

Midway, UT                      Latitude: 40°31'00" N Longitude: 111°27'30" W  
Local Time = UT - 7.00 hours    Elevation: 1707 meters                      Year 2010  
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Introduction to Reports Generated by Astronomy Lab

In all reports, times and dates are in standard time (not daylight savings time or summer time). Times are in 24 hour format.

Abbreviations used in reports:

|            |                      |
|------------|----------------------|
| AU         | Astronomical Units   |
| D          | Degrees              |
| DEC        | Declination          |
| DIST       | Distance             |
| DSO        | December Solstice    |
| E          | East                 |
| FM         | Full Moon            |
| FQ         | First Quarter Moon   |
| H          | Hours                |
| ILL FR,    |                      |
| ILLUM FRAC | Illuminated Fraction |
| JSO        | June Solstice        |
| KM         | Kilometers           |
| LE         | Lunar Eclipse        |
| LQ         | Last Quarter Moon    |
| M          | Minutes              |
| MEQ        | March Equinox        |
| MR         | Moon Rise            |
| MS         | Moon Set             |
| N          | North                |
| NM         | New Moon             |
| RA         | Right Ascension      |
| S          | South, Seconds       |
| SE         | Solar Eclipse        |
| SEQ        | September Equinox    |
| SR         | Sunrise              |
| SS         | Sunset               |
| UT         | Universal Time       |
| W          | West                 |
| ZHR        | Zenithal Hourly Rate |



February 2010

| Sunday    | Monday    | Tuesday   | Wednesday | Thursday  | Friday    | Saturday  |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|           | 1         | 2         | 3         | 4         | 5         | 6         |
|           | SR: 7:35  | SR: 7:34  | SR: 7:33  | SR: 7:32  | SR: 7:31  | SR: 7:30  |
|           | SS: 17:44 | SS: 17:45 | SS: 17:46 | SS: 17:48 | SS: 17:49 | SS: 17:50 |
|           | MR: 21:16 | MR: 22:30 | MR: 23:41 | MR: None  | MR: 0:51  | MR: 1:58  |
|           | MS: 8:46  | MS: 9:14  | MS: 9:43  | MS: 10:13 | MS: 10:47 | MS: 11:25 |
|           |           |           |           |           | LQ: 16:51 |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 7         | 8         | 9         | 10        | 11        | 12        | 13        |
| SR: 7:29  | SR: 7:28  | SR: 7:27  | SR: 7:26  | SR: 7:24  | SR: 7:23  | SR: 7:22  |
| SS: 17:51 | SS: 17:53 | SS: 17:54 | SS: 17:55 | SS: 17:56 | SS: 17:57 | SS: 17:59 |
| MR: 3:00  | MR: 3:57  | MR: 4:46  | MR: 5:28  | MR: 6:03  | MR: 6:33  | MR: 7:00  |
| MS: 12:10 | MS: 13:00 | MS: 13:56 | MS: 14:54 | MS: 15:55 | MS: 16:55 | MS: 17:55 |
|           |           |           |           |           |           | NM: 19:53 |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 14        | 15        | 16        | 17        | 18        | 19        | 20        |
| SR: 7:21  | SR: 7:19  | SR: 7:18  | SR: 7:17  | SR: 7:15  | SR: 7:14  | SR: 7:13  |
| SS: 18:00 | SS: 18:01 | SS: 18:02 | SS: 18:03 | SS: 18:05 | SS: 18:06 | SS: 18:07 |
| MR: 7:23  | MR: 7:46  | MR: 8:07  | MR: 8:30  | MR: 8:55  | MR: 9:23  | MR: 9:56  |
| MS: 18:55 | MS: 19:54 | MS: 20:54 | MS: 21:55 | MS: 22:57 | MS: None  | MS: 0:02  |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 21        | 22        | 23        | 24        | 25        | 26        | 27        |
| SR: 7:11  | SR: 7:10  | SR: 7:08  | SR: 7:07  | SR: 7:05  | SR: 7:04  | SR: 7:03  |
| SS: 18:08 | SS: 18:09 | SS: 18:11 | SS: 18:12 | SS: 18:13 | SS: 18:14 | SS: 18:15 |
| MR: 10:36 | MR: 11:26 | MR: 12:26 | MR: 13:36 | MR: 14:52 | MR: 16:11 | MR: 17:30 |
| MS: 1:08  | MS: 2:13  | MS: 3:15  | MS: 4:10  | MS: 4:57  | MS: 5:37  | MS: 6:12  |
| FQ: 17:43 |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 28        |           |           |           |           |           |           |
| SR: 7:01  |           |           |           |           |           |           |
| SS: 18:16 |           |           |           |           |           |           |
| MR: 18:47 |           |           |           |           |           |           |
| MS: 6:43  |           |           |           |           |           |           |
| FM: 9:39  |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |

March                    2010

| Sunday    | Monday    | Tuesday   | Wednesday | Thursday  | Friday    | Saturday  |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|           | 1         | 2         | 3         | 4         | 5         | 6         |
|           | SR: 7:00  | SR: 6:58  | SR: 6:56  | SR: 6:55  | SR: 6:53  | SR: 6:52  |
|           | SS: 18:17 | SS: 18:18 | SS: 18:20 | SS: 18:21 | SS: 18:22 | SS: 18:23 |
|           | MR: 20:03 | MR: 21:18 | MR: 22:31 | MR: 23:42 | MR: None  | MR: 0:48  |
|           | MS: 7:12  | MS: 7:40  | MS: 8:11  | MS: 8:44  | MS: 9:22  | MS: 10:05 |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 7         | 8         | 9         | 10        | 11        | 12        | 13        |
| SR: 6:50  | SR: 6:49  | SR: 6:47  | SR: 6:45  | SR: 6:44  | SR: 6:42  | SR: 6:41  |
| SS: 18:24 | SS: 18:25 | SS: 18:26 | SS: 18:27 | SS: 18:28 | SS: 18:29 | SS: 18:31 |
| MR: 1:49  | MR: 2:42  | MR: 3:26  | MR: 4:04  | MR: 4:36  | MR: 5:03  | MR: 5:28  |
| MS: 10:55 | MS: 11:49 | MS: 12:47 | MS: 13:47 | MS: 14:48 | MS: 15:48 | MS: 16:47 |
| LQ: 8:44  |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 14        | 15        | 16        | 17        | 18        | 19        | 20        |
| SR: 6:39  | SR: 6:37  | SR: 6:36  | SR: 6:34  | SR: 6:32  | SR: 6:31  | SR: 6:29  |
| SS: 18:32 | SS: 18:33 | SS: 18:34 | SS: 18:35 | SS: 18:36 | SS: 18:37 | SS: 18:38 |
| MR: 5:51  | MR: 6:13  | MR: 6:36  | MR: 7:00  | MR: 7:27  | MR: 7:59  | MR: 8:37  |
| MS: 17:47 | MS: 18:46 | MS: 19:47 | MS: 20:50 | MS: 21:55 | MS: 23:00 | MS: None  |
|           | NM: 14:03 |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           | MEQ:10:31 |
|           |           |           |           |           |           |           |
| 21        | 22        | 23        | 24        | 25        | 26        | 27        |
| SR: 6:28  | SR: 6:26  | SR: 6:24  | SR: 6:23  | SR: 6:21  | SR: 6:19  | SR: 6:18  |
| SS: 18:39 | SS: 18:40 | SS: 18:41 | SS: 18:42 | SS: 18:43 | SS: 18:44 | SS: 18:45 |
| MR: 9:23  | MR: 10:18 | MR: 11:22 | MR: 12:33 | MR: 13:48 | MR: 15:04 | MR: 16:20 |
| MS: 0:05  | MS: 1:07  | MS: 2:02  | MS: 2:51  | MS: 3:32  | MS: 4:08  | MS: 4:39  |
|           |           | FQ: 4:00  |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 28        | 29        | 30        | 31        |           |           |           |
| SR: 6:16  | SR: 6:14  | SR: 6:13  | SR: 6:11  |           |           |           |
| SS: 18:46 | SS: 18:47 | SS: 18:48 | SS: 18:50 |           |           |           |
| MR: 17:35 | MR: 18:50 | MR: 20:05 | MR: 21:18 |           |           |           |
| MS: 5:08  | MS: 5:37  | MS: 6:07  | MS: 6:39  |           |           |           |
|           | FM: 19:26 |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |



May                      2010

| Sunday    | Monday    | Tuesday   | Wednesday | Thursday  | Friday    | Saturday  |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| -----     |           |           |           |           |           |           |
|           |           |           |           |           |           | 1         |
|           |           |           |           |           |           | SR: 5:25  |
|           |           |           |           |           |           | SS: 19:22 |
|           |           |           |           |           |           | MR: 23:11 |
|           |           |           |           |           |           | MS: 7:27  |
| -----     |           |           |           |           |           |           |
| 2         | 3         | 4         | 5         | 6         | 7         | 8         |
| SR: 5:24  | SR: 5:22  | SR: 5:21  | SR: 5:20  | SR: 5:19  | SR: 5:18  | SR: 5:16  |
| SS: 19:23 | SS: 19:24 | SS: 19:25 | SS: 19:26 | SS: 19:27 | SS: 19:28 | SS: 19:29 |
| MR: 23:56 | MR: None  | MR: 0:33  | MR: 1:05  | MR: 1:32  | MR: 1:56  | MR: 2:19  |
| MS: 8:25  | MS: 9:25  | MS: 10:27 | MS: 11:27 | MS: 12:27 | MS: 13:26 | MS: 14:25 |
|           |           |           | LQ: 21:16 |           |           |           |
| -----     |           |           |           |           |           |           |
| 9         | 10        | 11        | 12        | 13        | 14        | 15        |
| SR: 5:15  | SR: 5:14  | SR: 5:13  | SR: 5:12  | SR: 5:11  | SR: 5:10  | SR: 5:09  |
| SS: 19:30 | SS: 19:31 | SS: 19:32 | SS: 19:33 | SS: 19:34 | SS: 19:35 | SS: 19:36 |
| MR: 2:42  | MR: 3:05  | MR: 3:31  | MR: 4:00  | MR: 4:35  | MR: 5:17  | MR: 6:08  |
| MS: 15:25 | MS: 16:27 | MS: 17:31 | MS: 18:37 | MS: 19:44 | MS: 20:50 | MS: 21:51 |
|           |           |           |           | NM: 18:06 |           |           |
| -----     |           |           |           |           |           |           |
| 16        | 17        | 18        | 19        | 20        | 21        | 22        |
| SR: 5:08  | SR: 5:07  | SR: 5:07  | SR: 5:06  | SR: 5:05  | SR: 5:04  | SR: 5:03  |
| SS: 19:37 | SS: 19:38 | SS: 19:39 | SS: 19:40 | SS: 19:40 | SS: 19:41 | SS: 19:42 |
| MR: 7:08  | MR: 8:16  | MR: 9:28  | MR: 10:41 | MR: 11:54 | MR: 13:06 | MR: 14:17 |
| MS: 22:45 | MS: 23:30 | MS: None  | MS: 0:09  | MS: 0:42  | MS: 1:11  | MS: 1:38  |
|           |           |           |           | FQ: 16:44 |           |           |
| -----     |           |           |           |           |           |           |
| 23        | 24        | 25        | 26        | 27        | 28        | 29        |
| SR: 5:03  | SR: 5:02  | SR: 5:01  | SR: 5:01  | SR: 5:00  | SR: 4:59  | SR: 4:59  |
| SS: 19:43 | SS: 19:44 | SS: 19:45 | SS: 19:46 | SS: 19:46 | SS: 19:47 | SS: 19:48 |
| MR: 15:28 | MR: 16:39 | MR: 17:49 | MR: 18:58 | MR: 20:03 | MR: 21:00 | MR: 21:49 |
| MS: 2:06  | MS: 2:35  | MS: 3:07  | MS: 3:44  | MS: 4:26  | MS: 5:16  | MS: 6:12  |
|           |           |           |           | FM: 16:08 |           |           |
| -----     |           |           |           |           |           |           |
| 30        | 31        |           |           |           |           |           |
| SR: 4:58  | SR: 4:58  |           |           |           |           |           |
| SS: 19:49 | SS: 19:50 |           |           |           |           |           |
| MR: 22:29 | MR: 23:03 |           |           |           |           |           |
| MS: 7:12  | MS: 8:13  |           |           |           |           |           |
| -----     |           |           |           |           |           |           |

