| NGC 6380 | Ton 1           | 17  | 34 | 28 | -39 | 4  | 9  | 12.06    | 11.31 | 10.7      |      |
| Terzan 1 | HP 2            | 17  | 35 | 47 | -30 | 28 | 54 | 11.07    | 15.90 | 5.6       |      |
| Ton 2    | Pismis<br>26    | 17  | 36 | 11 | -38 | 33 | 12 | 10.75    | 12.24 | 8.1       |      |
| NGC 6388 |                 | 17  | 36 | 17 | -44 | 44 | 6  | 6.21     | 6.72  | 10.0      | G2   |

## 球狀星團表 (續)

| 名稱        | 所在星座        | 赤經    | 赤緯       | 視半徑       | 視星等   | 距離    | 光譜型  |      |
|-----------|-------------|-------|----------|-----------|-------|-------|------|------|
|           |             | h m s | ° ' "    | '         |       | kpc   |      |      |
| NGC 6402  | M 14        | 蛇夫座   | 17 37 36 | -3 14 45  | 33.24 | 7.59  | 9.3  | F4   |
| NGC 6401  |             | 蛇夫座   | 17 38 37 | -23 54 34 | 12.10 | 9.45  | 10.5 | F9   |
| NGC 6397  |             | 天壇座   | 17 40 41 | -53 40 25 | 15.81 | 5.73  | 2.3  | F4   |
| Pal 6     |             | 蛇夫座   | 17 43 42 | -26 13 21 | 8.36  | 11.55 | 5.9  |      |
| NGC 6426  |             | 蛇夫座   | 17 44 55 | +3 10 13  | 13.23 | 11.01 | 20.7 | G1:  |
| Djorg 1   |             | 天蠍座   | 17 47 28 | -33 3 56  | 10.02 | 13.60 | 12.0 |      |
| Terzan 5  | Terzan 11   | 人馬座   | 17 48 5  | -24 46 45 | 13.27 | 13.85 | 10.3 |      |
| NGC 6440  |             | 人馬座   | 17 48 53 | -20 21 37 | 6.31  | 9.20  | 8.4  | G4   |
| NGC 6441  |             | 天蠍座   | 17 50 13 | -37 3 5   | 8.00  | 7.15  | 11.7 | G2   |
| Terzan 6  | HP 5        | 天蠍座   | 17 50 46 | -31 16 31 | 17.39 | 13.85 | 9.5  |      |
| NGC 6453  |             | 天蠍座   | 17 50 52 | -34 35 57 | 21.50 | 10.08 | 9.6  | F8   |
| UKS 1     |             | 人馬座   | 17 54 27 | -24 8 43  | 18.76 | 17.29 | 8.3  |      |
| NGC 6496  |             | 南冕座   | 17 59 2  | -44 15 54 | 5.27  | 8.54  | 11.5 | G4   |
| Terzan 9  |             | 人馬座   | 18 1 39  | -26 50 23 | 8.22  | 16.00 | 6.5  |      |
| Djorg 2   | ESO456-SC38 | 人馬座   | 18 1 49  | -27 49 33 | 10.53 | 9.90  | 6.7  |      |
| NGC 6517  |             | 蛇夫座   | 18 1 51  | -8 57 32  | 4.10  | 10.23 | 10.8 | F8   |
| Terzan10  |             | 人馬座   | 18 2 57  | -26 4 0   |       | 14.90 | 5.7  |      |
| NGC 6522  |             | 人馬座   | 18 3 34  | -30 2 2   | 16.44 | 8.27  | 7.8  | F7/8 |
| NGC 6535  |             | 巨蛇座   | 18 3 51  | -0 17 49  | 8.36  | 10.47 | 6.8  | G0   |
| NGC 6528  |             | 人馬座   | 18 4 50  | -30 3 21  | 16.57 | 9.60  | 7.9  | G3   |
| NGC 6539  |             | 巨蛇座   | 18 4 50  | -7 35 9   | 21.46 | 9.33  | 8.4  | G4:  |
| NGC 6540  | Djorg 3     | 人馬座   | 18 6 9   | -27 45 55 | 9.49  | 9.30  | 3.7  |      |
| NGC 6544  |             | 人馬座   | 18 7 21  | -24 59 51 | 2.05  | 7.77  | 2.7  | F9   |
| NGC 6541  |             | 南冕座   | 18 8 2   | -43 30 0  | 29.60 | 6.30  | 7.0  | F6   |
| 2MS-GC01  | 2MASS-GC01  | 人馬座   | 18 8 22  | -19 49 47 |       |       | 3.6  |      |
| ESO-SC06  | ESO280-SC06 | 天壇座   | 18 9 6   | -46 25 23 |       |       | 21.7 |      |
| NGC 6553  |             | 人馬座   | 18 9 18  | -25 54 31 | 8.16  | 8.06  | 6.0  | G4   |
| 2MS-GC02  | 2MASS-GC02  | 人馬座   | 18 9 37  | -20 46 44 |       |       | 4.0  |      |
| NGC 6558  |             | 人馬座   | 18 10 18 | -31 45 50 | 10.44 | 9.26  | 7.4  | F7   |
| IC 1276   | Pal 7       | 巨蛇座   | 18 10 44 | -7 12 27  | 20.98 | 10.34 | 5.4  |      |
