

行 星 表

行星表包含太陽系 8 個主要大行星的赤經、赤緯、距離、光度、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。主要係根據美國海軍天文臺發行的光碟版年鑑 (MICA) 所編算。除數值資料外，並加入各行星於日出、日沒時的方位與仰角位置圖、運行軌跡圖與該行星和地球距離變化圖。

水星、金星與火星因為距離地球較近，在天球上位置的變化較大，所以在表中列出每月 1 日、6 日、11 日、16 日、21 日、26 日各項資料。其餘各星因為與地球的距離較遠，所以在天球上的位置變化也小，因此列出每月 1 日、11 日、21 日各項資料。

火星、木星與土星這三顆行星，使用小口徑的望遠鏡就能清楚觀看其表面特徵，是業餘觀測者的理想目標，因此特別加列這 3 顆行星的表面座標。

2006 年 8 月國際天文聯合會 (IAU) 第 26 屆大會決議，將冥王星、穀神星及鬩神星 (Eris) 重新歸類為矮行星 (dwarf planets)；迄今又再加入鳥神星 (Makemake) 及妊神星 (Haumea)。

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。座標基準採用 2013.5 年的分點位置為準。

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、光度

光度係以總光度來表示，即以裸眼直接觀測所得的光度。當使用望遠鏡觀測時，行星若可看出大小而不再呈點光源，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。因地球實際自轉時間約為 23 時 56 分 56 秒，因此造成行星有可能一天之中有兩次升起或過中天或沉沒，遇此現象則兩次時間均予以列出，但其他欄位資料則以「---」表示。

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。

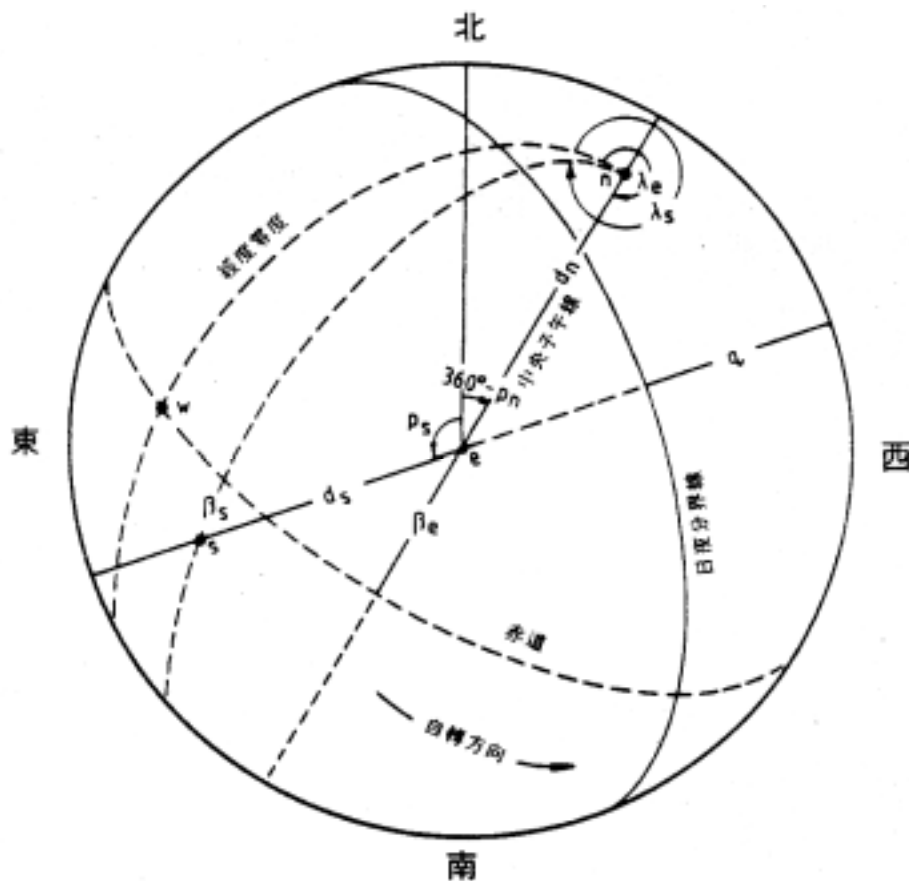
日地離角則是由行星觀察太陽與地球間所夾的角度。

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。

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

東經 120° 平太陽時 8 時，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 | 18 | 2 | 48.67 | -24 | 15 | 2.52 | 1.400101 | 11.64 | 21.8 |
| | 6 | 18 | 37 | 3.13 | -24 | 27 | 29.17 | 1.423071 | 11.83 | 16.0 |
| | 11 | 19 | 11 | 54.90 | -24 | 5 | 48.83 | 1.432528 | 11.91 | 10.4 |
| | 16 | 19 | 47 | 10.27 | -23 | 8 | 4.33 | 1.428072 | 11.88 | 5.4 |
| | 21 | 20 | 22 | 35.02 | -21 | 32 | 47.69 | 1.408535 | 11.71 | 6.2 |
| | 26 | 20 | 57 | 52.62 | -19 | 19 | 15.38 | 1.371806 | 11.41 | 13.8 |
| 2 | 1 | 21 | 39 | 28.31 | -15 | 49 | 47.29 | 1.300535 | 10.82 | 26.9 |
| | 6 | 22 | 12 | 31.80 | -12 | 19 | 50.92 | 1.214064 | 10.10 | 41.8 |
| | 11 | 22 | 42 | 16.52 | -8 | 32 | 8.81 | 1.100866 | 9.16 | 61.1 |
| | 16 | 23 | 5 | 27.85 | -4 | 55 | 33.35 | 0.966254 | 8.04 | 84.9 |
| | 21 | 23 | 17 | 40.95 | -2 | 14 | 47.02 | 0.827788 | 6.89 | 12.2 |
| | 26 | 23 | 15 | 42.28 | -1 | 15 | 49.25 | 0.711789 | 5.92 | 40.7 |
| 3 | 1 | 23 | 8 | 12.25 | -1 | 38 | 19.30 | 0.662835 | 5.51 | 57.2 |
| | 6 | 22 | 50 | 24.66 | -3 | 31 | 53.15 | 0.623186 | 5.18 | 67.6 |
| | 11 | 22 | 34 | 50.51 | -5 | 58 | 39.35 | 0.631622 | 5.25 | 46.9 |
| | 16 | 22 | 28 | 3.36 | -7 | 55 | 0.72 | 0.673680 | 5.60 | 27.9 |
| | 21 | 22 | 30 | 59.13 | -8 | 54 | 57.75 | 0.734518 | 6.11 | 12.7 |
| | 26 | 22 | 41 | 48.07 | -8 | 57 | 45.67 | 0.804065 | 6.69 | 0.7 |
| 4 | 1 | 23 | 2 | 12.38 | -7 | 55 | 22.80 | 0.891330 | 7.41 | 89.1 |
| | 6 | 23 | 23 | 33.22 | -6 | 16 | 54.19 | 0.964056 | 8.02 | 80.8 |
| | 11 | 23 | 47 | 48.43 | -4 | 2 | 17.93 | 1.035357 | 8.61 | 73.0 |
| | 16 | 0 | 14 | 28.75 | -1 | 16 | 8.69 | 1.104344 | 9.18 | 65.3 |
| | 21 | 0 | 43 | 26.71 | +1 | 57 | 32.92 | 1.169870 | 9.73 | 57.0 |
| | 26 | 1 | 14 | 52.51 | +5 | 34 | 36.13 | 1.229844 | 10.23 | 47.4 |
| 5 | 1 | 1 | 49 | 10.03 | +9 | 29 | 28.62 | 1.280396 | 10.65 | 35.7 |
| | 6 | 2 | 26 | 47.41 | +13 | 33 | 10.95 | 1.315020 | 10.94 | 21.2 |
| | 11 | 3 | 7 | 55.28 | +17 | 30 | 30.11 | 1.324725 | 11.02 | 3.4 |
| | 16 | 3 | 51 | 49.23 | +20 | 59 | 4.65 | 1.301285 | 10.82 | 16.9 |
| | 21 | 4 | 36 | 27.44 | +23 | 35 | 39.09 | 1.243644 | 10.34 | 37.5 |
| | 26 | 5 | 19 | 11.22 | +25 | 7 | 41.17 | 1.160445 | 9.65 | 56.2 |
| 6 | 1 | 6 | 5 | 0.10 | +25 | 36 | 56.39 | 1.044474 | 8.69 | 75.0 |
| | 6 | 6 | 37 | 12.68 | +25 | 7 | 22.61 | 0.945896 | 7.87 | 88.2 |
| | 11 | 7 | 3 | 15.14 | +24 | 3 | 37.87 | 0.851862 | 7.09 | 0.1 |
| | 16 | 7 | 22 | 32.83 | +22 | 39 | 12.05 | 0.765880 | 6.37 | 11.5 |
| | 21 | 7 | 34 | 28.13 | +21 | 6 | 54.74 | 0.690749 | 5.75 | 23.2 |
| | 26 | 7 | 38 | 27.37 | +19 | 39 | 14.54 | 0.629650 | 5.24 | 35.8 |

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 |
| 1 | 1 | 05:59 | 117 | 11:14 | 41S | 16:29 | 243 | 4.81 | 4.81 | 0.96 | -0.6 |
| | 6 | 06:14 | 117 | 11:28 | 40S | 16:43 | 243 | 4.73 | 4.73 | 0.98 | -0.8 |
| | 11 | 06:29 | 117 | 11:44 | 41S | 16:59 | 244 | 4.70 | 4.70 | 0.99 | -1.0 |
| | 16 | 06:42 | 115 | 11:59 | 42S | 17:17 | 245 | 4.71 | 4.71 | 1.00 | -1.3 |
| | 21 | 06:54 | 114 | 12:15 | 43S | 17:36 | 247 | 4.78 | 4.78 | 1.00 | -1.4 |
| | 26 | 07:05 | 111 | 12:31 | 46S | 17:57 | 249 | 4.90 | 4.90 | 0.99 | -1.3 |
| 2 | 1 | 07:16 | 107 | 12:49 | 49S | 18:22 | 253 | 5.17 | 5.17 | 0.95 | -1.1 |
| | 6 | 07:22 | 103 | 13:02 | 53S | 18:42 | 257 | 5.54 | 5.54 | 0.87 | -1.1 |
| | 11 | 07:25 | 99 | 13:12 | 57S | 18:59 | 261 | 6.11 | 6.11 | 0.74 | -1.0 |
| | 16 | 07:22 | 95 | 13:15 | 60S | 19:08 | 265 | 6.96 | 6.96 | 0.54 | -0.7 |
| | 21 | 07:09 | 92 | 13:07 | 63S | 19:05 | 268 | 8.13 | 8.13 | 0.31 | 0.2 |
| | 26 | 06:46 | 91 | 12:44 | 64S | 18:43 | 269 | 9.45 | 9.45 | 0.11 | 2.0 |
| 3 | 1 | 06:27 | 92 | 12:25 | 63S | 18:22 | 268 | 10.15 | 10.15 | 0.04 | 3.7 |
| | 6 | 05:53 | 94 | 11:48 | 61S | 17:41 | 266 | 10.80 | 10.80 | 0.01 | 5.1 |
| | 11 | 05:23 | 96 | 11:13 | 59S | 17:02 | 263 | 10.65 | 10.65 | 0.08 | 2.8 |
| | 16 | 05:00 | 98 | 10:46 | 57S | 16:33 | 261 | 9.99 | 9.99 | 0.19 | 1.4 |
| | 21 | 04:45 | 100 | 10:30 | 56S | 16:15 | 260 | 9.16 | 9.16 | 0.31 | 0.7 |
| | 26 | 04:36 | 100 | 10:21 | 56S | 16:07 | 260 | 8.37 | 8.37 | 0.41 | 0.4 |
| 4 | 1 | 04:31 | 99 | 10:18 | 57S | 16:06 | 262 | 7.55 | 7.55 | 0.51 | 0.2 |
| | 6 | 04:29 | 97 | 10:20 | 59S | 16:11 | 263 | 6.98 | 6.98 | 0.58 | 0.1 |
| | 11 | 04:29 | 94 | 10:24 | 61S | 16:20 | 266 | 6.50 | 6.50 | 0.65 | 0.0 |
| | 16 | 04:31 | 91 | 10:31 | 64S | 16:32 | 269 | 6.09 | 6.09 | 0.71 | -0.2 |
| | 21 | 04:34 | 88 | 10:41 | 67S | 16:48 | 273 | 5.75 | 5.75 | 0.77 | -0.3 |
| | 26 | 04:39 | 84 | 10:52 | 71S | 17:07 | 277 | 5.47 | 5.47 | 0.84 | -0.6 |
| 5 | 1 | 04:46 | 79 | 11:07 | 75S | 17:29 | 281 | 5.25 | 5.25 | 0.91 | -1.0 |
| | 6 | 04:56 | 75 | 11:25 | 79S | 17:55 | 286 | 5.12 | 5.12 | 0.97 | -1.5 |
| | 11 | 05:09 | 70 | 11:47 | 83S | 18:25 | 290 | 5.08 | 5.08 | 1.00 | -2.3 |
| | 16 | 05:26 | 66 | 12:11 | 86S | 18:57 | 294 | 5.17 | 5.17 | 0.98 | -1.9 |
| | 21 | 05:45 | 64 | 12:36 | 89S | 19:28 | 297 | 5.41 | 5.41 | 0.90 | -1.3 |
| | 26 | 06:04 | 62 | 12:59 | 90N | 19:54 | 298 | 5.80 | 5.80 | 0.78 | -0.9 |
| 6 | 1 | 06:25 | 61 | 13:21 | 89N | 20:17 | 299 | 6.44 | 6.44 | 0.63 | -0.4 |
| | 6 | 06:39 | 62 | 13:33 | 90S | 20:27 | 298 | 7.11 | 7.11 | 0.52 | -0.1 |
| | 11 | 06:48 | 63 | 13:39 | 89S | 20:30 | 297 | 7.90 | 7.90 | 0.41 | 0.3 |
| | 16 | 06:51 | 65 | 13:39 | 87S | 20:26 | 295 | 8.78 | 8.78 | 0.32 | 0.7 |
| | 21 | 06:47 | 66 | 13:30 | 86S | 20:14 | 294 | 9.74 | 9.74 | 0.23 | 1.3 |
| | 26 | 06:34 | 68 | 13:14 | 85S | 19:54 | 292 | 10.68 | 10.68 | 0.14 | 2.1 |

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 | 7 | 34 | 31.11 | +18 | 28 | 10.78 | 0.586724 | 4.88 | 49.6 |
| | 6 | 7 | 24 | 7.93 | +17 | 44 | 1.57 | 0.566945 | 4.72 | 63.7 |
| | 11 | 7 | 10 | 56.64 | +17 | 32 | 55.85 | 0.574996 | 4.78 | 68.1 |
| | 16 | 7 | 0 | 7.45 | +17 | 54 | 19.66 | 0.613480 | 5.10 | 54.5 |
| | 21 | 6 | 56 | 20.87 | +18 | 40 | 13.15 | 0.681887 | 5.67 | 37.4 |
| | 26 | 7 | 2 | 19.00 | +19 | 36 | 24.16 | 0.776888 | 6.46 | 19.5 |
| 8 | 1 | 7 | 23 | 21.56 | +20 | 30 | 37.40 | 0.917445 | 7.63 | 96.6 |
| | 6 | 7 | 51 | 40.53 | +20 | 38 | 43.81 | 1.044999 | 8.69 | 75.7 |
| | 11 | 8 | 27 | 35.69 | +19 | 50 | 49.42 | 1.166035 | 9.70 | 53.5 |
| | 16 | 9 | 7 | 36.95 | +17 | 57 | 26.69 | 1.264252 | 10.51 | 31.9 |
| | 21 | 9 | 48 | 0.55 | +15 | 6 | 47.58 | 1.330425 | 11.06 | 13.5 |
| | 26 | 10 | 26 | 22.10 | +11 | 37 | 56.28 | 1.365384 | 11.36 | 5.9 |
| 9 | 1 | 11 | 8 | 39.10 | +7 | 2 | 45.22 | 1.374738 | 11.43 | 17.9 |
| | 6 | 11 | 40 | 57.08 | +3 | 8 | 2.55 | 1.362515 | 11.33 | 27.0 |
| | 11 | 12 | 11 | 3.36 | -0 | 43 | 0.12 | 1.336632 | 11.12 | 34.7 |
| | 16 | 12 | 39 | 23.95 | -4 | 25 | 15.86 | 1.299584 | 10.81 | 41.6 |
| | 21 | 13 | 6 | 17.86 | -7 | 55 | 0.25 | 1.252685 | 10.42 | 48.1 |
| | 26 | 13 | 31 | 54.33 | -11 | 8 | 58.38 | 1.196451 | 9.95 | 54.8 |
| 10 | 1 | 13 | 56 | 8.51 | -14 | 3 | 40.41 | 1.130941 | 9.41 | 62.0 |
| | 6 | 14 | 18 | 34.33 | -16 | 34 | 38.02 | 1.056134 | 8.78 | 70.4 |
| | 11 | 14 | 38 | 11.69 | -18 | 35 | 23.50 | 0.972495 | 8.09 | 80.7 |
| | 16 | 14 | 53 | 5.18 | -19 | 55 | 38.57 | 0.882071 | 7.34 | 93.9 |
| | 21 | 15 | 0 | 1.06 | -20 | 18 | 2.39 | 0.790741 | 6.58 | 11.5 |
| | 26 | 14 | 54 | 52.34 | -19 | 15 | 51.56 | 0.712322 | 5.92 | 35.4 |
| 11 | 1 | 14 | 31 | 58.37 | -15 | 47 | 29.47 | 0.671648 | 5.59 | 73.5 |
| | 6 | 14 | 11 | 10.16 | -12 | 18 | 11.69 | 0.712196 | 5.92 | 49.8 |
| | 11 | 14 | 3 | 58.33 | -10 | 28 | 41.16 | 0.814621 | 6.77 | 15.9 |
| | 16 | 14 | 12 | 49.50 | -10 | 51 | 1.12 | 0.944178 | 7.85 | 88.2 |
| | 21 | 14 | 32 | 30.15 | -12 | 38 | 11.54 | 1.070414 | 8.90 | 67.1 |
| | 26 | 14 | 58 | 6.14 | -15 | 0 | 56.43 | 1.179177 | 9.81 | 51.3 |
| 12 | 1 | 15 | 26 | 52.54 | -17 | 29 | 3.42 | 1.267138 | 10.54 | 39.4 |
| | 6 | 15 | 57 | 31.69 | -19 | 46 | 19.76 | 1.335279 | 11.10 | 30.1 |
| | 11 | 16 | 29 | 28.89 | -21 | 43 | 53.39 | 1.385623 | 11.52 | 22.4 |
| | 16 | 17 | 2 | 28.42 | -23 | 16 | 22.02 | 1.420016 | 11.81 | 15.9 |
| | 21 | 17 | 36 | 21.26 | -24 | 20 | 0.13 | 1.439722 | 11.97 | 10.1 |
| | 26 | 18 | 10 | 59.00 | -24 | 51 | 46.62 | 1.445343 | 12.02 | 5.0 |
| | 31 | 18 | 46 | 11.24 | -24 | 49 | 6.02 | 1.436793 | 11.95 | 4.5 |

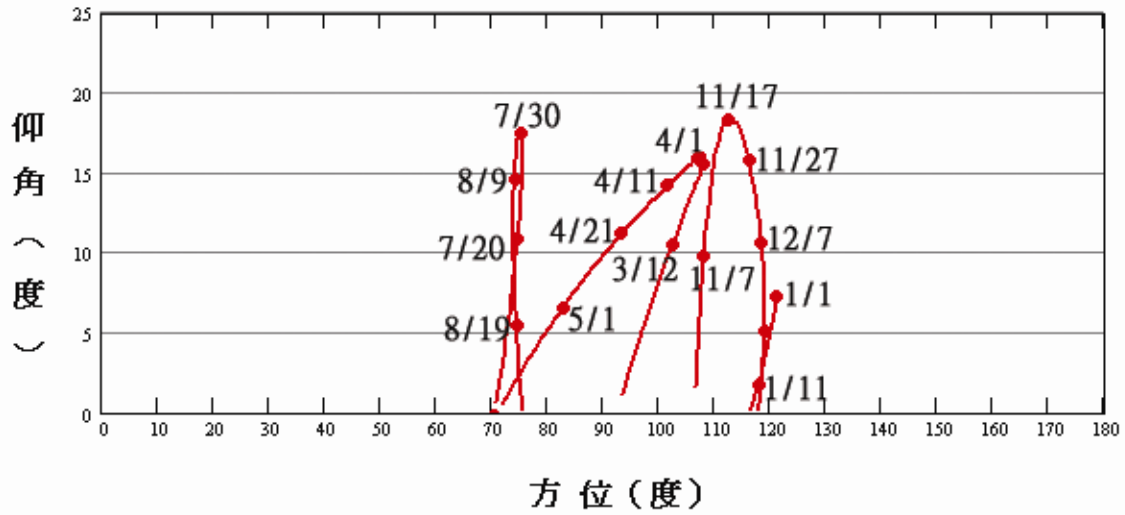
水星出沒時間表

東經：121.52°，北緯：25.10°

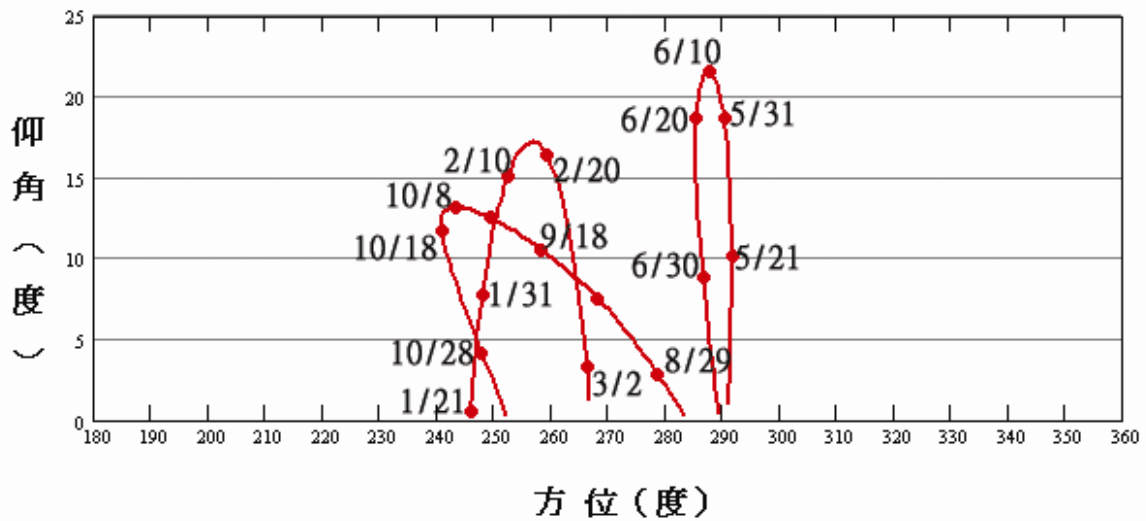
東經 120° 平太陽時

| 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 | ° | " | " | | |
| 7 | 1 | 06:13 | 69 | 12:50 | 83S | 19:27 | 291 | 11.47 | 11.47 | 0.07 | 3.2 |
| | 6 | 05:45 | 70 | 12:20 | 83S | 18:56 | 290 | 11.87 | 11.87 | 0.02 | 4.8 |
| | 11 | 05:13 | 70 | 11:48 | 82S | 18:23 | 290 | 11.70 | 11.70 | 0.01 | 5.4 |
| | 16 | 04:41 | 70 | 11:17 | 83S | 17:53 | 290 | 10.97 | 10.97 | 0.05 | 3.7 |
| | 21 | 04:16 | 69 | 10:54 | 84S | 17:32 | 291 | 9.87 | 9.87 | 0.13 | 2.1 |
| | 26 | 04:00 | 68 | 10:41 | 85S | 17:21 | 292 | 8.66 | 8.66 | 0.25 | 0.9 |
| 8 | 1 | 03:55 | 67 | 10:38 | 85S | 17:22 | 293 | 7.33 | 7.33 | 0.44 | -0.1 |
| | 6 | 04:03 | 67 | 10:47 | 86S | 17:31 | 293 | 6.44 | 6.44 | 0.62 | -0.7 |
| | 11 | 04:21 | 68 | 11:04 | 85S | 17:46 | 292 | 5.77 | 5.77 | 0.80 | -1.1 |
| | 16 | 04:45 | 70 | 11:24 | 83S | 18:02 | 290 | 5.32 | 5.32 | 0.92 | -1.4 |
| | 21 | 05:12 | 73 | 11:45 | 80S | 18:17 | 287 | 5.06 | 5.06 | 0.99 | -1.8 |
| | 26 | 05:37 | 77 | 12:03 | 76S | 18:28 | 283 | 4.93 | 4.93 | 1.00 | -1.9 |
| 9 | 1 | 06:05 | 82 | 12:22 | 72S | 18:38 | 278 | 4.89 | 4.89 | 0.98 | -1.2 |
| | 6 | 06:25 | 86 | 12:34 | 68S | 18:43 | 273 | 4.94 | 4.94 | 0.95 | -0.8 |
| | 11 | 06:43 | 90 | 12:45 | 64S | 18:46 | 269 | 5.03 | 5.03 | 0.91 | -0.5 |
| | 16 | 06:59 | 95 | 12:53 | 60S | 18:47 | 265 | 5.18 | 5.18 | 0.87 | -0.3 |
| | 21 | 07:12 | 98 | 13:00 | 57S | 18:48 | 261 | 5.37 | 5.37 | 0.83 | -0.2 |
| | 26 | 07:25 | 102 | 13:06 | 54S | 18:47 | 258 | 5.62 | 5.62 | 0.79 | -0.1 |
| 10 | 1 | 07:35 | 105 | 13:11 | 51S | 18:46 | 254 | 5.95 | 5.95 | 0.74 | -0.1 |
| | 6 | 07:43 | 108 | 13:13 | 48S | 18:44 | 252 | 6.37 | 6.37 | 0.67 | -0.1 |
| | 11 | 07:47 | 110 | 13:13 | 46S | 18:39 | 250 | 6.92 | 6.92 | 0.58 | -0.1 |
| | 16 | 07:45 | 112 | 13:08 | 45S | 18:31 | 248 | 7.63 | 7.63 | 0.47 | 0.1 |
| | 21 | 07:33 | 112 | 12:55 | 45S | 18:17 | 248 | 8.51 | 8.51 | 0.32 | 0.5 |
| | 26 | 07:06 | 111 | 12:29 | 46S | 17:53 | 249 | 9.44 | 9.44 | 0.14 | 1.7 |
| 11 | 1 | 06:13 | 107 | 11:43 | 49S | 17:14 | 253 | 10.02 | 10.02 | 0.00 | ---- |
| | 6 | 05:25 | 103 | 11:03 | 53S | 16:41 | 257 | 9.45 | 9.45 | 0.07 | 2.8 |
| | 11 | 04:55 | 101 | 10:36 | 54S | 16:18 | 259 | 8.26 | 8.26 | 0.28 | 0.3 |
| | 16 | 04:44 | 102 | 10:26 | 54S | 16:07 | 258 | 7.13 | 7.13 | 0.52 | -0.5 |
| | 21 | 04:47 | 104 | 10:26 | 52S | 16:04 | 256 | 6.29 | 6.29 | 0.70 | -0.7 |
| | 26 | 04:58 | 106 | 10:32 | 50S | 16:06 | 253 | 5.71 | 5.71 | 0.81 | -0.7 |
| 12 | 1 | 05:12 | 109 | 10:41 | 47S | 16:10 | 251 | 5.31 | 5.31 | 0.89 | -0.6 |
| | 6 | 05:27 | 112 | 10:52 | 45S | 16:16 | 248 | 5.04 | 5.04 | 0.93 | -0.7 |
| | 11 | 05:44 | 114 | 11:04 | 43S | 16:24 | 246 | 4.86 | 4.86 | 0.96 | -0.7 |
| | 16 | 06:01 | 116 | 11:18 | 42S | 16:34 | 244 | 4.74 | 4.74 | 0.98 | -0.8 |
| | 21 | 06:17 | 117 | 11:32 | 41S | 16:46 | 243 | 4.67 | 4.67 | 0.99 | -1.0 |
| | 26 | 06:33 | 117 | 11:47 | 40S | 17:00 | 243 | 4.65 | 4.65 | 1.00 | -1.2 |
| | 31 | 06:49 | 117 | 12:02 | 40S | 17:16 | 243 | 4.68 | 4.68 | 1.00 | -1.3 |