Midway, UT Latitude: 40°31'00" N Longitude: 111°27'30" W  
Local Time = UT - 7.00 hours Elevation: 1707 meters Year 2010  
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June 2010

| Sunday    | Monday    | Tuesday   | Wednesday | Thursday  | Friday    | Saturday  |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|           |           | 1         | 2         | 3         | 4         | 5         |
|           |           | SR: 4:57  | SR: 4:57  | SR: 4:57  | SR: 4:56  | SR: 4:56  |
|           |           | SS: 19:50 | SS: 19:51 | SS: 19:52 | SS: 19:52 | SS: 19:53 |
|           |           | MR: 23:32 | MR: 23:58 | MR: None  | MR: 0:21  | MR: 0:43  |
|           |           | MS: 9:15  | MS: 10:15 | MS: 11:15 | MS: 12:13 | MS: 13:12 |
|           |           |           |           |           | LQ: 15:14 |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 6         | 7         | 8         | 9         | 10        | 11        | 12        |
| SR: 4:56  | SR: 4:55  | SR: 4:55  | SR: 4:55  | SR: 4:55  | SR: 4:55  | SR: 4:55  |
| SS: 19:54 | SS: 19:54 | SS: 19:55 | SS: 19:55 | SS: 19:56 | SS: 19:56 | SS: 19:57 |
| MR: 1:06  | MR: 1:31  | MR: 1:58  | MR: 2:30  | MR: 3:09  | MR: 3:56  | MR: 4:54  |
| MS: 14:12 | MS: 15:15 | MS: 16:19 | MS: 17:26 | MS: 18:33 | MS: 19:37 | MS: 20:36 |
|           |           |           |           |           |           | NM: 4:16  |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 13        | 14        | 15        | 16        | 17        | 18        | 19        |
| SR: 4:55  | SR: 4:55  | SR: 4:55  | SR: 4:55  | SR: 4:55  | SR: 4:55  | SR: 4:55  |
| SS: 19:57 | SS: 19:58 | SS: 19:58 | SS: 19:59 | SS: 19:59 | SS: 19:59 | SS: 19:59 |
| MR: 6:01  | MR: 7:14  | MR: 8:29  | MR: 9:44  | MR: 10:57 | MR: 12:08 | MR: 13:19 |
| MS: 21:26 | MS: 22:08 | MS: 22:43 | MS: 23:14 | MS: 23:42 | MS: None  | MS: 0:10  |
|           |           |           |           |           | FQ: 21:31 |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 20        | 21        | 22        | 23        | 24        | 25        | 26        |
| SR: 4:55  | SR: 4:55  | SR: 4:56  | SR: 4:56  | SR: 4:56  | SR: 4:57  | SR: 4:57  |
| SS: 20:00 | SS: 20:00 | SS: 20:00 | SS: 20:00 | SS: 20:00 | SS: 20:00 | SS: 20:00 |
| MR: 14:29 | MR: 15:39 | MR: 16:47 | MR: 17:52 | MR: 18:51 | MR: 19:43 | MR: 20:26 |
| MS: 0:38  | MS: 1:08  | MS: 1:43  | MS: 2:23  | MS: 3:09  | MS: 4:02  | MS: 5:00  |
|           |           |           |           |           |           | FM: 4:31  |
|           |           |           |           |           |           | LE: 4:40  |
|           | JSO: 4:27 |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 27        | 28        | 29        | 30        |           |           |           |
| SR: 4:57  | SR: 4:58  | SR: 4:58  | SR: 4:59  |           |           |           |
| SS: 20:01 | SS: 20:00 | SS: 20:00 | SS: 20:00 |           |           |           |
| MR: 21:03 | MR: 21:33 | MR: 22:00 | MR: 22:24 |           |           |           |
| MS: 6:01  | MS: 7:03  | MS: 8:04  | MS: 9:04  |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |

Midway, UT

Latitude: 40°31'00" N Longitude: 111°27'30" W

Local Time = UT -

7.00 hours Elevation: 1707 meters

Year 2010

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July 2010

| Sunday    | Monday    | Tuesday   | Wednesday | Thursday  | Friday    | Saturday  |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|           |           |           |           | 1         | 2         | 3         |
|           |           |           |           | SR: 4:59  | SR: 5:00  | SR: 5:00  |
|           |           |           |           | SS: 20:00 | SS: 20:00 | SS: 20:00 |
|           |           |           |           | MR: 22:47 | MR: 23:09 | MR: 23:32 |
|           |           |           |           | MS: 10:03 | MS: 11:01 | MS: 12:00 |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 4         | 5         | 6         | 7         | 8         | 9         | 10        |
| SR: 5:01  | SR: 5:01  | SR: 5:02  | SR: 5:02  | SR: 5:03  | SR: 5:04  | SR: 5:04  |
| SS: 20:00 | SS: 19:59 | SS: 19:59 | SS: 19:59 | SS: 19:59 | SS: 19:58 | SS: 19:58 |
| MR: 23:57 | MR: None  | MR: 0:27  | MR: 1:02  | MR: 1:44  | MR: 2:37  | MR: 3:39  |
| MS: 13:00 | MS: 14:03 | MS: 15:07 | MS: 16:14 | MS: 17:19 | MS: 18:20 | MS: 19:15 |
| LQ: 7:37  |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 11        | 12        | 13        | 14        | 15        | 16        | 17        |
| SR: 5:05  | SR: 5:06  | SR: 5:07  | SR: 5:07  | SR: 5:08  | SR: 5:09  | SR: 5:10  |
| SS: 19:57 | SS: 19:57 | SS: 19:56 | SS: 19:56 | SS: 19:55 | SS: 19:55 | SS: 19:54 |
| MR: 4:51  | MR: 6:07  | MR: 7:25  | MR: 8:41  | MR: 9:55  | MR: 11:08 | MR: 12:20 |
| MS: 20:01 | MS: 20:40 | MS: 21:14 | MS: 21:44 | MS: 22:13 | MS: 22:41 | MS: 23:11 |
| NM: 12:41 |           |           |           |           |           |           |
| SE: 12:30 |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 18        | 19        | 20        | 21        | 22        | 23        | 24        |
| SR: 5:11  | SR: 5:11  | SR: 5:12  | SR: 5:13  | SR: 5:14  | SR: 5:15  | SR: 5:16  |
| SS: 19:53 | SS: 19:53 | SS: 19:52 | SS: 19:51 | SS: 19:50 | SS: 19:49 | SS: 19:49 |
| MR: 13:31 | MR: 14:39 | MR: 15:45 | MR: 16:46 | MR: 17:39 | MR: 18:25 | MR: 19:03 |
| MS: 23:45 | MS: None  | MS: 0:23  | MS: 1:06  | MS: 1:57  | MS: 2:52  | MS: 3:52  |
| FQ: 3:12  |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 25        | 26        | 27        | 28        | 29        | 30        | 31        |
| SR: 5:17  | SR: 5:17  | SR: 5:18  | SR: 5:19  | SR: 5:20  | SR: 5:21  | SR: 5:22  |
| SS: 19:48 | SS: 19:47 | SS: 19:46 | SS: 19:45 | SS: 19:44 | SS: 19:43 | SS: 19:42 |
| MR: 19:36 | MR: 20:04 | MR: 20:28 | MR: 20:51 | MR: 21:14 | MR: 21:36 | MR: 22:00 |
| MS: 4:53  | MS: 5:55  | MS: 6:55  | MS: 7:54  | MS: 8:53  | MS: 9:51  | MS: 10:50 |
| FM: 18:38 |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |



Midway, UT

Latitude: 40°31'00" N Longitude: 111°27'30" W

Local Time = UT - 7.00 hours Elevation: 1707 meters

Year 2010

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August 2010

| Sunday    | Monday    | Tuesday   | Wednesday | Thursday  | Friday    | Saturday  |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1         | 2         | 3         | 4         | 5         | 6         | 7         |
| SR: 5:23  | SR: 5:24  | SR: 5:25  | SR: 5:26  | SR: 5:27  | SR: 5:28  | SR: 5:29  |
| SS: 19:41 | SS: 19:40 | SS: 19:38 | SS: 19:37 | SS: 19:36 | SS: 19:35 | SS: 19:34 |
| MR: 22:27 | MR: 22:59 | MR: 23:37 | MR: None  | MR: 0:23  | MR: 1:20  | MR: 2:26  |
| MS: 11:51 | MS: 12:53 | MS: 13:57 | MS: 15:01 | MS: 16:03 | MS: 17:00 | MS: 17:50 |
|           | LQ: 22:01 |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 8         | 9         | 10        | 11        | 12        | 13        | 14        |
| SR: 5:30  | SR: 5:31  | SR: 5:32  | SR: 5:33  | SR: 5:34  | SR: 5:35  | SR: 5:36  |
| SS: 19:33 | SS: 19:31 | SS: 19:30 | SS: 19:29 | SS: 19:27 | SS: 19:26 | SS: 19:25 |
| MR: 3:39  | MR: 4:57  | MR: 6:16  | MR: 7:33  | MR: 8:49  | MR: 10:04 | MR: 11:17 |
| MS: 18:33 | MS: 19:10 | MS: 19:42 | MS: 20:13 | MS: 20:42 | MS: 21:13 | MS: 21:46 |
|           | NM: 20:09 |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 15        | 16        | 17        | 18        | 19        | 20        | 21        |
| SR: 5:37  | SR: 5:38  | SR: 5:39  | SR: 5:40  | SR: 5:40  | SR: 5:41  | SR: 5:42  |
| SS: 19:23 | SS: 19:22 | SS: 19:21 | SS: 19:19 | SS: 19:18 | SS: 19:16 | SS: 19:15 |
| MR: 12:29 | MR: 13:37 | MR: 14:40 | MR: 15:36 | MR: 16:23 | MR: 17:04 | MR: 17:38 |
| MS: 22:23 | MS: 23:05 | MS: 23:54 | MS: None  | MS: 0:48  | MS: 1:46  | MS: 2:47  |
|           | FQ: 11:15 |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 22        | 23        | 24        | 25        | 26        | 27        | 28        |
| SR: 5:43  | SR: 5:44  | SR: 5:45  | SR: 5:46  | SR: 5:47  | SR: 5:48  | SR: 5:49  |
| SS: 19:13 | SS: 19:12 | SS: 19:10 | SS: 19:09 | SS: 19:07 | SS: 19:06 | SS: 19:04 |
| MR: 18:07 | MR: 18:33 | MR: 18:57 | MR: 19:19 | MR: 19:42 | MR: 20:05 | MR: 20:31 |
| MS: 3:47  | MS: 4:48  | MS: 5:47  | MS: 6:46  | MS: 7:44  | MS: 8:43  | MS: 9:43  |
|           |           | FM: 10:06 |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 29        | 30        | 31        |           |           |           |           |
| SR: 5:50  | SR: 5:51  | SR: 5:52  |           |           |           |           |
| SS: 19:03 | SS: 19:01 | SS: 18:59 |           |           |           |           |
| MR: 21:01 | MR: 21:35 | MR: 22:17 |           |           |           |           |
| MS: 10:44 | MS: 11:46 | MS: 12:49 |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |





November 2010

| Sunday    | Monday    | Tuesday   | Wednesday | Thursday  | Friday    | Saturday  |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|           | 1         | 2         | 3         | 4         | 5         | 6         |
|           | SR: 6:56  | SR: 6:57  | SR: 6:58  | SR: 6:59  | SR: 7:01  | SR: 7:02  |
|           | SS: 17:22 | SS: 17:21 | SS: 17:20 | SS: 17:19 | SS: 17:18 | SS: 17:17 |
|           | MR: 1:36  | MR: 2:49  | MR: 4:02  | MR: 5:17  | MR: 6:32  | MR: 7:45  |
|           | MS: 14:34 | MS: 15:03 | MS: 15:33 | MS: 16:06 | MS: 16:44 | MS: 17:28 |
|           |           |           |           |           | NM: 21:52 |           |
|           |           |           |           |           |           |           |
| 7         | 8         | 9         | 10        | 11        | 12        | 13        |
| SR: 7:03  | SR: 7:04  | SR: 7:05  | SR: 7:06  | SR: 7:08  | SR: 7:09  | SR: 7:10  |
| SS: 17:16 | SS: 17:15 | SS: 17:14 | SS: 17:13 | SS: 17:12 | SS: 17:11 | SS: 17:10 |
| MR: 8:54  | MR: 9:56  | MR: 10:49 | MR: 11:33 | MR: 12:09 | MR: 12:40 | MR: 13:06 |
| MS: 18:18 | MS: 19:15 | MS: 20:16 | MS: 21:19 | MS: 22:21 | MS: 23:22 | MS: None  |
|           |           |           |           |           |           | FQ: 9:38  |
|           |           |           |           |           |           |           |
| 14        | 15        | 16        | 17        | 18        | 19        | 20        |
| SR: 7:11  | SR: 7:12  | SR: 7:13  | SR: 7:15  | SR: 7:16  | SR: 7:17  | SR: 7:18  |
| SS: 17:09 | SS: 17:08 | SS: 17:07 | SS: 17:07 | SS: 17:06 | SS: 17:05 | SS: 17:05 |
| MR: 13:31 | MR: 13:54 | MR: 14:17 | MR: 14:41 | MR: 15:08 | MR: 15:39 | MR: 16:15 |
| MS: 0:21  | MS: 1:20  | MS: 2:18  | MS: 3:17  | MS: 4:17  | MS: 5:19  | MS: 6:22  |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 21        | 22        | 23        | 24        | 25        | 26        | 27        |
| SR: 7:19  | SR: 7:20  | SR: 7:21  | SR: 7:23  | SR: 7:24  | SR: 7:25  | SR: 7:26  |
| SS: 17:04 | SS: 17:03 | SS: 17:03 | SS: 17:02 | SS: 17:02 | SS: 17:01 | SS: 17:01 |
| MR: 16:58 | MR: 17:49 | MR: 18:49 | MR: 19:54 | MR: 21:04 | MR: 22:15 | MR: 23:26 |
| MS: 7:25  | MS: 8:26  | MS: 9:23  | MS: 10:13 | MS: 10:56 | MS: 11:34 | MS: 12:06 |
| FM: 10:29 |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
| 28        | 29        | 30        |           |           |           |           |
| SR: 7:27  | SR: 7:28  | SR: 7:29  |           |           |           |           |
| SS: 17:01 | SS: 17:00 | SS: 17:00 |           |           |           |           |
| MR: None  | MR: 0:37  | MR: 1:48  |           |           |           |           |
| MS: 12:36 | MS: 13:04 | MS: 13:33 |           |           |           |           |
| LQ: 13:38 |           |           |           |           |           |           |
|           |           |           |           |           |           |           |
|           |           |           |           |           |           |           |