| Terzan12  |             | 人馬座   | 18 12 16 | -22 44 31 | 3.10  | 15.63 | 4.8  |      |
| NGC 6569  |             | 人馬座   | 18 13 39 | -31 49 37 | 6.95  | 8.55  | 10.7 | G1:  |
| BH 261    | AL3         | 人馬座   | 18 14 7  | -28 38 6  | 1.3   | 11    | 5.5  |      |
| GLIMPSE02 |             | 人馬座   | 18 18 31 | -16 58 38 |       |       | 9.8  |      |
| NGC 6584  |             | 望遠鏡座  | 18 18 38 | -52 12 54 | 9.37  | 8.27  | 13.4 | F6   |
| NGC 6624  |             | 人馬座   | 18 23 41 | -30 21 40 | 20.55 | 7.87  | 7.9  | G4/5 |
| NGC 6626  | M 28        | 人馬座   | 18 24 33 | -24 52 12 | 11.27 | 6.79  | 5.6  | F8   |
| NGC 6638  |             | 人馬座   | 18 30 56 | -25 29 51 | 6.63  | 9.02  | 9.6  | G0   |
| NGC 6637  | M 69        | 人馬座   | 18 31 23 | -32 20 53 | 8.35  | 7.64  | 9.1  | G2/3 |
| NGC 6642  |             | 人馬座   | 18 31 54 | -23 28 31 | 10.07 | 9.13  | 8.4  | F8   |
| NGC 6652  |             | 人馬座   | 18 35 46 | -32 59 25 | 4.48  | 8.62  | 10.1 | G3   |

## 球狀星團表(續)

| 名稱       | 所在星座  | 赤經    | 赤緯       | 視半徑       | 視星等   | 距離    | 光譜型  |      |
|----------|-------|-------|----------|-----------|-------|-------|------|------|
|          |       | h m s | ° ' "    | '         |       | kpc   |      |      |
| NGC 6656 | M 22  | 人馬座   | 18 36 24 | -23 54 12 | 28.97 | 5.10  | 3.2  | F5   |
| Pal 8    |       | 人馬座   | 18 41 30 | -19 49 33 | 13.55 | 11.02 | 12.9 |      |
| NGC 6681 | M 70  | 人馬座   | 18 43 13 | -32 17 31 | 7.91  | 7.87  | 9.0  | F5   |
| NGC 6712 |       | 盾牌座   | 18 53 4  | -8 42 22  | 7.44  | 8.10  | 6.9  | F9   |
| NGC 6715 | M 54  | 人馬座   | 18 55 3  | -30 28 42 | 7.47  | 7.60  | 26.8 | F7/8 |
| NGC 6717 | Pal 9 | 人馬座   | 18 55 6  | -22 42 3  | 9.87  | 9.28  | 7.1  | F6   |
| NGC 6723 |       | 人馬座   | 18 59 33 | -36 37 54 | 10.51 | 7.01  | 8.7  | F9   |
| NGC 6749 |       | 天鷹座   | 19 5 15  | +1 54 3   | 5.21  | 12.44 | 7.9  |      |
| NGC 6752 |       | 孔雀座   | 19 10 52 | -59 59 5  | 55.34 | 5.40  | 4.0  | F4/5 |
| NGC 6760 |       | 天鷹座   | 19 11 12 | +1 1 50   | 12.96 | 8.88  | 7.4  | G5   |
| NGC 6779 | M 56  | 天琴座   | 19 16 36 | +30 11 5  | 8.56  | 8.27  | 10.1 | F5   |
| Terzan 7 |       | 人馬座   | 19 17 44 | -34 39 27 | 7.27  | 12.00 | 23.2 |      |
| Pal 10   |       | 天箭座   | 19 18 2  | +18 34 18 | 3.08  | 13.22 | 5.9  |      |
| Arp 2    |       | 人馬座   | 19 28 44 | -30 21 14 | 12.65 | 12.30 | 28.6 |      |
| NGC 6809 | M 55  | 人馬座   | 19 39 59 | -30 57 44 | 16.28 | 6.32  | 5.3  | F4   |
| Terzan 8 |       | 人馬座   | 19 41 45 | -34 0 1   | 4.00  | 12.40 | 26.0 |      |
| Pal 11   |       | 天鷹座   | 19 45 14 | -8 0 26   | 9.82  | 9.80  | 13.0 |      |
| NGC 6838 | M 71  | 天箭座   | 19 53 46 | +18 46 42 | 8.96  | 8.19  | 4.0  | G1   |
| NGC 6864 | M 75  | 人馬座   | 20 6 5   | -21 55 17 | 7.28  | 8.52  | 20.7 | F9   |
| NGC 6934 |       | 海豚座   | 20 34 12 | +7 24 15  | 8.37  | 8.83  | 15.7 | F7/8 |
| NGC 6981 | M 72  | 寶瓶座   | 20 53 28 | -12 32 13 | 9.15  | 9.27  | 17.0 | F7   |
| NGC 7006 |       | 海豚座   | 21 1 30  | +16 11 15 | 6.34  | 10.56 | 41.5 | F6   |
| NGC 7078 | M 15  | 飛馬座   | 21 29 58 | +12 10 1  | 21.50 | 6.20  | 10.3 | F3/4 |
| NGC 7089 | M 2   | 寶瓶座   | 21 33 29 | -0 49 23  | 21.45 | 6.47  | 11.5 | F4   |
| NGC 7099 | M 30  | 摩羯座   | 21 40 22 | -23 10 45 | 18.34 | 7.19  | 8.0  | F3   |
| Pal 12   |       | 摩羯座   | 21 46 39 | -21 15 3  | 17.42 | 11.99 | 19.1 |      |