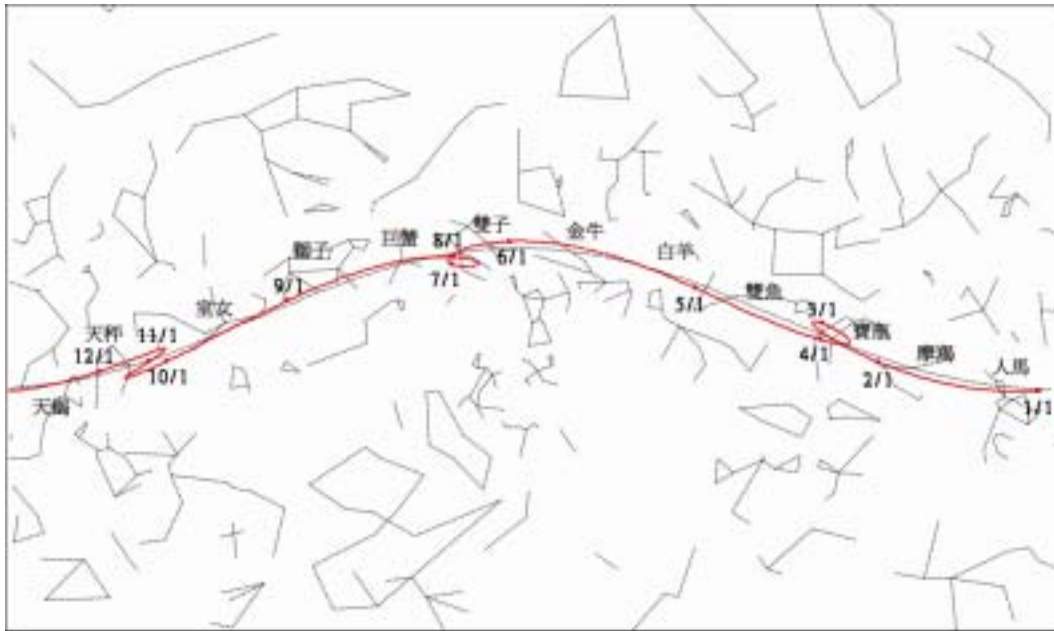
日出時水星方位與仰角



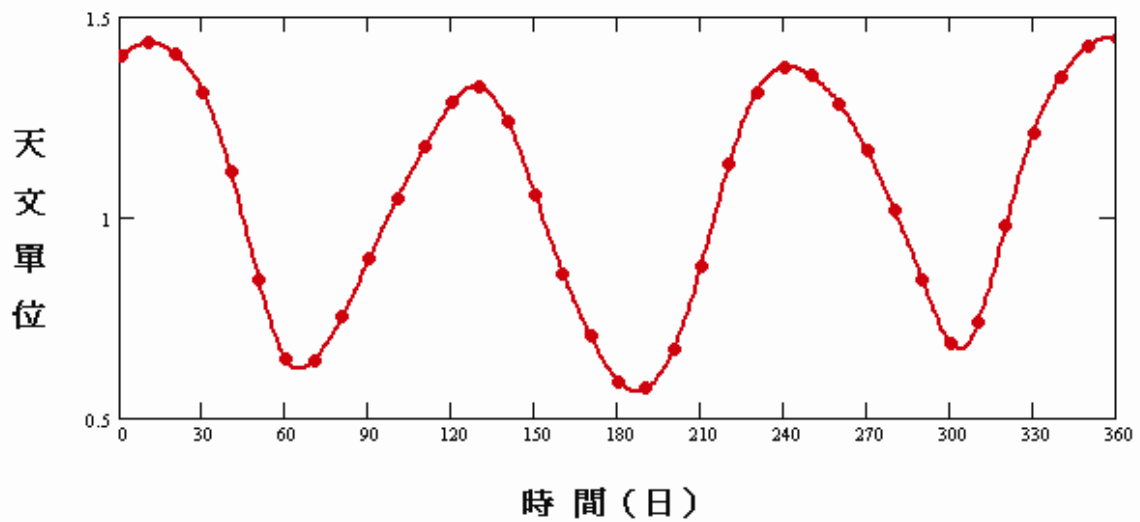
日沒時水星方位與仰角



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 | 17 | 15 | 41.42 | -22 | 20 | 44.82 | 1.550856 | 12.90 | 29.1 |
| | 6 | 17 | 42 | 44.13 | -22 | 53 | 18.55 | 1.568756 | 13.05 | 27.4 |
| | 11 | 18 | 9 | 57.46 | -23 | 8 | 31.73 | 1.585692 | 13.19 | 25.7 |
| | 16 | 18 | 37 | 13.77 | -23 | 6 | 2.68 | 1.601651 | 13.32 | 24.0 |
| | 21 | 19 | 4 | 25.32 | -22 | 45 | 49.60 | 1.616659 | 13.44 | 22.3 |
| | 26 | 19 | 31 | 25.08 | -22 | 8 | 11.48 | 1.630743 | 13.56 | 20.7 |
| 2 | 1 | 20 | 3 | 24.54 | -21 | 0 | 56.08 | 1.646436 | 13.69 | 18.7 |
| | 6 | 20 | 29 | 38.31 | -19 | 47 | 33.13 | 1.658484 | 13.79 | 17.1 |
| | 11 | 20 | 55 | 24.90 | -18 | 19 | 40.41 | 1.669553 | 13.88 | 15.4 |
| | 16 | 21 | 20 | 42.17 | -16 | 38 | 39.90 | 1.679629 | 13.97 | 13.8 |
| | 21 | 21 | 45 | 29.81 | -14 | 45 | 59.61 | 1.688723 | 14.04 | 12.2 |
| | 26 | 22 | 9 | 48.93 | -12 | 43 | 11.17 | 1.696844 | 14.11 | 10.6 |
| 3 | 1 | 22 | 24 | 11.70 | -11 | 25 | 16.60 | 1.701247 | 14.15 | 9.6 |
| | 6 | 22 | 47 | 50.87 | -9 | 9 | 27.31 | 1.707779 | 14.20 | 8.0 |
| | 11 | 23 | 11 | 9.83 | -6 | 47 | 32.14 | 1.713252 | 14.25 | 6.4 |
| | 16 | 23 | 34 | 12.71 | -4 | 21 | 5.51 | 1.717619 | 14.28 | 4.8 |
| | 21 | 23 | 57 | 4.19 | -1 | 51 | 40.12 | 1.720865 | 14.31 | 3.3 |
| | 26 | 0 | 19 | 49.25 | +0 | 39 | 12.70 | 1.722984 | 14.33 | 2.1 |
| 4 | 1 | 0 | 47 | 6.44 | +3 | 40 | 5.86 | 1.724021 | 14.34 | 2.1 |
| | 6 | 1 | 9 | 56.46 | +6 | 8 | 56.89 | 1.723579 | 14.33 | 3.3 |
| | 11 | 1 | 32 | 57.00 | +8 | 34 | 27.08 | 1.721878 | 14.32 | 4.9 |
| | 16 | 1 | 56 | 12.70 | +10 | 55 | 4.21 | 1.718873 | 14.30 | 6.6 |
| | 21 | 2 | 19 | 47.59 | +13 | 9 | 15.25 | 1.714545 | 14.26 | 8.4 |
| | 26 | 2 | 43 | 45.25 | +15 | 15 | 26.95 | 1.708892 | 14.21 | 10.2 |
| 5 | 1 | 3 | 8 | 8.71 | +17 | 12 | 7.35 | 1.701908 | 14.15 | 12.0 |
| | 6 | 3 | 32 | 59.79 | +18 | 57 | 44.60 | 1.693552 | 14.09 | 13.9 |
| | 11 | 3 | 58 | 18.88 | +20 | 30 | 48.85 | 1.683774 | 14.00 | 15.8 |
| | 16 | 4 | 24 | 4.64 | +21 | 49 | 56.00 | 1.672547 | 13.91 | 17.7 |
| | 21 | 4 | 50 | 14.04 | +22 | 53 | 49.68 | 1.659875 | 13.81 | 19.7 |
| | 26 | 5 | 16 | 42.77 | +23 | 41 | 25.00 | 1.645783 | 13.69 | 21.7 |
| 6 | 1 | 5 | 48 | 46.87 | +24 | 15 | 50.58 | 1.627033 | 13.53 | 24.0 |
| | 6 | 6 | 15 | 37.08 | +24 | 24 | 59.92 | 1.609864 | 13.39 | 26.0 |
| | 11 | 6 | 42 | 25.35 | +24 | 16 | 11.69 | 1.591280 | 13.23 | 28.1 |
| | 16 | 7 | 9 | 3.75 | +23 | 49 | 35.68 | 1.571297 | 13.07 | 30.1 |
| | 21 | 7 | 35 | 24.94 | +23 | 5 | 40.50 | 1.549960 | 12.89 | 32.1 |
| | 26 | 8 | 1 | 22.85 | +22 | 5 | 12.26 | 1.527339 | 12.70 | 34.2 |

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 | ° | " | " | | |
| 1 | 1 | 05:08 | 115 | 10:27 | 43S | 15:45 | 245 | 10.76 | 10.76 | 0.94 | -3.9 |
| | 6 | 05:16 | 115 | 10:34 | 42S | 15:51 | 245 | 10.64 | 10.64 | 0.94 | -3.9 |
| | 11 | 05:24 | 115 | 10:41 | 42S | 15:58 | 245 | 10.52 | 10.52 | 0.95 | -3.9 |
| | 16 | 05:32 | 115 | 10:49 | 42S | 16:06 | 245 | 10.42 | 10.42 | 0.96 | -3.9 |
| | 21 | 05:39 | 115 | 10:56 | 42S | 16:14 | 245 | 10.32 | 10.32 | 0.96 | -3.9 |
| | 26 | 05:45 | 114 | 11:04 | 43S | 16:23 | 246 | 10.23 | 10.23 | 0.97 | -3.9 |
| 2 | 1 | 05:51 | 113 | 11:12 | 44S | 16:34 | 247 | 10.14 | 10.14 | 0.97 | -3.9 |
| | 6 | 05:54 | 112 | 11:19 | 45S | 16:43 | 248 | 10.06 | 10.06 | 0.98 | -3.9 |
| | 11 | 05:57 | 110 | 11:25 | 47S | 16:52 | 250 | 10.00 | 10.00 | 0.98 | -3.9 |
| | 16 | 06:00 | 108 | 11:30 | 48S | 17:01 | 252 | 9.94 | 9.94 | 0.99 | -3.9 |
| | 21 | 06:01 | 106 | 11:35 | 50S | 17:10 | 254 | 9.88 | 9.88 | 0.99 | -3.9 |
| | 26 | 06:01 | 104 | 11:40 | 52S | 17:19 | 256 | 9.83 | 9.83 | 0.99 | -3.9 |
| 3 | 1 | 06:01 | 102 | 11:42 | 54S | 17:24 | 258 | 9.81 | 9.81 | 0.99 | -3.9 |
| | 6 | 06:01 | 100 | 11:46 | 56S | 17:32 | 260 | 9.77 | 9.77 | 1.00 | -3.9 |
| | 11 | 06:00 | 97 | 11:50 | 58S | 17:40 | 263 | 9.74 | 9.74 | 1.00 | -3.9 |
| | 16 | 05:59 | 95 | 11:53 | 61S | 17:48 | 266 | 9.72 | 9.72 | 1.00 | -3.9 |
| | 21 | 05:57 | 92 | 11:56 | 63S | 17:56 | 268 | 9.70 | 9.70 | 1.00 | -3.9 |
| | 26 | 05:56 | 89 | 11:59 | 66S | 18:04 | 271 | 9.69 | 9.69 | 1.00 | ---- |
| 4 | 1 | 05:54 | 86 | 12:03 | 69S | 18:13 | 275 | 9.68 | 9.68 | 1.00 | ---- |
| | 6 | 05:52 | 83 | 12:06 | 71S | 18:21 | 277 | 9.68 | 9.68 | 1.00 | -4.0 |
| | 11 | 05:51 | 80 | 12:09 | 74S | 18:29 | 280 | 9.69 | 9.69 | 1.00 | -3.9 |
| | 16 | 05:50 | 78 | 12:13 | 76S | 18:37 | 283 | 9.71 | 9.71 | 1.00 | -3.9 |
| | 21 | 05:49 | 75 | 12:17 | 78S | 18:45 | 285 | 9.73 | 9.73 | 1.00 | -3.9 |
| | 26 | 05:49 | 73 | 12:21 | 80S | 18:54 | 287 | 9.77 | 9.77 | 0.99 | -3.9 |
| 5 | 1 | 05:50 | 71 | 12:26 | 82S | 19:03 | 290 | 9.81 | 9.81 | 0.99 | -3.9 |
| | 6 | 05:51 | 69 | 12:31 | 84S | 19:11 | 291 | 9.85 | 9.85 | 0.99 | -3.9 |
| | 11 | 05:53 | 67 | 12:37 | 85S | 19:20 | 293 | 9.91 | 9.91 | 0.98 | -3.9 |
| | 16 | 05:56 | 65 | 12:43 | 87S | 19:29 | 295 | 9.98 | 9.98 | 0.98 | -3.9 |
| | 21 | 06:00 | 64 | 12:49 | 88S | 19:38 | 296 | 10.05 | 10.05 | 0.97 | -3.9 |
| | 26 | 06:05 | 63 | 12:56 | 89S | 19:47 | 297 | 10.14 | 10.14 | 0.97 | -3.9 |
| 6 | 1 | 06:12 | 63 | 13:04 | 89S | 19:56 | 297 | 10.26 | 10.26 | 0.96 | -3.8 |
| | 6 | 06:19 | 63 | 13:12 | 89S | 20:04 | 297 | 10.37 | 10.37 | 0.95 | -3.8 |
| | 11 | 06:27 | 63 | 13:19 | 89S | 20:11 | 297 | 10.49 | 10.49 | 0.94 | -3.8 |
| | 16 | 06:35 | 63 | 13:26 | 89S | 20:16 | 297 | 10.62 | 10.62 | 0.93 | -3.8 |
| | 21 | 06:43 | 64 | 13:32 | 88S | 20:21 | 296 | 10.77 | 10.77 | 0.92 | -3.8 |
| | 26 | 06:52 | 65 | 13:38 | 87S | 20:25 | 295 | 10.93 | 10.93 | 0.91 | -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 | ° |
| 7 | 1 | 8 | 26 | 52.89 | +20 | 49 | 10.66 | 1.503490 | 12.50 | 36.2 |
| | 6 | 8 | 51 | 52.12 | +19 | 18 | 46.97 | 1.478437 | 12.30 | 38.3 |
| | 11 | 9 | 16 | 18.76 | +17 | 35 | 22.72 | 1.452203 | 12.08 | 40.3 |
| | 16 | 9 | 40 | 12.35 | +15 | 40 | 25.12 | 1.424833 | 11.85 | 42.4 |
| | 21 | 10 | 3 | 33.83 | +13 | 35 | 23.93 | 1.396396 | 11.61 | 44.4 |
| | 26 | 10 | 26 | 25.35 | +11 | 21 | 49.36 | 1.366987 | 11.37 | 46.5 |
| 8 | 1 | 10 | 53 | 16.45 | +8 | 32 | 17.49 | 1.330509 | 11.07 | 49.0 |
| | 6 | 11 | 15 | 14.86 | +6 | 5 | 1.57 | 1.299166 | 10.81 | 51.0 |
| | 11 | 11 | 36 | 55.73 | +3 | 33 | 52.35 | 1.267001 | 10.54 | 53.1 |
| | 16 | 11 | 58 | 23.41 | +1 | 0 | 15.97 | 1.234062 | 10.26 | 55.1 |
| | 21 | 12 | 19 | 42.32 | -1 | 34 | 22.72 | 1.200426 | 9.98 | 57.2 |
| | 26 | 12 | 40 | 57.19 | -4 | 8 | 41.37 | 1.166184 | 9.70 | 59.2 |
| 9 | 1 | 13 | 6 | 28.71 | -7 | 11 | 32.20 | 1.124366 | 9.35 | 61.7 |
| | 6 | 13 | 27 | 51.58 | -9 | 40 | 21.60 | 1.088942 | 9.06 | 63.8 |
| | 11 | 13 | 49 | 24.50 | -12 | 4 | 28.02 | 1.053018 | 8.76 | 65.9 |
| | 16 | 14 | 11 | 10.36 | -14 | 22 | 26.85 | 1.016636 | 8.46 | 68.1 |
| | 21 | 14 | 33 | 11.26 | -16 | 32 | 53.32 | 0.979867 | 8.15 | 70.2 |
| | 26 | 14 | 55 | 28.98 | -18 | 34 | 25.66 | 0.942782 | 7.84 | 72.5 |
| 10 | 1 | 15 | 18 | 4.12 | -20 | 25 | 44.09 | 0.905419 | 7.53 | 74.7 |
| | 6 | 15 | 40 | 55.61 | -22 | 5 | 31.19 | 0.867795 | 7.22 | 77.0 |
| | 11 | 16 | 4 | 0.31 | -23 | 32 | 35.52 | 0.829927 | 6.90 | 79.4 |
| | 16 | 16 | 27 | 12.54 | -24 | 45 | 54.08 | 0.791859 | 6.59 | 81.9 |
| | 21 | 16 | 50 | 24.88 | -25 | 44 | 35.71 | 0.753675 | 6.27 | 84.4 |
| | 26 | 17 | 13 | 28.59 | -26 | 28 | 6.00 | 0.715457 | 5.95 | 87.1 |
| 11 | 1 | 17 | 40 | 42.56 | -26 | 59 | 53.48 | 0.669642 | 5.57 | 90.5 |
| | 6 | 18 | 2 | 47.27 | -27 | 9 | 29.84 | 0.631567 | 5.25 | 93.5 |
| | 11 | 18 | 24 | 2.15 | -27 | 4 | 18.74 | 0.593666 | 4.94 | 96.7 |
| | 16 | 18 | 44 | 9.90 | -26 | 45 | 14.54 | 0.556079 | 4.63 | 100.2 |
| | 21 | 19 | 2 | 52.56 | -26 | 13 | 32.38 | 0.518999 | 4.32 | 104.0 |
| | 26 | 19 | 19 | 51.03 | -25 | 30 | 46.73 | 0.482647 | 4.01 | 108.1 |
| 12 | 1 | 19 | 34 | 44.31 | -24 | 38 | 49.26 | 0.447276 | 3.72 | 112.7 |
| | 6 | 19 | 47 | 8.34 | -23 | 39 | 49.44 | 0.413196 | 3.44 | 117.8 |
| | 11 | 19 | 56 | 34.34 | -22 | 36 | 12.56 | 0.380826 | 3.17 | 123.5 |
| | 16 | 20 | 2 | 31.02 | -21 | 30 | 28.47 | 0.350771 | 2.92 | 130.0 |
| | 21 | 20 | 4 | 29.03 | -20 | 25 | 3.73 | 0.323805 | 2.69 | 137.4 |
| | 26 | 20 | 2 | 8.07 | -19 | 22 | 14.77 | 0.300855 | 2.50 | 145.8 |
| | 31 | 19 | 55 | 28.88 | -18 | 24 | 5.22 | 0.282950 | 2.35 | 155.0 |

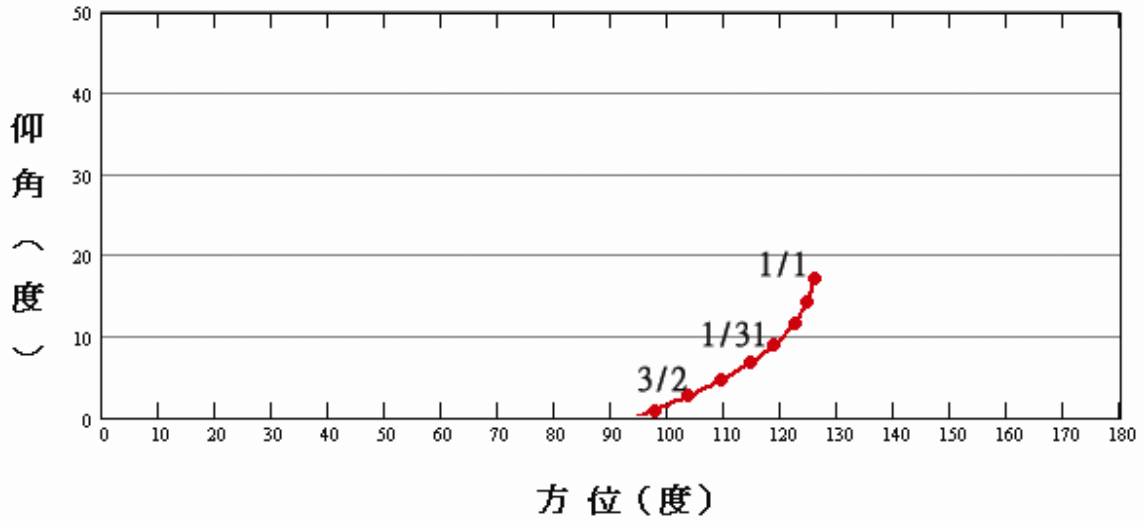
金星出沒時間表

東經：121.52°，北緯：25.10°

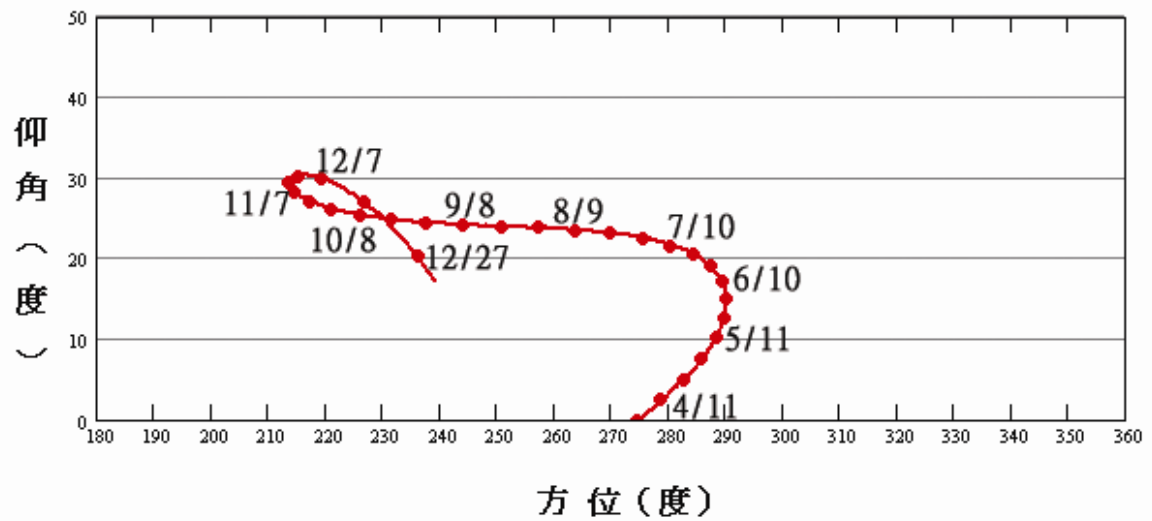
東經 120° 平太陽時

| 日期 | | 出 | | 中天 | | 沒 | | 視直徑 | | 相位 | 視亮度 |
|----|----|-----------|---------|-----------|---------|-----------|---------|---------|---------|------|------|
| 月 | 日 | 時間 h m | 方位 ° | 時間 h m | 仰角 ° | 時間 h m | 方位 ° | 赤道 " | 兩極 " | | 星等 |
| 7 | 1 | 07:00 | 67 | 13:44 | 86S | 20:28 | 293 | 11.10 | 11.10 | 0.90 | -3.8 |
| | 6 | 07:09 | 68 | 13:49 | 84S | 20:30 | 292 | 11.29 | 11.29 | 0.89 | -3.9 |
| | 11 | 07:17 | 70 | 13:54 | 82S | 20:31 | 290 | 11.49 | 11.49 | 0.88 | -3.9 |
| | 16 | 07:25 | 72 | 13:58 | 80S | 20:31 | 287 | 11.71 | 11.71 | 0.87 | -3.9 |
| | 21 | 07:33 | 75 | 14:02 | 78S | 20:30 | 285 | 11.95 | 11.95 | 0.86 | -3.9 |
| | 26 | 07:41 | 77 | 14:05 | 76S | 20:29 | 283 | 12.21 | 12.21 | 0.84 | -3.9 |
| 8 | 1 | 07:49 | 80 | 14:08 | 73S | 20:27 | 279 | 12.54 | 12.54 | 0.83 | -3.9 |
| | 6 | 07:56 | 83 | 14:11 | 71S | 20:24 | 277 | 12.84 | 12.84 | 0.82 | -3.9 |
| | 11 | 08:03 | 86 | 14:12 | 68S | 20:21 | 274 | 13.17 | 13.17 | 0.80 | -3.9 |
| | 16 | 08:10 | 89 | 14:14 | 66S | 20:18 | 271 | 13.52 | 13.52 | 0.79 | -4.0 |
| | 21 | 08:16 | 91 | 14:16 | 63S | 20:15 | 268 | 13.90 | 13.90 | 0.77 | -4.0 |
| | 26 | 08:23 | 94 | 14:17 | 61S | 20:12 | 265 | 14.31 | 14.31 | 0.76 | -4.0 |
| 9 | 1 | 08:30 | 98 | 14:19 | 58S | 20:08 | 262 | 14.84 | 14.84 | 0.74 | -4.0 |
| | 6 | 08:37 | 100 | 14:21 | 55S | 20:05 | 259 | 15.32 | 15.32 | 0.72 | -4.1 |
| | 11 | 08:43 | 103 | 14:23 | 53S | 20:02 | 257 | 15.85 | 15.85 | 0.70 | -4.1 |
| | 16 | 08:50 | 106 | 14:25 | 50S | 19:59 | 254 | 16.41 | 16.41 | 0.69 | -4.1 |
| | 21 | 08:56 | 108 | 14:27 | 48S | 19:57 | 252 | 17.03 | 17.03 | 0.67 | -4.2 |
| | 26 | 09:03 | 110 | 14:30 | 46S | 19:56 | 249 | 17.70 | 17.70 | 0.65 | -4.2 |
| 10 | 1 | 09:10 | 112 | 14:33 | 44S | 19:55 | 247 | 18.43 | 18.43 | 0.63 | -4.2 |
| | 6 | 09:17 | 114 | 14:36 | 43S | 19:54 | 246 | 19.23 | 19.23 | 0.61 | -4.3 |
| | 11 | 09:23 | 116 | 14:39 | 41S | 19:55 | 244 | 20.11 | 20.11 | 0.59 | -4.3 |
| | 16 | 09:30 | 117 | 14:43 | 40S | 19:55 | 243 | 21.07 | 21.07 | 0.57 | -4.4 |
| | 21 | 09:35 | 118 | 14:46 | 39S | 19:57 | 242 | 22.14 | 22.14 | 0.55 | -4.4 |
| | 26 | 09:40 | 119 | 14:49 | 38S | 19:58 | 241 | 23.32 | 23.32 | 0.53 | -4.5 |
| 11 | 1 | 09:45 | 120 | 14:53 | 38S | 20:01 | 240 | 24.92 | 24.92 | 0.50 | -4.5 |
| | 6 | 09:48 | 120 | 14:55 | 38S | 20:03 | 240 | 26.42 | 26.42 | 0.47 | -4.6 |
| | 11 | 09:49 | 120 | 14:57 | 38S | 20:04 | 240 | 28.11 | 28.11 | 0.44 | -4.7 |
| | 16 | 09:49 | 119 | 14:57 | 38S | 20:05 | 241 | 30.01 | 30.01 | 0.41 | -4.7 |
| | 21 | 09:47 | 119 | 14:56 | 39S | 20:06 | 241 | 32.15 | 32.15 | 0.38 | -4.8 |
| | 26 | 09:42 | 118 | 14:53 | 39S | 20:04 | 242 | 34.58 | 34.58 | 0.35 | -4.8 |
| 12 | 1 | 09:35 | 117 | 14:48 | 40S | 20:01 | 243 | 37.31 | 37.31 | 0.31 | -4.9 |
| | 6 | 09:26 | 116 | 14:41 | 41S | 19:56 | 244 | 40.39 | 40.39 | 0.27 | -4.9 |
| | 11 | 09:13 | 115 | 14:30 | 42S | 19:48 | 245 | 43.82 | 43.82 | 0.22 | -4.9 |
| | 16 | 08:57 | 114 | 14:16 | 43S | 19:36 | 247 | 47.58 | 47.58 | 0.18 | -4.9 |
| | 21 | 08:37 | 112 | 13:58 | 45S | 19:20 | 248 | 51.54 | 51.54 | 0.13 | -4.8 |
| | 26 | 08:13 | 111 | 13:36 | 46S | 19:00 | 249 | 55.47 | 55.47 | 0.09 | -4.7 |
| | 31 | 07:44 | 110 | 13:10 | 47S | 18:36 | 250 | 58.98 | 58.98 | 0.05 | -4.5 |

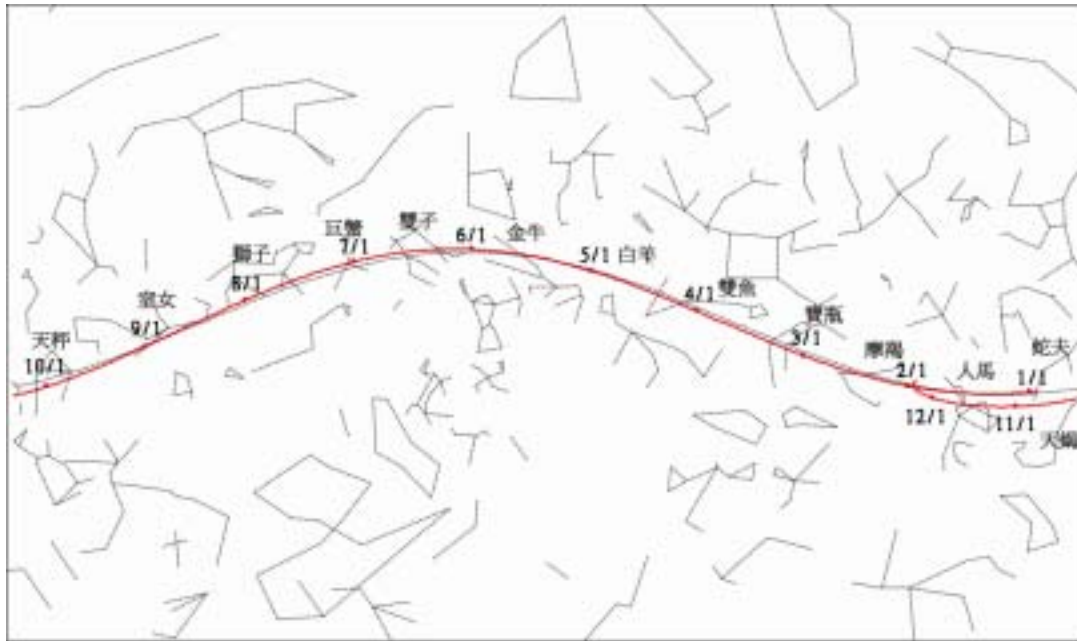
日出時金星方位與仰角



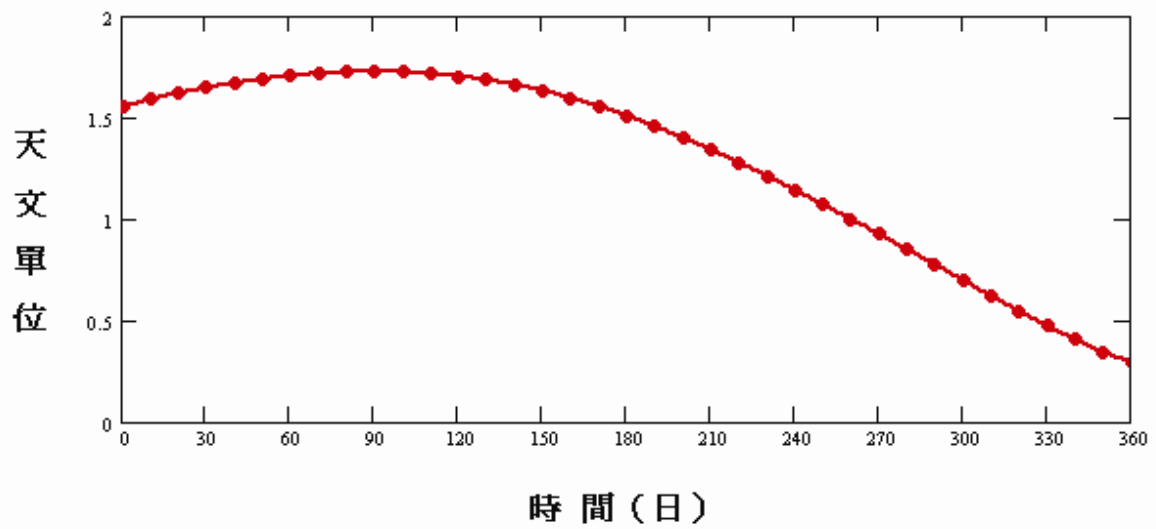
日沒時金星方位與仰角



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 | | 赤 經 | | | 赤 緯 | | | 距 離 | 光 程 | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|----------|-------|------|
| 月 | 日 | h | m | s | ° | ' | " | AU | 分 | ° |
| 1 | 1 | 20 | 29 | 15.75 | -20 | 12 | 31.01 | 2.224953 | 18.50 | 16.8 |
| | 6 | 20 | 45 | 25.02 | -19 | 12 | 24.19 | 2.236725 | 18.60 | 16.0 |
| | 11 | 21 | 1 | 24.35 | -18 | 7 | 2.22 | 2.248296 | 18.70 | 15.2 |
| | 16 | 21 | 17 | 13.09 | -16 | 56 | 49.41 | 2.259643 | 18.79 | 14.4 |
| | 21 | 21 | 32 | 50.75 | -15 | 42 | 10.76 | 2.270780 | 18.89 | 13.7 |
| | 26 | 21 | 48 | 17.29 | -14 | 23 | 31.72 | 2.281745 | 18.98 | 12.9 |
| 2 | 1 | 22 | 6 | 34.83 | -12 | 44 | 27.64 | 2.294718 | 19.08 | 12.0 |
| | 6 | 22 | 21 | 38.24 | -11 | 18 | 29.20 | 2.305376 | 19.17 | 11.2 |
| | 11 | 22 | 36 | 32.16 | -9 | 49 | 52.76 | 2.315859 | 19.26 | 10.4 |
| | 16 | 22 | 51 | 17.08 | -8 | 19 | 5.95 | 2.326138 | 19.35 | 9.6 |
| | 21 | 23 | 5 | 53.72 | -6 | 46 | 35.35 | 2.336223 | 19.43 | 8.8 |
| | 26 | 23 | 20 | 22.90 | -5 | 12 | 46.97 | 2.346132 | 19.51 | 8.1 |
| 3 | 1 | 23 | 29 | 1.27 | -4 | 16 | 2.84 | 2.351997 | 19.56 | 7.6 |
| | 6 | 23 | 43 | 20.89 | -2 | 41 | 0.29 | 2.361625 | 19.64 | 6.8 |
| | 11 | 23 | 57 | 36.01 | -1 | 5 | 42.92 | 2.371022 | 19.72 | 6.0 |
| | 16 | 0 | 11 | 47.49 | +0 | 29 | 24.32 | 2.380139 | 19.79 | 5.2 |
| | 21 | 0 | 25 | 56.27 | +2 | 3 | 57.64 | 2.388958 | 19.87 | 4.4 |
| | 26 | 0 | 40 | 3.24 | +3 | 37 | 33.97 | 2.397483 | 19.94 | 3.7 |
| 4 | 1 | 0 | 56 | 58.76 | +5 | 28 | 8.49 | 2.407319 | 20.02 | 2.7 |
| | 6 | 1 | 11 | 5.67 | +6 | 58 | 25.95 | 2.415138 | 20.09 | 1.9 |
| | 11 | 1 | 25 | 14.05 | +8 | 26 | 39.52 | 2.422542 | 20.15 | 1.2 |
| | 16 | 1 | 39 | 24.60 | +9 | 52 | 28.74 | 2.429480 | 20.21 | 0.4 |
| | 21 | 1 | 53 | 37.78 | +11 | 15 | 34.10 | 2.435933 | 20.26 | 0.5 |
| | 26 | 2 | 7 | 54.29 | +12 | 35 | 37.24 | 2.441895 | 20.31 | 1.3 |
| 5 | 1 | 2 | 22 | 14.82 | +13 | 52 | 21.24 | 2.447343 | 20.35 | 2.1 |
| | 6 | 2 | 36 | 39.86 | +15 | 5 | 29.52 | 2.452214 | 20.39 | 2.9 |
| | 11 | 2 | 51 | 9.65 | +16 | 14 | 45.67 | 2.456430 | 20.43 | 3.7 |
| | 16 | 3 | 5 | 44.15 | +17 | 19 | 54.52 | 2.459944 | 20.46 | 4.5 |
| | 21 | 3 | 20 | 23.15 | +18 | 20 | 41.57 | 2.462733 | 20.48 | 5.3 |
| | 26 | 3 | 35 | 6.58 | +19 | 16 | 54.15 | 2.464787 | 20.50 | 6.1 |
| 6 | 1 | 3 | 52 | 52.36 | +20 | 18 | 3.90 | 2.466231 | 20.51 | 7.0 |
| | 6 | 4 | 7 | 44.73 | +21 | 3 | 35.32 | 2.466494 | 20.51 | 7.8 |
| | 11 | 4 | 22 | 40.22 | +21 | 44 | 0.79 | 2.465829 | 20.51 | 8.6 |
| | 16 | 4 | 37 | 37.80 | +22 | 19 | 13.25 | 2.464200 | 20.49 | 9.4 |
| | 21 | 4 | 52 | 36.51 | +22 | 49 | 7.10 | 2.461591 | 20.47 | 10.3 |
| | 26 | 5 | 7 | 35.57 | +23 | 13 | 39.43 | 2.457991 | 20.44 | 11.1 |