Midway, UT                      Latitude: 40°31'00" N Longitude: 111°27'30" W  
Local Time = UT - 7.00 hours      Elevation: 1707 meters                      Year 2010  
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Midway, UT                      Latitude: 40°31'00" N Longitude: 111°27'30" W  
Local Time = UT - 7.00 hours      Elevation: 1707 meters

#### Seasons Report for 2010

|                       |                |            |
|-----------------------|----------------|------------|
| MEQ: 3/20/2010 10:31  | Winter Length: | 88.99 days |
| JSO: 6/21/2010 4:27   | Spring Length: | 92.75 days |
| SEQ: 9/22/2010 20:11  | Summer Length: | 93.66 days |
| DSO: 12/21/2010 16:39 | Autumn Length: | 89.85 days |

#### Dates of Easter Report for 2010

4/ 4/2010

#### Lunar Eclipse Report for 2010

Lunar eclipse on 6/26/2010  
Moon rise: 20:26  
Moon set: 5:00  
Magnitude: 0.53  
Partial phase begins: 3:19  
Time of maximum eclipse: 4:40  
Partial phase ends: 6:00

Lunar eclipse on 12/21/2010  
Moon rise: 17:40  
Moon set: 8:06  
Magnitude: 1.25  
Partial phase begins: 23:34  
Total phase begins: 0:42  
Time of maximum eclipse: 1:17  
Total phase ends: 1:53  
Partial phase ends: 3:01

#### Solar Eclipse Report for 2010

Solar eclipse on 1/15/2010  
Sun rise: 7:47  
Sun set: 17:24  
Time of maximum eclipse: 0:10  
Eclipse is annular  
Eclipse is visible in the northern hemisphere

Solar eclipse on 7/11/2010  
Sun rise: 5:05  
Sun set: 19:57  
Time of maximum eclipse: 12:30  
Eclipse is total  
Eclipse is visible in the southern hemisphere

Midway, UT Latitude: 40°31'00" N Longitude: 111°27'30" W  
Local Time = UT - 7.00 hours Elevation: 1707 meters Year 2010  
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Planet View Info Report for 1/ 1/2010 to 12/31/2010

Mercury

| Date       | Rise | Set   | RA        | Dec        | Elongation | Ill Fr | DIST(AU) |
|------------|------|-------|-----------|------------|------------|--------|----------|
| 1/ 1/2010  | 8:10 | 17:46 | 19h21m15s | -20°28'27" | 8°41'16"   | 0.062  | 0.70267  |
| 1/ 8/2010  | 7:03 | 16:42 | 18h43m09s | -19°50'23" | 8°05'42"   | 0.048  | 0.68028  |
| 1/15/2010  | 6:21 | 15:58 | 18h23m47s | -20°17'29" | 19°21'57"  | 0.287  | 0.77458  |
| 1/22/2010  | 6:09 | 15:39 | 18h34m00s | -21°14'06" | 24°00'03"  | 0.510  | 0.90719  |
| 1/29/2010  | 6:12 | 15:39 | 19h01m43s | -21°53'10" | 24°41'01"  | 0.660  | 1.03363  |
| 2/ 5/2010  | 6:21 | 15:49 | 19h38m16s | -21°47'20" | 23°21'27"  | 0.759  | 1.14134  |
| 2/12/2010  | 6:30 | 16:08 | 20h19m24s | -20°44'23" | 20°52'25"  | 0.828  | 1.22863  |
| 2/19/2010  | 6:38 | 16:34 | 21h03m01s | -18°39'13" | 17°32'48"  | 0.882  | 1.29612  |
| 2/26/2010  | 6:43 | 17:04 | 21h48m06s | -15°29'56" | 13°26'44"  | 0.928  | 1.34388  |
| 3/ 5/2010  | 6:46 | 17:39 | 22h34m25s | -11°16'13" | 8°32'18"   | 0.968  | 1.36954  |
| 3/12/2010  | 6:47 | 18:18 | 23h22m06s | -6°00'00"  | 2°57'01"   | 0.995  | 1.36641  |
| 3/19/2010  | 6:48 | 19:02 | 0h11m17s  | 0°09'43"   | 4°28'52"   | 0.987  | 1.32160  |
| 3/26/2010  | 6:47 | 19:46 | 1h00m48s  | 6°43'55"   | 11°21'52"  | 0.888  | 1.21926  |
| 4/ 2/2010  | 6:43 | 20:23 | 1h46m04s  | 12°40'19"  | 17°04'31"  | 0.668  | 1.05969  |
| 4/ 9/2010  | 6:33 | 20:41 | 2h19m43s  | 16°47'35"  | 19°21'00"  | 0.400  | 0.87749  |
| 4/16/2010  | 6:14 | 20:31 | 2h35m52s  | 18°26'31"  | 16°44'59"  | 0.178  | 0.71738  |
| 4/23/2010  | 5:48 | 19:54 | 2h33m27s  | 17°29'12"  | 9°05'29"   | 0.038  | 0.60811  |
| 4/30/2010  | 5:17 | 19:00 | 2h19m27s  | 14°33'21"  | 2°13'12"   | 0.002  | 0.56274  |
| 5/ 7/2010  | 4:49 | 18:11 | 2h07m15s  | 11°26'03"  | 12°50'06"  | 0.063  | 0.57911  |
| 5/14/2010  | 4:27 | 17:39 | 2h06m20s  | 9°49'23"   | 20°28'28"  | 0.174  | 0.64256  |
| 5/21/2010  | 4:11 | 17:28 | 2h18m21s  | 10°09'48"  | 24°21'49"  | 0.298  | 0.73711  |
| 5/28/2010  | 4:00 | 17:33 | 2h41m39s  | 12°06'21"  | 25°01'47"  | 0.424  | 0.85200  |
| 6/ 4/2010  | 3:55 | 17:52 | 3h14m57s  | 15°07'30"  | 23°03'25"  | 0.558  | 0.98005  |
| 6/11/2010  | 3:57 | 18:23 | 3h58m15s  | 18°39'43"  | 18°46'23"  | 0.710  | 1.11261  |
| 6/18/2010  | 4:11 | 19:05 | 4h52m16s  | 22°00'18"  | 12°21'32"  | 0.871  | 1.23272  |
| 6/25/2010  | 4:38 | 19:50 | 5h55m52s  | 24°09'51"  | 4°21'53"   | 0.984  | 1.31116  |
| 7/ 2/2010  | 5:18 | 20:28 | 7h02m47s  | 24°15'03"  | 4°32'12"   | 0.984  | 1.32384  |
| 7/ 9/2010  | 6:01 | 20:51 | 8h04m50s  | 22°14'43"  | 12°06'23"  | 0.900  | 1.27805  |
| 7/16/2010  | 6:41 | 21:01 | 8h58m06s  | 18°49'16"  | 18°17'01"  | 0.795  | 1.19868  |
| 7/23/2010  | 7:13 | 21:00 | 9h42m27s  | 14°40'50"  | 22°55'31"  | 0.696  | 1.10421  |
| 7/30/2010  | 7:37 | 20:51 | 10h18m38s | 10°21'00"  | 26°00'21"  | 0.600  | 1.00371  |
| 8/ 6/2010  | 7:51 | 20:37 | 10h46m52s | 6°15'12"   | 27°20'24"  | 0.500  | 0.90134  |
| 8/13/2010  | 7:53 | 20:15 | 11h06m04s | 2°50'37"   | 26°26'59"  | 0.385  | 0.80050  |
| 8/20/2010  | 7:39 | 19:47 | 11h13m31s | 0°45'00"   | 22°27'06"  | 0.247  | 0.70819  |
| 8/27/2010  | 7:01 | 19:11 | 11h05m52s | 0°50'39"   | 14°18'49"  | 0.098  | 0.64104  |
| 9/ 3/2010  | 6:03 | 18:33 | 10h45m17s | 3°35'42"   | 4°06'48"   | 0.009  | 0.63009  |
| 9/10/2010  | 5:06 | 18:03 | 10h28m04s | 7°22'19"   | 11°22'27"  | 0.092  | 0.70748  |
| 9/17/2010  | 4:41 | 17:50 | 10h33m33s | 9°08'49"   | 17°23'42"  | 0.357  | 0.86964  |
| 9/24/2010  | 4:51 | 17:48 | 11h03m24s | 7°37'19"   | 16°52'50"  | 0.669  | 1.06500  |
| 10/ 1/2010 | 5:21 | 17:49 | 11h45m59s | 3°34'40"   | 12°29'26"  | 0.881  | 1.23172  |
| 10/ 8/2010 | 5:56 | 17:49 | 12h31m20s | -1°33'57"  | 6°59'56"   | 0.973  | 1.34402  |
| 10/15/2010 | 6:31 | 17:47 | 13h15m49s | -6°50'35"  | 1°48'53"   | 0.999  | 1.40699  |
| 10/22/2010 | 7:04 | 17:45 | 13h59m10s | -11°47'34" | 3°22'34"   | 0.996  | 1.43178  |
| 10/29/2010 | 7:36 | 17:45 | 14h42m04s | -16°11'55" | 7°39'50"   | 0.979  | 1.42611  |
| 11/ 5/2010 | 8:06 | 17:46 | 15h25m07s | -19°55'35" | 11°34'16"  | 0.952  | 1.39362  |
| 11/12/2010 | 8:34 | 17:50 | 16h08m37s | -22°51'20" | 15°06'38"  | 0.913  | 1.33488  |
| 11/19/2010 | 8:58 | 17:58 | 16h52m06s | -24°51'22" | 18°13'46"  | 0.854  | 1.24835  |
| 11/26/2010 | 9:16 | 18:08 | 17h33m47s | -25°47'51" | 20°37'50"  | 0.756  | 1.13141  |
| 12/ 3/2010 | 9:20 | 18:15 | 18h08m48s | -25°35'51" | 21°23'26"  | 0.590  | 0.98358  |
| 12/10/2010 | 9:01 | 18:07 | 18h25m56s | -24°20'22" | 18°07'38"  | 0.321  | 0.81867  |
| 12/17/2010 | 8:05 | 17:26 | 18h08m44s | -22°20'20" | 7°10'34"   | 0.042  | 0.69387  |
| 12/24/2010 | 6:52 | 16:28 | 17h30m07s | -20°23'45" | 9°29'48"   | 0.070  | 0.69749  |
| 12/31/2010 | 6:13 | 15:51 | 17h15m57s | -20°06'50" | 19°44'21"  | 0.343  | 0.81569  |