| Pal 13   |       | 飛馬座   | 23 6 44  | +12 46 19 | 3.11  | 13.47 | 25.8 |      |
| NGC 7492 |       | 寶瓶座   | 23 8 27  | -15 36 41 | 8.35  | 11.29 | 25.8 |      |



## 疏散星團

| 名稱<br>NGC 其他 | 所在星座     | 赤經<br>(2000.0)<br>h m | 赤緯<br>(2000.0)<br>° ′ | 視直徑<br>′ | 距離<br>光年 | 星團中<br>最亮星<br>視星等 | 星數   |     |
|--------------|----------|-----------------------|-----------------------|----------|----------|-------------------|------|-----|
| 188          |          | 仙王座                   | 0 44.5                | +85 20   | 14       | 5050              | 14.6 | 70  |
| 581          | M03      | 仙后座                   | 1 33.2                | +60 42   | 7        | 7990              | 9.8  | 30  |
| 752          |          | 仙女座                   | 1 57.8                | +37 41   | 45       | 1240              | 9.6  | 60  |
| 869          | h Per    | 英仙座                   | 2 19.0                | +57 9    | 30       | 7010              | 9.5  | 300 |
| 884          | χ Per    | 英仙座                   | 2 22.5                | +57 7    | 30       | 8080              | 9.5  | 240 |
| 1039         | M34      | 英仙座                   | 2 42.0                | +42 47   | 30       | 1390              | 8.6  | 60  |
| 1245         |          | 英仙座                   | 3 14.8                | +47 14   | 7        | 7470              | 13.0 | 40  |
|              | α Per    | 英仙座                   | 3 24                  | +49      | 240      | 554               | 5.0  | 80  |
|              | Pleiades | 金牛座                   | 3 47.1                | +24 6    | 120      | 443               | 4.2  | 120 |
| 1528         |          | 英仙座                   | 4 15.4                | +51 14   | 22       | 2800              | 9.2  | 80  |
|              | Hyades   | 金牛座                   | 4 19.8                | +15 37   | 400      | 130               | 4.0  | 100 |
| 1912         | M38      | 御夫座                   | 5 28.7                | +35 50   | 18       | 4610              | 9.7  | 100 |
| 1960         | M36      | 御夫座                   | 5 36.1                | +34 8    | 17       | 4110              | 8.7  | 50  |
| 2099         | M37      | 御夫座                   | 5 52.4                | +32 33   | 25       | 4170              | 9.7  | 200 |
| 2264         | S Mon    | 麒麟座                   | 6 41.1                | +9 53    | 30       | 2330              | 8.9  | 60  |
| 2324         |          | 麒麟座                   | 7 4.2                 | +1 4     | 8        | 7400              | 13.7 | 30  |
| 2362         |          | 大犬座                   | 7 18.8                | -24 57   | 9        | 5020              | 9.4  | 30  |
| 2632         | Praesepe | 巨蟹座                   | 8 40.1                | +19 59   | 90       | 515               | 7.5  | 100 |
|              | IC 2391  | 船帆座                   | 8 40.2                | -53 4    | 45       | 499               | 3.5  | 15  |
| 2682         | M67      | 巨蟹座                   | 8 50.5                | +11 49   | 17       | 2710              | 10.8 | 80  |
|              | IC 2602  | 船底座                   | 10 43.0               | -64 24   | 65       | 473               | 6.0  | 25  |
| 3532         |          | 船底座                   | 11 6.4                | -58 40   | 55       | 1350              | 8.1  | 130 |
|              | Coma     | 后髮座                   | 12 25.0               | +26 6    | 300      | 261               | 5.0  | 40  |