火星出沒時間表

東經：121.52°，北緯：25.10°

東經 120°平太陽時

| 日期 | | 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 | 08:17 | 112 | 13:40 | 45S | 19:03 | 248 | 4.21 | 4.19 | 0.98 | 1.2 |
| | 6 | 08:11 | 111 | 13:36 | 46S | 19:01 | 249 | 4.19 | 4.16 | 0.98 | 1.2 |
| | 11 | 08:05 | 110 | 13:32 | 47S | 19:00 | 250 | 4.17 | 4.14 | 0.98 | 1.2 |
| | 16 | 07:59 | 108 | 13:29 | 48S | 18:58 | 252 | 4.14 | 4.12 | 0.98 | 1.2 |
| | 21 | 07:52 | 107 | 13:24 | 49S | 18:57 | 253 | 4.12 | 4.10 | 0.99 | 1.2 |
| | 26 | 07:45 | 106 | 13:20 | 51S | 18:55 | 254 | 4.10 | 4.08 | 0.99 | 1.2 |
| 2 | 1 | 07:37 | 104 | 13:15 | 52S | 18:53 | 256 | 4.08 | 4.06 | 0.99 | 1.2 |
| | 6 | 07:29 | 102 | 13:10 | 54S | 18:51 | 258 | 4.06 | 4.04 | 0.99 | 1.2 |
| | 11 | 07:22 | 101 | 13:05 | 55S | 18:49 | 260 | 4.04 | 4.02 | 0.99 | 1.2 |
| | 16 | 07:14 | 99 | 13:00 | 57S | 18:47 | 261 | 4.03 | 4.01 | 0.99 | 1.2 |
| | 21 | 07:06 | 97 | 12:55 | 58S | 18:45 | 263 | 4.01 | 3.99 | 0.99 | 1.2 |
| | 26 | 06:58 | 96 | 12:50 | 60S | 18:43 | 265 | 3.99 | 3.97 | 1.00 | 1.2 |
| 3 | 1 | 06:53 | 94 | 12:47 | 61S | 18:41 | 266 | 3.98 | 3.96 | 1.00 | 1.2 |
| | 6 | 06:44 | 93 | 12:41 | 62S | 18:39 | 267 | 3.97 | 3.95 | 1.00 | 1.2 |
| | 11 | 06:36 | 91 | 12:36 | 64S | 18:36 | 269 | 3.95 | 3.93 | 1.00 | 1.2 |
| | 16 | 06:27 | 89 | 12:31 | 65S | 18:34 | 271 | 3.93 | 3.92 | 1.00 | 1.2 |
| | 21 | 06:19 | 87 | 12:25 | 67S | 18:31 | 273 | 3.92 | 3.90 | 1.00 | 1.2 |
| | 26 | 06:10 | 86 | 12:19 | 69S | 18:29 | 274 | 3.91 | 3.89 | 1.00 | 1.2 |
| 4 | 1 | 06:00 | 84 | 12:13 | 70S | 18:25 | 276 | 3.89 | 3.87 | 1.00 | 1.2 |
| | 6 | 05:52 | 82 | 12:07 | 72S | 18:23 | 278 | 3.88 | 3.86 | 1.00 | 1.2 |
| | 11 | 05:43 | 80 | 12:01 | 73S | 18:20 | 280 | 3.87 | 3.85 | 1.00 | 1.2 |
| | 16 | 05:35 | 79 | 11:56 | 75S | 18:17 | 281 | 3.85 | 3.84 | 1.00 | 1.2 |
| | 21 | 05:27 | 77 | 11:50 | 76S | 18:14 | 283 | 3.84 | 3.82 | 1.00 | 1.2 |
| | 26 | 05:19 | 76 | 11:45 | 78S | 18:12 | 284 | 3.84 | 3.82 | 1.00 | 1.2 |
| 5 | 1 | 05:11 | 74 | 11:40 | 79S | 18:09 | 286 | 3.83 | 3.81 | 1.00 | 1.3 |
| | 6 | 05:03 | 73 | 11:34 | 80S | 18:06 | 287 | 3.82 | 3.80 | 1.00 | 1.3 |
| | 11 | 04:56 | 72 | 11:29 | 81S | 18:03 | 288 | 3.81 | 3.79 | 1.00 | 1.3 |
| | 16 | 04:48 | 71 | 11:24 | 82S | 18:00 | 290 | 3.81 | 3.79 | 1.00 | 1.3 |
| | 21 | 04:41 | 69 | 11:19 | 83S | 17:57 | 291 | 3.80 | 3.78 | 1.00 | 1.4 |
| | 26 | 04:34 | 68 | 11:14 | 84S | 17:54 | 292 | 3.80 | 3.78 | 1.00 | 1.4 |
| 6 | 1 | 04:26 | 67 | 11:08 | 85S | 17:51 | 293 | 3.80 | 3.78 | 1.00 | 1.4 |
| | 6 | 04:19 | 66 | 11:03 | 86S | 17:47 | 294 | 3.80 | 3.78 | 1.00 | 1.4 |
| | 11 | 04:13 | 66 | 10:58 | 87S | 17:44 | 294 | 3.80 | 3.78 | 0.99 | 1.4 |
| | 16 | 04:07 | 65 | 10:54 | 87S | 17:41 | 295 | 3.80 | 3.78 | 0.99 | 1.5 |
| | 21 | 04:01 | 64 | 10:49 | 88S | 17:37 | 296 | 3.80 | 3.78 | 0.99 | 1.5 |
| | 26 | 03:55 | 64 | 10:44 | 88S | 17:33 | 296 | 3.81 | 3.79 | 0.99 | 1.5 |

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 | 5 | 22 | 34.01 | +23 | 32 | 48.30 | 2.453348 | 20.40 | 11.9 |
| | 6 | 5 | 37 | 30.82 | +23 | 46 | 33.71 | 2.447583 | 20.36 | 12.7 |
| | 11 | 5 | 52 | 24.65 | +23 | 54 | 58.02 | 2.440643 | 20.30 | 13.5 |
| | 16 | 6 | 7 | 14.13 | +23 | 58 | 4.68 | 2.432499 | 20.23 | 14.3 |
| | 21 | 6 | 21 | 58.13 | +23 | 55 | 58.93 | 2.423147 | 20.15 | 15.1 |
| | 26 | 6 | 36 | 35.67 | +23 | 48 | 47.91 | 2.412578 | 20.06 | 16.0 |
| 8 | 1 | 6 | 53 | 59.02 | +23 | 33 | 38.65 | 2.398205 | 19.94 | 16.9 |
| | 6 | 7 | 8 | 19.25 | +23 | 15 | 46.51 | 2.384747 | 19.83 | 17.8 |
| | 11 | 7 | 22 | 29.93 | +22 | 53 | 20.91 | 2.369905 | 19.71 | 18.6 |
| | 16 | 7 | 36 | 30.23 | +22 | 26 | 34.00 | 2.353676 | 19.57 | 19.4 |
| | 21 | 7 | 50 | 19.61 | +21 | 55 | 39.08 | 2.336070 | 19.43 | 20.2 |
| | 26 | 8 | 3 | 57.73 | +21 | 20 | 49.07 | 2.317069 | 19.27 | 21.0 |
| 9 | 1 | 8 | 20 | 4.30 | +20 | 34 | 10.87 | 2.292352 | 19.06 | 22.0 |
| | 6 | 8 | 33 | 16.62 | +19 | 51 | 35.73 | 2.270114 | 18.88 | 22.8 |
| | 11 | 8 | 46 | 16.60 | +19 | 5 | 54.16 | 2.246379 | 18.68 | 23.6 |
| | 16 | 8 | 59 | 4.15 | +18 | 17 | 21.76 | 2.221173 | 18.47 | 24.4 |
| | 21 | 9 | 11 | 39.38 | +17 | 26 | 13.42 | 2.194515 | 18.25 | 25.1 |
| | 26 | 9 | 24 | 2.63 | +16 | 32 | 43.46 | 2.166388 | 18.02 | 25.9 |
| 10 | 1 | 9 | 36 | 14.03 | +15 | 37 | 8.07 | 2.136760 | 17.77 | 26.7 |
| | 6 | 9 | 48 | 13.53 | +14 | 39 | 43.54 | 2.105626 | 17.51 | 27.4 |
| | 11 | 10 | 0 | 1.19 | +13 | 40 | 45.59 | 2.073015 | 17.24 | 28.2 |
| | 16 | 10 | 11 | 37.16 | +12 | 40 | 29.54 | 2.038981 | 16.96 | 28.9 |
| | 21 | 10 | 23 | 1.87 | +11 | 39 | 8.91 | 2.003560 | 16.66 | 29.6 |
| | 26 | 10 | 34 | 15.72 | +10 | 36 | 57.86 | 1.966754 | 16.36 | 30.3 |
| 11 | 1 | 10 | 47 | 30.08 | +9 | 21 | 36.08 | 1.920763 | 15.97 | 31.1 |
| | 6 | 10 | 58 | 20.08 | +8 | 18 | 28.88 | 1.880958 | 15.64 | 31.8 |
| | 11 | 11 | 8 | 59.08 | +7 | 15 | 20.46 | 1.839892 | 15.30 | 32.4 |
| | 16 | 11 | 19 | 27.14 | +6 | 12 | 24.18 | 1.797647 | 14.95 | 33.0 |
| | 21 | 11 | 29 | 44.49 | +5 | 9 | 52.61 | 1.754272 | 14.59 | 33.5 |
| | 26 | 11 | 39 | 50.91 | +4 | 8 | 0.24 | 1.709800 | 14.22 | 34.0 |
| 12 | 1 | 11 | 49 | 45.93 | +3 | 7 | 2.20 | 1.664283 | 13.84 | 34.5 |
| | 6 | 11 | 59 | 28.83 | +2 | 7 | 13.57 | 1.617804 | 13.45 | 34.9 |
| | 11 | 12 | 8 | 58.80 | +1 | 8 | 48.99 | 1.570494 | 13.06 | 35.3 |
| | 16 | 12 | 18 | 15.30 | +0 | 12 | 0.62 | 1.522465 | 12.66 | 35.6 |
| | 21 | 12 | 27 | 17.57 | -0 | 42 | 58.46 | 1.473799 | 12.26 | 35.9 |
| | 26 | 12 | 36 | 4.28 | -1 | 35 | 53.31 | 1.424578 | 11.85 | 36.1 |
| | 31 | 12 | 44 | 33.72 | -2 | 26 | 28.47 | 1.374905 | 11.43 | 36.2 |

火星出沒時間表

東經：121.52°，北緯：25.10°

東經 120°平太陽時

| 日期 月 日 | | 出 | | 中天 | | 沒 | | 視直徑 | | 相位 | 視 亮度 星等 |
|-----------|----|-----------|---------|-----------|---------|-----------|---------|---------|---------|------|---------------|
| | | 時間 h m | 方位 ° | 時間 h m | 仰角 ° | 時間 h m | 方位 ° | 赤道 " | 兩極 " | | |
| 7 | 1 | 03:50 | 64 | 10:40 | 88S | 17:29 | 296 | 3.82 | 3.79 | 0.99 | 1.5 |
| | 6 | 03:45 | 63 | 10:35 | 89S | 17:25 | 297 | 3.83 | 3.80 | 0.99 | 1.5 |
| | 11 | 03:40 | 63 | 10:30 | 89S | 17:20 | 297 | 3.84 | 3.81 | 0.99 | 1.6 |
| | 16 | 03:34 | 63 | 10:25 | 89S | 17:16 | 297 | 3.85 | 3.83 | 0.98 | 1.6 |
| | 21 | 03:30 | 63 | 10:20 | 89S | 17:11 | 297 | 3.86 | 3.84 | 0.98 | 1.6 |
| | 26 | 03:25 | 63 | 10:15 | 89S | 17:05 | 297 | 3.88 | 3.86 | 0.98 | 1.6 |
| 8 | 1 | 03:19 | 63 | 10:09 | 88S | 16:58 | 296 | 3.91 | 3.88 | 0.98 | 1.6 |
| | 6 | 03:14 | 64 | 10:03 | 88S | 16:52 | 296 | 3.93 | 3.90 | 0.98 | 1.6 |
| | 11 | 03:10 | 64 | 09:58 | 88S | 16:46 | 296 | 3.95 | 3.93 | 0.97 | 1.6 |
| | 16 | 03:05 | 65 | 09:52 | 87S | 16:39 | 295 | 3.98 | 3.96 | 0.97 | 1.6 |
| | 21 | 03:00 | 65 | 09:46 | 87S | 16:32 | 295 | 4.01 | 3.99 | 0.97 | 1.6 |
| | 26 | 02:56 | 66 | 09:40 | 86S | 16:25 | 294 | 4.04 | 4.02 | 0.97 | 1.6 |
| 9 | 1 | 02:50 | 67 | 09:33 | 85S | 16:15 | 293 | 4.09 | 4.06 | 0.96 | 1.6 |
| | 6 | 02:45 | 68 | 09:26 | 85S | 16:07 | 292 | 4.13 | 4.10 | 0.96 | 1.6 |
| | 11 | 02:40 | 68 | 09:19 | 84S | 15:59 | 291 | 4.17 | 4.15 | 0.96 | 1.6 |
| | 16 | 02:35 | 69 | 09:13 | 83S | 15:50 | 290 | 4.22 | 4.19 | 0.96 | 1.6 |
| | 21 | 02:29 | 70 | 09:05 | 82S | 15:41 | 290 | 4.27 | 4.25 | 0.95 | 1.6 |
| | 26 | 02:24 | 71 | 08:58 | 81S | 15:32 | 289 | 4.32 | 4.30 | 0.95 | 1.6 |
| 10 | 1 | 02:18 | 72 | 08:51 | 81S | 15:23 | 288 | 4.38 | 4.36 | 0.95 | 1.6 |
| | 6 | 02:12 | 73 | 08:43 | 80S | 15:13 | 286 | 4.45 | 4.42 | 0.94 | 1.6 |
| | 11 | 02:06 | 75 | 08:35 | 79S | 15:03 | 285 | 4.52 | 4.49 | 0.94 | 1.6 |
| | 16 | 02:00 | 76 | 08:27 | 78S | 14:53 | 284 | 4.59 | 4.57 | 0.94 | 1.6 |
| | 21 | 01:54 | 77 | 08:19 | 77S | 14:43 | 283 | 4.67 | 4.65 | 0.94 | 1.5 |
| | 26 | 01:48 | 78 | 08:10 | 76S | 14:32 | 282 | 4.76 | 4.74 | 0.93 | 1.5 |
| 11 | 1 | 01:40 | 79 | 08:00 | 74S | 14:19 | 281 | 4.88 | 4.85 | 0.93 | 1.5 |
| | 6 | 01:33 | 80 | 07:51 | 73S | 14:08 | 279 | 4.98 | 4.95 | 0.93 | 1.4 |
| | 11 | 01:26 | 82 | 07:42 | 72S | 13:57 | 278 | 5.09 | 5.07 | 0.92 | 1.4 |
| | 16 | 01:19 | 83 | 07:33 | 71S | 13:46 | 277 | 5.21 | 5.18 | 0.92 | 1.4 |
| | 21 | 01:11 | 84 | 07:23 | 70S | 13:35 | 276 | 5.34 | 5.31 | 0.92 | 1.3 |
| | 26 | 01:04 | 85 | 07:13 | 69S | 13:23 | 275 | 5.48 | 5.45 | 0.91 | 1.3 |
| 12 | 1 | 00:56 | 86 | 07:04 | 68S | 13:11 | 274 | 5.63 | 5.60 | 0.91 | 1.2 |
| | 6 | 00:48 | 87 | 06:54 | 67S | 13:00 | 273 | 5.79 | 5.76 | 0.91 | 1.2 |
| | 11 | 00:39 | 88 | 06:44 | 66S | 12:48 | 271 | 5.96 | 5.93 | 0.91 | 1.1 |
| | 16 | 00:31 | 89 | 06:33 | 65S | 12:35 | 270 | 6.15 | 6.12 | 0.91 | 1.1 |
| | 21 | 00:22 | 90 | 06:22 | 64S | 12:23 | 269 | 6.35 | 6.32 | 0.91 | 1.0 |
| | 26 | 00:12 | 91 | 06:12 | 63S | 12:10 | 268 | 6.57 | 6.54 | 0.90 | 0.9 |
| | 31 | 00:03 | 92 | 06:00 | 62S | 11:58 | 268 | 6.81 | 6.78 | 0.90 | 0.9 |

火星表面位置座標表

世界時 0 時

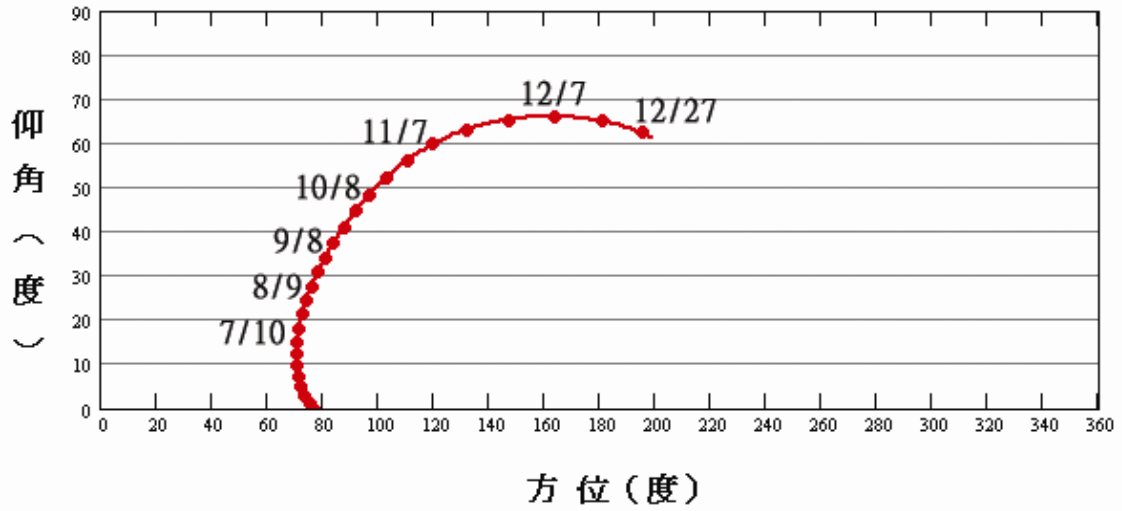
| 日期 | | 中心點座標 | | 日下點座標 | | | | 北極點位置 | |
|----|----|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | 地球 | | 太陽 | | 距離 (ds) " | 方位 (Ps) ° | 距離 (dn) " | 方位 (Pn) ° |
| 月 | 日 | 經度 (e) ° | 緯度 (e) ° | 經度 (s) ° | 緯度 (s) ° | | | | |
| 1 | 1 | 223.27 | -16.48 | 206.22 | -20.94 | 0.61 | 258.63 | -2.01 | 6.54 |
| | 6 | 173.85 | -17.84 | 157.37 | -21.72 | 0.58 | 257.47 | -1.98 | 4.05 |
| | 11 | 124.36 | -19.13 | 108.48 | -22.43 | 0.55 | 256.39 | -1.96 | 1.54 |
| | 16 | 74.80 | -20.33 | 59.56 | -23.07 | 0.52 | 255.41 | -1.93 | 359.01 |
| | 21 | 25.18 | -21.43 | 10.60 | -23.64 | 0.49 | 254.52 | -1.91 | 356.48 |
| | 26 | 335.50 | -22.44 | 321.62 | -24.14 | 0.46 | 253.73 | -1.89 | 353.96 |
| 2 | 1 | 275.82 | -23.50 | 262.81 | -24.64 | 0.42 | 252.92 | -1.86 | 350.95 |
| | 6 | 226.02 | -24.26 | 213.78 | -24.96 | 0.39 | 252.36 | -1.84 | 348.47 |
| | 11 | 176.18 | -24.89 | 164.74 | -25.20 | 0.36 | 251.92 | -1.83 | 346.02 |
| | 16 | 126.31 | -25.40 | 115.69 | -25.37 | 0.34 | 251.58 | -1.81 | 343.62 |
| | 21 | 76.42 | -25.78 | 66.65 | -25.45 | 0.31 | 251.37 | -1.80 | 341.29 |
| | 26 | 26.51 | -26.03 | 17.62 | -25.44 | 0.28 | 251.28 | -1.79 | 339.03 |
| 3 | 1 | 356.56 | -26.12 | 348.20 | -25.40 | 0.26 | 251.29 | -1.78 | 337.71 |
| | 6 | 306.66 | -26.16 | 299.20 | -25.27 | 0.23 | 251.42 | -1.77 | 335.60 |
| | 11 | 256.77 | -26.06 | 250.21 | -25.06 | 0.21 | 251.70 | -1.77 | 333.59 |
| | 16 | 206.90 | -25.84 | 201.26 | -24.77 | 0.18 | 252.17 | -1.76 | 331.71 |
| | 21 | 157.08 | -25.49 | 152.33 | -24.41 | 0.15 | 252.88 | -1.76 | 329.96 |
| | 26 | 107.30 | -25.02 | 103.45 | -23.98 | 0.12 | 253.90 | -1.76 | 328.35 |
| 4 | 1 | 47.64 | -24.30 | 44.85 | -23.37 | 0.09 | 255.85 | -1.77 | 326.62 |
| | 6 | 357.99 | -23.58 | 356.07 | -22.79 | 0.07 | 258.70 | -1.77 | 325.36 |
| | 11 | 308.41 | -22.75 | 307.34 | -22.15 | 0.04 | 264.93 | -1.78 | 324.26 |
| | 16 | 258.89 | -21.83 | 258.66 | -21.46 | 0.01 | 292.07 | -1.78 | 323.34 |
| | 21 | 209.46 | -20.82 | 210.03 | -20.71 | 0.02 | 41.33 | -1.79 | 322.59 |
| | 26 | 160.10 | -19.73 | 161.45 | -19.92 | 0.04 | 60.50 | -1.80 | 322.02 |
| 5 | 1 | 110.81 | -18.57 | 112.93 | -19.08 | 0.07 | 66.10 | -1.81 | 321.63 |
| | 6 | 61.59 | -17.34 | 64.46 | -18.20 | 0.10 | 69.16 | -1.81 | 321.42 |
| | 11 | 12.45 | -16.05 | 16.05 | -17.28 | 0.12 | 71.37 | -1.82 | 321.37 |
| | 16 | 323.38 | -14.71 | 327.69 | -16.34 | 0.15 | 73.21 | -1.83 | 321.50 |
| | 21 | 274.37 | -13.33 | 279.38 | -15.36 | 0.17 | 74.88 | -1.84 | 321.79 |
| | 26 | 225.42 | -11.91 | 231.12 | -14.36 | 0.20 | 76.46 | -1.85 | 322.25 |
| 6 | 1 | 166.76 | -10.16 | 173.28 | -13.13 | 0.23 | 78.31 | -1.86 | 322.99 |
| | 6 | 117.93 | -8.68 | 125.12 | -12.08 | 0.26 | 79.84 | -1.87 | 323.77 |
| | 11 | 69.15 | -7.17 | 77.01 | -11.02 | 0.29 | 81.36 | -1.87 | 324.69 |
| | 16 | 20.41 | -5.66 | 28.94 | -9.95 | 0.31 | 82.89 | -1.88 | 325.74 |
| | 21 | 331.71 | -4.14 | 340.91 | -8.86 | 0.34 | 84.43 | -1.89 | 326.91 |
| | 26 | 283.04 | -2.62 | 292.92 | -7.77 | 0.37 | 85.96 | -1.89 | 328.20 |

火星表面位置座標表

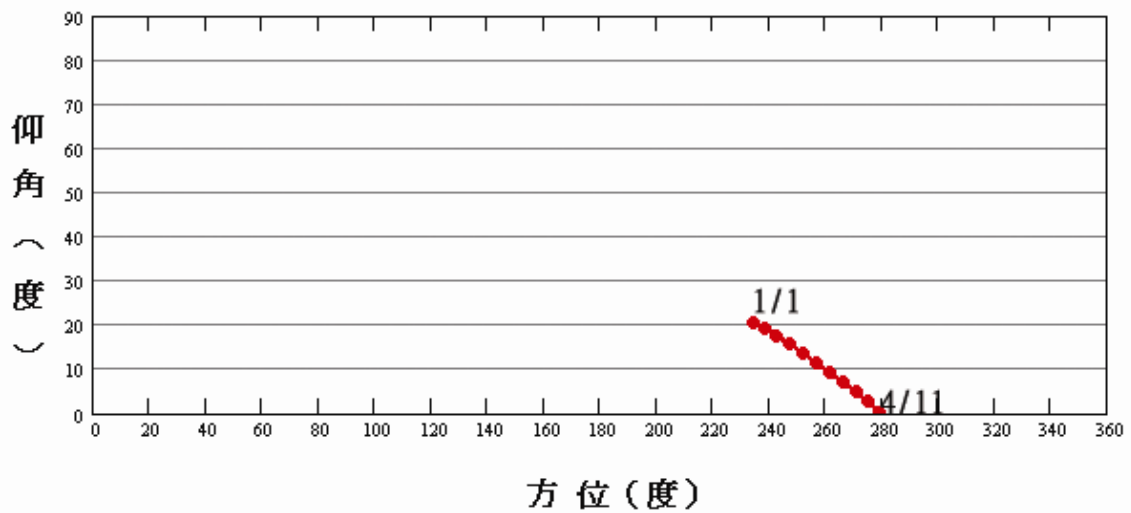
世界時 0 時

| 日期 | | 中心點座標 | | 日下點座標 | | | | 北極點位置 | |
|----|----|--------------------------|--------------------------|--------------------------|--------------------------|------|--------|---------------|---------------------|
| | | 地球 | | 太陽 | | 距離 | 方位 | | |
| 月 | 日 | 經度 (e) $^{\circ}$ | 緯度 (e) $^{\circ}$ | 經度 (s) $^{\circ}$ | 緯度 (s) $^{\circ}$ | | | (ds) $''$ | (Ps) $^{\circ}$ |
| 7 | 1 | 234.41 | -1.10 | 244.97 | -6.68 | 0.39 | 87.50 | -1.90 | 329.58 |
| | 6 | 185.79 | 0.42 | 197.04 | -5.58 | 0.42 | 89.03 | 1.90 | 331.06 |
| | 11 | 137.20 | 1.92 | 149.15 | -4.48 | 0.45 | 90.56 | 1.91 | 332.63 |
| | 16 | 88.62 | 3.40 | 101.29 | -3.39 | 0.48 | 92.07 | 1.91 | 334.28 |
| | 21 | 40.05 | 4.87 | 53.46 | -2.30 | 0.51 | 93.55 | 1.91 | 335.99 |
| | 26 | 351.49 | 6.31 | 5.65 | -1.21 | 0.53 | 95.02 | 1.92 | 337.76 |
| 8 | 1 | 293.22 | 8.00 | 308.31 | 0.09 | 0.57 | 96.73 | 1.92 | 339.96 |
| | 6 | 244.66 | 9.37 | 260.54 | 1.16 | 0.60 | 98.12 | 1.93 | 341.84 |
| | 11 | 196.10 | 10.71 | 212.80 | 2.22 | 0.63 | 99.46 | 1.93 | 343.75 |
| | 16 | 147.54 | 12.01 | 165.07 | 3.27 | 0.66 | 100.76 | 1.94 | 345.70 |
| | 21 | 98.97 | 13.26 | 117.36 | 4.30 | 0.69 | 102.01 | 1.94 | 347.67 |
| | 26 | 50.38 | 14.46 | 69.66 | 5.32 | 0.72 | 103.20 | 1.95 | 349.65 |
| 9 | 1 | 352.07 | 15.84 | 12.44 | 6.53 | 0.76 | 104.56 | 1.96 | 352.06 |
| | 6 | 303.46 | 16.93 | 324.76 | 7.52 | 0.80 | 105.62 | 1.96 | 354.07 |
| | 11 | 254.84 | 17.96 | 277.09 | 8.49 | 0.83 | 106.62 | 1.97 | 356.08 |
| | 16 | 206.21 | 18.93 | 229.43 | 9.44 | 0.87 | 107.56 | 1.98 | 358.09 |
| | 21 | 157.57 | 19.84 | 181.77 | 10.38 | 0.91 | 108.44 | 2.00 | 0.09 |
| | 26 | 108.92 | 20.69 | 134.12 | 11.29 | 0.94 | 109.24 | 2.01 | 2.08 |
| 10 | 1 | 60.26 | 21.46 | 86.47 | 12.18 | 0.98 | 109.99 | 2.03 | 4.06 |
| | 6 | 11.59 | 22.17 | 38.81 | 13.05 | 1.02 | 110.67 | 2.05 | 6.02 |
| | 11 | 322.92 | 22.80 | 351.16 | 13.90 | 1.07 | 111.28 | 2.07 | 7.95 |
| | 16 | 274.25 | 23.36 | 303.51 | 14.72 | 1.11 | 111.83 | 2.10 | 9.85 |
| | 21 | 225.59 | 23.85 | 255.85 | 15.52 | 1.15 | 112.31 | 2.13 | 11.71 |
| | 26 | 176.94 | 24.26 | 208.19 | 16.30 | 1.20 | 112.73 | 2.16 | 13.54 |
| 11 | 1 | 118.58 | 24.65 | 150.99 | 17.19 | 1.26 | 113.15 | 2.21 | 15.68 |
| | 6 | 69.97 | 24.90 | 103.31 | 17.91 | 1.31 | 113.44 | 2.25 | 17.40 |
| | 11 | 21.40 | 25.08 | 55.63 | 18.60 | 1.36 | 113.66 | 2.30 | 19.07 |
| | 16 | 332.86 | 25.18 | 7.94 | 19.26 | 1.41 | 113.83 | 2.35 | 20.67 |
| | 21 | 284.36 | 25.22 | 320.24 | 19.89 | 1.47 | 113.94 | 2.41 | 22.21 |
| | 26 | 235.91 | 25.18 | 272.53 | 20.49 | 1.53 | 114.00 | 2.47 | 23.68 |
| 12 | 1 | 187.51 | 25.09 | 224.82 | 21.06 | 1.59 | 114.01 | 2.54 | 25.08 |
| | 6 | 139.18 | 24.93 | 177.09 | 21.60 | 1.65 | 113.96 | 2.61 | 26.40 |
| | 11 | 90.93 | 24.72 | 129.35 | 22.10 | 1.72 | 113.86 | 2.70 | 27.63 |
| | 16 | 42.75 | 24.45 | 81.60 | 22.58 | 1.79 | 113.72 | 2.79 | 28.79 |
| | 21 | 354.66 | 24.14 | 33.84 | 23.02 | 1.86 | 113.54 | 2.89 | 29.85 |
| | 26 | 306.67 | 23.79 | 346.07 | 23.42 | 1.93 | 113.32 | 3.00 | 30.84 |
| | 31 | 258.78 | 23.41 | 298.29 | 23.79 | 2.00 | 113.05 | 3.11 | 31.73 |