Midway, UT

Latitude: 40°31'00" N Longitude: 111°27'30" W

Local Time = UT - 7.00 hours Elevation: 1707 meters

Year 2010

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## Venus

| Date       | Rise | Set   | RA        | Dec        | Elongation | Ill Fr | DIST(AU) |
|------------|------|-------|-----------|------------|------------|--------|----------|
| 1/ 1/2010  | 7:43 | 16:55 | 18h34m20s | -23°38'34" | 2°37'53"   | 0.999  | 1.70811  |
| 1/ 8/2010  | 7:51 | 17:09 | 19h12m39s | -23°05'17" | 1°09'07"   | 1.000  | 1.71065  |
| 1/15/2010  | 7:56 | 17:24 | 19h50m29s | -21°57'14" | 1°11'27"   | 1.000  | 1.71126  |
| 1/22/2010  | 7:59 | 17:41 | 20h27m33s | -20°16'44" | 2°40'16"   | 0.999  | 1.70990  |
| 1/29/2010  | 7:59 | 17:58 | 21h03m39s | -18°07'07" | 4°17'46"   | 0.997  | 1.70660  |
| 2/ 5/2010  | 7:56 | 18:15 | 21h38m45s | -15°32'16" | 5°56'52"   | 0.995  | 1.70140  |
| 2/12/2010  | 7:51 | 18:33 | 22h12m51s | -12°36'25" | 7°36'29"   | 0.992  | 1.69423  |
| 2/19/2010  | 7:45 | 18:50 | 22h46m05s | -9°24'01"  | 9°16'30"   | 0.988  | 1.68498  |
| 2/26/2010  | 7:38 | 19:07 | 23h18m35s | -5°59'31"  | 10°57'00"  | 0.983  | 1.67360  |
| 3/ 5/2010  | 7:31 | 19:23 | 23h50m35s | -2°27'17"  | 12°37'55"  | 0.977  | 1.66011  |
| 3/12/2010  | 7:22 | 19:40 | 0h22m20s  | 1°08'28"   | 14°19'12"  | 0.970  | 1.64444  |
| 3/19/2010  | 7:14 | 19:56 | 0h54m03s  | 4°43'32"   | 16°00'53"  | 0.963  | 1.62645  |
| 3/26/2010  | 7:06 | 20:13 | 1h25m58s  | 8°13'38"   | 17°43'04"  | 0.954  | 1.60604  |
| 4/ 2/2010  | 6:59 | 20:29 | 1h58m19s  | 11°34'33"  | 19°25'40"  | 0.944  | 1.58323  |
| 4/ 9/2010  | 6:53 | 20:46 | 2h31m18s  | 14°42'04"  | 21°08'27"  | 0.933  | 1.55799  |
| 4/16/2010  | 6:49 | 21:04 | 3h05m04s  | 17°31'55"  | 22°51'19"  | 0.920  | 1.53023  |
| 4/23/2010  | 6:46 | 21:20 | 3h39m41s  | 19°59'54"  | 24°34'11"  | 0.907  | 1.49988  |
| 4/30/2010  | 6:45 | 21:37 | 4h15m09s  | 22°01'56"  | 26°16'49"  | 0.892  | 1.46700  |
| 5/ 7/2010  | 6:47 | 21:52 | 4h51m21s  | 23°34'33"  | 27°58'47"  | 0.876  | 1.43166  |
| 5/14/2010  | 6:52 | 22:05 | 5h28m05s  | 24°34'53"  | 29°39'47"  | 0.859  | 1.39388  |
| 5/21/2010  | 7:00 | 22:16 | 6h05m04s  | 25°01'02"  | 31°19'33"  | 0.840  | 1.35367  |
| 5/28/2010  | 7:10 | 22:24 | 6h41m55s  | 24°52'18"  | 32°57'41"  | 0.821  | 1.31115  |
| 6/ 4/2010  | 7:22 | 22:29 | 7h18m17s  | 24°09'15"  | 34°33'33"  | 0.800  | 1.26652  |
| 6/11/2010  | 7:36 | 22:31 | 7h53m50s  | 22°53'38"  | 36°06'37"  | 0.778  | 1.21993  |
| 6/18/2010  | 7:50 | 22:30 | 8h28m20s  | 21°08'08"  | 37°36'26"  | 0.754  | 1.17145  |
| 6/25/2010  | 8:05 | 22:26 | 9h01m35s  | 18°56'16"  | 39°02'23"  | 0.730  | 1.12127  |
| 7/ 2/2010  | 8:20 | 22:20 | 9h33m31s  | 16°21'56"  | 40°23'32"  | 0.705  | 1.06965  |
| 7/ 9/2010  | 8:34 | 22:12 | 10h04m10s | 13°29'06"  | 41°38'57"  | 0.678  | 1.01682  |
| 7/16/2010  | 8:47 | 22:02 | 10h33m34s | 10°21'47"  | 42°47'50"  | 0.650  | 0.96291  |
| 7/23/2010  | 8:59 | 21:50 | 11h01m49s | 7°04'03"   | 43°49'00"  | 0.621  | 0.90810  |
| 7/30/2010  | 9:10 | 21:38 | 11h28m58s | 3°39'47"   | 44°40'42"  | 0.590  | 0.85267  |
| 8/ 6/2010  | 9:21 | 21:25 | 11h55m08s | 0°12'36"   | 45°21'00"  | 0.558  | 0.79690  |
| 8/13/2010  | 9:30 | 21:10 | 12h20m22s | -3°14'00"  | 45°47'43"  | 0.524  | 0.74097  |
| 8/20/2010  | 9:38 | 20:55 | 12h44m37s | -6°36'24"  | 45°57'50"  | 0.487  | 0.68508  |
| 8/27/2010  | 9:45 | 20:39 | 13h07m45s | -9°50'58"  | 45°46'56"  | 0.448  | 0.62955  |
| 9/ 3/2010  | 9:50 | 20:22 | 13h29m31s | -12°54'07" | 45°09'23"  | 0.406  | 0.57483  |
| 9/10/2010  | 9:52 | 20:04 | 13h49m31s | -15°42'09" | 43°58'07"  | 0.360  | 0.52131  |
| 9/17/2010  | 9:51 | 19:44 | 14h07m05s | -18°10'43" | 42°03'13"  | 0.310  | 0.46951  |
| 9/24/2010  | 9:45 | 19:22 | 14h21m11s | -20°14'19" | 39°10'55"  | 0.254  | 0.42027  |
| 10/ 1/2010 | 9:33 | 18:57 | 14h30m32s | -21°45'44" | 35°04'06"  | 0.194  | 0.37485  |
| 10/ 8/2010 | 9:11 | 18:29 | 14h33m47s | -22°35'06" | 29°24'32"  | 0.131  | 0.33488  |
| 10/15/2010 | 8:38 | 17:58 | 14h29m52s | -22°29'19" | 21°59'07"  | 0.071  | 0.30253  |
| 10/22/2010 | 7:54 | 17:24 | 14h19m07s | -21°16'35" | 13°03'39"  | 0.025  | 0.28055  |
| 10/29/2010 | 7:02 | 16:52 | 14h04m28s | -19°00'00" | 5°59'23"   | 0.005  | 0.27161  |
| 11/ 5/2010 | 6:10 | 16:22 | 13h50m49s | -16°09'27" | 11°51'22"  | 0.020  | 0.27691  |
| 11/12/2010 | 5:25 | 15:57 | 13h42m25s | -13°29'39" | 21°02'29"  | 0.065  | 0.29554  |
| 11/19/2010 | 4:50 | 15:35 | 13h41m12s | -11°34'19" | 28°54'41"  | 0.126  | 0.32517  |
| 11/26/2010 | 4:26 | 15:18 | 13h47m03s | -10°35'22" | 34°58'46"  | 0.191  | 0.36305  |
| 12/ 3/2010 | 4:10 | 15:03 | 13h58m52s | -10°28'41" | 39°24'34"  | 0.253  | 0.40665  |
| 12/10/2010 | 4:02 | 14:50 | 14h15m25s | -11°03'17" | 42°31'33"  | 0.311  | 0.45407  |
| 12/17/2010 | 3:59 | 14:39 | 14h35m38s | -12°07'22" | 44°37'45"  | 0.363  | 0.50407  |
| 12/24/2010 | 3:59 | 14:30 | 14h58m49s | -13°30'22" | 45°57'11"  | 0.411  | 0.55576  |
| 12/31/2010 | 4:03 | 14:22 | 15h24m29s | -15°02'59" | 46°40'44"  | 0.454  | 0.60844  |



Midway, UT                                      Latitude: 40°31'00" N Longitude: 111°27'30" W  
Local Time = UT - 7.00 hours                      Elevation: 1707 meters    Year 2010

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Mars

| Date       | Rise  | Set   | RA        | Dec        | Elongation | Ill Fr | DIST(AU) |
|------------|-------|-------|-----------|------------|------------|--------|----------|
| 1/ 1/2010  | 19:57 | 10:21 | 9h29m54s  | 18°45'13"  | 141°29'33" | 0.963  | 0.73882  |
| 1/ 8/2010  | 19:21 | 9:51  | 9h24m36s  | 19°27'17"  | 149°56'44" | 0.977  | 0.70625  |
| 1/15/2010  | 18:42 | 9:19  | 9h16m44s  | 20°17'40"  | 158°56'01" | 0.988  | 0.68208  |
| 1/22/2010  | 18:01 | 8:45  | 9h06m45s  | 21°11'39"  | 168°07'54" | 0.996  | 0.66775  |
| 1/29/2010  | 17:18 | 8:10  | 8h55m31s  | 22°03'27"  | 175°20'13" | 0.999  | 0.66416  |
| 2/ 5/2010  | 16:36 | 7:34  | 8h44m03s  | 22°47'48"  | 170°11'23" | 0.997  | 0.67159  |
| 2/12/2010  | 15:56 | 6:59  | 8h33m24s  | 23°21'04"  | 161°10'04" | 0.991  | 0.68984  |
| 2/19/2010  | 15:19 | 6:24  | 8h24m33s  | 23°41'37"  | 152°14'36" | 0.980  | 0.71813  |
| 2/26/2010  | 14:45 | 5:51  | 8h18m08s  | 23°49'47"  | 143°50'16" | 0.968  | 0.75516  |
| 3/ 5/2010  | 14:14 | 5:19  | 8h14m24s  | 23°47'06"  | 136°03'21" | 0.955  | 0.79946  |
| 3/12/2010  | 13:47 | 4:50  | 8h13m21s  | 23°35'13"  | 128°54'13" | 0.943  | 0.84968  |
| 3/19/2010  | 13:22 | 4:23  | 8h14m48s  | 23°15'31"  | 122°21'16" | 0.932  | 0.90460  |
| 3/26/2010  | 13:01 | 3:57  | 8h18m31s  | 22°48'59"  | 116°21'37" | 0.922  | 0.96297  |
| 4/ 2/2010  | 12:42 | 3:33  | 8h24m10s  | 22°16'22"  | 110°51'15" | 0.914  | 1.02378  |
| 4/ 9/2010  | 12:24 | 3:10  | 8h31m27s  | 21°38'04"  | 105°46'06" | 0.908  | 1.08627  |
| 4/16/2010  | 12:09 | 2:48  | 8h40m08s  | 20°54'12"  | 101°02'59" | 0.903  | 1.14980  |
| 4/23/2010  | 11:54 | 2:27  | 8h49m58s  | 20°04'52"  | 96°39'21"  | 0.900  | 1.21373  |
| 4/30/2010  | 11:41 | 2:07  | 9h00m44s  | 19°10'11"  | 92°32'30"  | 0.898  | 1.27752  |
| 5/ 7/2010  | 11:29 | 1:47  | 9h12m17s  | 18°10'14"  | 88°39'56"  | 0.897  | 1.34086  |
| 5/14/2010  | 11:18 | 1:27  | 9h24m28s  | 17°05'04"  | 84°59'51"  | 0.897  | 1.40346  |
| 5/21/2010  | 11:08 | 1:08  | 9h37m12s  | 15°54'45"  | 81°31'00"  | 0.898  | 1.46496  |
| 5/28/2010  | 10:59 | 0:48  | 9h50m21s  | 14°39'32"  | 78°12'05"  | 0.899  | 1.52506  |
| 6/ 4/2010  | 10:50 | 0:29  | 10h03m51s | 13°19'38"  | 75°01'40"  | 0.902  | 1.58365  |
| 6/11/2010  | 10:41 | 0:10  | 10h17m40s | 11°55'15"  | 71°58'43"  | 0.904  | 1.64060  |
| 6/18/2010  | 10:33 | 23:49 | 10h31m45s | 10°26'37"  | 69°02'40"  | 0.907  | 1.69570  |
| 6/25/2010  | 10:25 | 23:30 | 10h46m04s | 8°54'07"   | 66°12'54"  | 0.911  | 1.74877  |
| 7/ 2/2010  | 10:18 | 23:12 | 11h00m35s | 7°18'07"   | 63°28'32"  | 0.914  | 1.79979  |
| 7/ 9/2010  | 10:11 | 22:53 | 11h15m19s | 5°38'57"   | 60°48'56"  | 0.918  | 1.84872  |
| 7/16/2010  | 10:04 | 22:34 | 11h30m16s | 3°56'58"   | 58°13'47"  | 0.922  | 1.89544  |
| 7/23/2010  | 9:58  | 22:16 | 11h45m26s | 2°12'39"   | 55°42'48"  | 0.926  | 1.93985  |
| 7/30/2010  | 9:51  | 21:58 | 12h00m49s | 0°26'29"   | 53°15'29"  | 0.930  | 1.98195  |
| 8/ 6/2010  | 9:46  | 21:40 | 12h16m26s | -1°21'04"  | 50°51'20"  | 0.934  | 2.02179  |
| 8/13/2010  | 9:40  | 21:22 | 12h32m20s | -3°09'31"  | 48°30'08"  | 0.939  | 2.05931  |
| 8/20/2010  | 9:35  | 21:04 | 12h48m31s | -4°58'17"  | 46°11'51"  | 0.943  | 2.09444  |
| 8/27/2010  | 9:30  | 20:47 | 13h05m01s | -6°46'43"  | 43°56'11"  | 0.947  | 2.12722  |
| 9/ 3/2010  | 9:26  | 20:30 | 13h21m52s | -8°34'12"  | 41°42'44"  | 0.951  | 2.15775  |
| 9/10/2010  | 9:22  | 20:14 | 13h39m06s | -10°20'07" | 39°31'21"  | 0.955  | 2.18601  |
| 9/17/2010  | 9:18  | 19:58 | 13h56m46s | -12°03'39" | 37°22'06"  | 0.959  | 2.21197  |
| 9/24/2010  | 9:15  | 19:42 | 14h14m52s | -13°44'01" | 35°14'52"  | 0.963  | 2.23570  |
| 10/ 1/2010 | 9:12  | 19:27 | 14h33m26s | -15°20'22" | 33°09'22"  | 0.966  | 2.25732  |
| 10/ 8/2010 | 9:09  | 19:13 | 14h52m32s | -16°51'51" | 31°05'28"  | 0.970  | 2.27689  |
| 10/15/2010 | 9:06  | 19:00 | 15h12m08s | -18°17'30" | 29°03'17"  | 0.973  | 2.29438  |
| 10/22/2010 | 9:04  | 18:47 | 15h32m17s | -19°36'20" | 27°02'52"  | 0.976  | 2.30988  |
| 10/29/2010 | 9:02  | 18:36 | 15h52m57s | -20°47'23" | 25°04'02"  | 0.979  | 2.32356  |
| 11/ 5/2010 | 9:00  | 18:25 | 16h14m09s | -21°49'39" | 23°06'40"  | 0.982  | 2.33551  |
| 11/12/2010 | 8:58  | 18:16 | 16h35m52s | -22°42'11" | 21°10'54"  | 0.985  | 2.34572  |
| 11/19/2010 | 8:55  | 18:08 | 16h58m02s | -23°24'03" | 19°16'52"  | 0.987  | 2.35430  |
| 11/26/2010 | 8:52  | 18:01 | 17h20m36s | -23°54'26" | 17°24'31"  | 0.990  | 2.36144  |
| 12/ 3/2010 | 8:49  | 17:55 | 17h43m31s | -24°12'38" | 15°33'45"  | 0.992  | 2.36725  |
| 12/10/2010 | 8:45  | 17:50 | 18h06m42s | -24°18'06" | 13°44'40"  | 0.993  | 2.37176  |
| 12/17/2010 | 8:40  | 17:47 | 18h30m02s | -24°10'28" | 11°57'27"  | 0.995  | 2.37506  |
| 12/24/2010 | 8:34  | 17:44 | 18h53m28s | -23°49'34" | 10°12'09"  | 0.996  | 2.37734  |
| 12/31/2010 | 8:27  | 17:43 | 19h16m52s | -23°15'27" | 8°28'43"   | 0.997  | 2.37873  |