| 4755         |          | 南十字座                  | 12 53.7               | -60 20   | 12       | 3370              | 7.0  | 30  |
| 6351         | M21      | 人馬座                   | 18 4.6                | -22 30   | 12       | 4350              | 9.3  | 40  |
| 6611         | M16      | 巨蛇座                   | 18 18.8               | -13 47   | 8        | 5490              | 10.6 | 40  |
| 6705         | M11      | 盾牌座                   | 18 51.1               | -6 16    | 12       | 5540              | 12.0 | 80  |
| 6755         |          | 天鷹座                   | 19 7.8                | +4 13    | 30       | 5050              | 11.0 | 50  |
| 7092         | M39      | 天鵝座                   | 21 32.2               | +48 26   | 32       | 864               | 6.5  | 20  |
| 7142         |          | 仙王座                   | 21 45.9               | +65 48   | 11       | 1990              | 13.0 | 35  |

# 彌散星雲表

| 編號<br>(NGC、IC 或其他)    | 所在星座 | 位置(2000.0 分點) |             | 視直徑       |          | 距離<br>(光年) | 型式 |
|-----------------------|------|---------------|-------------|-----------|----------|------------|----|
|                       |      | 經<br>h m      | 赤緯<br>° ' " | ' x ' 光年  | x 光年     |            |    |
| N. 281                | 仙后座  | 0 51.9        | +56 37      | 27 x 23   | 44 x 37  | 5500       | e  |
| I. 1795               | 仙后座  | 2 24.8        | +61 53      | 27 x 13   | 44 x 21  | 5500       |    |
| I. 1805               | 仙后座  | 2 32.0        | +61 28      | 50 x 44   | 37 x 32  | 2580       | e  |
| I. 1845               | 仙后座  | 2 51.3        | +60 25      | 60 x 30   | 38 x 19  | 2200       | e  |
| N. 1333               | 英仙座  | 3 29.1        | +31 22      | 9 x 5     | 10 x 6   | 3900       | e  |
| I. 349                | 金牛座  | 3 44.7        | +23 40      | 30 x 30   | 4 x 4    | 410        | c  |
| N. 1491               | 英仙座  | 4 3.3         | +51 18      | 3 x 3     | 9 x 9    | 10800      | e  |
| N. 1499 (加州)          | 英仙座  | 4 3.3         | +36 25      | 145 x 40  | 82 x 23  | 2000       | e  |
| I. 405                | 玉夫座  | 5 14.7        | +34 17      | 30 x 19   | 19 x 12  | 2200       | e  |
| I. 410                | 玉夫座  | 5 20.9        | +33 29      | 23 x 20   | 15 x 13  | 2200       | c  |
| N. 1973               | 獵戶座  | 5 35.1        | - 4 44      | 40 x 25   |          |            |    |
| N. 1976 = M42 (獵戶)    | 獵戶座  | 5 35.3        | - 5 23      | 66 x 60   | 25 x 23  | 1300       | e  |
| N. 1982 = M43 (鳥頭)    | 獵戶座  | 5 35.5        | - 5 16      | 20 x 15   |          |            | ce |
| I. 434                | 獵戶座  | 5 39.9        | - 2 25      | 60 x 10   | 23 x 4   | 1300       | ce |
| N. 2023               | 獵戶座  | 5 41.8        | - 2 13      | 10 x 10   |          |            | ce |
| N. 2024               | 獵戶座  | 5 42.0        | - 1 50      | 30 x 30   | 11 x 11  | 1300       | e  |
| N. 2070               | 繪架座  | 5 46.8        | -69 5       | 20 x 20   |          |            |    |
| N. 2068 = M78         | 獵戶座  | 5 46.8        | + 0 3       | 8 x 6     |          |            | c  |
| N. 2071               | 獵戶座  | 5 47.2        | + 0 18      | 4 x 3     |          |            | c  |
| N. 2174-5             | 獵戶座  | 6 9.7         | +20 30      | 29 x 25   | 27 x 24  | 3300       | e  |