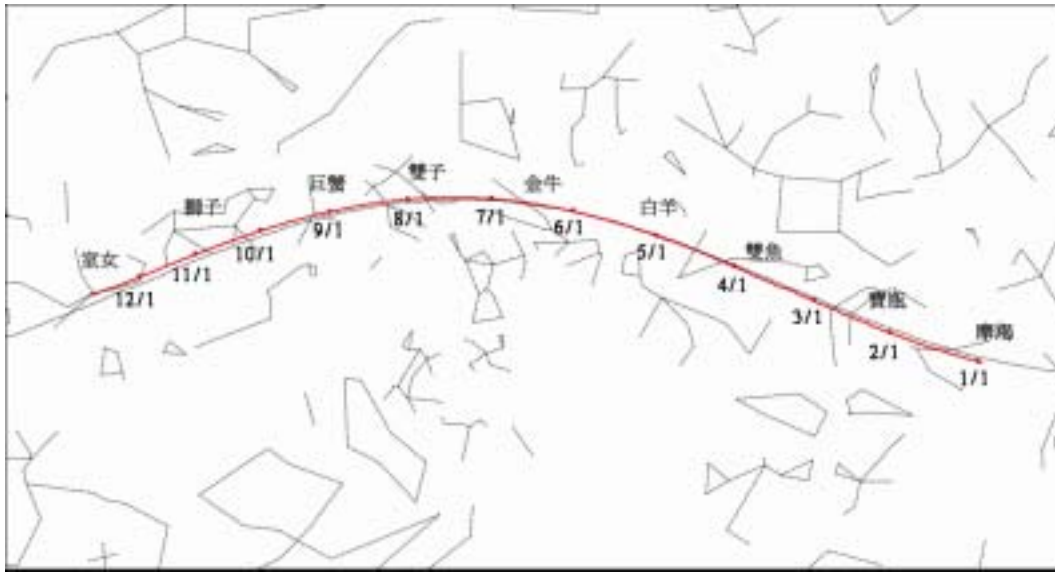
日出時火星方位與仰角



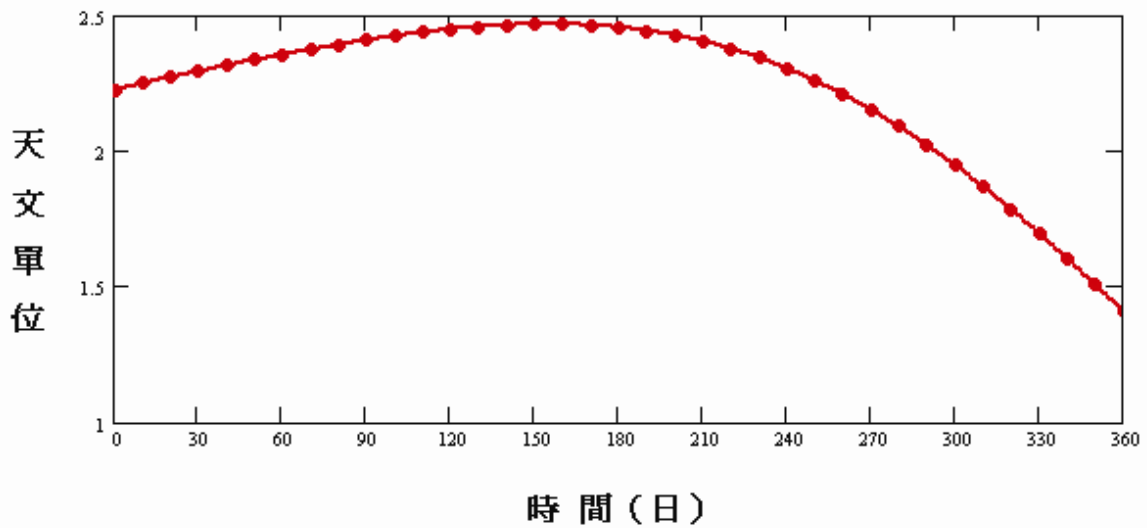
日沒時火星方位與仰角



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 | 4 | 24 | 27.56 | +20 | 54 | 17.80 | 4.210305 | 35.02 | 6.1 |
| | 11 | 4 | 21 | 2.60 | +20 | 48 | 37.09 | 4.312674 | 35.87 | 7.7 |
| | 21 | 4 | 18 | 56.97 | +20 | 45 | 58.32 | 4.436528 | 36.90 | 9.1 |
| 2 | 1 | 4 | 18 | 17.41 | +20 | 46 | 59.10 | 4.591727 | 38.19 | 10.2 |
| | 11 | 4 | 19 | 11.57 | +20 | 51 | 29.48 | 4.744910 | 39.46 | 10.9 |
| | 21 | 4 | 21 | 28.87 | +20 | 59 | 9.44 | 4.904640 | 40.79 | 11.2 |
| 3 | 1 | 4 | 24 | 14.52 | +21 | 7 | 15.47 | 5.034038 | 41.87 | 11.2 |
| | 11 | 4 | 28 | 45.55 | +21 | 19 | 20.66 | 5.194535 | 43.20 | 11.0 |
| | 21 | 4 | 34 | 20.96 | +21 | 33 | 0.47 | 5.350133 | 44.50 | 10.6 |
| 4 | 1 | 4 | 41 | 34.53 | +21 | 49 | 3.57 | 5.511712 | 45.84 | 9.8 |
| | 11 | 4 | 48 | 59.35 | +22 | 3 | 52.69 | 5.647106 | 46.97 | 9.0 |
| | 21 | 4 | 57 | 5.16 | +22 | 18 | 17.70 | 5.769014 | 47.98 | 7.9 |
| 5 | 1 | 5 | 5 | 44.61 | +22 | 31 | 46.31 | 5.875601 | 48.87 | 6.8 |
| | 11 | 5 | 14 | 51.62 | +22 | 43 | 51.39 | 5.965457 | 49.61 | 5.5 |
| | 21 | 5 | 24 | 20.11 | +22 | 54 | 10.73 | 6.037216 | 50.21 | 4.2 |
| 6 | 1 | 5 | 35 | 2.99 | +23 | 3 | 8.71 | 6.094353 | 50.69 | 2.7 |
| | 11 | 5 | 44 | 57.81 | +23 | 8 | 54.23 | 6.125841 | 50.95 | 1.2 |
| | 21 | 5 | 54 | 56.63 | +23 | 12 | 16.42 | 6.137388 | 51.04 | 0.2 |
| 7 | 1 | 6 | 4 | 54.29 | +23 | 13 | 13.52 | 6.129107 | 50.97 | 1.6 |
| | 11 | 6 | 14 | 45.78 | +23 | 11 | 48.14 | 6.101063 | 50.74 | 3.0 |
| | 21 | 6 | 24 | 25.38 | +23 | 8 | 9.14 | 6.053628 | 50.35 | 4.4 |
| 8 | 1 | 6 | 34 | 42.93 | +23 | 1 | 49.32 | 5.980046 | 49.73 | 5.8 |
| | 11 | 6 | 43 | 40.19 | +22 | 54 | 17.50 | 5.894544 | 49.02 | 7.0 |
| | 21 | 6 | 52 | 7.90 | +22 | 45 | 28.10 | 5.792676 | 48.18 | 8.1 |
| 9 | 1 | 7 | 0 | 45.18 | +22 | 34 | 48.16 | 5.663673 | 47.10 | 9.2 |
| | 11 | 7 | 7 | 50.56 | +22 | 24 | 49.24 | 5.532913 | 46.02 | 10.0 |
| | 21 | 7 | 14 | 5.76 | +22 | 15 | 9.91 | 5.391882 | 44.84 | 10.6 |
| 10 | 1 | 7 | 19 | 23.86 | +22 | 6 | 26.05 | 5.243275 | 43.61 | 11.0 |
| | 11 | 7 | 23 | 36.98 | +21 | 59 | 16.26 | 5.090210 | 42.33 | 11.1 |
| | 21 | 7 | 26 | 37.99 | +21 | 54 | 14.85 | 4.936547 | 41.06 | 11.0 |
| 11 | 1 | 7 | 28 | 26.66 | +21 | 51 | 45.84 | 4.771587 | 39.68 | 10.5 |
| | 11 | 7 | 28 | 37.70 | +21 | 52 | 38.11 | 4.630278 | 38.51 | 9.7 |
| | 21 | 7 | 27 | 23.83 | +21 | 56 | 32.56 | 4.502293 | 37.44 | 8.6 |
| 12 | 1 | 7 | 24 | 47.57 | +22 | 3 | 17.12 | 4.392320 | 36.53 | 7.1 |
| | 11 | 7 | 20 | 56.53 | +22 | 12 | 20.13 | 4.305134 | 35.80 | 5.4 |
| | 21 | 7 | 16 | 5.41 | +22 | 22 | 52.49 | 4.244740 | 35.30 | 3.4 |
| | 31 | 7 | 10 | 33.73 | +22 | 33 | 59.55 | 4.214029 | 35.05 | 1.3 |

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 | 視亮度 |
|----|----|-----------|---------|-----------|---------|-----------|---------|---------|---------|------|------|
| 月 | 日 | 時間 h m | 方位 ° | 時間 h m | 仰角 ° | 時間 h m | 方位 ° | 赤道 " | 兩極 " | | 星等 |
| 1 | 1 | 14:50 | 67 | 21:33 | 86S | 04:20 | 293 | 46.83 | 43.80 | 1.00 | -2.7 |
| | 11 | 14:07 | 67 | 20:50 | 86S | 03:37 | 293 | 45.72 | 42.76 | 1.00 | -2.7 |
| | 21 | 13:26 | 67 | 20:09 | 86S | 02:55 | 293 | 44.44 | 41.56 | 0.99 | -2.6 |
| 2 | 1 | 12:42 | 67 | 19:25 | 86S | 02:11 | 293 | 42.94 | 40.16 | 0.99 | -2.5 |
| | 11 | 12:04 | 67 | 18:47 | 86S | 01:33 | 293 | 41.55 | 38.86 | 0.99 | -2.4 |
| | 21 | 11:26 | 66 | 18:10 | 86S | 00:56 | 294 | 40.20 | 37.60 | 0.99 | -2.4 |
| 3 | 1 | 10:57 | 66 | 17:41 | 86S | 00:28 | 294 | 39.17 | 36.63 | 0.99 | -2.3 |
| | 11 | 10:22 | 66 | 17:06 | 86S | 23:50 | 294 | 37.96 | 35.50 | 0.99 | -2.2 |
| | 21 | 09:48 | 66 | 16:32 | 86S | 23:17 | 294 | 36.85 | 34.47 | 0.99 | -2.2 |
| 4 | 1 | 09:11 | 65 | 15:56 | 87S | 22:41 | 295 | 35.77 | 33.46 | 0.99 | -2.1 |
| | 11 | 08:39 | 65 | 15:24 | 87S | 22:10 | 295 | 34.91 | 32.65 | 0.99 | -2.1 |
| | 21 | 08:07 | 65 | 14:53 | 87S | 21:39 | 295 | 34.18 | 31.96 | 1.00 | -2.0 |
| 5 | 1 | 07:36 | 65 | 14:23 | 87S | 21:09 | 295 | 33.56 | 31.38 | 1.00 | -2.0 |
| | 11 | 07:05 | 64 | 13:52 | 88S | 20:40 | 296 | 33.05 | 30.91 | 1.00 | -2.0 |
| | 21 | 06:35 | 64 | 13:22 | 88S | 20:10 | 296 | 32.66 | 30.54 | 1.00 | -1.9 |
| 6 | 1 | 06:02 | 64 | 12:50 | 88S | 19:38 | 296 | 32.35 | 30.25 | 1.00 | -1.9 |
| | 11 | 05:32 | 64 | 12:20 | 88S | 19:09 | 296 | 32.18 | 30.10 | 1.00 | -1.9 |
| | 21 | 05:03 | 64 | 11:51 | 88S | 18:39 | 296 | 32.12 | 30.04 | 1.00 | -1.9 |
| 7 | 1 | 04:33 | 64 | 11:22 | 88S | 18:10 | 296 | 32.16 | 30.08 | 1.00 | -1.9 |
| | 11 | 04:04 | 64 | 10:52 | 88S | 17:40 | 296 | 32.31 | 30.22 | 1.00 | -1.9 |
| | 21 | 03:34 | 64 | 10:22 | 88S | 17:10 | 296 | 32.57 | 30.46 | 1.00 | -1.9 |
| 8 | 1 | 03:01 | 64 | 09:49 | 88S | 16:37 | 296 | 32.97 | 30.83 | 1.00 | -1.9 |
| | 11 | 02:31 | 64 | 09:19 | 88S | 16:06 | 296 | 33.44 | 31.28 | 1.00 | -2.0 |
| | 21 | 02:01 | 64 | 08:48 | 88S | 15:35 | 296 | 34.03 | 31.83 | 1.00 | -2.0 |
| 9 | 1 | 01:27 | 65 | 08:13 | 87S | 15:00 | 295 | 34.81 | 32.55 | 0.99 | -2.0 |
| | 11 | 00:55 | 65 | 07:41 | 87S | 14:28 | 295 | 35.63 | 33.32 | 0.99 | -2.1 |
| | 21 | 00:22 | 65 | 07:08 | 87S | 13:54 | 295 | 36.56 | 34.19 | 0.99 | -2.1 |
| 10 | 1 | 23:45 | 65 | 06:34 | 87S | 13:20 | 295 | 37.60 | 35.16 | 0.99 | -2.2 |
| | 11 | 23:10 | 65 | 05:59 | 87S | 12:44 | 295 | 38.73 | 36.22 | 0.99 | -2.2 |
| | 21 | 22:34 | 65 | 05:23 | 87S | 12:08 | 295 | 39.93 | 37.34 | 0.99 | -2.3 |
| 11 | 1 | 21:52 | 65 | 04:41 | 87S | 11:26 | 295 | 41.31 | 38.63 | 0.99 | -2.4 |
| | 11 | 21:13 | 65 | 04:02 | 87S | 10:47 | 295 | 42.57 | 39.81 | 0.99 | -2.5 |
| | 21 | 20:32 | 65 | 03:21 | 87S | 10:07 | 295 | 43.78 | 40.95 | 0.99 | -2.5 |
| 12 | 1 | 19:50 | 65 | 02:40 | 87S | 09:25 | 295 | 44.88 | 41.97 | 1.00 | -2.6 |
| | 11 | 19:06 | 65 | 01:56 | 87S | 08:42 | 295 | 45.79 | 42.82 | 1.00 | -2.6 |
| | 21 | 18:22 | 65 | 01:12 | 87S | 07:58 | 295 | 46.44 | 43.43 | 1.00 | -2.7 |
| | 31 | 17:37 | 65 | 00:28 | 87S | 07:14 | 295 | 46.78 | 43.75 | 1.00 | -2.7 |

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 | | 中心點座標 | | 日下點座標 (系統一) | | | | 北極點位置 | |
|----|----|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | 地球 | | 太陽 | | 距離 (ds) " | 方位 (Ps) ° | 距離 (dn) " | 方位 (Pn) ° |
| 月 | 日 | 經度 (e) ° | 緯度 (e) ° | 經度 (s) ° | 緯度 (s) ° | | | | |
| 1 | 1 | 65.24 | 3.35 | 59.16 | 3.20 | 2.46 | 259.63 | 21.86 | 350.72 |
| | 11 | 204.52 | 3.31 | 196.77 | 3.17 | 3.07 | 259.72 | 21.35 | 350.38 |
| | 21 | 343.38 | 3.26 | 334.27 | 3.15 | 3.50 | 259.77 | 20.75 | 350.17 |
| 2 | 1 | 279.64 | 3.21 | 269.42 | 3.12 | 3.79 | 259.90 | 20.05 | 350.10 |
| | 11 | 57.65 | 3.17 | 46.77 | 3.09 | 3.90 | 260.11 | 19.40 | 350.19 |
| | 21 | 195.29 | 3.13 | 184.09 | 3.07 | 3.89 | 260.41 | 18.77 | 350.42 |
| 3 | 1 | 17.17 | 3.10 | 5.93 | 3.04 | 3.80 | 260.73 | 18.29 | 350.70 |
| | 11 | 154.28 | 3.06 | 143.25 | 3.02 | 3.62 | 261.22 | 17.73 | 351.16 |
| | 21 | 291.17 | 3.02 | 280.59 | 2.99 | 3.37 | 261.81 | 17.21 | 351.74 |
| 4 | 1 | 225.55 | 2.98 | 215.72 | 2.95 | 3.04 | 262.55 | 16.71 | 352.48 |
| | 11 | 2.13 | 2.95 | 353.17 | 2.92 | 2.71 | 263.32 | 16.31 | 353.25 |
| | 21 | 138.62 | 2.91 | 130.69 | 2.89 | 2.35 | 264.16 | 15.96 | 354.10 |
| 5 | 1 | 275.06 | 2.87 | 268.28 | 2.86 | 1.97 | 265.07 | 15.67 | 355.02 |
| | 11 | 51.49 | 2.83 | 45.96 | 2.83 | 1.58 | 266.07 | 15.44 | 355.99 |
| | 21 | 187.94 | 2.79 | 183.74 | 2.79 | 1.19 | 267.17 | 15.25 | 357.00 |
| 6 | 1 | 122.07 | 2.74 | 119.40 | 2.76 | 0.75 | 268.59 | 15.11 | 358.15 |
| | 11 | 258.63 | 2.69 | 257.39 | 2.72 | 0.35 | 270.70 | 15.03 | 359.22 |
| | 21 | 35.28 | 2.63 | 35.47 | 2.69 | 0.06 | 76.52 | 15.01 | 0.29 |
| 7 | 1 | 172.03 | 2.58 | 173.66 | 2.65 | 0.46 | 89.04 | 15.03 | 1.36 |
| | 11 | 308.91 | 2.52 | 311.94 | 2.62 | 0.85 | 90.77 | 15.10 | 2.42 |
| | 21 | 85.93 | 2.46 | 90.33 | 2.58 | 1.25 | 92.00 | 15.22 | 3.46 |
| 8 | 1 | 20.83 | 2.39 | 26.67 | 2.54 | 1.67 | 93.17 | 15.40 | 4.55 |
| | 11 | 158.20 | 2.33 | 165.25 | 2.50 | 2.05 | 94.13 | 15.63 | 5.50 |
| | 21 | 295.76 | 2.26 | 303.91 | 2.46 | 2.41 | 95.02 | 15.90 | 6.39 |
| 9 | 1 | 231.32 | 2.19 | 240.54 | 2.42 | 2.78 | 95.90 | 16.27 | 7.29 |
| | 11 | 9.34 | 2.13 | 19.35 | 2.38 | 3.09 | 96.61 | 16.65 | 8.02 |
| | 21 | 147.60 | 2.07 | 158.22 | 2.34 | 3.36 | 97.23 | 17.09 | 8.66 |
| 10 | 1 | 286.12 | 2.02 | 297.13 | 2.30 | 3.58 | 97.75 | 17.57 | 9.20 |
| | 11 | 64.91 | 1.97 | 76.06 | 2.26 | 3.74 | 98.16 | 18.10 | 9.63 |
| | 21 | 203.99 | 1.93 | 215.00 | 2.22 | 3.80 | 98.45 | 18.66 | 9.93 |
| 11 | 1 | 141.30 | 1.89 | 151.81 | 2.17 | 3.76 | 98.62 | 19.31 | 10.11 |
| | 11 | 280.98 | 1.87 | 290.69 | 2.13 | 3.58 | 98.62 | 19.90 | 10.13 |
| | 21 | 60.92 | 1.85 | 69.50 | 2.09 | 3.26 | 98.49 | 20.47 | 10.00 |
| 12 | 1 | 201.10 | 1.85 | 208.22 | 2.05 | 2.78 | 98.21 | 20.98 | 9.74 |
| | 11 | 341.44 | 1.84 | 346.82 | 2.00 | 2.14 | 97.78 | 21.40 | 9.35 |
| | 21 | 121.89 | 1.85 | 125.30 | 1.96 | 1.38 | 97.16 | 21.71 | 8.86 |
| | 31 | 262.33 | 1.86 | 263.62 | 1.92 | 0.52 | 95.93 | 21.87 | 8.30 |

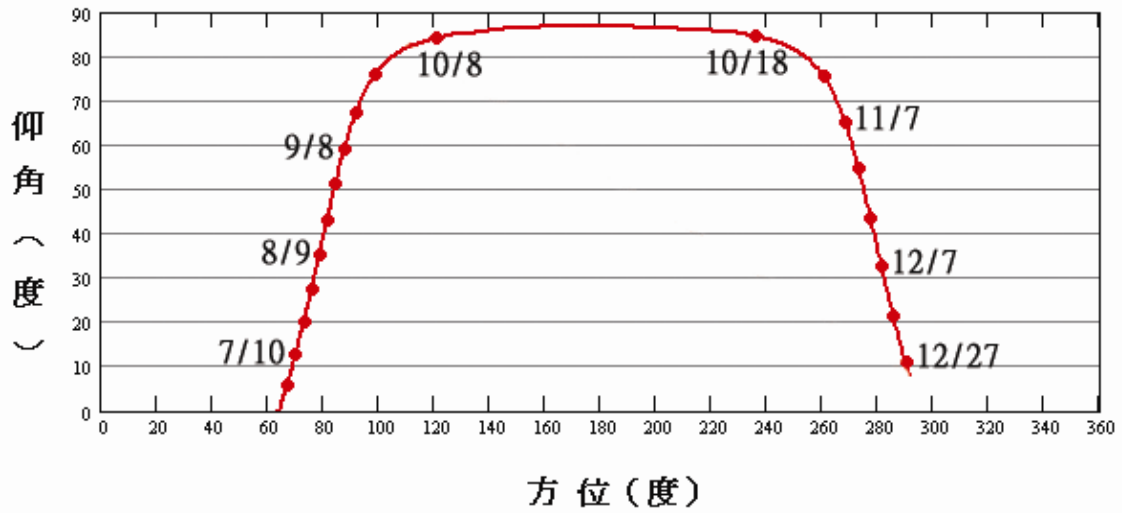
木星表面位置座標表

世界時 0 時

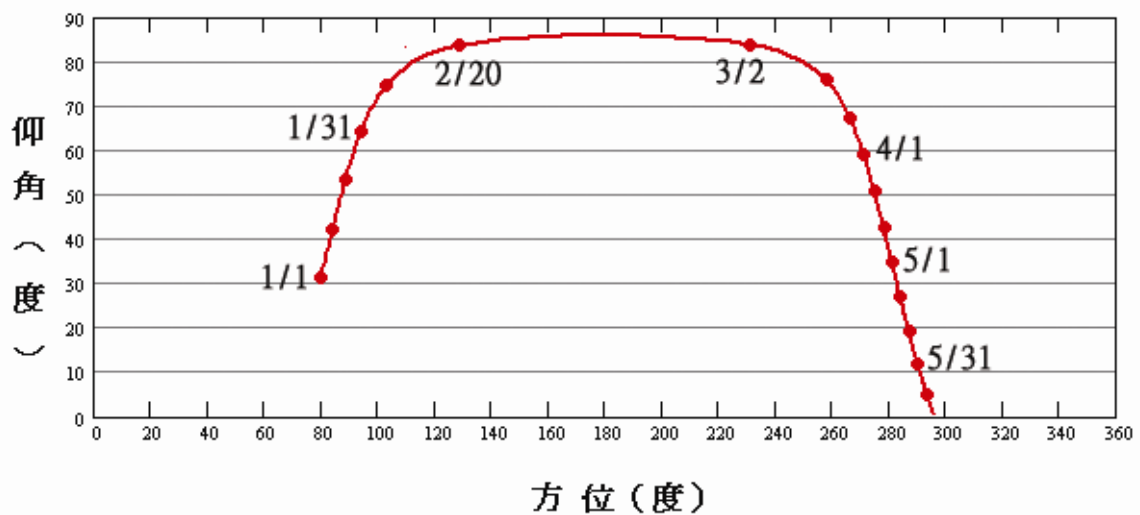
適用於木星表面高緯度可見之雲帶系統

| 日期 | | 中心點座標 | | 日下點座標 (系統二) | | | | 北極點位置 | |
|----|----|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | 地球 | | 太 陽 | | 距離 (ds) " | 方位 (Ps) ° | 距離 (dn) " | 方位 (Pn) ° |
| 月 | 日 | 經度 (e) ° | 緯度 (e) ° | 經度 (s) ° | 緯度 (s) ° | | | | |
| 1 | 1 | 170.56 | 3.35 | 164.49 | 3.20 | 2.46 | 259.63 | 21.86 | 350.72 |
| | 11 | 233.55 | 3.31 | 225.80 | 3.17 | 3.07 | 259.72 | 21.35 | 350.38 |
| | 21 | 296.12 | 3.26 | 287.00 | 3.15 | 3.50 | 259.77 | 20.75 | 350.17 |
| 2 | 1 | 148.46 | 3.21 | 138.23 | 3.12 | 3.79 | 259.90 | 20.05 | 350.10 |
| | 11 | 210.16 | 3.17 | 199.29 | 3.09 | 3.90 | 260.11 | 19.40 | 350.19 |
| | 21 | 271.51 | 3.13 | 260.31 | 3.07 | 3.89 | 260.41 | 18.77 | 350.42 |
| 3 | 1 | 32.36 | 3.10 | 21.13 | 3.04 | 3.80 | 260.73 | 18.29 | 350.70 |
| | 11 | 93.18 | 3.06 | 82.15 | 3.02 | 3.62 | 261.22 | 17.73 | 351.16 |
| | 21 | 153.78 | 3.02 | 143.20 | 2.99 | 3.37 | 261.81 | 17.21 | 351.74 |
| 4 | 1 | 4.23 | 2.98 | 354.40 | 2.95 | 3.04 | 262.55 | 16.71 | 352.48 |
| | 11 | 64.51 | 2.95 | 55.56 | 2.92 | 2.71 | 263.32 | 16.31 | 353.25 |
| | 21 | 124.71 | 2.91 | 116.78 | 2.89 | 2.35 | 264.16 | 15.96 | 354.10 |
| 5 | 1 | 184.86 | 2.87 | 178.08 | 2.86 | 1.97 | 265.07 | 15.67 | 355.02 |
| | 11 | 244.99 | 2.83 | 239.47 | 2.83 | 1.58 | 266.07 | 15.44 | 355.99 |
| | 21 | 305.14 | 2.79 | 300.94 | 2.79 | 1.19 | 267.17 | 15.25 | 357.00 |
| 6 | 1 | 155.35 | 2.74 | 152.68 | 2.76 | 0.75 | 268.59 | 15.11 | 358.15 |
| | 11 | 215.61 | 2.69 | 214.36 | 2.72 | 0.35 | 270.70 | 15.03 | 359.22 |
| | 21 | 275.96 | 2.63 | 276.15 | 2.69 | 0.06 | 76.52 | 15.01 | 0.29 |
| 7 | 1 | 336.41 | 2.58 | 338.04 | 2.65 | 0.46 | 89.04 | 15.03 | 1.36 |
| | 11 | 36.98 | 2.52 | 40.02 | 2.62 | 0.85 | 90.77 | 15.10 | 2.42 |
| | 21 | 97.70 | 2.46 | 102.11 | 2.58 | 1.25 | 92.00 | 15.22 | 3.46 |
| 8 | 1 | 308.67 | 2.39 | 314.51 | 2.54 | 1.67 | 93.17 | 15.40 | 4.55 |
| | 11 | 9.74 | 2.33 | 16.79 | 2.50 | 2.05 | 94.13 | 15.63 | 5.50 |
| | 21 | 70.99 | 2.26 | 79.15 | 2.46 | 2.41 | 95.02 | 15.90 | 6.39 |
| 9 | 1 | 282.62 | 2.19 | 291.83 | 2.42 | 2.78 | 95.90 | 16.27 | 7.29 |
| | 11 | 344.33 | 2.13 | 354.34 | 2.38 | 3.09 | 96.61 | 16.65 | 8.02 |
| | 21 | 46.28 | 2.07 | 56.91 | 2.34 | 3.36 | 97.23 | 17.09 | 8.66 |
| 10 | 1 | 108.50 | 2.02 | 119.51 | 2.30 | 3.58 | 97.75 | 17.57 | 9.20 |
| | 11 | 170.98 | 1.97 | 182.14 | 2.26 | 3.74 | 98.16 | 18.10 | 9.63 |
| | 21 | 233.75 | 1.93 | 244.77 | 2.22 | 3.80 | 98.45 | 18.66 | 9.93 |
| 11 | 1 | 87.13 | 1.89 | 97.64 | 2.17 | 3.76 | 98.62 | 19.31 | 10.11 |
| | 11 | 150.50 | 1.87 | 160.21 | 2.13 | 3.58 | 98.62 | 19.90 | 10.13 |
| | 21 | 214.14 | 1.85 | 222.71 | 2.09 | 3.26 | 98.49 | 20.47 | 10.00 |
| 12 | 1 | 278.01 | 1.85 | 285.13 | 2.05 | 2.78 | 98.21 | 20.98 | 9.74 |
| | 11 | 342.05 | 1.84 | 347.43 | 2.00 | 2.14 | 97.78 | 21.40 | 9.35 |
| | 21 | 46.19 | 1.85 | 49.60 | 1.96 | 1.38 | 97.16 | 21.71 | 8.86 |
| | 31 | 110.34 | 1.86 | 111.62 | 1.92 | 0.52 | 95.93 | 21.87 | 8.30 |