Jupiter

| Date       | Rise  | Set   | RA        | Dec        | Elongation | Ill Fr | DIST(AU) |
|------------|-------|-------|-----------|------------|------------|--------|----------|
| 1/ 1/2010  | 10:22 | 20:52 | 21h55m52s | -13°35'40" | 45°57'27"  | 0.995  | 5.63771  |
| 1/ 8/2010  | 9:58  | 20:32 | 22h01m27s | -13°05'33" | 40°16'27"  | 0.996  | 5.71237  |
| 1/15/2010  | 9:34  | 20:12 | 22h07m14s | -12°33'49" | 34°39'03"  | 0.997  | 5.77887  |
| 1/22/2010  | 9:11  | 19:52 | 22h13m13s | -12°00'39" | 29°05'05"  | 0.998  | 5.83657  |
| 1/29/2010  | 8:47  | 19:33 | 22h19m19s | -11°26'13" | 23°34'27"  | 0.998  | 5.88502  |
| 2/ 5/2010  | 8:24  | 19:14 | 22h25m31s | -10°50'42" | 18°06'43"  | 0.999  | 5.92396  |
| 2/12/2010  | 8:00  | 18:54 | 22h31m49s | -10°14'16" | 12°41'36"  | 1.000  | 5.95308  |
| 2/19/2010  | 7:37  | 18:35 | 22h38m09s | -9°37'06"  | 7°19'30"   | 1.000  | 5.97213  |
| 2/26/2010  | 7:13  | 18:16 | 22h44m30s | -8°59'25"  | 2°07'17"   | 1.000  | 5.98100  |
| 3/ 5/2010  | 6:50  | 17:57 | 22h50m50s | -8°21'24"  | 3°33'12"   | 1.000  | 5.97978  |
| 3/12/2010  | 6:27  | 17:38 | 22h57m09s | -7°43'14"  | 8°47'37"   | 1.000  | 5.96849  |
| 3/19/2010  | 6:03  | 17:19 | 23h03m24s | -7°05'07"  | 14°04'41"  | 0.999  | 5.94720  |
| 3/26/2010  | 5:39  | 17:00 | 23h09m33s | -6°27'17"  | 19°21'47"  | 0.999  | 5.91613  |
| 4/ 2/2010  | 5:16  | 16:41 | 23h15m36s | -5°49'56"  | 24°38'54"  | 0.998  | 5.87564  |
| 4/ 9/2010  | 4:52  | 16:21 | 23h21m31s | -5°13'15"  | 29°56'33"  | 0.997  | 5.82607  |
| 4/16/2010  | 4:28  | 16:01 | 23h27m17s | -4°37'28"  | 35°15'14"  | 0.997  | 5.76774  |
| 4/23/2010  | 4:04  | 15:41 | 23h32m51s | -4°02'47"  | 40°35'13"  | 0.996  | 5.70115  |
| 4/30/2010  | 3:40  | 15:21 | 23h38m13s | -3°29'28"  | 45°56'54"  | 0.995  | 5.62694  |
| 5/ 7/2010  | 3:16  | 15:00 | 23h43m20s | -2°57'40"  | 51°21'03"  | 0.994  | 5.54569  |
| 5/14/2010  | 2:51  | 14:39 | 23h48m12s | -2°27'39"  | 56°48'23"  | 0.993  | 5.45798  |
| 5/21/2010  | 2:27  | 14:18 | 23h52m45s | -1°59'39"  | 62°19'23"  | 0.992  | 5.36459  |
| 5/28/2010  | 2:02  | 13:56 | 23h56m58s | -1°33'54"  | 67°54'32"  | 0.991  | 5.26640  |
| 6/ 4/2010  | 1:37  | 13:34 | 0h00m50s  | -1°10'35"  | 73°34'40"  | 0.990  | 5.16427  |
| 6/11/2010  | 1:12  | 13:11 | 0h04m18s  | -0°49'58"  | 79°20'43"  | 0.990  | 5.05906  |
| 6/18/2010  | 0:46  | 12:47 | 0h07m19s  | -0°32'18"  | 85°13'20"  | 0.990  | 4.95182  |
| 6/25/2010  | 0:20  | 12:23 | 0h09m53s  | -0°17'45"  | 91°13'00"  | 0.989  | 4.84375  |
| 7/ 2/2010  | 23:51 | 11:58 | 0h11m57s  | -0°06'33"  | 97°20'30"  | 0.990  | 4.73600  |
| 7/ 9/2010  | 23:24 | 11:32 | 0h13m29s  | 0°01'09"   | 103°36'45" | 0.990  | 4.62973  |
| 7/16/2010  | 22:57 | 11:06 | 0h14m27s  | 0°05'10"   | 110°02'23" | 0.991  | 4.52633  |
| 7/23/2010  | 22:30 | 10:39 | 0h14m50s  | 0°05'24"   | 116°37'35" | 0.992  | 4.42727  |
| 7/30/2010  | 22:02 | 10:11 | 0h14m39s  | 0°01'52"   | 123°22'39" | 0.993  | 4.33395  |
| 8/ 6/2010  | 21:35 | 9:42  | 0h13m52s  | -0°05'25"  | 130°18'02" | 0.994  | 4.24776  |
| 8/13/2010  | 21:06 | 9:12  | 0h12m30s  | -0°16'18"  | 137°23'39" | 0.995  | 4.17020  |
| 8/20/2010  | 20:38 | 8:42  | 0h10m36s  | -0°30'32"  | 144°38'45" | 0.997  | 4.10279  |
| 8/27/2010  | 20:09 | 8:11  | 0h08m13s  | -0°47'41"  | 152°02'23" | 0.998  | 4.04678  |
| 9/ 3/2010  | 19:39 | 7:40  | 0h05m25s  | -1°07'14"  | 159°33'32" | 0.999  | 4.00329  |
| 9/10/2010  | 19:10 | 7:08  | 0h02m18s  | -1°28'34"  | 167°10'11" | 0.999  | 3.97335  |
| 9/17/2010  | 18:40 | 6:36  | 23h58m58s | -1°50'53"  | 174°44'50" | 1.000  | 3.95777  |
| 9/24/2010  | 18:11 | 6:03  | 23h55m33s | -2°13'23"  | 176°48'25" | 1.000  | 3.95689  |
| 10/ 1/2010 | 17:41 | 5:31  | 23h52m10s | -2°35'14"  | 169°19'50" | 1.000  | 3.97075  |
| 10/ 8/2010 | 17:11 | 4:59  | 23h48m57s | -2°55'38"  | 161°36'47" | 0.999  | 3.99921  |
| 10/15/2010 | 16:42 | 4:28  | 23h46m00s | -3°13'49"  | 153°55'01" | 0.998  | 4.04176  |
| 10/22/2010 | 16:13 | 3:57  | 23h43m27s | -3°29'07"  | 146°17'45" | 0.997  | 4.09745  |
| 10/29/2010 | 15:44 | 3:27  | 23h41m22s | -3°41'05"  | 138°46'28" | 0.996  | 4.16513  |
| 11/ 5/2010 | 15:16 | 2:57  | 23h39m50s | -3°49'21"  | 131°22'09" | 0.994  | 4.24360  |
| 11/12/2010 | 14:47 | 2:29  | 23h38m53s | -3°53'38"  | 124°05'52" | 0.993  | 4.33142  |
| 11/19/2010 | 14:20 | 2:01  | 23h38m32s | -3°53'51"  | 116°58'24" | 0.992  | 4.42695  |
| 11/26/2010 | 13:52 | 1:34  | 23h38m49s | -3°50'01"  | 109°59'53" | 0.991  | 4.52857  |
| 12/ 3/2010 | 13:25 | 1:08  | 23h39m43s | -3°42'12"  | 103°10'03" | 0.991  | 4.63479  |
| 12/10/2010 | 12:58 | 0:42  | 23h41m13s | -3°30'32"  | 96°28'55"  | 0.990  | 4.74405  |
| 12/17/2010 | 12:32 | 0:18  | 23h43m17s | -3°15'12"  | 89°56'28"  | 0.990  | 4.85474  |
| 12/24/2010 | 12:06 | 23:51 | 23h45m53s | -2°56'29"  | 83°32'19"  | 0.990  | 4.96543  |
| 12/31/2010 | 11:41 | 23:28 | 23h48m59s | -2°34'37"  | 77°15'48"  | 0.991  | 5.07484  |

Midway, UT                      Latitude: 40°31'00" N Longitude: 111°27'30" W  
Local Time = UT - 7.00 hours    Elevation: 1707 meters                      Year 2010  
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Saturn