| I. 443                | 雙子座  | 6 15.4        | +22 47      | 27 x 5    |          |            |    |
| N. 2237-38-44-46 (玫瑰) | 麒麟座  | 6 30.3        | + 5 3       | 64 x 61   | 67 x 64  | 3600       | e  |
| N. 2261 (哈伯變光)        | 麒麟座  | 6 39.2        | + 8 43      |           |          | 650        | ce |
| N. 2264               | 麒麟座  | 6 41.2        | + 9 53      | 60 x 30   | 57 x 28  | 3300       | e  |
| I. 2177               | 麒麟座  | 7 5.5         | -10 33      | 85 x 25   | 45 x 13  | 1820       | e  |
| N. 3372 = η car       | 船底座  | 10 45.1       | -59 41      | 85 x 80   | 89 x 83  | 3600       | e  |
| I. 2944               | 半人馬座 | 11 35.8       | -63 0       | 66 x 36   | 13 x 7   | 680        | c  |
| I. 4063-64            | 蛇夫座  | 16 25.3       | -23 27      | 145 x 70  | 16 x 8   | 390        | c  |
| I. 4628               | 天蠍座  | 16 52.8       | -40 23      | 34 x 16   |          |            |    |
| N. 6334               | 天蠍座  | 17 20.6       | -36 4       | 20 x 20   | 7 x 7    | 1230       | c  |
| N. 6357               | 天蠍座  | 17 24.7       | -34 9       | 57 x 44   | 54 x 42  | 3300       | e  |
| N. 6514 = M20 (三裂)    | 人馬座  | 18 2.3        | -23 2       | 24 x 27   | 18 x 17  | 2230       | e  |
| N. 6523 = M8 (渦湖)     | 人馬座  | 18 3.1        | -24 23      | 60 x 35   | 44 x 26  | 2500       | e  |
| N. 6611 = M16         | 巨蛇座  | 18 18.8       | -13 46      | 35 x 28   | 46 x 37  | 4600       | e  |
| N. 6618 = M17 (ω)     | 人馬座  | 18 20.7       | -16 10      | 46 x 37   | 43 x 35  | 3300       | e  |
| N. 6729               | 南冕座  | 19 1.8        | -36 58      |           |          |            | ce |
| N. 6820               | 狐狸座  | 19 42.7       | +23 5       | 1 x 1     |          |            |    |
| N. 6888               | 天鵝座  | 20 12.8       | +38 19      | 18 x 12   | 15 x 10  | 3000       | e  |
| γ cyg                 | 天鵝座  | 20 22.9       | +40 40      | 85 x 50   | 14 x 8   | 550        |    |
| N. 6960               | 天鵝座  | 20 45.6       | +30 42      | 70 x 6    | 26 x 2   | 1300       | e  |
| I. 5067-70            | 天鵝座  | 20 48.7       | +44 22      | 85 x 75   | 22 x 20  | 910        | ce |
| N. 6992-5             | 天鵝座  | 20 56.3       | +31 41      | 78 x 8    | 30 x 3   | 1300       | e  |
| N. 7000 (北美洲)         | 天鵝座  | 21 1.8        | +44 12      | 120 x 100 | 32 x 26  | 910        | ce |
| I. 1396               | 仙王座  | 21 39.1       | +57 27      | 165 x 135 | 120 x 99 | 2500       | e  |
| N. 7129               | 仙王座  | 21 41.3       | +66 6       | 7 x 7     | 7 x 7    | 3600       | c  |
| I. 5146               | 天鵝座  | 21 53.2       | +47 16      | 12 x 12   | 19 x 19  | 5500       | c  |
| N. 7538               | 仙王座  | 23 14.2       | +61 29      | 10 x 5    |          |            |    |

註：e 發射星雲；c 反射星雲

## 行星狀星雲表

| 編號<br>(NGC、IC 或其他)  | 所在<br>星座 | 位置(2000.0 分點) |               | 視直徑       |             | 距離<br>(光年) | 攝影<br>星等 |
|---------------------|----------|---------------|---------------|-----------|-------------|------------|----------|
|                     |          | 赤<br>經<br>h m | 赤<br>緯<br>° ′ | " × "     | 光年 × 光年     |            |          |
| N. 40               | 仙王座      | 0 13.1        | +72 31        | 60 × 38   | 0.95 × 0.60 | 3300       | 10.2     |
| N. 246              | 鯨魚座      | 0 47.2        | -12 8         | 240 × 210 | 1.73 × 1.52 | 1500       | 8.5      |