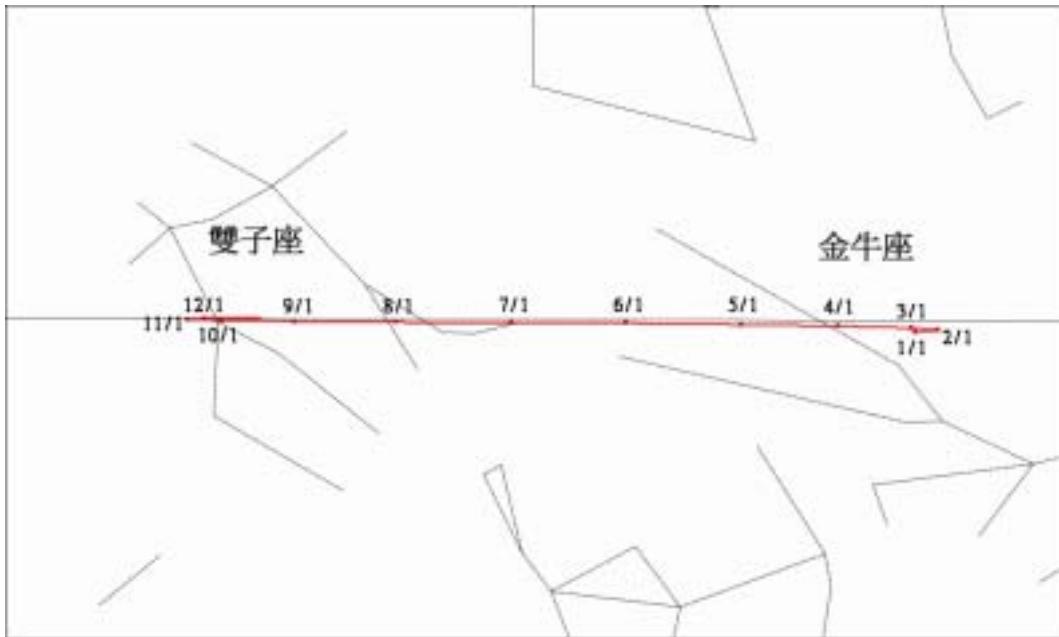
日出時木星方位與仰角



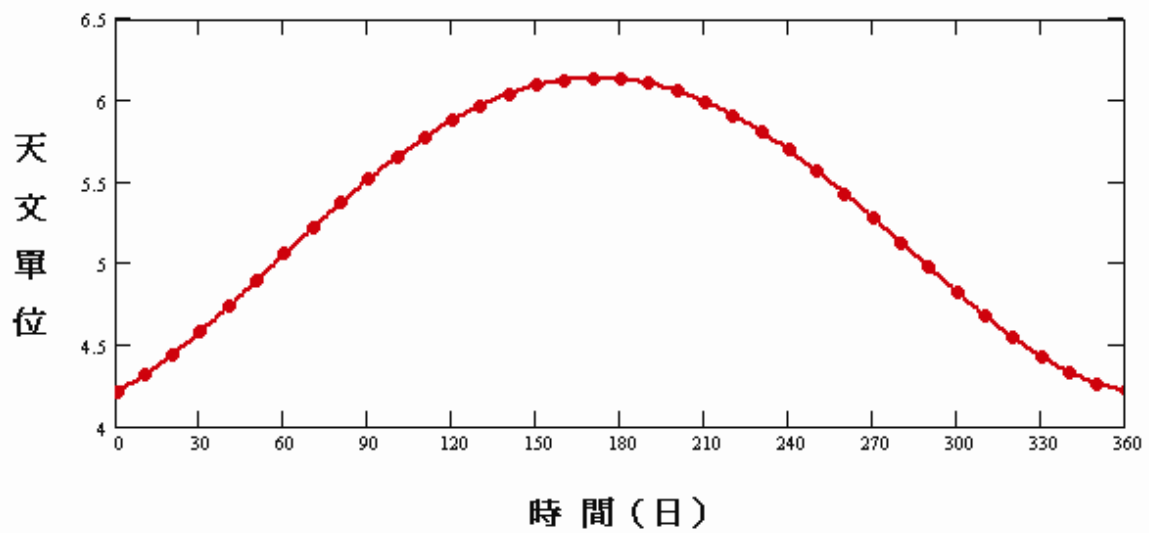
日沒時木星方位與仰角



木星在天球上運行的軌跡圖



木星與地球距離變化圖



木星衛星 (木衛一 木衛二) 位置表

世界時 0 時，以木星位置座標為基準

| 日期 月 日 | 木衛一 Io | | | | 木衛二 Europa | | | |
|-----------|----------|------------|-----------|----------|------------|------------|-----------|----------|
| | 赤經差 s | 赤緯差 ' " | 角距 ' " | 方位角 ° | 赤經差 s | 赤緯差 ' " | 角距 ' " | 方位角 ° |
| 1 1 | -4.54 | -0 3.98 | 1 8.24 | -93.6 | -5.08 | -0 23.87 | 1 19.91 | -108.5 |
| 1 11 | -4.54 | -0 16.95 | 1 10.13 | -104.9 | 10.96 | +0 18.61 | 2 45.46 | 83.1 |
| 1 21 | 9.12 | +0 22.87 | 2 18.73 | 79.9 | 13.74 | +0 38.88 | 3 29.77 | 78.6 |
| 2 1 | 2.73 | +0 0.57 | 0 40.87 | 89.1 | 13.85 | +0 32.57 | 3 30.34 | 80.5 |
| 2 11 | 5.07 | +0 17.17 | 1 18.01 | 76.4 | 8.39 | +0 29.56 | 2 9.32 | 75.9 |
| 2 21 | -8.37 | -0 19.75 | 2 7.03 | -99.6 | -6.37 | -0 6.64 | 1 35.72 | -94.3 |
| 3 1 | 8.06 | +0 17.64 | 2 2.14 | 81.1 | 11.32 | +0 31.78 | 2 52.67 | 78.6 |
| 3 11 | -3.83 | -0 3.65 | 0 57.63 | -93.9 | -1.37 | +0 6.36 | 0 21.53 | -71.6 |
| 3 21 | -3.22 | -0 11.21 | 0 49.51 | -104.0 | -11.75 | -0 22.16 | 2 57.60 | -97.7 |
| 4 1 | -7.37 | -0 12.63 | 1 51.27 | -97.0 | -7.77 | -0 8.19 | 1 56.77 | -94.3 |
| 4 11 | 3.20 | +0 0.97 | 0 48.05 | 88.7 | -11.12 | -0 21.74 | 2 48.18 | -98.0 |
| 4 21 | 3.32 | +0 8.79 | 0 50.56 | 79.2 | -0.65 | -0 9.10 | 0 13.37 | -135.1 |
| 5 1 | -6.98 | -0 9.24 | 1 45.17 | -95.4 | 10.27 | +0 9.88 | 2 34.41 | 86.0 |
| 5 11 | 5.19 | +0 2.10 | 1 17.86 | 88.3 | 7.93 | +0 13.69 | 1 59.74 | 82.9 |
| 5 21 | 0.69 | +0 4.63 | 0 11.28 | 63.9 | -4.30 | +0 3.68 | 1 4.62 | -86.5 |
| 6 1 | 6.85 | +0 3.64 | 1 42.87 | 87.8 | 1.82 | +0 8.27 | 0 28.48 | 71.7 |
| 6 11 | -4.93 | +0 1.81 | 1 14.04 | -88.5 | -9.39 | +0 1.59 | 2 20.87 | -89.3 |
| 6 21 | -0.71 | -0 3.80 | 0 11.27 | -111.3 | -8.93 | -0 4.06 | 2 13.97 | -91.9 |
| 7 1 | 5.93 | -0 0.03 | 1 28.99 | 90.0 | 2.65 | -0 7.63 | 0 40.46 | 101.8 |
| 7 11 | -6.38 | +0 5.12 | 1 35.82 | -86.7 | 10.82 | -0 6.72 | 2 42.45 | 92.6 |
| 7 21 | 1.91 | -0 5.13 | 0 29.15 | 101.0 | 5.05 | +0 2.11 | 1 15.83 | 88.3 |
| 8 1 | -6.10 | +0 4.95 | 1 31.56 | -86.6 | 9.68 | -0 7.03 | 2 25.32 | 93.0 |
| 8 11 | 6.55 | -0 10.16 | 1 38.76 | 96.4 | -1.59 | +0 8.85 | 0 25.47 | -68.1 |
| 8 21 | -1.62 | +0 5.97 | 0 25.04 | -75.1 | -11.20 | +0 18.70 | 2 48.97 | -83.1 |
| 9 1 | 6.57 | -0 10.08 | 1 39.08 | 96.3 | -7.97 | +0 18.97 | 2 1.10 | -80.2 |
| 9 11 | -6.68 | +0 14.67 | 1 41.26 | -81.0 | -11.24 | +0 19.33 | 2 49.77 | -82.9 |
| 9 21 | 1.32 | -0 6.24 | 0 20.79 | 108.8 | -0.58 | -0 5.78 | 0 10.48 | -125.5 |
| 10 1 | 5.47 | -0 9.80 | 1 22.59 | 97.3 | 11.30 | -0 28.46 | 2 51.86 | 100.3 |
| 10 11 | -8.01 | +0 19.46 | 2 1.73 | -80.1 | 9.63 | -0 18.05 | 2 25.62 | 97.7 |
| 10 21 | 3.85 | -0 12.55 | 0 59.07 | 103.2 | -4.28 | +0 17.14 | 1 6.37 | -73.9 |
| 11 1 | -6.70 | +0 14.40 | 1 41.55 | -81.2 | 3.88 | -0 2.65 | 0 58.24 | 92.8 |
| 11 11 | 8.54 | -0 22.27 | 2 10.01 | 100.6 | -10.83 | +0 31.61 | 2 45.51 | -78.2 |
| 11 21 | -3.00 | +0 10.93 | 0 46.27 | -75.3 | -12.92 | +0 28.20 | 3 15.90 | -81.1 |
| 12 1 | -5.66 | +0 10.50 | 1 25.56 | -82.4 | 0.63 | -0 9.36 | 0 13.31 | 136.9 |
| 12 11 | 9.56 | -0 22.09 | 2 25.03 | 99.4 | 14.15 | -0 35.57 | 3 35.26 | 100.2 |
| 12 21 | -5.12 | +0 14.48 | 1 18.13 | -78.5 | 11.72 | -0 20.04 | 2 56.95 | 97.0 |
| 12 31 | -4.22 | +0 4.93 | 1 3.44 | -85.2 | -4.38 | +0 16.57 | 1 7.76 | -74.7 |

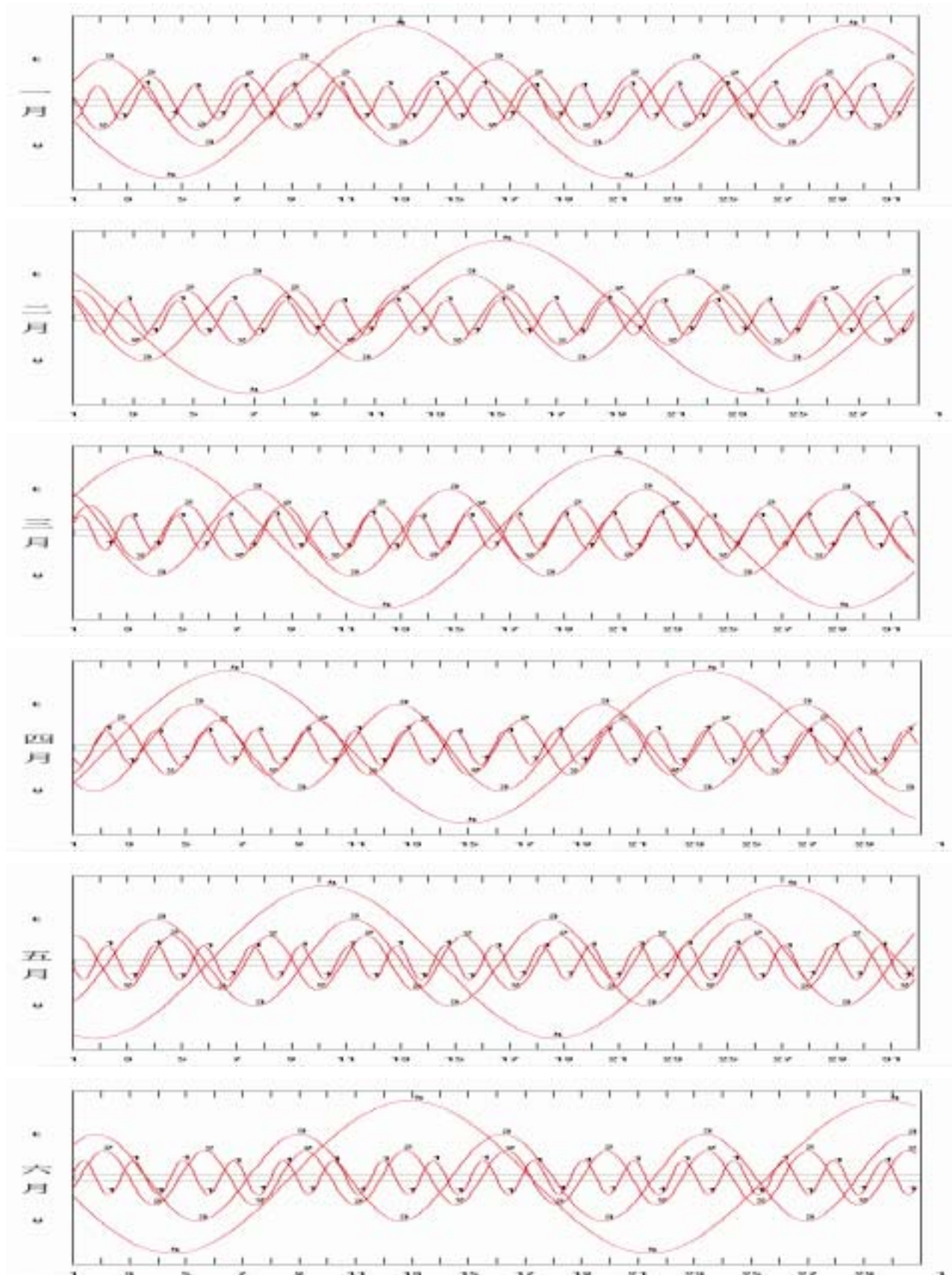
木 星 衛 星 (^{木衛三}_{木衛四}) 位 置 表

世界時 0 時，以木星位置座標為基準

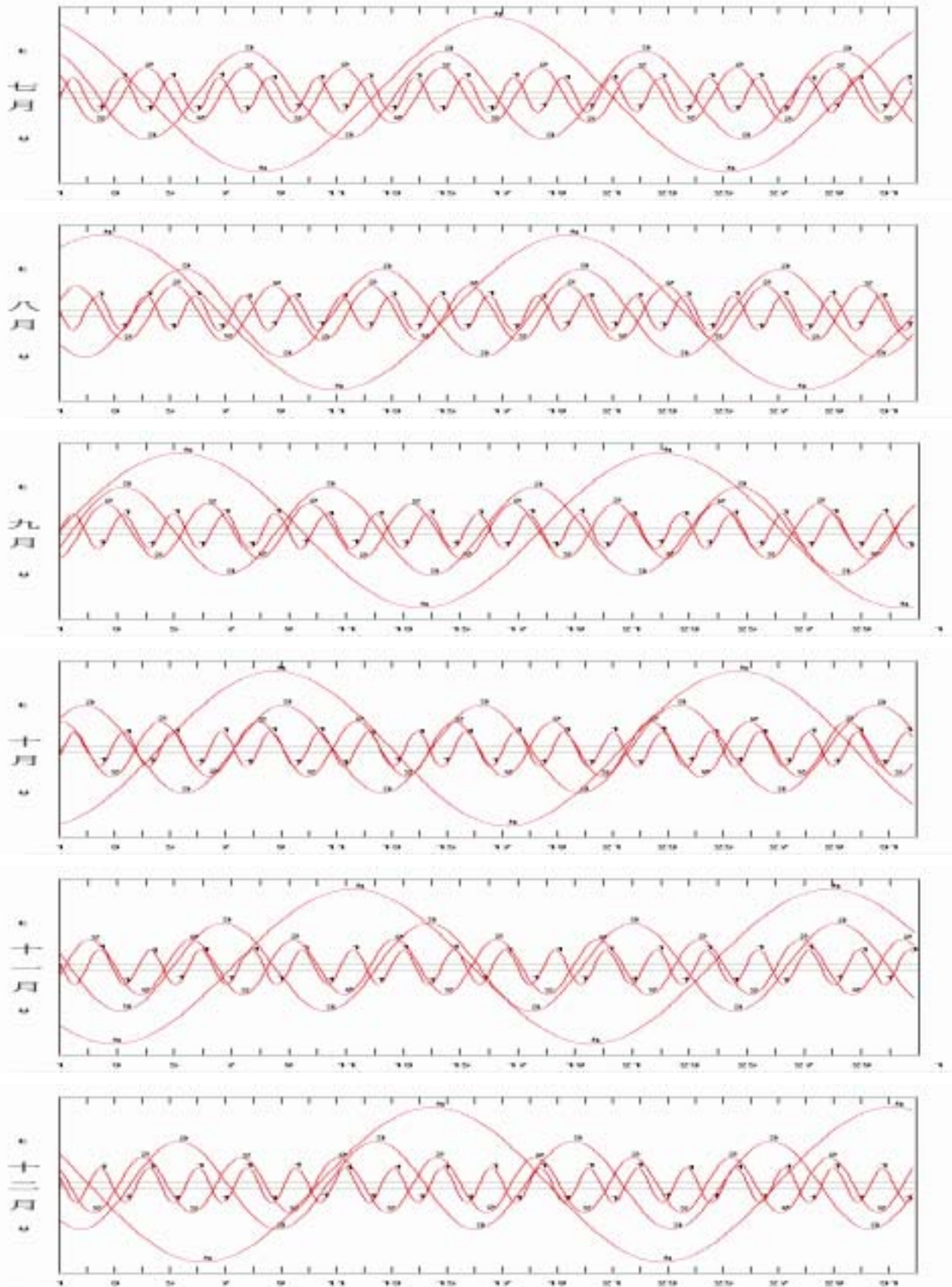
| 日期 月 日 | 木衛三 Ganymede | | | | | | 木衛四 Callisto | | | | | | |
|-----------|--------------|----------|---------|---------------|---|-------|--------------|---------|---------|---------------|----|-------|--------|
| | 赤經差 s | 赤緯差 ' | 角距 " | 方位角 ' " | | ° | 赤經差 s | 赤緯 ' | 角距 " | 方位角 ' " | | ° | |
| 1 | 1 | 17.13 | +0 | 52.90 | 4 | 22.34 | 77.6 | -14.94 | -1 | 1.68 | 3 | 52.39 | -106.4 |
| | 11 | -3.24 | -0 | 25.45 | 0 | 54.83 | -119.3 | 36.02 | +1 | 39.88 | 9 | 9.41 | 78.8 |
| | 21 | -11.09 | -0 | 12.25 | 2 | 46.73 | -94.5 | -40.76 | -1 | 37.33 | 10 | 19.05 | -99.6 |
| 2 | 1 | 5.87 | -0 | 1.22 | 1 | 27.99 | 90.8 | 19.73 | +0 | 25.37 | 4 | 57.07 | 84.7 |
| | 11 | -17.17 | -0 | 32.56 | 4 | 19.62 | -97.7 | 4.83 | +0 | 35.84 | 1 | 20.76 | 62.1 |
| | 21 | 21.21 | +0 | 50.45 | 5 | 22.12 | 80.3 | -24.35 | -1 | 15.05 | 6 | 12.92 | -102.4 |
| 3 | 1 | 15.31 | +0 | 25.79 | 3 | 51.10 | 83.1 | 20.50 | +1 | 5.21 | 5 | 14.34 | 77.2 |
| | 11 | -19.99 | -0 | 42.94 | 5 | 2.85 | -98.7 | -32.53 | -1 | 18.73 | 8 | 14.25 | -99.8 |
| | 21 | 16.31 | +0 | 40.72 | 4 | 8.05 | 79.8 | 33.84 | +1 | 3.55 | 8 | 31.61 | 82.3 |
| 4 | 1 | -17.67 | -0 | 37.71 | 4 | 27.75 | -98.7 | -12.05 | -0 | 3.95 | 3 | 0.86 | -91.3 |
| | 11 | 9.27 | +0 | 26.01 | 2 | 21.42 | 78.6 | -6.47 | -0 | 29.18 | 1 | 41.29 | -108.0 |
| | 21 | 2.97 | -0 | 7.26 | 0 | 45.08 | 100.0 | 23.53 | +0 | 46.10 | 5 | 55.88 | 81.9 |
| 5 | 1 | -13.34 | -0 | 8.87 | 3 | 20.22 | -92.7 | -31.03 | -0 | 40.95 | 7 | 47.18 | -95.4 |
| | 11 | 17.84 | +0 | 17.14 | 4 | 28.14 | 86.0 | 29.08 | +0 | 21.44 | 7 | 16.65 | 86.9 |
| | 21 | -14.30 | -0 | 17.08 | 3 | 35.20 | -94.9 | -16.59 | +0 | 1.65 | 4 | 8.81 | -89.6 |
| 6 | 1 | 15.95 | +0 | 11.88 | 3 | 59.53 | 86.9 | -11.02 | -0 | 20.02 | 2 | 46.51 | -97.5 |
| | 11 | -7.66 | -0 | 10.87 | 1 | 55.38 | -95.9 | 25.50 | +0 | 13.84 | 6 | 22.73 | 87.7 |
| | 21 | -3.83 | +0 | 9.99 | 0 | 58.24 | -79.3 | -30.45 | +0 | 1.13 | 7 | 36.69 | -89.8 |
| 7 | 1 | 13.82 | -0 | 10.30 | 3 | 27.47 | 93.1 | 26.33 | -0 | 16.23 | 6 | 35.26 | 92.5 |
| | 11 | -17.50 | +0 | 9.59 | 4 | 22.68 | -87.7 | -12.30 | +0 | 20.28 | 3 | 5.68 | -83.2 |
| | 21 | 13.53 | -0 | 4.80 | 3 | 23.04 | 91.5 | -4.49 | -0 | 10.65 | 1 | 8.18 | -99.8 |
| 8 | 1 | -15.60 | +0 | 12.20 | 3 | 54.36 | -86.7 | 28.43 | -0 | 24.53 | 7 | 7.09 | 93.6 |
| | 11 | 6.88 | -0 | 0.29 | 1 | 43.23 | 90.2 | -31.20 | +0 | 42.41 | 7 | 49.84 | -84.4 |
| | 21 | 5.22 | -0 | 16.95 | 1 | 20.05 | 103.2 | 24.48 | -0 | 46.49 | 6 | 10.16 | 97.8 |
| 9 | 1 | -1.52 | +0 | 11.98 | 0 | 25.80 | -60.4 | 4.38 | +0 | 6.03 | 1 | 5.93 | 84.3 |
| | 11 | 13.11 | -0 | 32.18 | 3 | 19.29 | 100.0 | -21.67 | +0 | 31.16 | 5 | 26.51 | -84.1 |
| | 21 | -19.25 | +0 | 41.71 | 4 | 51.72 | -81.1 | 33.38 | -1 | 6.18 | 8 | 25.02 | 98.1 |
| 10 | 1 | 17.39 | -0 | 34.24 | 4 | 23.13 | 98.0 | -32.79 | +1 | 17.15 | 8 | 17.81 | -80.4 |
| | 11 | -7.97 | +0 | 9.90 | 1 | 59.92 | -84.9 | 21.49 | -1 | 1.17 | 5 | 28.05 | 101.6 |
| | 21 | -5.33 | +0 | 22.20 | 1 | 22.99 | -73.3 | 0.22 | +0 | 13.38 | 0 | 13.77 | 12.7 |
| 11 | 1 | 0.63 | -0 | 11.32 | 0 | 14.75 | 142.2 | -31.81 | +1 | 9.79 | 8 | 2.21 | -81.0 |
| | 11 | -13.95 | +0 | 42.23 | 3 | 33.42 | -77.7 | 39.91 | -1 | 38.54 | 10 | 6.64 | 100.0 |
| | 21 | 22.43 | -0 | 57.38 | 5 | 41.31 | 100.4 | -31.63 | +1 | 25.35 | 8 | 2.08 | -79.0 |
| 12 | 1 | -22.26 | +0 | 48.97 | 5 | 37.40 | -81.0 | 11.85 | -0 | 42.14 | 3 | 2.66 | 104.3 |
| | 11 | 13.23 | -0 | 21.24 | 3 | 19.65 | 96.6 | 15.89 | -0 | 21.84 | 3 | 59.37 | 95.6 |
| | 21 | 1.18 | -0 | 13.21 | 0 | 22.13 | 128.8 | -36.63 | +1 | 9.61 | 9 | 13.89 | -82.2 |
| | 31 | -15.43 | +0 | 39.34 | 3 | 54.71 | -79.6 | 44.18 | -1 | 29.48 | 11 | 8.67 | 98.3 |

2013 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。



2013 年木星四大衛星繞行木星軌跡圖



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 | ° |
| 1 | 1 | 14 | 31 | 36.98 | -12 | 26 | 55.83 | 10.227704 | 85.06 | 5.0 |
| | 11 | 14 | 34 | 24.75 | -12 | 38 | 17.76 | 10.075930 | 83.80 | 5.4 |
| | 21 | 14 | 36 | 39.20 | -12 | 46 | 40.86 | 9.914961 | 82.46 | 5.7 |
| 2 | 1 | 14 | 38 | 24.79 | -12 | 52 | 18.68 | 9.732747 | 80.94 | 5.8 |
| | 11 | 14 | 39 | 19.67 | -12 | 54 | 4.97 | 9.567410 | 79.57 | 5.7 |
| | 21 | 14 | 39 | 33.70 | -12 | 52 | 39.74 | 9.407620 | 78.24 | 5.4 |
| 3 | 1 | 14 | 39 | 15.71 | -12 | 49 | 18.63 | 9.287182 | 77.24 | 5.1 |
| | 11 | 14 | 38 | 17.97 | -12 | 42 | 30.76 | 9.149801 | 76.10 | 4.5 |
| | 21 | 14 | 36 | 43.75 | -12 | 33 | 5.87 | 9.031455 | 75.11 | 3.8 |
| 4 | 1 | 14 | 34 | 24.21 | -12 | 20 | 15.63 | 8.928042 | 74.25 | 2.8 |
| | 11 | 14 | 31 | 51.70 | -12 | 6 | 55.51 | 8.861767 | 73.70 | 1.8 |
| | 21 | 14 | 29 | 3.06 | -11 | 52 | 41.45 | 8.824478 | 73.39 | 0.8 |
| 5 | 1 | 14 | 26 | 7.37 | -11 | 38 | 17.65 | 8.817257 | 73.33 | 0.4 |
| | 11 | 14 | 23 | 13.49 | -11 | 24 | 28.50 | 8.840227 | 73.52 | 1.4 |
| | 21 | 14 | 20 | 30.59 | -11 | 11 | 59.05 | 8.892539 | 73.96 | 2.4 |
| 6 | 1 | 14 | 17 | 53.63 | -11 | 0 | 33.18 | 8.981357 | 74.70 | 3.4 |
| | 11 | 14 | 15 | 58.20 | -10 | 52 | 50.02 | 9.087541 | 75.58 | 4.2 |
| | 21 | 14 | 14 | 34.33 | -10 | 48 | 5.46 | 9.214237 | 76.63 | 4.8 |
| 7 | 1 | 14 | 13 | 45.41 | -10 | 46 | 33.63 | 9.357248 | 77.82 | 5.4 |
| | 11 | 14 | 13 | 33.43 | -10 | 48 | 20.73 | 9.512407 | 79.11 | 5.7 |
| | 21 | 14 | 13 | 59.24 | -10 | 53 | 25.76 | 9.675104 | 80.47 | 5.9 |
| 8 | 1 | 14 | 15 | 10.40 | -11 | 2 | 39.21 | 9.857431 | 81.98 | 5.9 |
| | 11 | 14 | 16 | 52.60 | -11 | 14 | 6.65 | 10.021679 | 83.35 | 5.8 |
| | 21 | 14 | 19 | 8.36 | -11 | 28 | 11.30 | 10.180058 | 84.67 | 5.5 |
| 9 | 1 | 14 | 22 | 12.95 | -11 | 46 | 16.76 | 10.343086 | 86.02 | 5.0 |
| | 11 | 14 | 25 | 29.73 | -12 | 4 | 42.60 | 10.477343 | 87.14 | 4.5 |
| | 21 | 14 | 29 | 10.48 | -12 | 24 | 37.24 | 10.594967 | 88.12 | 3.8 |
| 10 | 1 | 14 | 33 | 11.56 | -12 | 45 | 36.72 | 10.693452 | 88.93 | 3.1 |
| | 11 | 14 | 37 | 29.32 | -13 | 7 | 17.69 | 10.770421 | 89.57 | 2.3 |
| | 21 | 14 | 41 | 59.57 | -13 | 29 | 16.12 | 10.824035 | 90.02 | 1.5 |
| 11 | 1 | 14 | 47 | 6.54 | -13 | 53 | 19.97 | 10.854672 | 90.28 | 0.5 |
| | 11 | 14 | 51 | 49.81 | -14 | 14 | 43.00 | 10.855759 | 90.28 | 0.5 |
| | 21 | 14 | 56 | 32.26 | -14 | 35 | 15.89 | 10.831257 | 90.08 | 1.3 |
| 12 | 1 | 15 | 1 | 9.54 | -14 | 54 | 40.18 | 10.781619 | 89.67 | 2.1 |
| | 11 | 15 | 5 | 36.89 | -15 | 12 | 37.94 | 10.707677 | 89.05 | 2.9 |
| | 21 | 15 | 9 | 49.39 | -15 | 28 | 52.58 | 10.611216 | 88.25 | 3.7 |
| | 31 | 15 | 13 | 42.45 | -15 | 43 | 10.59 | 10.494400 | 87.28 | 4.3 |