| Date       | Rise  | Set   | RA        | Dec       | Elongation | Ill Fr | DIST(AU) |
|------------|-------|-------|-----------|-----------|------------|--------|----------|
| 1/ 1/2010  | 23:55 | 12:05 | 12h20m37s | 0°15'48"  | 95°49'35"  | 0.997  | 9.33351  |
| 1/ 8/2010  | 23:28 | 11:38 | 12h21m07s | 0°14'50"  | 102°50'08" | 0.997  | 9.21904  |
| 1/15/2010  | 23:01 | 11:11 | 12h21m16s | 0°15'59"  | 109°56'03" | 0.998  | 9.10770  |
| 1/22/2010  | 22:33 | 10:43 | 12h21m06s | 0°19'13"  | 117°06'55" | 0.998  | 9.00133  |
| 1/29/2010  | 22:05 | 10:15 | 12h20m37s | 0°24'28"  | 124°22'09" | 0.998  | 8.90170  |
| 2/ 5/2010  | 21:36 | 9:47  | 12h19m49s | 0°31'36"  | 131°41'25" | 0.998  | 8.81043  |
| 2/12/2010  | 21:07 | 9:19  | 12h18m44s | 0°40'27"  | 139°04'23" | 0.999  | 8.72905  |
| 2/19/2010  | 20:37 | 8:51  | 12h17m23s | 0°50'49"  | 146°30'11" | 0.999  | 8.65908  |
| 2/26/2010  | 20:07 | 8:23  | 12h15m49s | 1°02'26"  | 153°57'30" | 0.999  | 8.60180  |
| 3/ 5/2010  | 19:37 | 7:54  | 12h14m04s | 1°15'00"  | 161°24'49" | 1.000  | 8.55817  |
| 3/12/2010  | 19:07 | 7:25  | 12h12m10s | 1°28'11"  | 168°48'46" | 1.000  | 8.52894  |
| 3/19/2010  | 18:37 | 6:57  | 12h10m12s | 1°41'39"  | 175°45'41" | 1.000  | 8.51471  |
| 3/26/2010  | 18:07 | 6:28  | 12h08m11s | 1°55'01"  | 175°08'23" | 1.000  | 8.51573  |
| 4/ 2/2010  | 17:36 | 5:59  | 12h06m12s | 2°07'57"  | 168°08'15" | 1.000  | 8.53181  |
| 4/ 9/2010  | 17:06 | 5:30  | 12h04m17s | 2°20'06"  | 160°50'17" | 1.000  | 8.56261  |
| 4/16/2010  | 16:36 | 5:02  | 12h02m30s | 2°31'11"  | 153°32'17" | 0.999  | 8.60760  |
| 4/23/2010  | 16:07 | 4:33  | 12h00m53s | 2°40'53"  | 146°17'37" | 0.999  | 8.66590  |
| 4/30/2010  | 15:37 | 4:05  | 11h59m28s | 2°49'01"  | 139°07'35" | 0.999  | 8.73635  |
| 5/ 7/2010  | 15:08 | 3:36  | 11h58m18s | 2°55'23"  | 132°02'40" | 0.998  | 8.81771  |
| 5/14/2010  | 14:40 | 3:08  | 11h57m24s | 2°59'52"  | 125°03'07" | 0.998  | 8.90871  |
| 5/21/2010  | 14:12 | 2:40  | 11h56m47s | 3°02'21"  | 118°09'26" | 0.998  | 9.00783  |
| 5/28/2010  | 13:44 | 2:12  | 11h56m28s | 3°02'49"  | 111°21'54" | 0.998  | 9.11346  |
| 6/ 4/2010  | 13:16 | 1:45  | 11h56m27s | 3°01'15"  | 104°40'15" | 0.997  | 9.22405  |
| 6/11/2010  | 12:49 | 1:17  | 11h56m45s | 2°57'42"  | 98°04'08"  | 0.997  | 9.33812  |
| 6/18/2010  | 12:23 | 0:50  | 11h57m20s | 2°52'10"  | 91°33'31"  | 0.997  | 9.45408  |
| 6/25/2010  | 11:57 | 0:23  | 11h58m13s | 2°44'46"  | 85°08'18"  | 0.997  | 9.57034  |
| 7/ 2/2010  | 11:31 | 23:52 | 11h59m24s | 2°35'35"  | 78°48'00"  | 0.997  | 9.68549  |
| 7/ 9/2010  | 11:05 | 23:26 | 12h00m50s | 2°24'44"  | 72°31'57"  | 0.997  | 9.79823  |
| 7/16/2010  | 10:40 | 22:59 | 12h02m31s | 2°12'19"  | 66°19'50"  | 0.998  | 9.90718  |
| 7/23/2010  | 10:15 | 22:33 | 12h04m27s | 1°58'29"  | 60°11'26"  | 0.998  | 10.01105 |
| 7/30/2010  | 9:51  | 22:07 | 12h06m35s | 1°43'21"  | 54°06'12"  | 0.998  | 10.10874 |
| 8/ 6/2010  | 9:27  | 21:41 | 12h08m56s | 1°27'04"  | 48°03'26"  | 0.998  | 10.19928 |
| 8/13/2010  | 9:03  | 21:15 | 12h11m27s | 1°09'46"  | 42°02'39"  | 0.999  | 10.28165 |
| 8/20/2010  | 8:39  | 20:49 | 12h14m07s | 0°51'35"  | 36°03'40"  | 0.999  | 10.35491 |
| 8/27/2010  | 8:15  | 20:23 | 12h16m56s | 0°32'42"  | 30°06'05"  | 0.999  | 10.41836 |
| 9/ 3/2010  | 7:52  | 19:57 | 12h19m51s | 0°13'13"  | 24°09'23"  | 1.000  | 10.47139 |
| 9/10/2010  | 7:28  | 19:32 | 12h22m52s | -0°06'42" | 18°13'22"  | 1.000  | 10.51339 |
| 9/17/2010  | 7:05  | 19:06 | 12h25m58s | -0°26'53" | 12°18'53"  | 1.000  | 10.54382 |
| 9/24/2010  | 6:42  | 18:40 | 12h29m06s | -0°47'12" | 6°30'45"   | 1.000  | 10.56241 |
| 10/ 1/2010 | 6:19  | 18:15 | 12h32m16s | -1°07'30" | 2°10'16"   | 1.000  | 10.56898 |
| 10/ 8/2010 | 5:55  | 17:49 | 12h35m27s | -1°27'38" | 6°16'43"   | 1.000  | 10.56334 |
| 10/15/2010 | 5:32  | 17:24 | 12h38m37s | -1°47'27" | 12°09'14"  | 1.000  | 10.54543 |
| 10/22/2010 | 5:09  | 16:58 | 12h41m44s | -2°06'46" | 18°11'32"  | 1.000  | 10.51545 |
| 10/29/2010 | 4:45  | 16:33 | 12h44m47s | -2°25'27" | 24°18'31"  | 1.000  | 10.47372 |
| 11/ 5/2010 | 4:22  | 16:07 | 12h47m45s | -2°43'22" | 30°29'32"  | 0.999  | 10.42054 |
| 11/12/2010 | 3:58  | 15:42 | 12h50m36s | -3°00'21" | 36°44'26"  | 0.999  | 10.35640 |
| 11/19/2010 | 3:34  | 15:16 | 12h53m19s | -3°16'15" | 43°03'07"  | 0.999  | 10.28203 |
| 11/26/2010 | 3:10  | 14:50 | 12h55m53s | -3°30'54" | 49°25'48"  | 0.998  | 10.19829 |
| 12/ 3/2010 | 2:46  | 14:24 | 12h58m15s | -3°44'12" | 55°52'55"  | 0.998  | 10.10606 |
| 12/10/2010 | 2:21  | 13:58 | 13h00m24s | -3°56'00" | 62°24'41"  | 0.998  | 10.00636 |
| 12/17/2010 | 1:56  | 13:32 | 13h02m20s | -4°06'10" | 69°00'58"  | 0.998  | 9.90050  |
| 12/24/2010 | 1:30  | 13:05 | 13h03m59s | -4°14'35" | 75°41'53"  | 0.998  | 9.78987  |
| 12/31/2010 | 1:05  | 12:39 | 13h05m23s | -4°21'11" | 82°27'47"  | 0.997  | 9.67584  |

Uranus

| Date       | Rise  | Set   | RA        | Dec       | Elongation | Ill Fr | DIST(AU) |
|------------|-------|-------|-----------|-----------|------------|--------|----------|
| 1/ 1/2010  | 11:25 | 23:06 | 23h35m48s | -3°25'44" | 72°38'05"  | 0.999  | 20.36980 |
| 1/ 8/2010  | 10:58 | 22:39 | 23h36m31s | -3°20'52" | 65°41'53"  | 1.000  | 20.48286 |
| 1/15/2010  | 10:31 | 22:13 | 23h37m22s | -3°15'09" | 58°47'48"  | 1.000  | 20.59006 |
| 1/22/2010  | 10:04 | 21:47 | 23h38m20s | -3°08'40" | 51°56'03"  | 1.000  | 20.68983 |
| 1/29/2010  | 9:37  | 21:21 | 23h39m24s | -3°01'28" | 45°06'52"  | 1.000  | 20.78078 |
| 2/ 5/2010  | 9:11  | 20:55 | 23h40m35s | -2°53'40" | 38°20'04"  | 1.000  | 20.86180 |
| 2/12/2010  | 8:44  | 20:29 | 23h41m50s | -2°45'20" | 31°35'27"  | 1.000  | 20.93186 |
| 2/19/2010  | 8:17  | 20:04 | 23h43m10s | -2°36'34" | 24°53'04"  | 1.000  | 20.98998 |
| 2/26/2010  | 7:51  | 19:38 | 23h44m34s | -2°27'27" | 18°13'07"  | 1.000  | 21.03545 |
| 3/ 5/2010  | 7:24  | 19:12 | 23h45m59s | -2°18'06" | 11°35'35"  | 1.000  | 21.06784 |
| 3/12/2010  | 6:57  | 18:47 | 23h47m27s | -2°08'35" | 5°01'05"   | 1.000  | 21.08681 |
| 3/19/2010  | 6:31  | 18:21 | 23h48m55s | -1°59'02" | 1°45'50"   | 1.000  | 21.09211 |
| 3/26/2010  | 6:04  | 17:56 | 23h50m23s | -1°49'31" | 8°11'29"   | 1.000  | 21.08374 |
| 4/ 2/2010  | 5:37  | 17:30 | 23h51m50s | -1°40'09" | 14°42'05"  | 1.000  | 21.06198 |
| 4/ 9/2010  | 5:11  | 17:05 | 23h53m15s | -1°31'01" | 21°12'10"  | 1.000  | 21.02717 |
| 4/16/2010  | 4:44  | 16:39 | 23h54m37s | -1°22'12" | 27°41'41"  | 1.000  | 20.97974 |
| 4/23/2010  | 4:17  | 16:13 | 23h55m56s | -1°13'48" | 34°10'35"  | 1.000  | 20.92033 |
| 4/30/2010  | 3:51  | 15:47 | 23h57m10s | -1°05'54" | 40°38'59"  | 1.000  | 20.84985 |
| 5/ 7/2010  | 3:24  | 15:21 | 23h58m19s | -0°58'34" | 47°07'23"  | 1.000  | 20.76920 |
| 5/14/2010  | 2:57  | 14:55 | 23h59m23s | -0°51'52" | 53°36'12"  | 1.000  | 20.67935 |
| 5/21/2010  | 2:30  | 14:29 | 0h00m20s  | -0°45'54" | 60°05'32"  | 1.000  | 20.58148 |
| 5/28/2010  | 2:03  | 14:03 | 0h01m10s  | -0°40'41" | 66°35'29"  | 0.999  | 20.47694 |
| 6/ 4/2010  | 1:36  | 13:36 | 0h01m53s  | -0°36'18" | 73°06'31"  | 0.999  | 20.36706 |
| 6/11/2010  | 1:09  | 13:09 | 0h02m27s  | -0°32'48" | 79°39'05"  | 0.999  | 20.25319 |
| 6/18/2010  | 0:42  | 12:42 | 0h02m54s  | -0°30'11" | 86°13'21"  | 0.999  | 20.13684 |
| 6/25/2010  | 0:14  | 12:15 | 0h03m12s  | -0°28'30" | 92°49'18"  | 0.999  | 20.01966 |
| 7/ 2/2010  | 23:43 | 11:48 | 0h03m21s  | -0°27'45" | 99°27'16"  | 0.999  | 19.90318 |
| 7/ 9/2010  | 23:16 | 11:20 | 0h03m22s  | -0°27'57" | 106°07'40" | 0.999  | 19.78890 |
| 7/16/2010  | 22:48 | 10:53 | 0h03m14s  | -0°29'05" | 112°50'39" | 0.999  | 19.67847 |
| 7/23/2010  | 22:20 | 10:25 | 0h02m57s  | -0°31'07" | 119°36'02" | 1.000  | 19.57353 |
| 7/30/2010  | 21:52 | 9:56  | 0h02m33s  | -0°34'01" | 126°23'55" | 1.000  | 19.47556 |
| 8/ 6/2010  | 21:25 | 9:28  | 0h02m01s  | -0°37'44" | 133°14'39" | 1.000  | 19.38593 |
| 8/13/2010  | 20:57 | 9:00  | 0h01m21s  | -0°42'11" | 140°08'14" | 1.000  | 19.30606 |
| 8/20/2010  | 20:29 | 8:31  | 0h00m36s  | -0°47'17" | 147°04'20" | 1.000  | 19.23727 |
| 8/27/2010  | 20:01 | 8:02  | 23h59m45s | -0°52'56" | 154°02'46" | 1.000  | 19.18061 |
| 9/ 3/2010  | 19:32 | 7:34  | 23h58m50s | -0°59'02" | 161°03'36" | 1.000  | 19.13695 |
| 9/10/2010  | 19:04 | 7:05  | 23h57m51s | -1°05'28" | 168°06'33" | 1.000  | 19.10710 |
| 9/17/2010  | 18:36 | 6:36  | 23h56m50s | -1°12'05" | 175°09'46" | 1.000  | 19.09169 |
| 9/24/2010  | 18:08 | 6:07  | 23h55m48s | -1°18'46" | 177°31'34" | 1.000  | 19.09097 |
| 10/ 1/2010 | 17:40 | 5:38  | 23h54m47s | -1°25'22" | 170°28'43" | 1.000  | 19.10498 |
| 10/ 8/2010 | 17:12 | 5:09  | 23h53m47s | -1°31'46" | 163°19'34" | 1.000  | 19.13365 |
| 10/15/2010 | 16:44 | 4:40  | 23h52m50s | -1°37'48" | 156°09'03" | 1.000  | 19.17664 |
| 10/22/2010 | 16:16 | 4:12  | 23h51m57s | -1°43'21" | 148°58'03" | 1.000  | 19.23326 |
| 10/29/2010 | 15:47 | 3:43  | 23h51m09s | -1°48'18" | 141°46'50" | 1.000  | 19.30260 |
| 11/ 5/2010 | 15:20 | 3:15  | 23h50m28s | -1°52'34" | 134°35'31" | 1.000  | 19.38370 |
| 11/12/2010 | 14:52 | 2:46  | 23h49m54s | -1°56'01" | 127°24'35" | 1.000  | 19.47533 |
| 11/19/2010 | 14:24 | 2:18  | 23h49m27s | -1°58'36" | 120°14'35" | 1.000  | 19.57598 |
| 11/26/2010 | 13:56 | 1:50  | 23h49m09s | -2°00'15" | 113°05'44" | 0.999  | 19.68407 |
| 12/ 3/2010 | 13:28 | 1:23  | 23h49m00s | -2°00'56" | 105°58'01" | 0.999  | 19.79801 |
| 12/10/2010 | 13:01 | 0:55  | 23h49m00s | -2°00'37" | 98°51'46"  | 0.999  | 19.91606 |
| 12/17/2010 | 12:34 | 0:28  | 23h49m09s | -1°59'17" | 91°47'26"  | 0.999  | 20.03635 |
| 12/24/2010 | 12:06 | 0:01  | 23h49m28s | -1°56'58" | 84°45'12"  | 0.999  | 20.15705 |
| 12/31/2010 | 11:39 | 23:30 | 23h49m56s | -1°53'40" | 77°44'59"  | 0.999  | 20.27646 |