| N. 650 = M76        | 英仙座      | 1 42.0        | +51 34        | 150 × 87  | 6.23 × 3.45 | 8180       | 12.2     |
| N. 1514             | 金牛座      | 4 9.3         | +30 46        | 120 × 90  | 2.50 × 1.88 | 4300       | 10.8     |
| N. 1535             | 波江座      | 4 14.3        | -12 44        | 20 × 17   | 0.21 × 0.18 | 2150       | 9.3      |
| N. 1714             | 劍魚座      | 4 52.1        | -66 55        | 8         |             |            | 10.0     |
| I. 418              | 天兔座      | 5 27.7        | -12 41        | 14 × 11   | 0.51 × 0.40 | 7460       | 12.0     |
| N. 1952 = M1 (蟹狀)   | 金牛座      | 5 34.5        | +22 1         | 360 × 240 | 1.59 × 1.06 | 7200       | 8.4      |
|                     | 劍魚座      | 5 43.3        | -67 52        | 420       | 13.3        | 6500       | 10.6     |
| I. 2149             | 玉夫座      | 5 56.3        | +46 08        | 15 × 10   | 0.21 × 0.14 |            |          |
| N. 2392             | 雙子座      | 7 29.2        | +20 55        | 47 × 43   | 0.31 × 0.28 | 1360       | 8.3      |
| N. 2438             | 船尾座      | 7 41.8        | -14 43        | 68        | 1.78        | 5410       | 11.3     |
| N. 2440             | 船尾座      | 7 42.1        | -18 12        | 54 × 20   | 1.70 × 0.63 | 6500       | 11.7     |
| N. 2867             | 船底座      | 9 21.4        | -58 18        | 13 × 11   | 0.16 × 0.14 | 2600       | 9.7      |
| N. 3132 (八字形)       | 唧筒座      | 10 7.1        | -40 25        | 84 × 53   | 0.53 × 0.33 | 1300       | 8.2      |
| N. 3211             | 船底座      | 10 17.8       | -62 41        | 14        | 0.46        | 6810       | 11.8     |
| N. 3242             | 長蛇座      | 10 24.8       | -18 38        | 40 × 35   | 0.37 × 0.32 | 1890       | 9.0      |
| N. 3587 = M97 (貓頭鷹) | 大熊座      | 11 14.7       | +55 1         | 203 × 199 | 7.34 × 7.20 | 7460       | 12.0     |
|                     | 半人馬座     | 11 27.4       | -52 47        | 45 × 30   |             |            | 11.4     |
| N. 4361             | 烏鴉座      | 12 24.6       | -18 46        | 81        | 1.69        | 4300       | 10.8     |
| I. 3568             | 鹿豹座      | 12 33.7       | +82 34        | 18        | 0.54        | 6200       | 9.3      |
| I. 4406             | 豺狼座      | 14 22.5       | -44 8         | 100 × 37  | 1.90 × 0.70 | 3900       | 10.6     |
| N. 5882             | 豺狼座      | 15 16.9       | -45 38        | 7         | 0.13        | 3710       | 10.5     |
|                     | 矩尺座      | 15 49.3       | -54 25        | 72        |             |            | 8.4      |
| I. 4593             | 巨蛇座      | 16 11.8       | +12 4         | 15 × 11   | 0.24 × 0.17 | 3250       | 10.2     |
| N. 6153             | 天蠍座      | 16 31.4       | -40 14        | 28 × 21   | 0.80 × 0.60 | 5930       | 11.5     |
| N. 6210             | 武仙座      | 16 44.5       | +23 47        | 20 × 13   | 0.25 × 0.16 | 2570       | 9.7      |
| N. 6309             | 蛇夫座      | 17 14.0       | -12 54        | 19 × 10   | 0.57 × 0.30 | 6190       | 11.6     |
| N. 6369             | 蛇夫座      | 17 29.3       | -23 46        | 28        | 3.20        | 23600      | 9.9      |
| N. 6543             | 天龍座      | 17 58.6       | +66 38        | 22        | 0.18        | 1690       | 8.8      |