土星出沒時間表

東經：121.52°，北緯：25.10°

東經 120° 平太陽時

| 日期 | | 出 | | 中天 | | 沒 | | 視直徑 | | 相位 | 視亮度 |
|----|----|-----------|---------|-----------|---------|-----------|---------|---------|---------|------|-----|
| 月 | 日 | 時間 h m | 方位 ° | 時間 h m | 仰角 ° | 時間 h m | 方位 ° | 赤道 " | 兩極 " | | 星等 |
| 1 | 1 | 02:04 | 103 | 07:42 | 52S | 13:20 | 256 | 16.25 | 14.82 | 1.00 | 0.6 |
| | 11 | 01:28 | 104 | 07:06 | 52S | 12:43 | 256 | 16.49 | 15.05 | 1.00 | 0.6 |
| | 21 | 00:51 | 104 | 06:29 | 52S | 12:06 | 256 | 16.76 | 15.30 | 1.00 | 0.6 |
| 2 | 1 | 00:10 | 104 | 05:47 | 52S | 11:24 | 256 | 17.07 | 15.58 | 1.00 | 0.5 |
| | 11 | 23:28 | 104 | 05:09 | 52S | 10:46 | 256 | 17.37 | 15.85 | 1.00 | 0.5 |
| | 21 | 22:49 | 104 | 04:30 | 52S | 10:07 | 256 | 17.66 | 16.12 | 1.00 | 0.5 |
| 3 | 1 | 22:17 | 104 | 03:58 | 52S | 09:35 | 256 | 17.89 | 16.33 | 1.00 | 0.4 |
| | 11 | 21:36 | 104 | 03:18 | 52S | 08:55 | 256 | 18.16 | 16.57 | 1.00 | 0.4 |
| | 21 | 20:55 | 104 | 02:37 | 52S | 08:15 | 256 | 18.40 | 16.79 | 1.00 | 0.3 |
| 4 | 1 | 20:09 | 103 | 01:51 | 53S | 07:29 | 257 | 18.61 | 16.98 | 1.00 | 0.2 |
| | 11 | 19:27 | 103 | 01:09 | 53S | 06:48 | 257 | 18.75 | 17.10 | 1.00 | 0.2 |
| | 21 | 18:44 | 103 | 00:27 | 53S | 06:06 | 257 | 18.83 | 17.17 | 1.00 | 0.2 |
| 5 | 1 | 18:01 | 103 | 23:41 | 53S | 05:25 | 257 | 18.85 | 17.18 | 1.00 | 0.1 |
| | 11 | 17:19 | 102 | 22:59 | 54S | 04:43 | 258 | 18.80 | 17.13 | 1.00 | 0.2 |
| | 21 | 16:36 | 102 | 22:17 | 54S | 04:01 | 258 | 18.69 | 17.03 | 1.00 | 0.3 |
| 6 | 1 | 15:50 | 102 | 21:31 | 54S | 03:16 | 258 | 18.51 | 16.85 | 1.00 | 0.3 |
| | 11 | 15:09 | 102 | 20:50 | 54S | 02:35 | 258 | 18.29 | 16.66 | 1.00 | 0.4 |
| | 21 | 14:28 | 102 | 20:09 | 54S | 01:54 | 258 | 18.04 | 16.42 | 1.00 | 0.5 |
| 7 | 1 | 13:48 | 102 | 19:29 | 54S | 01:14 | 258 | 17.76 | 16.17 | 1.00 | 0.5 |
| | 11 | 13:08 | 102 | 18:49 | 54S | 00:34 | 258 | 17.47 | 15.91 | 1.00 | 0.6 |
| | 21 | 12:30 | 102 | 18:11 | 54S | 23:52 | 258 | 17.18 | 15.64 | 1.00 | 0.6 |
| 8 | 1 | 11:48 | 102 | 17:29 | 54S | 23:09 | 258 | 16.86 | 15.36 | 1.00 | 0.6 |
| | 11 | 11:11 | 102 | 16:51 | 54S | 22:31 | 258 | 16.59 | 15.11 | 1.00 | 0.7 |
| | 21 | 10:34 | 102 | 16:14 | 53S | 21:54 | 258 | 16.33 | 14.88 | 1.00 | 0.7 |
| 9 | 1 | 09:54 | 103 | 15:34 | 53S | 21:13 | 257 | 16.07 | 14.65 | 1.00 | 0.7 |
| | 11 | 09:19 | 103 | 14:58 | 53S | 20:36 | 257 | 15.86 | 14.47 | 1.00 | 0.7 |
| | 21 | 08:44 | 103 | 14:22 | 52S | 20:00 | 257 | 15.69 | 14.31 | 1.00 | 0.7 |
| 10 | 1 | 08:09 | 104 | 13:47 | 52S | 19:24 | 256 | 15.54 | 14.18 | 1.00 | 0.6 |
| | 11 | 07:35 | 104 | 13:12 | 52S | 18:48 | 256 | 15.43 | 14.09 | 1.00 | 0.6 |
| | 21 | 07:01 | 105 | 12:37 | 51S | 18:13 | 255 | 15.35 | 14.02 | 1.00 | 0.6 |
| 11 | 1 | 06:23 | 105 | 11:59 | 51S | 17:34 | 255 | 15.31 | 13.99 | 1.00 | 0.5 |
| | 11 | 05:50 | 105 | 11:24 | 51S | 16:59 | 254 | 15.31 | 14.00 | 1.00 | 0.5 |
| | 21 | 05:16 | 106 | 10:49 | 50S | 16:23 | 254 | 15.34 | 14.03 | 1.00 | 0.5 |
| 12 | 1 | 04:42 | 106 | 10:15 | 50S | 15:48 | 254 | 15.41 | 14.10 | 1.00 | 0.6 |
| | 11 | 04:07 | 107 | 09:40 | 50S | 15:12 | 253 | 15.52 | 14.21 | 1.00 | 0.6 |
| | 21 | 03:33 | 107 | 09:05 | 49S | 14:37 | 253 | 15.66 | 14.34 | 1.00 | 0.6 |
| | 31 | 02:58 | 107 | 08:29 | 49S | 14:01 | 253 | 15.84 | 14.50 | 1.00 | 0.6 |

土星表面位置座標表




世界時 0 時

| 日期 | | 中心點座標 | | 日下點座標 (系統二) | | | | 北極點位置 | |
|----|----|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | 地球 | | 太 陽 | | 距離 (ds) " | 方位 (Ps) ° | 距離 (dn) " | 方位 (Pn) ° |
| 月 | 日 | 經度 (e) ° | 緯度 (e) ° | 經度 (s) ° | 緯度 (s) ° | | | | |
| 1 | 1 | 299.44 | 22.76 | 304.40 | 20.66 | 0.69 | 109.59 | 6.94 | 359.61 |
| | 11 | 127.37 | 22.98 | 132.74 | 20.79 | 0.75 | 108.96 | 7.03 | 359.69 |
| | 21 | 315.49 | 23.15 | 321.13 | 20.93 | 0.80 | 108.39 | 7.14 | 359.76 |
| 2 | 1 | 234.62 | 23.26 | 240.37 | 21.07 | 0.83 | 107.82 | 7.27 | 359.81 |
| | 11 | 63.10 | 23.29 | 68.78 | 21.20 | 0.83 | 107.32 | 7.39 | 359.84 |
| | 21 | 251.73 | 23.27 | 257.15 | 21.33 | 0.80 | 106.82 | 7.52 | 359.84 |
| 3 | 1 | 258.72 | 23.20 | 263.82 | 21.43 | 0.76 | 106.38 | 7.62 | 359.84 |
| | 11 | 87.55 | 23.07 | 92.09 | 21.56 | 0.69 | 105.74 | 7.74 | 359.81 |
| | 21 | 276.45 | 22.88 | 280.27 | 21.69 | 0.58 | 104.88 | 7.85 | 359.76 |
| 4 | 1 | 196.27 | 22.63 | 199.15 | 21.83 | 0.44 | 103.30 | 7.95 | 359.69 |
| | 11 | 25.17 | 22.37 | 27.08 | 21.96 | 0.29 | 100.24 | 8.02 | 359.62 |
| | 21 | 214.01 | 22.08 | 214.89 | 22.08 | 0.13 | 89.44 | 8.07 | 359.54 |
| 5 | 1 | 42.73 | 21.79 | 42.55 | 22.21 | 0.06 | 332.66 | 8.08 | 359.45 |
| | 11 | 231.31 | 21.52 | 230.07 | 22.33 | 0.22 | 300.06 | 8.07 | 359.37 |
| | 21 | 59.70 | 21.26 | 57.45 | 22.45 | 0.37 | 295.06 | 8.04 | 359.29 |
| 6 | 1 | 338.69 | 21.03 | 335.42 | 22.59 | 0.52 | 292.93 | 7.97 | 359.21 |
| | 11 | 166.62 | 20.87 | 162.55 | 22.71 | 0.64 | 291.87 | 7.88 | 359.16 |
| | 21 | 354.32 | 20.77 | 349.58 | 22.83 | 0.73 | 291.16 | 7.77 | 359.12 |
| 7 | 1 | 181.80 | 20.74 | 176.54 | 22.95 | 0.80 | 290.60 | 7.66 | 359.09 |
| | 11 | 9.07 | 20.77 | 3.43 | 23.07 | 0.83 | 290.12 | 7.53 | 359.09 |
| | 21 | 196.13 | 20.87 | 190.30 | 23.19 | 0.85 | 289.66 | 7.40 | 359.10 |
| 8 | 1 | 113.71 | 21.06 | 107.83 | 23.32 | 0.83 | 289.17 | 7.26 | 359.13 |
| | 11 | 300.44 | 21.29 | 294.69 | 23.44 | 0.80 | 288.69 | 7.13 | 359.18 |
| | 21 | 127.06 | 21.58 | 121.57 | 23.56 | 0.75 | 288.17 | 7.01 | 359.25 |
| 9 | 1 | 44.24 | 21.94 | 39.19 | 23.68 | 0.67 | 287.51 | 6.89 | 359.34 |
| | 11 | 230.71 | 22.31 | 226.19 | 23.80 | 0.59 | 286.80 | 6.79 | 359.43 |
| | 21 | 57.15 | 22.71 | 53.26 | 23.91 | 0.50 | 285.92 | 6.70 | 359.54 |
| 10 | 1 | 243.60 | 23.12 | 240.42 | 24.03 | 0.40 | 284.74 | 6.62 | 359.65 |
| | 11 | 70.07 | 23.55 | 67.68 | 24.14 | 0.30 | 282.94 | 6.56 | 359.78 |
| | 21 | 256.59 | 23.98 | 255.06 | 24.25 | 0.19 | 279.43 | 6.51 | 359.91 |
| 11 | 1 | 173.86 | 24.44 | 173.30 | 24.37 | 0.07 | 263.61 | 6.48 | 0.07 |
| | 11 | 0.57 | 24.85 | 0.91 | 24.48 | 0.06 | 134.77 | 6.46 | 0.21 |
| | 21 | 187.40 | 25.24 | 188.65 | 24.59 | 0.17 | 115.78 | 6.46 | 0.35 |
| 12 | 1 | 14.37 | 25.60 | 16.51 | 24.70 | 0.28 | 111.54 | 6.48 | 0.49 |
| | 11 | 201.50 | 25.94 | 204.47 | 24.81 | 0.38 | 109.49 | 6.51 | 0.62 |
| | 21 | 28.80 | 26.23 | 32.55 | 24.92 | 0.48 | 108.17 | 6.56 | 0.75 |
| | 31 | 216.27 | 26.49 | 220.71 | 25.02 | 0.57 | 107.19 | 6.62 | 0.86 |

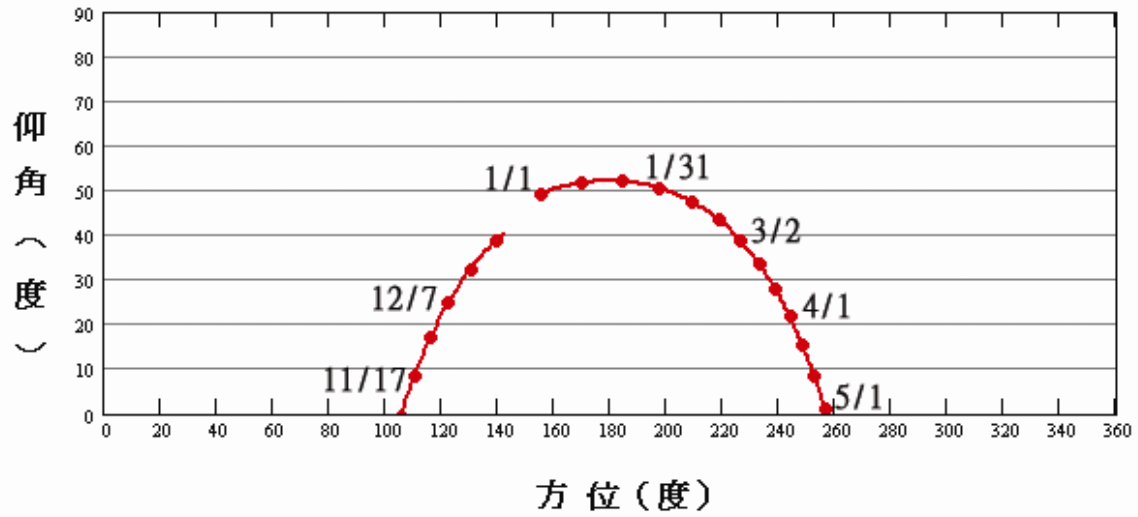
土星環的變化

由於土星的自轉軸與軌道面有 27° 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° 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。

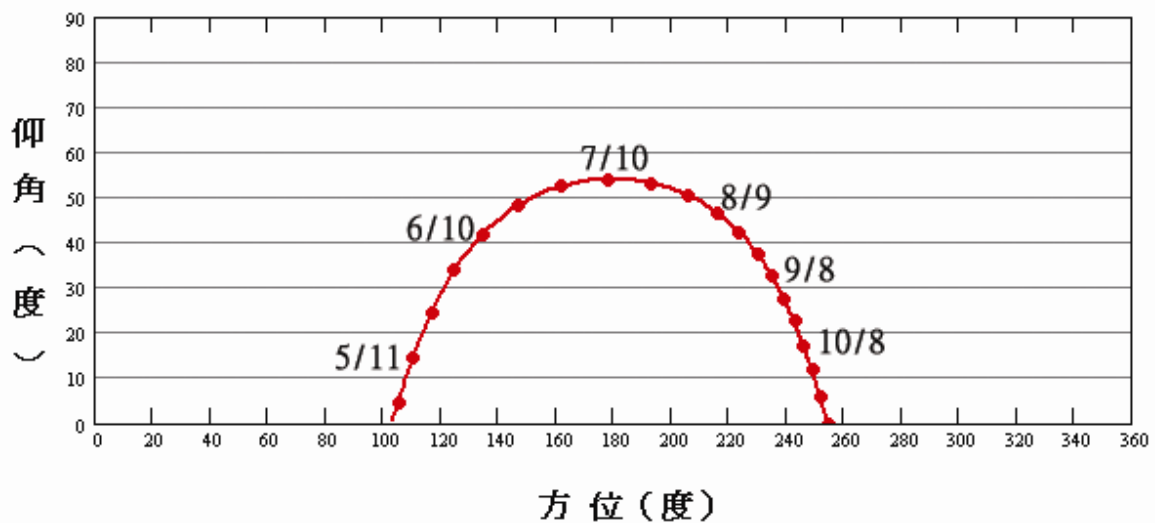
下面三張圖，第一張是今年內土星環相對於地球視直徑最大，第二、第三張分別是臺灣地區所見土星環呈最大傾斜與最小傾斜時所見到的示意景像。三張土星影像示意圖均已做畫面旋轉，與實際觀測到的方位有所不同。

| | |
|---|--|
| <p>最大視直徑： 04/25 ~ 05/02 赤道視直徑：18".85</p> |  |
| <p>最小傾斜 06/27 ~ 07/05 環傾斜角：$20^\circ.74$</p> |  |
| <p>最大傾斜 12/31 環傾斜角：$26^\circ.79$</p> |  |

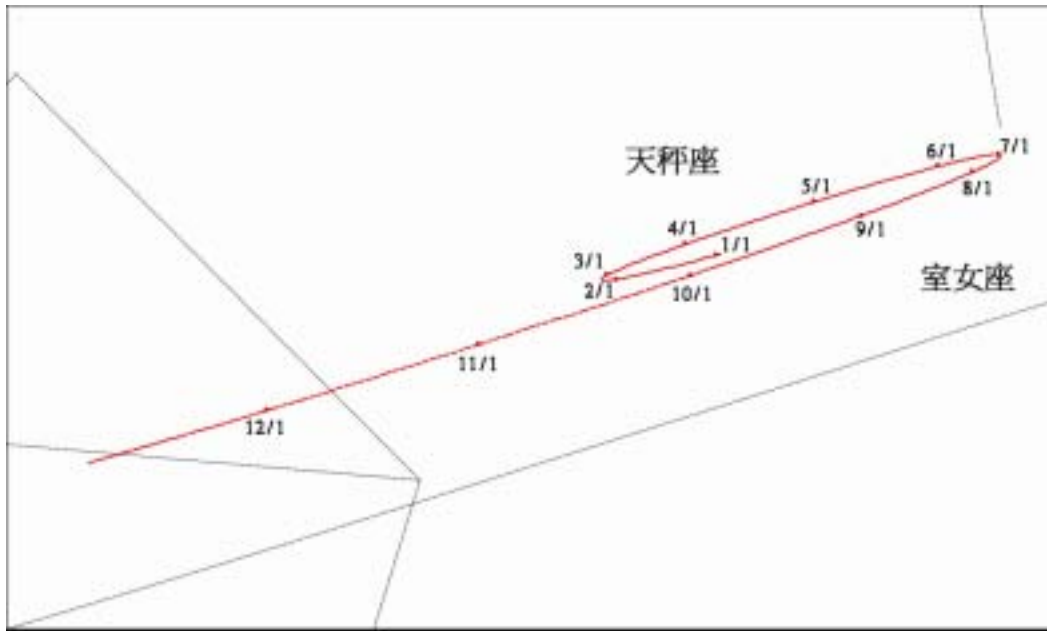
日出時土星方位與仰角



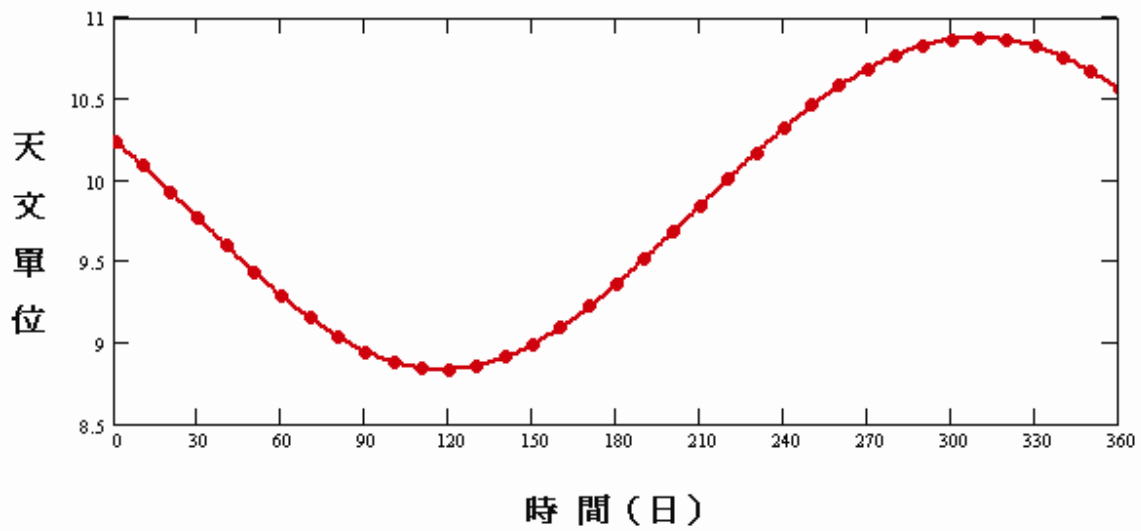
日沒時土星方位與仰角



土星在天球上運行的軌跡圖



土星與地球的距離變化圖



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 | 0 | 18 | 35.90 | +1 | 14 | 37.71 | 20.136132 | 167.47 | 2.8 |
| | 11 | 0 | 19 | 19.23 | +1 | 19 | 43.72 | 20.305282 | 168.87 | 2.7 |
| | 21 | 0 | 20 | 20.06 | +1 | 26 | 41.23 | 20.466325 | 170.21 | 2.5 |
| 2 | 1 | 0 | 21 | 45.27 | +1 | 36 | 16.29 | 20.628520 | 171.56 | 2.3 |
| | 11 | 0 | 23 | 17.40 | +1 | 46 | 30.90 | 20.758089 | 172.64 | 1.9 |
| | 21 | 0 | 25 | 1.25 | +1 | 57 | 57.62 | 20.866844 | 173.54 | 1.6 |
| 3 | 1 | 0 | 26 | 31.12 | +2 | 7 | 48.05 | 20.937006 | 174.13 | 1.3 |
| | 11 | 0 | 28 | 29.98 | +2 | 20 | 44.40 | 21.001952 | 174.67 | 0.8 |
| | 21 | 0 | 30 | 33.66 | +2 | 34 | 7.05 | 21.040059 | 174.99 | 0.4 |
| 4 | 1 | 0 | 32 | 52.07 | +2 | 48 | 59.78 | 21.050213 | 175.07 | 0.1 |
| | 11 | 0 | 34 | 57.43 | +3 | 2 | 23.31 | 21.030586 | 174.91 | 0.6 |
| | 21 | 0 | 36 | 59.66 | +3 | 15 | 21.88 | 20.984043 | 174.52 | 1.0 |
| 5 | 1 | 0 | 38 | 56.28 | +3 | 27 | 40.05 | 20.912127 | 173.92 | 1.5 |
| | 11 | 0 | 40 | 45.06 | +3 | 39 | 3.74 | 20.816704 | 173.13 | 1.8 |
| | 21 | 0 | 42 | 23.75 | +3 | 49 | 19.28 | 20.700247 | 172.16 | 2.2 |
| 6 | 1 | 0 | 43 | 58.32 | +3 | 59 | 3.55 | 20.551673 | 170.92 | 2.5 |
| | 11 | 0 | 45 | 9.66 | +4 | 6 | 18.73 | 20.401612 | 169.67 | 2.7 |
| | 21 | 0 | 46 | 5.38 | +4 | 11 | 53.00 | 20.241388 | 168.34 | 2.8 |
| 7 | 1 | 0 | 46 | 44.47 | +4 | 15 | 40.58 | 20.075291 | 166.96 | 2.9 |
| | 11 | 0 | 47 | 6.02 | +4 | 17 | 36.51 | 19.907606 | 165.57 | 2.9 |
| | 21 | 0 | 47 | 9.58 | +4 | 17 | 38.81 | 19.743113 | 164.20 | 2.8 |
| 8 | 1 | 0 | 46 | 53.00 | +4 | 15 | 32.63 | 19.571339 | 162.77 | 2.6 |
| | 11 | 0 | 46 | 19.93 | +4 | 11 | 45.60 | 19.428386 | 161.58 | 2.3 |
| | 21 | 0 | 45 | 31.09 | +4 | 6 | 20.78 | 19.302665 | 160.54 | 2.0 |
| 9 | 1 | 0 | 44 | 21.41 | +3 | 58 | 45.17 | 19.188779 | 159.59 | 1.6 |
| | 11 | 0 | 43 | 6.13 | +3 | 50 | 38.53 | 19.111199 | 158.94 | 1.1 |
| | 21 | 0 | 41 | 42.76 | +3 | 41 | 43.77 | 19.061189 | 158.53 | 0.6 |
| 10 | 1 | 0 | 40 | 14.65 | +3 | 32 | 22.24 | 19.040426 | 158.35 | 0.1 |
| | 11 | 0 | 38 | 45.40 | +3 | 22 | 57.23 | 19.050005 | 158.43 | 0.4 |
| | 21 | 0 | 37 | 18.95 | +3 | 13 | 53.67 | 19.089782 | 158.77 | 0.9 |
| 11 | 1 | 0 | 35 | 51.39 | +3 | 4 | 48.12 | 19.166966 | 159.41 | 1.4 |
| | 11 | 0 | 34 | 42.44 | +2 | 57 | 43.77 | 19.265358 | 160.23 | 1.8 |
| | 21 | 0 | 33 | 46.75 | +2 | 52 | 7.08 | 19.387247 | 161.24 | 2.2 |
| 12 | 1 | 0 | 33 | 6.66 | +2 | 48 | 12.85 | 19.528786 | 162.42 | 2.4 |
| | 11 | 0 | 32 | 44.12 | +2 | 46 | 12.97 | 19.685512 | 163.72 | 2.7 |
| | 21 | 0 | 32 | 40.21 | +2 | 46 | 13.44 | 19.852248 | 165.11 | 2.8 |
| | 31 | 0 | 32 | 55.26 | +2 | 48 | 16.04 | 20.023913 | 166.53 | 2.8 |

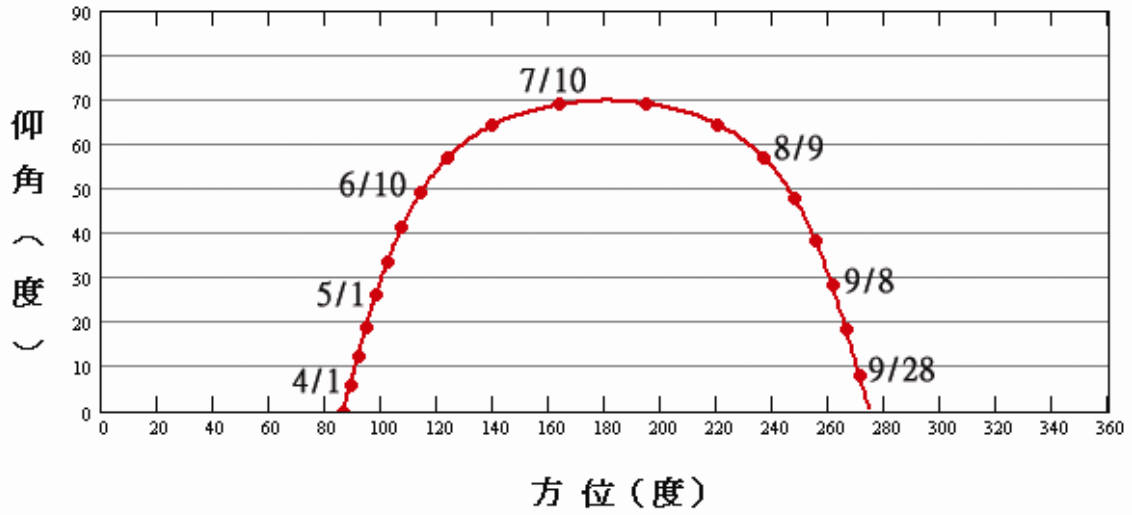
天王星出沒時間表

東經：121.52°，北緯：25.10°

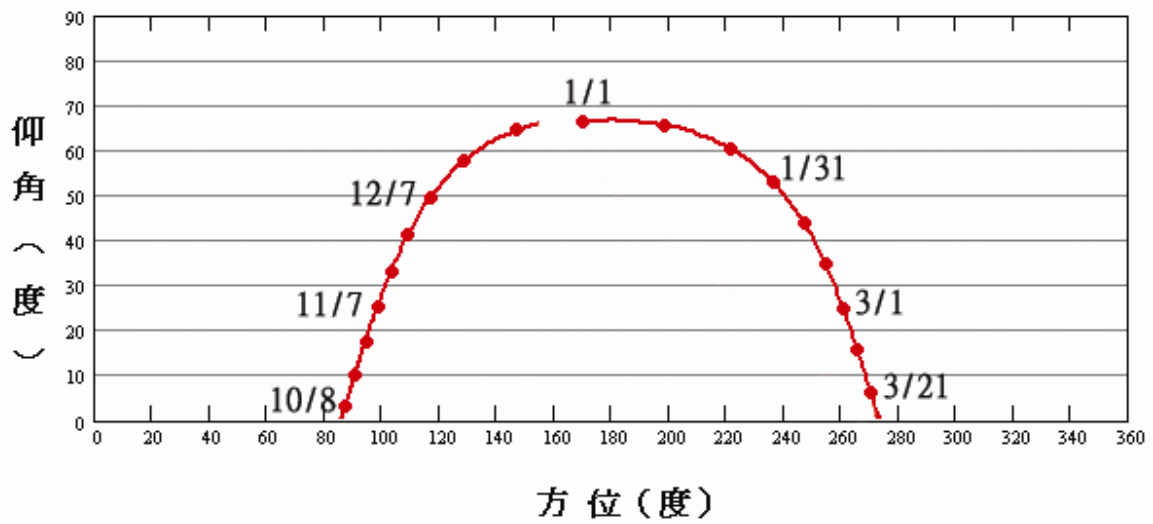
東經 120° 平太陽時

| 日期 | | 出 | | 中天 | | 沒 | | 視直徑 | | 相位 | 視 亮度 星等 |
|----|----|-----------|---------|-----------|---------|-----------|---------|---------|---------|------|---------------|
| 月 | 日 | 時間 h m | 方位 ° | 時間 h m | 仰角 ° | 時間 h m | 方位 ° | 赤道 " | 兩極 " | | |
| 1 | 1 | 11:24 | 88 | 17:28 | 66S | 23:32 | 272 | 3.50 | 3.43 | 1.00 | 5.8 |
| | 11 | 10:45 | 88 | 16:49 | 66S | 22:53 | 272 | 3.47 | 3.40 | 1.00 | 5.9 |
| | 21 | 10:07 | 88 | 16:11 | 66S | 22:15 | 272 | 3.44 | 3.37 | 1.00 | 5.9 |
| 2 | 1 | 09:24 | 88 | 15:29 | 67S | 21:34 | 272 | 3.42 | 3.35 | 1.00 | 5.9 |
| | 11 | 08:46 | 88 | 14:51 | 67S | 20:56 | 272 | 3.40 | 3.33 | 1.00 | 5.9 |
| | 21 | 08:08 | 88 | 14:14 | 67S | 20:19 | 272 | 3.38 | 3.31 | 1.00 | 5.9 |
| 3 | 1 | 07:38 | 87 | 13:44 | 67S | 19:49 | 273 | 3.37 | 3.30 | 1.00 | 5.9 |
| | 11 | 07:00 | 87 | 13:06 | 67S | 19:12 | 273 | 3.36 | 3.29 | 1.00 | 5.9 |
| | 21 | 06:23 | 87 | 12:29 | 67S | 18:35 | 273 | 3.35 | 3.28 | 1.00 | 5.9 |
| 4 | 1 | 05:41 | 87 | 11:48 | 68S | 17:55 | 273 | 3.35 | 3.28 | 1.00 | 5.9 |
| | 11 | 05:04 | 86 | 11:11 | 68S | 17:18 | 274 | 3.35 | 3.28 | 1.00 | 5.9 |
| | 21 | 04:26 | 86 | 10:34 | 68S | 16:41 | 274 | 3.36 | 3.29 | 1.00 | 5.9 |
| 5 | 1 | 03:48 | 86 | 09:56 | 68S | 16:04 | 274 | 3.37 | 3.30 | 1.00 | 5.9 |
| | 11 | 03:10 | 86 | 09:19 | 69S | 15:27 | 274 | 3.39 | 3.32 | 1.00 | 5.9 |
| | 21 | 02:32 | 86 | 08:41 | 69S | 14:50 | 274 | 3.40 | 3.34 | 1.00 | 5.9 |
| 6 | 1 | 01:50 | 85 | 07:59 | 69S | 14:08 | 275 | 3.43 | 3.36 | 1.00 | 5.9 |
| | 11 | 01:12 | 85 | 07:21 | 69S | 13:30 | 275 | 3.45 | 3.39 | 1.00 | 5.9 |
| | 21 | 00:33 | 85 | 06:43 | 69S | 12:52 | 275 | 3.48 | 3.42 | 1.00 | 5.9 |
| 7 | 1 | 23:51 | 85 | 06:04 | 69S | 12:14 | 275 | 3.51 | 3.44 | 1.00 | 5.8 |
| | 11 | 23:12 | 85 | 05:25 | 69S | 11:35 | 275 | 3.54 | 3.47 | 1.00 | 5.8 |
| | 21 | 22:32 | 85 | 04:46 | 69S | 10:55 | 275 | 3.57 | 3.50 | 1.00 | 5.8 |
| 8 | 1 | 21:49 | 85 | 04:02 | 69S | 10:12 | 275 | 3.60 | 3.53 | 1.00 | 5.8 |
| | 11 | 21:09 | 85 | 03:23 | 69S | 09:32 | 275 | 3.63 | 3.56 | 1.00 | 5.8 |
| | 21 | 20:29 | 85 | 02:42 | 69S | 08:52 | 275 | 3.65 | 3.58 | 1.00 | 5.8 |
| 9 | 1 | 19:45 | 85 | 01:58 | 69S | 08:07 | 275 | 3.67 | 3.60 | 1.00 | 5.7 |
| | 11 | 19:05 | 85 | 01:17 | 69S | 07:26 | 275 | 3.69 | 3.62 | 1.00 | 5.7 |
| | 21 | 18:24 | 86 | 00:37 | 69S | 06:45 | 274 | 3.70 | 3.63 | 1.00 | 5.7 |
| 10 | 1 | 17:44 | 86 | 23:52 | 68S | 06:04 | 274 | 3.70 | 3.63 | 1.00 | 5.7 |
| | 11 | 17:03 | 86 | 23:11 | 68S | 05:23 | 274 | 3.70 | 3.63 | 1.00 | 5.7 |
| | 21 | 16:23 | 86 | 22:30 | 68S | 04:42 | 274 | 3.69 | 3.62 | 1.00 | 5.7 |
| 11 | 1 | 15:38 | 86 | 21:46 | 68S | 03:57 | 274 | 3.68 | 3.60 | 1.00 | 5.7 |
| | 11 | 14:58 | 86 | 21:05 | 68S | 03:16 | 274 | 3.66 | 3.59 | 1.00 | 5.7 |
| | 21 | 14:18 | 87 | 20:25 | 68S | 02:36 | 273 | 3.64 | 3.56 | 1.00 | 5.8 |
| 12 | 1 | 13:38 | 87 | 19:45 | 68S | 01:56 | 273 | 3.61 | 3.54 | 1.00 | 5.8 |
| | 11 | 12:59 | 87 | 19:05 | 68S | 01:16 | 273 | 3.58 | 3.51 | 1.00 | 5.8 |
| | 21 | 12:19 | 87 | 18:26 | 68S | 00:37 | 273 | 3.55 | 3.48 | 1.00 | 5.8 |
| | 31 | 11:40 | 87 | 17:47 | 68S | 23:54 | 273 | 3.52 | 3.45 | 1.00 | 5.8 |