Neptune

| Date       | Rise  | Set   | RA        | Dec        | Elongation | Ill Fr | DIST(AU) |
|------------|-------|-------|-----------|------------|------------|--------|----------|
| 1/ 1/2010  | 10:14 | 20:42 | 21h48m07s | -13°43'13" | 44°08'16"  | 1.000  | 30.72238 |
| 1/ 8/2010  | 9:47  | 20:16 | 21h48m57s | -13°38'57" | 37°13'10"  | 1.000  | 30.80149 |
| 1/15/2010  | 9:20  | 19:50 | 21h49m50s | -13°34'21" | 30°18'57"  | 1.000  | 30.86917 |
| 1/22/2010  | 8:53  | 19:23 | 21h50m47s | -13°29'29" | 23°25'54"  | 1.000  | 30.92438 |
| 1/29/2010  | 8:26  | 18:57 | 21h51m46s | -13°24'24" | 16°34'14"  | 1.000  | 30.96640 |
| 2/ 5/2010  | 8:00  | 18:31 | 21h52m46s | -13°19'11" | 9°43'57"   | 1.000  | 30.99477 |
| 2/12/2010  | 7:33  | 18:05 | 21h53m48s | -13°13'52" | 2°55'45"   | 1.000  | 31.00913 |
| 2/19/2010  | 7:06  | 17:39 | 21h54m49s | -13°08'31" | 3°55'51"   | 1.000  | 31.00923 |
| 2/26/2010  | 6:39  | 17:12 | 21h55m51s | -13°03'11" | 10°42'02"  | 1.000  | 30.99517 |
| 3/ 5/2010  | 6:12  | 16:46 | 21h56m51s | -12°57'58" | 17°27'42"  | 1.000  | 30.96728 |
| 3/12/2010  | 5:45  | 16:20 | 21h57m50s | -12°52'53" | 24°12'35"  | 1.000  | 30.92596 |
| 3/19/2010  | 5:19  | 15:54 | 21h58m46s | -12°48'01" | 30°56'40"  | 1.000  | 30.87177 |
| 3/26/2010  | 4:52  | 15:27 | 21h59m39s | -12°43'25" | 37°39'49"  | 1.000  | 30.80552 |
| 4/ 2/2010  | 4:25  | 15:01 | 22h00m28s | -12°39'08" | 44°22'05"  | 1.000  | 30.72825 |
| 4/ 9/2010  | 3:58  | 14:34 | 22h01m14s | -12°35'13" | 51°03'52"  | 1.000  | 30.64100 |
| 4/16/2010  | 3:31  | 14:08 | 22h01m54s | -12°31'42" | 57°45'22"  | 1.000  | 30.54492 |
| 4/23/2010  | 3:03  | 13:41 | 22h02m30s | -12°28'39" | 64°26'30"  | 1.000  | 30.44138 |
| 4/30/2010  | 2:36  | 13:14 | 22h03m01s | -12°26'05" | 71°07'19"  | 1.000  | 30.33190 |
| 5/ 7/2010  | 2:09  | 12:47 | 22h03m25s | -12°24'02" | 77°48'12"  | 1.000  | 30.21792 |
| 5/14/2010  | 1:42  | 12:20 | 22h03m44s | -12°22'31" | 84°29'27"  | 1.000  | 30.10092 |
| 5/21/2010  | 1:14  | 11:53 | 22h03m57s | -12°21'33" | 91°11'02"  | 1.000  | 29.98259 |
| 5/28/2010  | 0:47  | 11:25 | 22h04m04s | -12°21'09" | 97°52'56"  | 1.000  | 29.86461 |
| 6/ 4/2010  | 0:19  | 10:58 | 22h04m04s | -12°21'18" | 104°35'27" | 1.000  | 29.74855 |
| 6/11/2010  | 23:48 | 10:30 | 22h03m58s | -12°22'00" | 111°18'58" | 1.000  | 29.63596 |
| 6/18/2010  | 23:20 | 10:02 | 22h03m47s | -12°23'13" | 118°03'26" | 1.000  | 29.52848 |
| 6/25/2010  | 22:53 | 9:34  | 22h03m30s | -12°24'58" | 124°48'43" | 1.000  | 29.42768 |
| 7/ 2/2010  | 22:25 | 9:06  | 22h03m07s | -12°27'10" | 131°35'02" | 1.000  | 29.33493 |
| 7/ 9/2010  | 21:57 | 8:38  | 22h02m40s | -12°29'48" | 138°22'42" | 1.000  | 29.25151 |
| 7/16/2010  | 21:29 | 8:10  | 22h02m08s | -12°32'50" | 145°11'42" | 1.000  | 29.17872 |
| 7/23/2010  | 21:01 | 7:41  | 22h01m33s | -12°36'11" | 152°01'47" | 1.000  | 29.11769 |
| 7/30/2010  | 20:33 | 7:13  | 22h00m54s | -12°39'48" | 158°52'58" | 1.000  | 29.06924 |
| 8/ 6/2010  | 20:05 | 6:45  | 22h00m13s | -12°43'37" | 165°45'29" | 1.000  | 29.03409 |
| 8/13/2010  | 19:37 | 6:16  | 21h59m30s | -12°47'34" | 172°39'05" | 1.000  | 29.01290 |
| 8/20/2010  | 19:09 | 5:48  | 21h58m46s | -12°51'35" | 179°21'41" | 1.000  | 29.00605 |
| 8/27/2010  | 18:41 | 5:19  | 21h58m02s | -12°55'34" | 173°27'39" | 1.000  | 29.01362 |
| 9/ 3/2010  | 18:13 | 4:51  | 21h57m18s | -12°59'28" | 166°31'00" | 1.000  | 29.03553 |
| 9/10/2010  | 17:45 | 4:22  | 21h56m37s | -13°03'13" | 159°32'50" | 1.000  | 29.07160 |
| 9/17/2010  | 17:17 | 3:54  | 21h55m57s | -13°06'44" | 152°33'48" | 1.000  | 29.12135 |
| 9/24/2010  | 16:49 | 3:26  | 21h55m21s | -13°09'57" | 145°34'12" | 1.000  | 29.18401 |
| 10/ 1/2010 | 16:21 | 2:57  | 21h54m48s | -13°12'49" | 138°33'57" | 1.000  | 29.25866 |
| 10/ 8/2010 | 15:54 | 2:29  | 21h54m20s | -13°15'17" | 131°32'59" | 1.000  | 29.34432 |
| 10/15/2010 | 15:26 | 2:01  | 21h53m57s | -13°17'16" | 124°31'40" | 1.000  | 29.43973 |
| 10/22/2010 | 14:58 | 1:33  | 21h53m40s | -13°18'47" | 117°30'20" | 1.000  | 29.54340 |
| 10/29/2010 | 14:30 | 1:05  | 21h53m28s | -13°19'45" | 110°28'56" | 1.000  | 29.65379 |
| 11/ 5/2010 | 14:03 | 0:38  | 21h53m23s | -13°20'11" | 103°27'22" | 1.000  | 29.76937 |
| 11/12/2010 | 13:35 | 0:10  | 21h53m24s | -13°20'02" | 96°25'55"  | 1.000  | 29.88840 |
| 11/19/2010 | 13:08 | 23:39 | 21h53m31s | -13°19'20" | 89°24'57"  | 1.000  | 30.00901 |
| 11/26/2010 | 12:41 | 23:12 | 21h53m45s | -13°18'03" | 82°24'29"  | 1.000  | 30.12945 |
| 12/ 3/2010 | 12:13 | 22:45 | 21h54m06s | -13°16'13" | 75°24'24"  | 1.000  | 30.24802 |
| 12/10/2010 | 11:46 | 22:18 | 21h54m32s | -13°13'51" | 68°24'52"  | 1.000  | 30.36294 |
| 12/17/2010 | 11:19 | 21:51 | 21h55m05s | -13°10'57" | 61°26'15"  | 1.000  | 30.47244 |
| 12/24/2010 | 10:52 | 21:24 | 21h55m43s | -13°07'35" | 54°28'38"  | 1.000  | 30.57497 |
| 12/31/2010 | 10:25 | 20:58 | 21h56m26s | -13°03'47" | 47°31'52"  | 1.000  | 30.66913 |

Midway, UT

Latitude: 40°31'00" N Longitude: 111°27'30" W

Local Time = UT -

7.00 hours

Elevation: 1707 meters

Year 2010

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Pluto

| Date       | Rise  | Set   | RA        | Dec        | Elongation | Ill Fr | DIST(AU) |
|------------|-------|-------|-----------|------------|------------|--------|----------|
| 1/ 1/2010  | 6:58  | 16:51 | 18h13m53s | -18°18'03" | 8°46'09"   | 1.000  | 32.73480 |
| 1/ 8/2010  | 6:31  | 16:25 | 18h14m56s | -18°18'09" | 14°54'15"  | 1.000  | 32.71626 |
| 1/15/2010  | 6:05  | 15:58 | 18h15m58s | -18°18'07" | 21°29'52"  | 1.000  | 32.68382 |
| 1/22/2010  | 5:38  | 15:32 | 18h16m58s | -18°17'56" | 28°13'55"  | 1.000  | 32.63794 |
| 1/29/2010  | 5:12  | 15:05 | 18h17m54s | -18°17'37" | 35°01'24"  | 1.000  | 32.57943 |
| 2/ 5/2010  | 4:45  | 14:39 | 18h18m47s | -18°17'13" | 41°50'41"  | 1.000  | 32.50919 |
| 2/12/2010  | 4:18  | 14:12 | 18h19m36s | -18°16'43" | 48°41'14"  | 1.000  | 32.42822 |
| 2/19/2010  | 3:51  | 13:45 | 18h20m20s | -18°16'10" | 55°32'29"  | 1.000  | 32.33770 |
| 2/26/2010  | 3:24  | 13:18 | 18h20m59s | -18°15'33" | 62°23'57"  | 1.000  | 32.23907 |
| 3/ 5/2010  | 2:57  | 12:51 | 18h21m32s | -18°14'55" | 69°15'32"  | 1.000  | 32.13383 |
| 3/12/2010  | 2:30  | 12:24 | 18h21m59s | -18°14'17" | 76°07'22"  | 1.000  | 32.02348 |
| 3/19/2010  | 2:03  | 11:57 | 18h22m20s | -18°13'39" | 82°59'22"  | 1.000  | 31.90962 |
| 3/26/2010  | 1:36  | 11:30 | 18h22m35s | -18°13'04" | 89°51'10"  | 1.000  | 31.79405 |
| 4/ 2/2010  | 1:08  | 11:03 | 18h22m42s | -18°12'32" | 96°42'43"  | 1.000  | 31.67850 |
| 4/ 9/2010  | 0:41  | 10:35 | 18h22m44s | -18°12'05" | 103°34'13" | 1.000  | 31.56458 |
| 4/16/2010  | 0:13  | 10:08 | 18h22m39s | -18°11'43" | 110°25'40" | 1.000  | 31.45400 |
| 4/23/2010  | 23:41 | 9:40  | 18h22m27s | -18°11'27" | 117°16'45" | 1.000  | 31.34848 |
| 4/30/2010  | 23:14 | 9:12  | 18h22m10s | -18°11'18" | 124°07'15" | 1.000  | 31.24958 |
| 5/ 7/2010  | 22:46 | 8:44  | 18h21m47s | -18°11'17" | 130°57'16" | 1.000  | 31.15869 |
| 5/14/2010  | 22:18 | 8:16  | 18h21m19s | -18°11'24" | 137°46'45" | 1.000  | 31.07717 |
| 5/21/2010  | 21:50 | 7:48  | 18h20m47s | -18°11'39" | 144°35'03" | 1.000  | 31.00632 |
| 5/28/2010  | 21:22 | 7:20  | 18h20m10s | -18°12'03" | 151°21'17" | 1.000  | 30.94721 |
| 6/ 4/2010  | 20:53 | 6:52  | 18h19m31s | -18°12'35" | 158°04'01" | 1.000  | 30.90061 |
| 6/11/2010  | 20:25 | 6:23  | 18h18m49s | -18°13'16" | 164°39'02" | 1.000  | 30.86728 |
| 6/18/2010  | 19:57 | 5:55  | 18h18m05s | -18°14'06" | 170°49'19" | 1.000  | 30.84782 |
| 6/25/2010  | 19:29 | 5:27  | 18h17m20s | -18°15'03" | 174°49'06" | 1.000  | 30.84251 |
| 7/ 2/2010  | 19:01 | 4:58  | 18h16m35s | -18°16'09" | 172°03'07" | 1.000  | 30.85140 |
| 7/ 9/2010  | 18:32 | 4:30  | 18h15m51s | -18°17'21" | 166°06'15" | 1.000  | 30.87442 |
| 7/16/2010  | 18:04 | 4:02  | 18h15m08s | -18°18'41" | 159°35'30" | 1.000  | 30.91138 |
| 7/23/2010  | 17:36 | 3:33  | 18h14m28s | -18°20'06" | 152°55'32" | 1.000  | 30.96173 |
| 7/30/2010  | 17:08 | 3:05  | 18h13m50s | -18°21'38" | 146°12'00" | 1.000  | 31.02474 |
| 8/ 6/2010  | 16:40 | 2:37  | 18h13m17s | -18°23'13" | 139°26'38" | 1.000  | 31.09958 |
| 8/13/2010  | 16:12 | 2:09  | 18h12m48s | -18°24'54" | 132°40'13" | 1.000  | 31.18532 |
| 8/20/2010  | 15:45 | 1:41  | 18h12m23s | -18°26'37" | 125°53'27" | 1.000  | 31.28073 |
| 8/27/2010  | 15:17 | 1:13  | 18h12m05s | -18°28'22" | 119°06'35" | 1.000  | 31.38443 |
| 9/ 3/2010  | 14:49 | 0:45  | 18h11m52s | -18°30'09" | 112°19'27" | 1.000  | 31.49506 |
| 9/10/2010  | 14:22 | 0:17  | 18h11m45s | -18°31'57" | 105°32'01" | 1.000  | 31.61116 |
| 9/17/2010  | 13:54 | 23:46 | 18h11m44s | -18°33'43" | 98°44'33"  | 1.000  | 31.73109 |
| 9/24/2010  | 13:27 | 23:18 | 18h11m50s | -18°35'29" | 91°57'11"  | 1.000  | 31.85312 |
| 10/ 1/2010 | 13:00 | 22:51 | 18h12m03s | -18°37'12" | 85°09'39"  | 1.000  | 31.97566 |
| 10/ 8/2010 | 12:33 | 22:24 | 18h12m21s | -18°38'51" | 78°21'48"  | 1.000  | 32.09707 |
| 10/15/2010 | 12:06 | 21:56 | 18h12m46s | -18°40'26" | 71°33'49"  | 1.000  | 32.21561 |
| 10/22/2010 | 11:39 | 21:29 | 18h13m18s | -18°41'56" | 64°45'53"  | 1.000  | 32.32960 |
| 10/29/2010 | 11:12 | 21:02 | 18h13m54s | -18°43'19" | 57°57'51"  | 1.000  | 32.43755 |
| 11/ 5/2010 | 10:45 | 20:35 | 18h14m36s | -18°44'36" | 51°09'35"  | 1.000  | 32.53800 |
| 11/12/2010 | 10:19 | 20:09 | 18h15m24s | -18°45'44" | 44°21'19"  | 1.000  | 32.62949 |
| 11/19/2010 | 9:52  | 19:42 | 18h16m15s | -18°46'45" | 37°33'30"  | 1.000  | 32.71072 |
| 11/26/2010 | 9:25  | 19:15 | 18h17m10s | -18°47'37" | 30°46'30"  | 1.000  | 32.78066 |
| 12/ 3/2010 | 8:59  | 18:49 | 18h18m08s | -18°48'19" | 24°01'03"  | 1.000  | 32.83836 |
| 12/10/2010 | 8:32  | 18:22 | 18h19m09s | -18°48'53" | 17°19'36"  | 1.000  | 32.88297 |
| 12/17/2010 | 8:06  | 17:56 | 18h20m11s | -18°49'17" | 10°50'52"  | 1.000  | 32.91384 |
| 12/24/2010 | 7:40  | 17:29 | 18h21m15s | -18°49'32" | 5°25'06"   | 1.000  | 32.93066 |
| 12/31/2010 | 7:13  | 17:03 | 18h22m19s | -18°49'38" | 5°57'03"   | 1.000  | 32.93326 |