| N. 6572             | 蛇夫座      | 18 12.1       | + 6 50        | 16 × 13   | 0.19 × 0.16 | 2470       | 9.6      |
| N. 6567             | 人馬座      | 18 13.8       | -19 4         | 11 × 7    | 0.35 × 0.22 | 6500       | 11.7     |
| N. 6629             | 人馬座      | 18 25.7       | -23 12        | 16 × 14   | 0.55 × 0.48 | 7130       | 10.6     |
| N. 6720 = M57 (環狀)  | 天琴座      | 18 53.5       | +33 2         | 83 × 59   | 0.87 × 0.61 | 2150       | 9.3      |
| N. 6741             | 天鷹座      | 19 2.6        | - 0 26        | 9 × 7     | 0.28 × 0.22 | 6510       | 11.7     |
| N. 6818             | 人馬座      | 19 43.9       | -14 8         | 22 × 15   | 0.30 × 0.21 | 2830       | 9.9      |
| N. 6826             | 天鵝座      | 19 44.9       | +50 31        | 27 × 24   | 0.22 × 0.20 | 1690       | 8.8      |
| N. 6853 = M27 (啞鈴)  | 狐狸座      | 19 59.6       | +22 43        | 480 × 240 | 2.26 × 1.13 | 970        | 7.6      |
| N. 6891             | 天鷹座      | 20 15.2       | +12 42        | 15 × 7    | 0.41 × 0.19 | 5670       | 11.4     |
| N. 6905             | 海豚座      | 20 22.4       | +20 6         | 44 × 37   | 1.52 × 1.28 | 7130       | 11.9     |
| N. 7009 (土星星雲)      | 寶瓶座      | 21 4.3        | -11 22        | 44 × 26   | 0.31 × 0.18 | 1430       | 8.4      |
| N. 7027             | 天鵝座      | 21 7.0        | +42 14        | 18 × 11   | 0.31 × 0.19 | 3580       | 10.4     |
| N. 7048             | 天鵝座      | 21 14.2       | +46 16        | 60 × 50   | 1.57 × 1.31 | 5410       | 11.3     |
| N. 7293 (螺旋)        | 寶瓶座      | 22 29.7       | -20 47        | 900 × 700 | 2.53 × 1.97 | 580        | 6.5      |
| I. 1470             | 仙王座      | 23 5.3        | +60 15        | 70 × 45   | 2.31 × 1.49 | 6810       | 8.1      |
| N. 7635             | 仙后座      | 23 20.7       | +61 11        | 205 × 180 | 1.68 × 1.47 | 1690       | 8.5      |
| N. 7662             | 仙女座      | 23 25.9       | +42 32        | 32 × 28   | 0.28 × 0.24 | 1790       | 8.9      |

## 本 星 系 群

位於銀河系近旁距離約 500 萬光年內，彼此以重力互相吸引而繞著共同質心旋轉的星系集團，稱為本星系群。本星系群所含星系數量尚未有定論，本表主要參考 van den Bergh 於 2000 年 5 月發表在 PASP (2000PASP,112,529V)論文，尚待確定是否屬於本星系群者並未列入。表中赤經赤緯座標係 2000 分點，視星等與距離標有「:」表示數據不確定。星系的形狀分類為橢圓(E)，透鏡(SO)；螺旋(S)，棒旋(SB)，與螺旋與棒旋的中間形(SAB)，以及不規則(I)。其中橢圓(E)依其扁平的程度再細分為 0~7；而透鏡(SO)、螺旋(S)、棒旋(SB)、與中間形(SAB)亦依緊密至鬆散的程度細分為 a、b、c、d 四種。此外，m、p 代表特異的性質；在分類最前面的英文小寫字母 d 則代表矮星系 (dwarf galaxies)。

| 星 系 名 稱   | 赤<br>h  | 經<br>m | 赤 緯<br>s | °   | '    | 視星等  | 視直徑<br>' × ' | 形狀        | 距離<br>kpc       |      |
|-----------|---------|--------|----------|-----|------|------|--------------|-----------|-----------------|------|
| WLM       | 0       | 1      | 58       | -15 | 27.7 | 10.6 | 12 × 4       | IB(s)m V  | 950             |      |
| IC 10     | 0       | 20     | 20       | 59  | 18.0 | 11:  | 6.3 × 5.1    | IB(s)m IV | 660:            |      |
| Cetus     | 0       | 26     | 11       | -11 | 2.5  | 14:  |              | dE        | 780             |      |
| NGC 147   | 0       | 33     | 12       | 48  | 30.5 | 9.5  | 13 × 8       | dE5       | 710             |      |
| And III   | 0       | 35     | 29       | 36  | 30.5 | 15:  | 4.5 × 3.0    | dE        | 750             |      |
| NGC 185   | 0       | 38     | 58       | 48  | 20.2 | 9.2  | 12 × 10      | dE3       | 640             |      |
| NGC 205   | M110    | 0      | 40       | 22  | 41   | 41.1 | 8.1          | 22 × 11   | SA0-            | 810  |