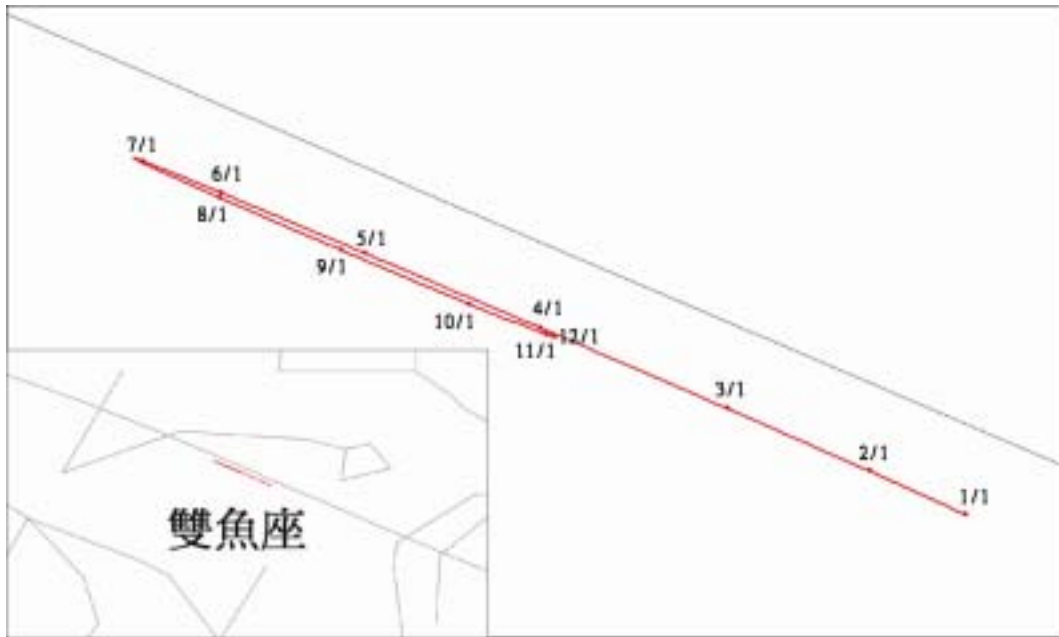
日出時天王星方位與仰角



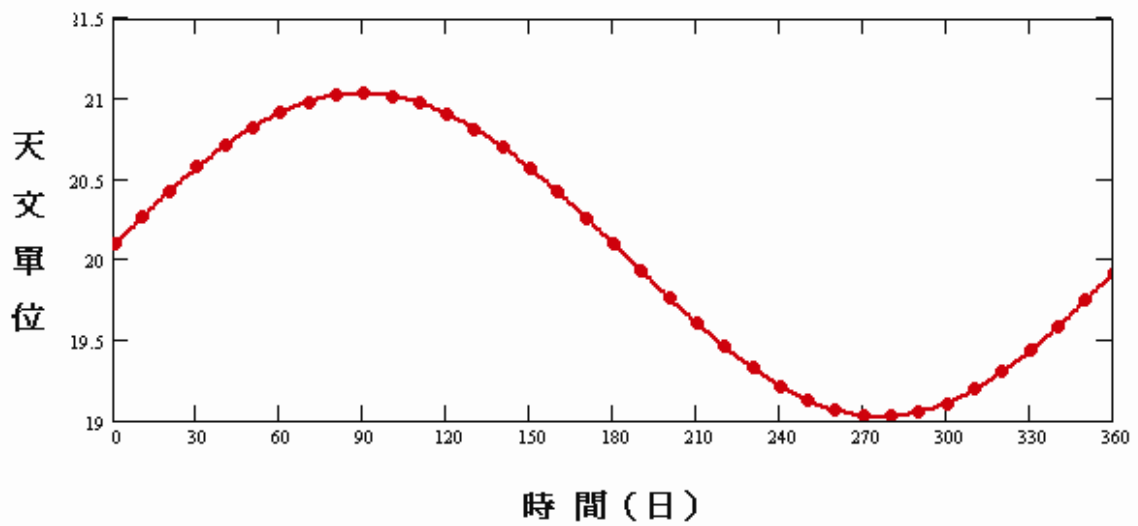
日沒時天王星方位與仰角



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 | | 赤 經 | | | 赤 緯 | | | 距 離 | 光 程 | 日地離角 |
|----|----|-----|----|-------|-----|----|-------|-----------|--------|------|
| 月 | 日 | h | m | s | ° | ' | " | AU | 分 | ° |
| 1 | 1 | 22 | 13 | 19.55 | -11 | 39 | 43.41 | 30.608662 | 254.56 | 1.4 |
| | 11 | 22 | 14 | 25.30 | -11 | 33 | 32.54 | 30.732101 | 255.59 | 1.2 |
| | 21 | 22 | 15 | 39.02 | -11 | 26 | 37.60 | 30.833096 | 256.43 | 1.0 |
| 2 | 1 | 22 | 17 | 7.12 | -11 | 18 | 22.26 | 30.914979 | 257.11 | 0.6 |
| | 11 | 22 | 18 | 31.57 | -11 | 10 | 27.56 | 30.960784 | 257.49 | 0.3 |
| | 21 | 22 | 19 | 58.07 | -11 | 2 | 22.16 | 30.977938 | 257.64 | 0.0 |
| 3 | 1 | 22 | 21 | 7.31 | -10 | 55 | 52.76 | 30.970909 | 257.58 | 0.2 |
| | 11 | 22 | 22 | 32.49 | -10 | 47 | 54.80 | 30.936556 | 257.29 | 0.6 |
| | 21 | 22 | 23 | 54.21 | -10 | 40 | 17.09 | 30.874731 | 256.78 | 0.9 |
| 4 | 1 | 22 | 25 | 17.93 | -10 | 32 | 29.59 | 30.777461 | 255.97 | 1.2 |
| | 11 | 22 | 26 | 26.72 | -10 | 26 | 7.47 | 30.665155 | 255.03 | 1.4 |
| | 21 | 22 | 27 | 26.94 | -10 | 20 | 35.56 | 30.533350 | 253.94 | 1.6 |
| 5 | 1 | 22 | 28 | 17.32 | -10 | 16 | 1.26 | 30.385926 | 252.71 | 1.8 |
| | 11 | 22 | 28 | 56.84 | -10 | 12 | 30.87 | 30.226824 | 251.39 | 1.9 |
| | 21 | 22 | 29 | 24.67 | -10 | 10 | 9.06 | 30.060534 | 250.01 | 1.9 |
| 6 | 1 | 22 | 29 | 41.28 | -10 | 8 | 54.93 | 29.874939 | 248.46 | 1.9 |
| | 11 | 22 | 29 | 43.40 | -10 | 9 | 3.26 | 29.708722 | 247.08 | 1.9 |
| | 21 | 22 | 29 | 33.30 | -10 | 10 | 22.47 | 29.549904 | 245.76 | 1.8 |
| 7 | 1 | 22 | 29 | 11.63 | -10 | 12 | 48.30 | 29.402966 | 244.54 | 1.6 |
| | 11 | 22 | 28 | 39.16 | -10 | 16 | 15.60 | 29.272074 | 243.45 | 1.4 |
| | 21 | 22 | 27 | 57.11 | -10 | 20 | 36.57 | 29.161275 | 242.53 | 1.2 |
| 8 | 1 | 22 | 27 | 1.73 | -10 | 26 | 13.88 | 29.066402 | 241.74 | 0.8 |
| | 11 | 22 | 26 | 5.01 | -10 | 31 | 54.29 | 29.007661 | 241.25 | 0.5 |
| | 21 | 22 | 25 | 4.50 | -10 | 37 | 53.18 | 28.977210 | 241.00 | 0.2 |
| 9 | 1 | 22 | 23 | 56.19 | -10 | 44 | 33.89 | 28.977461 | 241.00 | 0.2 |
| | 11 | 22 | 22 | 55.05 | -10 | 50 | 28.81 | 29.008725 | 241.26 | 0.5 |
| | 21 | 22 | 21 | 57.41 | -10 | 56 | 0.24 | 29.068714 | 241.76 | 0.8 |
| 10 | 1 | 22 | 21 | 5.42 | -11 | 0 | 56.02 | 29.155664 | 242.48 | 1.1 |
| | 11 | 22 | 20 | 21.17 | -11 | 5 | 4.70 | 29.267219 | 243.41 | 1.3 |
| | 21 | 22 | 19 | 46.55 | -11 | 8 | 16.41 | 29.399899 | 244.51 | 1.6 |
| 11 | 1 | 22 | 19 | 21.26 | -11 | 10 | 32.58 | 29.565495 | 245.89 | 1.7 |
| | 11 | 22 | 19 | 11.14 | -11 | 11 | 21.98 | 29.729038 | 247.25 | 1.8 |
| | 21 | 22 | 19 | 13.89 | -11 | 10 | 57.85 | 29.899637 | 248.67 | 1.9 |
| 12 | 1 | 22 | 19 | 29.68 | -11 | 9 | 19.61 | 30.072259 | 250.10 | 1.9 |
| | 11 | 22 | 19 | 58.43 | -11 | 6 | 28.04 | 30.241647 | 251.51 | 1.8 |
| | 21 | 22 | 20 | 39.41 | -11 | 2 | 27.36 | 30.402584 | 252.85 | 1.7 |
| | 31 | 22 | 21 | 31.65 | -10 | 57 | 23.16 | 30.550467 | 254.08 | 1.5 |

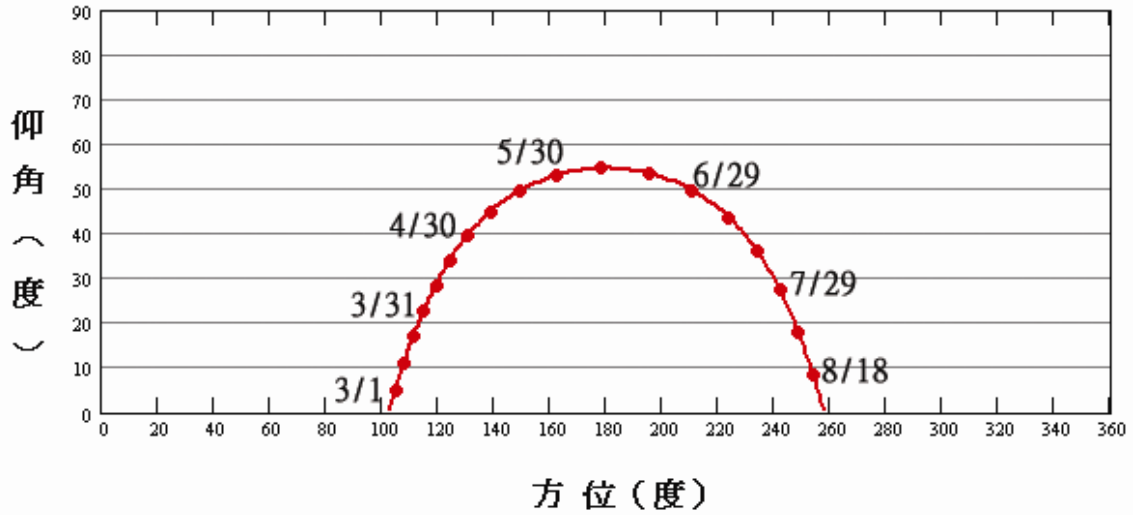
海王星出沒時間表

東經：121.52°，北緯：25.10°

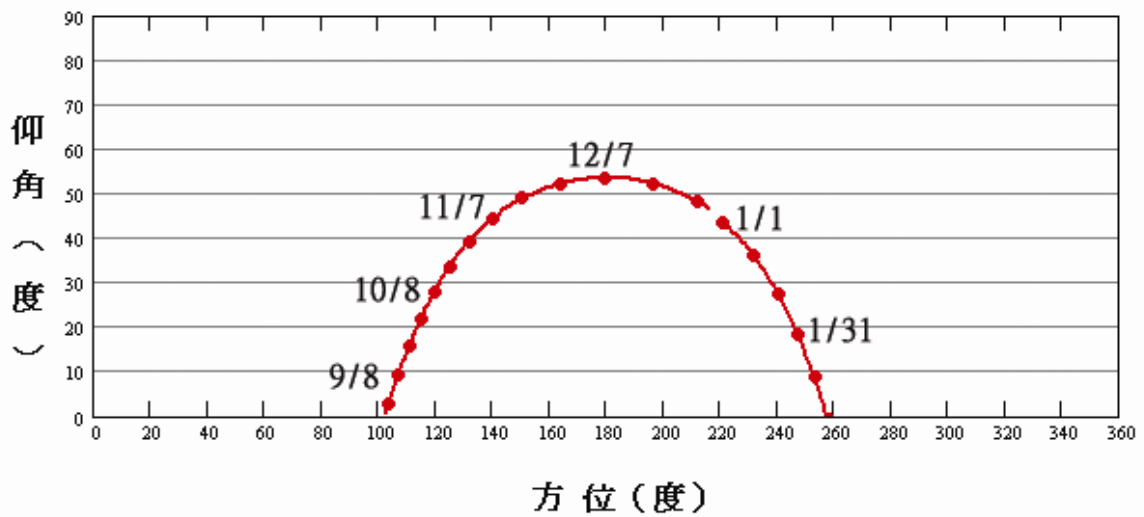
東經 120° 平太陽時

| 日期 | | 出 | | 中天 | | 沒 | | 視直徑 | | 相位 | 視 亮度 星等 |
|----|----|-----------|---------|-----------|---------|-----------|---------|---------|---------|------|---------------|
| 月 | 日 | 時間 h m | 方位 ° | 時間 h m | 仰角 ° | 時間 h m | 方位 ° | 赤道 " | 兩極 " | | |
| 1 | 1 | 09:43 | 103 | 15:23 | 53S | 21:02 | 257 | 2.23 | 2.20 | 1.00 | 7.9 |
| | 11 | 09:05 | 103 | 14:45 | 53S | 20:24 | 257 | 2.22 | 2.19 | 1.00 | 8.0 |
| | 21 | 08:27 | 102 | 14:07 | 53S | 19:46 | 258 | 2.21 | 2.18 | 1.00 | 8.0 |
| 2 | 1 | 07:45 | 102 | 13:25 | 54S | 19:05 | 258 | 2.21 | 2.18 | 1.00 | 8.0 |
| | 11 | 07:06 | 102 | 12:47 | 54S | 18:27 | 258 | 2.21 | 2.18 | 1.00 | 8.0 |
| | 21 | 06:28 | 102 | 12:09 | 54S | 17:50 | 258 | 2.20 | 2.17 | 1.00 | 8.0 |
| 3 | 1 | 05:58 | 102 | 11:39 | 54S | 17:20 | 258 | 2.20 | 2.17 | 1.00 | 8.0 |
| | 11 | 05:20 | 102 | 11:01 | 54S | 16:42 | 258 | 2.21 | 2.18 | 1.00 | 8.0 |
| | 21 | 04:41 | 102 | 10:23 | 54S | 16:04 | 258 | 2.21 | 2.18 | 1.00 | 8.0 |
| 4 | 1 | 03:59 | 101 | 09:41 | 54S | 15:23 | 259 | 2.22 | 2.19 | 1.00 | 8.0 |
| | 11 | 03:21 | 101 | 09:03 | 54S | 14:45 | 259 | 2.23 | 2.20 | 1.00 | 7.9 |
| | 21 | 02:42 | 101 | 08:24 | 55S | 14:06 | 259 | 2.24 | 2.21 | 1.00 | 7.9 |
| 5 | 1 | 02:04 | 101 | 07:46 | 55S | 13:28 | 259 | 2.25 | 2.22 | 1.00 | 7.9 |
| | 11 | 01:25 | 101 | 07:07 | 55S | 12:50 | 259 | 2.26 | 2.23 | 1.00 | 7.9 |
| | 21 | 00:46 | 101 | 06:28 | 55S | 12:11 | 259 | 2.27 | 2.24 | 1.00 | 7.9 |
| 6 | 1 | 00:03 | 101 | 05:45 | 55S | 11:28 | 259 | 2.29 | 2.25 | 1.00 | 7.9 |
| | | 23:59 | 101 | | | | | | | | |
| | 11 | 23:20 | 101 | 05:06 | 55S | 10:49 | 259 | 2.30 | 2.27 | 1.00 | 7.9 |
| | 21 | 22:40 | 101 | 04:27 | 55S | 10:09 | 259 | 2.31 | 2.28 | 1.00 | 7.9 |
| 7 | 1 | 22:01 | 101 | 03:47 | 55S | 09:29 | 259 | 2.32 | 2.29 | 1.00 | 7.9 |
| | 11 | 21:21 | 101 | 03:07 | 55S | 08:49 | 259 | 2.33 | 2.30 | 1.00 | 7.8 |
| | 21 | 20:41 | 101 | 02:27 | 55S | 08:09 | 259 | 2.34 | 2.31 | 1.00 | 7.8 |
| 8 | 1 | 19:57 | 101 | 01:43 | 54S | 07:25 | 259 | 2.35 | 2.32 | 1.00 | 7.8 |
| | 11 | 19:17 | 101 | 01:03 | 54S | 06:44 | 259 | 2.35 | 2.32 | 1.00 | 7.8 |
| | 21 | 18:37 | 101 | 00:22 | 54S | 06:04 | 259 | 2.36 | 2.32 | 1.00 | 7.8 |
| 9 | 1 | 17:53 | 102 | 23:34 | 54S | 05:19 | 258 | 2.36 | 2.32 | 1.00 | 7.8 |
| | 11 | 17:13 | 102 | 22:54 | 54S | 04:39 | 258 | 2.35 | 2.32 | 1.00 | 7.8 |
| | 21 | 16:33 | 102 | 22:13 | 54S | 03:58 | 258 | 2.35 | 2.32 | 1.00 | 7.8 |
| 10 | 1 | 15:53 | 102 | 21:33 | 54S | 03:18 | 258 | 2.34 | 2.31 | 1.00 | 7.8 |
| | 11 | 15:13 | 102 | 20:53 | 54S | 02:38 | 258 | 2.33 | 2.30 | 1.00 | 7.8 |
| | 21 | 14:33 | 102 | 20:13 | 54S | 01:58 | 258 | 2.32 | 2.29 | 1.00 | 7.9 |
| 11 | 1 | 13:49 | 102 | 19:30 | 54S | 01:14 | 258 | 2.31 | 2.28 | 1.00 | 7.9 |
| | 11 | 13:10 | 102 | 18:50 | 54S | 00:34 | 258 | 2.30 | 2.27 | 1.00 | 7.9 |
| | 21 | 12:30 | 102 | 18:11 | 54S | 23:51 | 258 | 2.28 | 2.25 | 1.00 | 7.9 |
| 12 | 1 | 11:51 | 102 | 17:32 | 54S | 23:12 | 258 | 2.27 | 2.24 | 1.00 | 7.9 |
| | 11 | 11:12 | 102 | 16:53 | 54S | 22:34 | 258 | 2.26 | 2.23 | 1.00 | 7.9 |
| | 21 | 10:34 | 102 | 16:14 | 54S | 21:55 | 258 | 2.25 | 2.22 | 1.00 | 7.9 |
| | 31 | 09:55 | 102 | 15:36 | 54S | 21:17 | 258 | 2.24 | 2.21 | 1.00 | 7.9 |

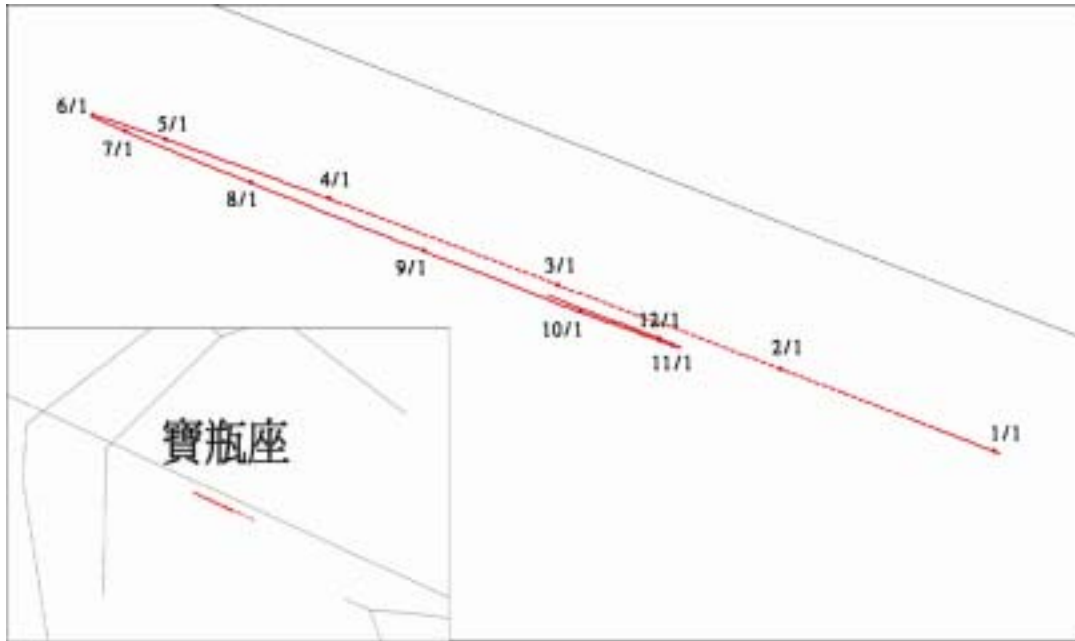
日出時海王星方位與仰角



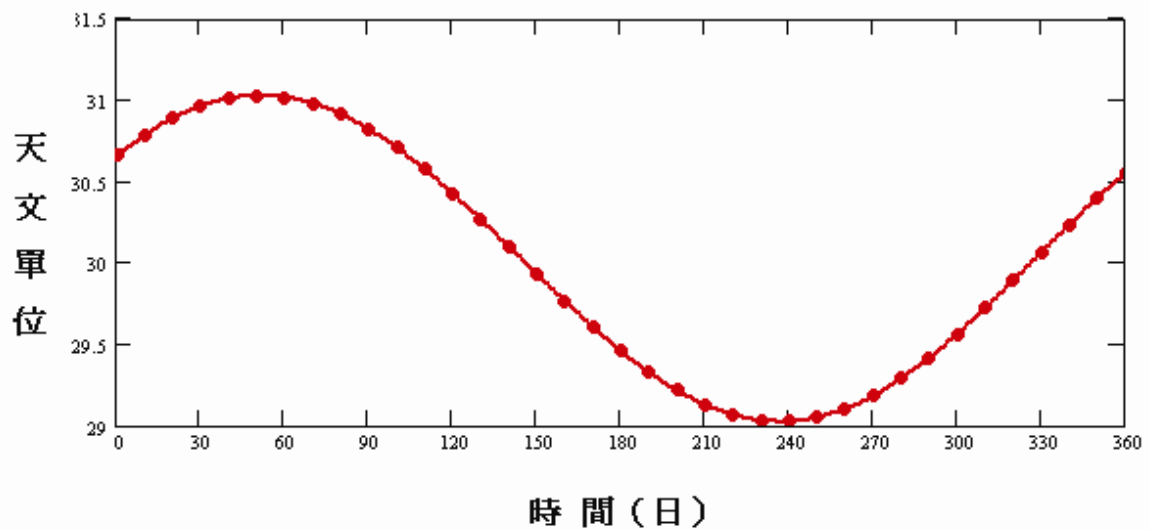
日沒時海王星方位與仰角



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 | 06:27 | 112 | 17:13 | 248 | 18 | 39 | 35.06 | -19 | 47 | 20.64 | 33.341250 | 14.2 |
| | 11 | 05:49 | 112 | 16:35 | 248 | 18 | 41 | 4.93 | -19 | 46 | 43.33 | 33.328052 | 14.2 |
| | 21 | 05:11 | 112 | 15:57 | 248 | 18 | 42 | 32.29 | -19 | 45 | 55.25 | 33.286069 | 14.2 |
| 2 | 1 | 04:29 | 112 | 15:15 | 248 | 18 | 44 | 3.02 | -19 | 44 | 53.57 | 33.208530 | 14.2 |
| | 11 | 03:51 | 112 | 14:37 | 248 | 18 | 45 | 18.62 | -19 | 43 | 52.83 | 33.111893 | 14.2 |
| | 21 | 03:13 | 112 | 13:59 | 248 | 18 | 46 | 25.70 | -19 | 42 | 51.65 | 32.993379 | 14.1 |
| 3 | 1 | 02:42 | 112 | 13:28 | 248 | 18 | 47 | 12.21 | -19 | 42 | 5.13 | 32.885383 | 14.1 |
| | 11 | 02:04 | 112 | 12:50 | 248 | 18 | 48 | 0.44 | -19 | 41 | 12.47 | 32.737248 | 14.1 |
| | 21 | 01:25 | 112 | 12:11 | 248 | 18 | 48 | 36.54 | -19 | 40 | 29.38 | 32.578728 | 14.1 |
| 4 | 1 | 00:42 | 112 | 11:28 | 248 | 18 | 49 | 1.49 | -19 | 39 | 56.84 | 32.398286 | 14.1 |
| | 11 | 00:03 | 112 | 10:49 | 248 | 18 | 49 | 10.43 | -19 | 39 | 43.52 | 32.233929 | 14.1 |
| | 21 | 23:19 | 112 | 10:10 | 248 | 18 | 49 | 6.31 | -19 | 39 | 47.55 | 32.074507 | 14.1 |
| 5 | 1 | 22:40 | 112 | 09:30 | 248 | 18 | 48 | 49.62 | -19 | 40 | 9.99 | 31.924876 | 14.1 |
| | 11 | 22:00 | 112 | 08:50 | 248 | 18 | 48 | 21.15 | -19 | 40 | 51.71 | 31.789396 | 14.1 |
| | 21 | 21:20 | 112 | 08:10 | 248 | 18 | 47 | 42.13 | -19 | 41 | 52.52 | 31.672358 | 14.1 |
| 6 | 1 | 20:36 | 112 | 07:26 | 248 | 18 | 46 | 48.98 | -19 | 43 | 19.91 | 31.569072 | 14.1 |
| | 11 | 19:56 | 112 | 06:46 | 248 | 18 | 45 | 53.23 | -19 | 44 | 56.64 | 31.501400 | 14.0 |
| | 21 | 19:16 | 112 | 06:06 | 248 | 18 | 44 | 52.62 | -19 | 46 | 47.94 | 31.461086 | 14.0 |
| 7 | 1 | 18:35 | 112 | 05:25 | 248 | 18 | 43 | 49.50 | -19 | 48 | 51.29 | 31.449285 | 14.0 |
| | 11 | 17:55 | 112 | 04:45 | 248 | 18 | 42 | 46.11 | -19 | 51 | 4.06 | 31.466582 | 14.0 |
| | 21 | 17:15 | 112 | 04:04 | 248 | 18 | 41 | 44.85 | -19 | 53 | 23.39 | 31.512701 | 14.1 |
| 8 | 1 | 16:31 | 112 | 03:20 | 248 | 18 | 40 | 42.66 | -19 | 56 | 1.20 | 31.595083 | 14.1 |
| | 11 | 15:51 | 112 | 02:40 | 248 | 18 | 39 | 53.11 | -19 | 58 | 25.75 | 31.696740 | 14.1 |
| | 21 | 15:11 | 112 | 02:00 | 248 | 18 | 39 | 12.29 | -20 | 0 | 48.13 | 31.820944 | 14.1 |
| 9 | 1 | 14:27 | 112 | 01:16 | 248 | 18 | 38 | 39.20 | -20 | 3 | 19.49 | 31.979414 | 14.1 |
| | 11 | 13:47 | 112 | 00:36 | 248 | 18 | 38 | 21.28 | -20 | 5 | 29.71 | 32.139151 | 14.1 |
| | 21 | 13:08 | 112 | 23:53 | 248 | 18 | 38 | 15.93 | -20 | 7 | 30.47 | 32.309032 | 14.1 |
| 10 | 1 | 12:29 | 112 | 23:13 | 248 | 18 | 38 | 23.54 | -20 | 9 | 19.58 | 32.484385 | 14.1 |
| | 11 | 11:50 | 112 | 22:34 | 248 | 18 | 38 | 44.25 | -20 | 10 | 55.11 | 32.660353 | 14.1 |
| | 21 | 11:11 | 112 | 21:56 | 248 | 18 | 39 | 17.78 | -20 | 12 | 15.73 | 32.831807 | 14.1 |
| 11 | 1 | 10:29 | 112 | 21:13 | 248 | 18 | 40 | 8.69 | -20 | 13 | 25.49 | 33.009637 | 14.2 |
| | 11 | 09:51 | 112 | 20:35 | 248 | 18 | 41 | 6.73 | -20 | 14 | 10.41 | 33.156503 | 14.2 |
| | 21 | 09:12 | 112 | 19:57 | 248 | 18 | 42 | 14.50 | -20 | 14 | 37.42 | 33.284911 | 14.2 |
| 12 | 1 | 08:34 | 112 | 19:18 | 248 | 18 | 43 | 30.48 | -20 | 14 | 46.73 | 33.391430 | 14.2 |
| | 11 | 07:56 | 112 | 18:41 | 248 | 18 | 44 | 52.99 | -20 | 14 | 38.60 | 33.472925 | 14.2 |
| | 21 | 07:19 | 112 | 18:03 | 248 | 18 | 46 | 19.96 | -20 | 14 | 14.19 | 33.527195 | 14.2 |
| | 31 | 06:41 | 112 | 17:25 | 248 | 18 | 47 | 49.36 | -20 | 13 | 35.15 | 33.552904 | 14.2 |