| NGC 221   | M32     | 0      | 42       | 42  | 40   | 51.9 | 8.1          | 8.7 × 6.5 | cE2             | 770  |
| NGC 224   | M31     | 0      | 42       | 44  | 41   | 16.1 | 3.4          | 190 × 60  | SA(s)b I-II     | 770  |
| And I     | 0       | 45     | 40       | 38  | 2.2  | 13.6 | 2.5 × 2.5    | E3        | 810:            |      |
| SMC       | 0       | 52     | 44       | -72 | 49.7 | 2.3  | 320 × 185    | IB(s)m V  | 60              |      |
| Sculptor  | 1       | 0      | 9        | -33 | 42.5 | 9:   | 40 × 31      | dE        | 85              |      |
| Pisces    | LGS 3   | 1      | 3        | 54  | 21   | 53.0 | 18:          | 2 × 2     | Im VI?          | 620  |
| IC 1613   |         | 1      | 4        | 46  | 2    | 7.1  | 9.2          | 16 × 15   | IB(s)m V        | 740: |
| And V     |         | 1      | 10       | 17  | 47   | 37.7 | 15           |           | dE              | 810: |
| And II    |         | 1      | 16       | 30  | 33   | 25.2 | 13           | 3.6 × 2.5 | dE              | 680  |
| NGC 598   | M33     | 1      | 33       | 51  | 30   | 39.6 | 5.7          | 71 × 42   | SA(s)cd II-III  | 930  |
| Phoenix   |         | 1      | 51       | 7   | -44  | 26.7 | 12.5:        | 4.9 × 4.1 | IAm V           | 440: |
| Fornax    |         | 2      | 39       | 59  | -34  | 27.0 | 9:           | 17 × 13   | dE0             | 140  |
| LMC       |         | 5      | 23       | 34  | -69  | 45.4 | 0.6          | 645 × 550 | IB(s)m IV       | 50   |
| Carina    |         | 6      | 41       | 37  | -50  | 58.0 | 16?          | 23 × 16   | E3              | 100  |
| Leo A     | DDO 69  | 9      | 59       | 26  | 30   | 44.8 | 12:          | 5.1 × 3.1 | IBm V           | 800  |
| Leo I     |         | 10     | 8        | 27  | 12   | 18.5 | 10:          | 9.8 × 7.4 | dE              | 260  |
| Sextans   |         | 10     | 13       | 3   | -1   | 36.9 | 12:          |           | dE              | 85:  |
| Leo II    | DDO 93  | 11     | 13       | 29  | 22   | 9.3  | 12.0:        | 12 × 11   | dE0             | 210  |
| UMi       |         | 15     | 9        | 11  | 67   | 12.9 | 11:          | 30 × 19   | dE              | 75   |
| Draco     |         | 17     | 20       | 12  | 57   | 54.9 | 10:          | 36 × 25   | dE              | 95   |
| Milky Way |         | 17     | 45       | 40  | -29  | 0.5  |              |           | SB:(rs?)bc: II? |      |
| Sgr I     |         | 18     | 55       | 3   | -30  | 28.7 |              |           | dE?             | 28   |
| SagDIG    |         | 19     | 29       | 59  | -17  | 40.7 | 15:          | 2.9 × 2.1 | IB(s)m: V       | 1200 |
| NGC 6822  |         | 19     | 44       | 56  | -14  | 48.1 | 9:           | 16 × 14   | IB(s)m V        | 500  |
| Aquarius  | DDO 210 | 20     | 46       | 52  | -12  | 50.9 | 13.9:        | 2.2 × 1.1 | IB(s)m V        | 950  |
| Tucana    |         | 22     | 41       | 50  | -64  | 25.2 | 15:          | 2.9 × 1.2 | dE4             | 900  |
| And VII   |         | 23     | 26       | 31  | 50   | 41.5 | 13:          | 2.5 × 2.0 | dE?             | 690: |
| Pegasus   | DDO 216 | 23     | 28       | 35  | 14   | 44.6 | 13:          | 5.0 × 2.7 | Im V            | 760  |
| And VI    |         | 23     | 51       | 46  | 24   | 35.0 | 14:          | 4.0 × 2.0 | dE?             | 790  |