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 亮度 |
|----|----|-------|----|-------|-----|-----|----|-------|-----|----|-------|----------|---------|
| 月 | 日 | 時間 | 方位 | 時間 | 方位 | h | m | s | ° | ' | " | AU | 星等 |
| 1 | 1 | 15:45 | 61 | 05:39 | 299 | 5 | 32 | 2.36 | +26 | 1 | 13.82 | 1.703666 | 7.1 |
| | 11 | 14:57 | 60 | 04:52 | 300 | 5 | 23 | 26.11 | +26 | 28 | 10.37 | 1.750087 | 7.4 |
| | 21 | 14:10 | 60 | 04:08 | 300 | 5 | 17 | 19.59 | +26 | 50 | 55.14 | 1.820658 | 7.6 |
| 2 | 1 | 13:23 | 59 | 03:22 | 301 | 5 | 14 | 6.85 | +27 | 13 | 2.52 | 1.920733 | 7.8 |
| | 11 | 12:43 | 59 | 02:44 | 301 | 5 | 14 | 30.69 | +27 | 31 | 54.21 | 2.027202 | 8.0 |
| | 21 | 12:07 | 59 | 02:09 | 301 | 5 | 17 | 57.45 | +27 | 50 | 10.96 | 2.143872 | 8.2 |
| 3 | 1 | 11:40 | 58 | 01:42 | 302 | 5 | 22 | 42.99 | +28 | 4 | 20.28 | 2.241803 | 8.3 |
| | 11 | 11:08 | 58 | 01:12 | 302 | 5 | 30 | 53.21 | +28 | 20 | 52.53 | 2.367281 | 8.4 |
| | 21 | 10:38 | 58 | 00:43 | 302 | 5 | 41 | 13.87 | +28 | 35 | 14.13 | 2.493467 | 8.5 |
| 4 | 1 | 10:08 | 58 | 00:14 | 302 | 5 | 54 | 43.39 | +28 | 47 | 13.84 | 2.630152 | 8.6 |
| | 11 | 09:42 | 57 | 23:46 | 303 | 6 | 8 | 35.76 | +28 | 53 | 25.43 | 2.750613 | 8.7 |
| | 21 | 09:18 | 57 | 23:22 | 303 | 6 | 23 | 44.58 | +28 | 54 | 3.74 | 2.865748 | 8.7 |
| 5 | 1 | 08:55 | 58 | 22:59 | 302 | 6 | 39 | 54.95 | +28 | 48 | 16.21 | 2.974323 | 8.8 |
| | 11 | 08:33 | 58 | 22:36 | 302 | 6 | 56 | 55.07 | +28 | 35 | 17.41 | 3.075509 | 8.8 |
| | 21 | 08:12 | 58 | 22:13 | 302 | 7 | 14 | 34.24 | +28 | 14 | 37.05 | 3.168347 | 8.8 |
| 6 | 1 | 07:50 | 59 | 21:48 | 301 | 7 | 34 | 31.89 | +27 | 42 | 37.16 | 3.260160 | 8.8 |
| | 11 | 07:31 | 60 | 21:26 | 300 | 7 | 53 | 1.78 | +27 | 4 | 55.89 | 3.333792 | 8.8 |
| | 21 | 07:12 | 60 | 21:03 | 300 | 8 | 11 | 43.95 | +26 | 19 | 9.88 | 3.397486 | 8.8 |
| 7 | 1 | 06:53 | 61 | 20:41 | 299 | 8 | 30 | 31.74 | +25 | 25 | 32.95 | 3.451074 | 8.7 |
| | 11 | 06:35 | 63 | 20:18 | 297 | 8 | 49 | 20.64 | +24 | 24 | 25.57 | 3.494294 | 8.7 |
| | 21 | 06:17 | 64 | 19:54 | 296 | 9 | 8 | 5.91 | +23 | 16 | 22.29 | 3.526822 | 8.6 |
| 8 | 1 | 05:57 | 65 | 19:28 | 295 | 9 | 28 | 35.30 | +21 | 54 | 14.42 | 3.550271 | 8.5 |
| | 11 | 05:39 | 67 | 19:05 | 293 | 9 | 47 | 3.12 | +20 | 33 | 44.01 | 3.560163 | 8.5 |
| | 21 | 05:21 | 68 | 18:40 | 291 | 10 | 5 | 18.96 | +19 | 8 | 33.84 | 3.559046 | 8.4 |
| 9 | 1 | 05:01 | 70 | 18:13 | 290 | 10 | 25 | 9.06 | +17 | 30 | 30.06 | 3.545250 | 8.5 |
| | 11 | 04:43 | 72 | 17:49 | 288 | 10 | 42 | 56.20 | +15 | 58 | 24.80 | 3.521129 | 8.6 |
| | 21 | 04:24 | 74 | 17:24 | 286 | 11 | 0 | 27.72 | +14 | 24 | 36.28 | 3.486092 | 8.6 |
| 10 | 1 | 04:05 | 75 | 16:58 | 284 | 11 | 17 | 43.23 | +12 | 50 | 3.35 | 3.440350 | 8.7 |
| | 11 | 03:46 | 77 | 16:33 | 283 | 11 | 34 | 41.63 | +11 | 15 | 53.76 | 3.383916 | 8.7 |
| | 21 | 03:26 | 79 | 16:07 | 281 | 11 | 51 | 20.94 | +9 | 43 | 16.43 | 3.317171 | 8.8 |
| 11 | 1 | 03:04 | 81 | 15:38 | 279 | 12 | 9 | 16.62 | +8 | 4 | 27.86 | 3.232301 | 8.8 |
| | 11 | 02:43 | 82 | 15:12 | 278 | 12 | 25 | 9.77 | +6 | 38 | 46.73 | 3.145103 | 8.8 |
| | 21 | 02:22 | 84 | 14:46 | 276 | 12 | 40 | 35.19 | +5 | 18 | 15.95 | 3.049141 | 8.8 |
| 12 | 1 | 02:00 | 85 | 14:19 | 275 | 12 | 55 | 28.67 | +4 | 4 | 5.15 | 2.945104 | 8.7 |
| | 11 | 01:37 | 86 | 13:52 | 274 | 13 | 9 | 43.21 | +2 | 57 | 30.66 | 2.833846 | 8.7 |
| | 21 | 01:13 | 88 | 13:24 | 272 | 13 | 23 | 10.72 | +1 | 59 | 40.34 | 2.716679 | 8.6 |
| | 31 | 00:47 | 88 | 12:55 | 272 | 13 | 35 | 41.79 | +1 | 11 | 41.08 | 2.594836 | 8.6 |

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 | 11:57 | 108 | 22:58 | 252 | 0 | 18 | 7.97 | -16 | 8 | 31.23 | 2.768205 | 9.6 |
| | 11 | 11:26 | 107 | 22:30 | 253 | 0 | 27 | 43.29 | -15 | 22 | 21.61 | 2.875287 | 9.6 |
| | 21 | 10:55 | 106 | 22:04 | 254 | 0 | 38 | 38.97 | -14 | 27 | 51.08 | 2.974184 | 9.7 |
| 2 | 1 | 10:23 | 104 | 21:36 | 256 | 0 | 52 | 0.04 | -13 | 20 | 40.85 | 3.071628 | 9.7 |
| | 11 | 09:55 | 103 | 21:12 | 257 | 1 | 5 | 11.94 | -12 | 14 | 50.14 | 3.148858 | 9.7 |
| | 21 | 09:27 | 102 | 20:49 | 258 | 1 | 19 | 17.70 | -11 | 6 | 5.59 | 3.214364 | 9.6 |
| 3 | 1 | 09:06 | 101 | 20:31 | 259 | 1 | 31 | 8.84 | -10 | 10 | 0.54 | 3.258085 | 9.6 |
| | 11 | 08:40 | 100 | 20:10 | 260 | 1 | 46 | 37.67 | -8 | 59 | 35.57 | 3.301885 | 9.6 |
| | 21 | 08:14 | 98 | 19:49 | 262 | 2 | 2 | 47.72 | -7 | 50 | 5.75 | 3.333563 | 9.5 |
| 4 | 1 | 07:47 | 97 | 19:26 | 263 | 2 | 21 | 18.16 | -6 | 36 | 13.70 | 3.354840 | 9.5 |
| | 11 | 07:23 | 96 | 19:06 | 264 | 2 | 38 | 45.12 | -5 | 32 | 39.12 | 3.362475 | 9.4 |
| | 21 | 07:00 | 95 | 18:47 | 265 | 2 | 56 | 45.52 | -4 | 33 | 46.29 | 3.359458 | 9.4 |
| 5 | 1 | 06:37 | 94 | 18:28 | 266 | 3 | 15 | 16.82 | -3 | 40 | 42.45 | 3.346660 | 9.3 |
| | 11 | 06:16 | 93 | 18:09 | 267 | 3 | 34 | 17.63 | -2 | 54 | 31.00 | 3.324915 | 9.3 |
| | 21 | 05:54 | 92 | 17:50 | 268 | 3 | 53 | 45.28 | -2 | 16 | 18.96 | 3.294947 | 9.3 |
| 6 | 1 | 05:32 | 92 | 17:29 | 268 | 4 | 15 | 37.10 | -1 | 44 | 37.48 | 3.253700 | 9.3 |
| | 11 | 05:12 | 91 | 17:11 | 269 | 4 | 35 | 51.81 | -1 | 26 | 9.56 | 3.209531 | 9.2 |
| | 21 | 04:53 | 91 | 16:52 | 269 | 4 | 56 | 23.06 | -1 | 18 | 21.27 | 3.159766 | 9.2 |
| 7 | 1 | 04:35 | 91 | 16:33 | 269 | 5 | 17 | 6.73 | -1 | 21 | 42.98 | 3.105297 | 9.2 |
| | 11 | 04:16 | 92 | 16:14 | 268 | 5 | 37 | 58.53 | -1 | 36 | 41.92 | 3.046636 | 9.2 |
| | 21 | 03:59 | 92 | 15:55 | 268 | 5 | 58 | 52.39 | -2 | 3 | 29.14 | 2.984303 | 9.2 |
| 8 | 1 | 03:40 | 93 | 15:33 | 267 | 6 | 21 | 47.87 | -2 | 46 | 26.09 | 2.912142 | 9.2 |
| | 11 | 03:23 | 94 | 15:13 | 266 | 6 | 42 | 28.76 | -3 | 37 | 28.67 | 2.843418 | 9.1 |
| | 21 | 03:05 | 95 | 14:52 | 265 | 7 | 2 | 53.63 | -4 | 39 | 18.18 | 2.771941 | 9.1 |
| 9 | 1 | 02:47 | 96 | 14:28 | 264 | 7 | 24 | 56.11 | -5 | 58 | 44.48 | 2.690261 | 9.1 |
| | 11 | 02:29 | 98 | 14:06 | 262 | 7 | 44 | 28.82 | -7 | 20 | 14.72 | 2.612995 | 9.0 |
| | 21 | 02:12 | 99 | 13:43 | 260 | 8 | 3 | 26.47 | -8 | 49 | 7.92 | 2.532842 | 9.0 |
| 10 | 1 | 01:54 | 101 | 13:18 | 259 | 8 | 21 | 43.46 | -10 | 23 | 55.24 | 2.449605 | 8.9 |
| | 11 | 01:35 | 103 | 12:53 | 257 | 8 | 39 | 12.07 | -12 | 2 | 53.75 | 2.362973 | 8.9 |
| | 21 | 01:16 | 105 | 12:27 | 255 | 8 | 55 | 44.37 | -13 | 43 | 57.60 | 2.272963 | 8.8 |
| 11 | 1 | 00:53 | 107 | 11:57 | 253 | 9 | 12 | 41.18 | -15 | 35 | 0.44 | 2.169920 | 8.7 |
| | 11 | 00:31 | 109 | 11:28 | 251 | 9 | 26 | 45.06 | -17 | 13 | 2.03 | 2.072653 | 8.6 |
| | 21 | 00:07 | 110 | 10:58 | 249 | 9 | 39 | 19.63 | -18 | 45 | 3.69 | 1.972504 | 8.5 |
| 12 | 1 | 23:39 | 112 | 10:27 | 248 | 9 | 50 | 10.40 | -20 | 7 | 37.42 | 1.870029 | 8.4 |
| | 11 | 23:11 | 113 | 09:54 | 247 | 9 | 58 | 58.89 | -21 | 16 | 9.66 | 1.766354 | 8.3 |
| | 21 | 22:40 | 114 | 09:19 | 246 | 10 | 5 | 27.58 | -22 | 5 | 7.04 | 1.663228 | 8.1 |
| | 31 | 22:05 | 115 | 08:43 | 245 | 10 | 9 | 18.49 | -22 | 27 | 49.62 | 1.562764 | 8.0 |

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 | 05:54 | 105 | 17:05 | 255 | 18 | 19 | 4.26 | -13 | 39 | 54.08 | 4.123909 | 11.2 |
| | 11 | 05:29 | 105 | 16:41 | 255 | 18 | 33 | 56.58 | -13 | 30 | 56.25 | 4.085011 | 11.2 |
| | 21 | 05:04 | 104 | 16:17 | 256 | 18 | 48 | 44.58 | -13 | 14 | 38.43 | 4.029884 | 11.2 |
| 2 | 1 | 04:36 | 104 | 15:51 | 256 | 19 | 4 | 49.36 | -12 | 48 | 34.30 | 3.951400 | 11.2 |
| | 11 | 04:09 | 103 | 15:27 | 257 | 19 | 19 | 9.97 | -12 | 17 | 51.16 | 3.864627 | 11.2 |
| | 21 | 03:43 | 103 | 15:02 | 257 | 19 | 33 | 8.41 | -11 | 40 | 59.55 | 3.764073 | 11.2 |
| 3 | 1 | 03:21 | 102 | 14:43 | 258 | 19 | 43 | 59.39 | -11 | 7 | 31.23 | 3.674592 | 11.2 |
| | 11 | 02:53 | 101 | 14:18 | 259 | 19 | 57 | 3.99 | -10 | 21 | 16.73 | 3.552417 | 11.2 |
| | 21 | 02:25 | 100 | 13:53 | 260 | 20 | 9 | 29.68 | -9 | 30 | 58.83 | 3.420015 | 11.1 |
| 4 | 1 | 01:53 | 99 | 13:24 | 261 | 20 | 22 | 17.27 | -8 | 32 | 9.36 | 3.264607 | 11.0 |
| | 11 | 01:22 | 98 | 12:57 | 262 | 20 | 32 | 59.66 | -7 | 36 | 40.94 | 3.116131 | 10.9 |
| | 21 | 00:51 | 97 | 12:29 | 263 | 20 | 42 | 40.01 | -6 | 40 | 41.81 | 2.962739 | 10.8 |
| 5 | 1 | 00:18 | 96 | 12:00 | 264 | 20 | 51 | 9.52 | -5 | 45 | 40.38 | 2.806567 | 10.7 |
| | 11 | 23:41 | 95 | 11:29 | 265 | 20 | 58 | 17.61 | -4 | 53 | 19.21 | 2.649638 | 10.6 |
| | 21 | 23:06 | 94 | 10:57 | 266 | 21 | 3 | 51.87 | -4 | 5 | 42.67 | 2.494514 | 10.4 |
| 6 | 1 | 22:25 | 93 | 10:19 | 267 | 21 | 7 | 57.17 | -3 | 21 | 31.42 | 2.329242 | 10.2 |
| | 11 | 21:46 | 93 | 09:42 | 267 | 21 | 9 | 34.78 | -2 | 51 | 40.89 | 2.187004 | 10.0 |
| | 21 | 21:06 | 93 | 09:03 | 267 | 21 | 9 | 2.15 | -2 | 34 | 41.74 | 2.056042 | 9.8 |
| 7 | 1 | 20:23 | 93 | 08:21 | 267 | 21 | 6 | 15.34 | -2 | 33 | 18.72 | 1.939874 | 9.6 |
| | 11 | 19:40 | 93 | 07:36 | 267 | 21 | 1 | 17.57 | -2 | 49 | 57.90 | 1.842186 | 9.4 |
| | 21 | 18:55 | 94 | 06:49 | 266 | 20 | 54 | 27.81 | -3 | 25 | 49.19 | 1.766666 | 9.2 |
| 8 | 1 | 18:04 | 95 | 05:55 | 265 | 20 | 45 | 30.26 | -4 | 26 | 23.05 | 1.712384 | 9.0 |
| | 11 | 17:19 | 96 | 05:05 | 264 | 20 | 36 | 5.67 | -5 | 45 | 0.28 | 1.690444 | 9.0 |
| | 21 | 16:34 | 97 | 04:15 | 263 | 20 | 28 | 15.44 | -7 | 6 | 3.57 | 1.698481 | 9.1 |
| 9 | 1 | 15:47 | 99 | 03:22 | 261 | 20 | 21 | 30.23 | -8 | 38 | 6.67 | 1.735694 | 9.2 |
| | 11 | 15:06 | 101 | 02:36 | 259 | 20 | 17 | 47.18 | -9 | 58 | 9.85 | 1.792021 | 9.4 |
| | 21 | 14:28 | 102 | 01:53 | 258 | 20 | 16 | 46.11 | -11 | 10 | 4.79 | 1.865497 | 9.5 |
| 10 | 1 | 13:52 | 103 | 01:13 | 257 | 20 | 18 | 31.61 | -12 | 11 | 0.40 | 1.951983 | 9.6 |
| | 11 | 13:19 | 104 | 00:36 | 256 | 20 | 22 | 59.17 | -12 | 59 | 10.83 | 2.047576 | 9.7 |
| | 21 | 12:47 | 105 | 00:02 | 255 | 20 | 29 | 55.91 | -13 | 33 | 46.82 | 2.148486 | 9.8 |
| | | | | 23:59 | 255 | | | | | | | | |
| 11 | 1 | 12:15 | 105 | 23:25 | 255 | 20 | 40 | 6.56 | -13 | 55 | 53.86 | 2.262090 | 9.9 |
| | 11 | 11:47 | 105 | 22:57 | 255 | 20 | 51 | 22.77 | -14 | 1 | 30.64 | 2.364876 | 10.0 |
| | 21 | 11:20 | 105 | 22:31 | 255 | 21 | 4 | 16.38 | -13 | 53 | 40.70 | 2.464838 | 10.1 |
| 12 | 1 | 10:54 | 105 | 22:06 | 255 | 21 | 18 | 32.34 | -13 | 32 | 50.06 | 2.560392 | 10.1 |
| | 11 | 10:29 | 104 | 21:43 | 256 | 21 | 33 | 58.07 | -12 | 59 | 29.49 | 2.650001 | 10.1 |
| | 21 | 10:04 | 103 | 21:22 | 257 | 21 | 50 | 21.02 | -12 | 14 | 24.54 | 2.732499 | 10.2 |
| | 31 | 09:40 | 102 | 21:01 | 258 | 20 | 44 | 38.90 | -4 | 32 | 52.51 | 1.709033 | 10.1 |

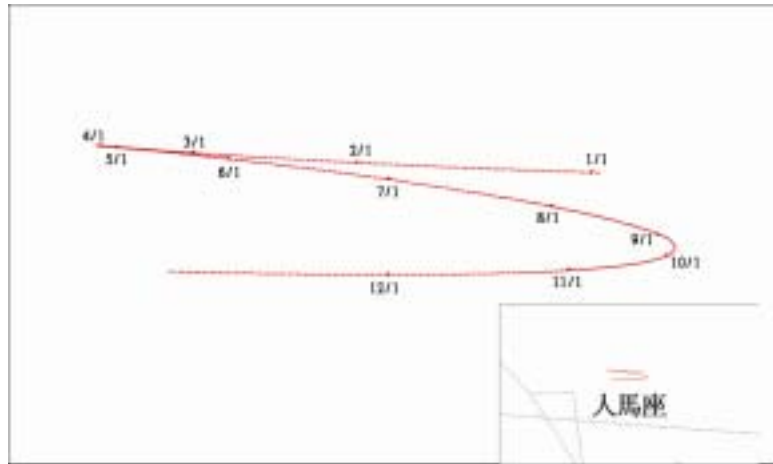
灶神星 (Vesta) 位置與出沒時間表

東經：121.52°，北緯：25.10°

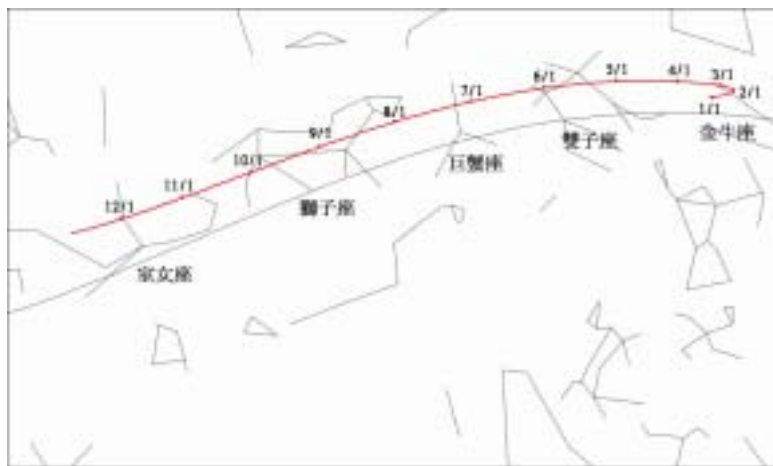
東經 120° 平太陽時

| 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 | 15:16 | 69 | 04:35 | 291 | 4 | 45 | 27.70 | +18 | 17 | 6.94 | 1.662619 | 6.9 |
| | 11 | 14:30 | 69 | 03:50 | 291 | 4 | 38 | 46.74 | +18 | 38 | 51.68 | 1.737074 | 7.1 |
| | 21 | 13:46 | 69 | 03:08 | 291 | 4 | 35 | 6.04 | +19 | 5 | 21.31 | 1.831485 | 7.3 |
| 2 | 1 | 13:01 | 68 | 02:25 | 292 | 4 | 34 | 40.00 | +19 | 39 | 32.92 | 1.952539 | 7.5 |
| | 11 | 12:23 | 67 | 01:50 | 293 | 4 | 37 | 23.53 | +20 | 14 | 13.88 | 2.073482 | 7.7 |
| | 21 | 11:48 | 67 | 01:17 | 293 | 4 | 42 | 49.66 | +20 | 51 | 0.80 | 2.200624 | 7.8 |
| 3 | 1 | 11:22 | 66 | 00:53 | 294 | 4 | 48 | 53.99 | +21 | 20 | 56.78 | 2.304380 | 7.9 |
| | 11 | 10:50 | 65 | 00:24 | 295 | 4 | 58 | 22.39 | +21 | 57 | 41.78 | 2.434339 | 8.0 |
| | 21 | 10:21 | 65 | 23:55 | 295 | 5 | 9 | 40.58 | +22 | 32 | 19.12 | 2.562240 | 8.1 |
| 4 | 1 | 09:51 | 64 | 23:27 | 296 | 5 | 23 | 53.17 | +23 | 6 | 17.92 | 2.698023 | 8.2 |
| | 11 | 09:25 | 64 | 23:03 | 296 | 5 | 38 | 10.02 | +23 | 32 | 6.51 | 2.815401 | 8.3 |
| | 21 | 09:00 | 63 | 22:40 | 297 | 5 | 53 | 32.51 | +23 | 51 | 58.41 | 2.925484 | 8.3 |
| 5 | 1 | 08:36 | 63 | 22:17 | 297 | 6 | 9 | 48.73 | +24 | 5 | 0.63 | 3.027207 | 8.4 |
| | 11 | 08:14 | 63 | 21:55 | 297 | 6 | 26 | 49.53 | +24 | 10 | 29.32 | 3.119845 | 8.4 |
| | 21 | 07:52 | 63 | 21:33 | 297 | 6 | 44 | 26.36 | +24 | 7 | 52.62 | 3.202530 | 8.4 |
| 6 | 1 | 07:29 | 63 | 21:09 | 297 | 7 | 4 | 20.26 | +23 | 55 | 14.32 | 3.281440 | 8.4 |
| | 11 | 07:09 | 63 | 20:48 | 296 | 7 | 22 | 47.32 | +23 | 34 | 38.01 | 3.341834 | 8.4 |
| | 21 | 06:49 | 64 | 20:26 | 296 | 7 | 41 | 28.30 | +23 | 5 | 21.09 | 3.390941 | 8.3 |
| 7 | 1 | 06:30 | 65 | 20:04 | 295 | 8 | 0 | 17.44 | +22 | 27 | 31.19 | 3.428693 | 8.3 |
| | 11 | 06:11 | 66 | 19:41 | 294 | 8 | 19 | 10.75 | +21 | 41 | 22.07 | 3.454903 | 8.2 |
| | 21 | 05:53 | 67 | 19:19 | 293 | 8 | 38 | 3.68 | +20 | 47 | 20.06 | 3.469371 | 8.1 |
| 8 | 1 | 05:33 | 68 | 18:54 | 292 | 8 | 58 | 45.51 | +19 | 39 | 23.37 | 3.471894 | 8.0 |
| | 11 | 05:14 | 69 | 18:31 | 291 | 9 | 17 | 28.21 | +18 | 30 | 31.58 | 3.461933 | 8.0 |
| | 21 | 04:56 | 71 | 18:07 | 289 | 9 | 36 | 2.22 | +17 | 15 | 41.14 | 3.440359 | 8.1 |
| 9 | 1 | 04:36 | 72 | 17:41 | 288 | 9 | 56 | 16.07 | +15 | 47 | 21.75 | 3.403559 | 8.1 |
| | 11 | 04:18 | 74 | 17:17 | 286 | 10 | 14 | 28.06 | +14 | 22 | 33.93 | 3.358273 | 8.2 |
| | 21 | 03:59 | 75 | 16:53 | 284 | 10 | 32 | 27.51 | +12 | 54 | 29.73 | 3.302062 | 8.2 |
| 10 | 1 | 03:41 | 77 | 16:28 | 283 | 10 | 50 | 14.20 | +11 | 24 | 5.95 | 3.235339 | 8.2 |
| | 11 | 03:22 | 79 | 16:03 | 281 | 11 | 7 | 47.11 | +9 | 52 | 29.40 | 3.158344 | 8.2 |
| | 21 | 03:03 | 80 | 15:38 | 279 | 11 | 25 | 4.58 | +8 | 20 | 50.18 | 3.071698 | 8.2 |
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| | 11 | 02:21 | 84 | 14:45 | 276 | 12 | 0 | 27.35 | +5 | 13 | 29.29 | 2.860924 | 8.1 |
| | 21 | 02:01 | 85 | 14:19 | 274 | 12 | 16 | 45.17 | +3 | 49 | 31.82 | 2.748445 | 8.1 |
| 12 | 1 | 01:40 | 87 | 13:53 | 273 | 12 | 32 | 36.83 | +2 | 30 | 47.74 | 2.629345 | 8.0 |
| | 11 | 01:18 | 88 | 13:27 | 272 | 12 | 47 | 55.75 | +1 | 18 | 48.64 | 2.504614 | 7.9 |
| | 21 | 00:55 | 89 | 13:00 | 271 | 13 | 2 | 34.33 | +0 | 15 | 1.66 | 2.375637 | 7.8 |
| | 31 | 00:31 | 90 | 12:33 | 270 | 13 | 16 | 23.25 | -0 | 39 | 2.65 | 2.243649 | 7.7 |

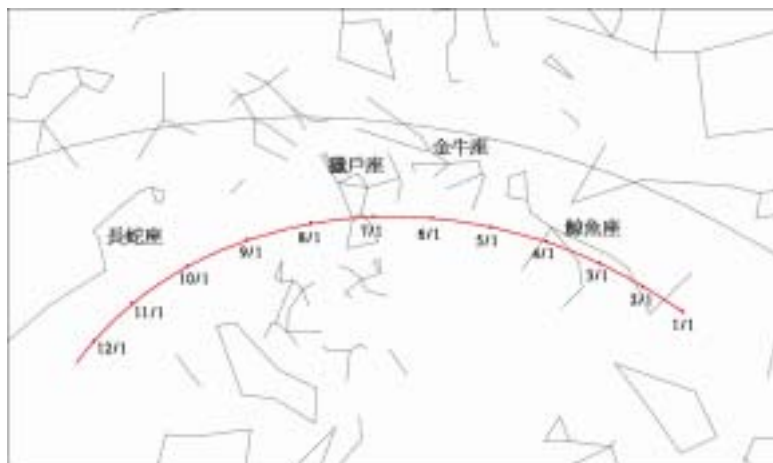
冥王星在天球上運行的軌跡圖



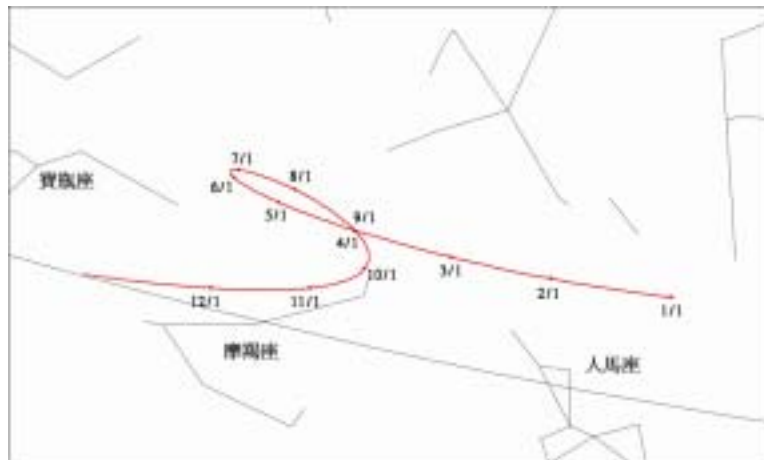
穀神星在天球上運行的軌跡圖



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