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Planet Apsides Report for 2010

Earth

|           |            |                    |         |
|-----------|------------|--------------------|---------|
| 1/ 3/2010 | Perihelion | Distance from Sun: | 0.98 AU |
| 7/ 4/2010 | Aphelion   | Distance from Sun: | 1.02 AU |

Mercury

|            |            |                    |         |
|------------|------------|--------------------|---------|
| 3/29/2010  | Perihelion | Distance from Sun: | 0.31 AU |
| 6/25/2010  | Perihelion | Distance from Sun: | 0.31 AU |
| 9/21/2010  | Perihelion | Distance from Sun: | 0.31 AU |
| 12/18/2010 | Perihelion | Distance from Sun: | 0.31 AU |
| 2/13/2010  | Aphelion   | Distance from Sun: | 0.47 AU |
| 5/12/2010  | Aphelion   | Distance from Sun: | 0.47 AU |
| 8/ 8/2010  | Aphelion   | Distance from Sun: | 0.47 AU |
| 11/ 4/2010 | Aphelion   | Distance from Sun: | 0.47 AU |

Venus

|            |            |                    |         |
|------------|------------|--------------------|---------|
| 5/16/2010  | Perihelion | Distance from Sun: | 0.72 AU |
| 12/27/2010 | Perihelion | Distance from Sun: | 0.72 AU |
| 1/24/2010  | Aphelion   | Distance from Sun: | 0.73 AU |
| 9/ 6/2010  | Aphelion   | Distance from Sun: | 0.73 AU |

Mars

|           |          |                    |         |
|-----------|----------|--------------------|---------|
| 3/30/2010 | Aphelion | Distance from Sun: | 1.67 AU |
|-----------|----------|--------------------|---------|

Jupiter

No Apsis

Saturn

No Apsis

Planet Conjunction/Opposition Report for 1/ 1/2010 to 12/31/2010

Mercury

| Date       | Hour | Event                |
|------------|------|----------------------|
| 1/ 4/2010  | 17   | Inferior Conjunction |
| 3/14/2010  | 17   | Superior Conjunction |
| 4/28/2010  | 17   | Inferior Conjunction |
| 6/28/2010  | 5    | Superior Conjunction |
| 9/ 3/2010  | 17   | Inferior Conjunction |
| 10/16/2010 | 18   | Superior Conjunction |
| 12/19/2010 | 18   | Inferior Conjunction |

Venus

| Date       | Hour | Event                |
|------------|------|----------------------|
| 1/11/2010  | 17   | Superior Conjunction |
| 10/28/2010 | 18   | Inferior Conjunction |

Mars

| Date      | Hour | Event      |
|-----------|------|------------|
| 1/29/2010 | 17   | Opposition |

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Jupiter

| Date      | Hour | Event       |
|-----------|------|-------------|
| 2/28/2010 | 5    | Conjunction |
| 9/21/2010 | 17   | Opposition  |

Saturn

| Date      | Hour | Event       |
|-----------|------|-------------|
| 9/30/2010 | 21   | Conjunction |
| 3/21/2010 | 21   | Opposition  |

Uranus

| Date      | Hour | Event       |
|-----------|------|-------------|
| 3/17/2010 | 0    | Conjunction |
| 9/21/2010 | 17   | Opposition  |

Neptune

| Date      | Hour | Event       |
|-----------|------|-------------|
| 2/14/2010 | 17   | Conjunction |
| 8/20/2010 | 3    | Opposition  |

Pluto

| Date       | Hour | Event       |
|------------|------|-------------|
| 12/26/2010 | 18   | Conjunction |
| 6/25/2010  | 17   | Opposition  |

Planet Data Report

| Planet  | Mean Dist<br>From Sun<br>(AU) | Period of<br>Revolution | Inclination | Equatorial<br>Diameter<br>(km) |
|---------|-------------------------------|-------------------------|-------------|--------------------------------|
| Mercury | 0.39                          | 88 days                 | 7°          | 4880                           |
| Venus   | 0.72                          | 224.7 days              | 3.4°        | 12100                          |
| Earth   | 1.00                          | 365.24 days             | 0°          | 12756                          |
| Mars    | 1.52                          | 687 days                | 1.9°        | 6794                           |
| Jupiter | 5.20                          | 11.86 years             | 1.3°        | 143200                         |
| Saturn  | 9.54                          | 29.46 years             | 2.5°        | 120000                         |
| Uranus  | 19.18                         | 84 years                | 0.8°        | 52290                          |
| Neptune | 30.06                         | 165 years               | 1.8°        | 50450                          |
| Pluto   | 39.44                         | 248 years               | 17.2°       | 2200-2300                      |



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Moon Apsides Report for 1/ 1/2010 to 12/31/2010

| Date       | Hour | Apsis   | Distance (km) | Diameter |
|------------|------|---------|---------------|----------|
| 1/ 1/2010  | 14   | Perigee | 358681        | 0.5552°  |
| 1/16/2010  | 19   | Apogee  | 406434        | 0.4900°  |
| 1/30/2010  | 2    | Perigee | 356606        | 0.5585°  |
| 2/12/2010  | 19   | Apogee  | 406544        | 0.4899°  |
| 2/27/2010  | 14   | Perigee | 357830        | 0.5566°  |
| 3/12/2010  | 3    | Apogee  | 406013        | 0.4905°  |
| 3/27/2010  | 22   | Perigee | 361870        | 0.5504°  |
| 4/ 8/2010  | 20   | Apogee  | 405008        | 0.4917°  |
| 4/24/2010  | 14   | Perigee | 367147        | 0.5424°  |
| 5/ 6/2010  | 15   | Apogee  | 404233        | 0.4927°  |
| 5/20/2010  | 2    | Perigee | 369730        | 0.5387°  |
| 6/ 3/2010  | 10   | Apogee  | 404273        | 0.4926°  |
| 6/15/2010  | 8    | Perigee | 365931        | 0.5442°  |
| 7/ 1/2010  | 3    | Apogee  | 405062        | 0.4917°  |
| 7/13/2010  | 4    | Perigee | 361122        | 0.5515°  |
| 7/28/2010  | 17   | Apogee  | 405957        | 0.4906°  |
| 8/10/2010  | 11   | Perigee | 357869        | 0.5565°  |
| 8/24/2010  | 23   | Apogee  | 406370        | 0.4901°  |
| 9/ 7/2010  | 21   | Perigee | 357204        | 0.5575°  |
| 9/21/2010  | 1    | Apogee  | 406173        | 0.4903°  |
| 10/ 6/2010 | 7    | Perigee | 359470        | 0.5540°  |
| 10/18/2010 | 11   | Apogee  | 405425        | 0.4912°  |
| 11/ 3/2010 | 10   | Perigee | 364203        | 0.5468°  |
| 11/15/2010 | 5    | Apogee  | 404627        | 0.4922°  |
| 11/30/2010 | 12   | Perigee | 369435        | 0.5391°  |
| 12/13/2010 | 2    | Apogee  | 404419        | 0.4925°  |
| 12/25/2010 | 5    | Perigee | 368453        | 0.5405°  |

Meteor Showers Report for 1/ 1/2010 to 12/31/2010

| Date       | Meteor Shower      | ZHR | RA     | DEC  | Illum. Frac. | Longitude |
|------------|--------------------|-----|--------|------|--------------|-----------|
| 1/ 3/2010  | Quadrantids        | 80  | 15h28m | 50°  | 0.88         | 283°      |
| 4/11/2010  | Virginids          | 5   | 14h04m | -9°  | 0.08         | 22°       |
| 4/21/2010  | Lyrids             | 12  | 18h08m | 32°  | 0.50         | 32°       |
| 4/28/2010  | alpha-Scorpiids    | 5   | 16h32m | -24° | 1.00         | 38°       |
| 5/ 5/2010  | eta-Aquarids       | 35  | 22h20m | -1°  | 0.55         | 45°       |
| 5/12/2010  | alpha-Scorpiids    | 5   | 16h04m | -24° | 0.02         | 52°       |
| 6/ 9/2010  | Ophiuchids         | 5   | 17h56m | -23° | 0.09         | 79°       |
| 6/20/2010  | Ophiuchids         | 5   | 17h20m | -20° | 0.67         | 89°       |
| 7/ 7/2010  | Capricornids       | 5   |        |      | 0.21         | 106°      |
| 7/15/2010  | Capricornids       | 5   | 20h44m | -15° | 0.21         | 113°      |
| 7/20/2010  | alpha-Cygnids      | 5   | 21h00m | 48°  | 0.74         | 118°      |
| 7/25/2010  | Capricornids       | 5   | 21h00m | -15° | 1.00         | 123°      |
| 7/28/2010  | delta-Aquarids     | 20  | 22h36m | -17° | 0.94         | 126°      |
| 7/30/2010  | Piscis Australids  | 5   | 22h40m | -30° | 0.82         | 128°      |
| 8/ 2/2010  | alpha-Capricornids | 5   | 20h36m | -10° | 0.55         | 130°      |
| 8/ 6/2010  | iota-Aquarids      | 8   | 22h10m | -15° | 0.16         | 134°      |
| 8/12/2010  | Perseids           | 75  | 3h04m  | 58°  | 0.10         | 140°      |
| 8/20/2010  | alpha-Cygnids      | 5   | 21h00m | 48°  | 0.86         | 148°      |
| 9/ 8/2010  | Piscids            | 10  | 0h36m  | 7°   | 0.00         | 166°      |
| 9/20/2010  | Piscids            | 5   | 0h24m  | 0°   | 0.94         | 178°      |
| 10/13/2010 | Piscids            | ??  | 1h44m  | 14°  | 0.38         | 200°      |
| 10/22/2010 | Orionids           | 25  | 6h24m  | 15°  | 1.00         | 209°      |
| 11/ 3/2010 | Taurids            | 8   | 3h44m  | 14°  | 0.09         | 221°      |

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|            |                |    |        |      |      |      |
|------------|----------------|----|--------|------|------|------|
| 11/17/2010 | Leonids        | 10 | 10h08m | 22°  | 0.85 | 235° |
| 12/ 8/2010 | Puppids-Velids | 15 | 9h00m  | -48° | 0.10 | 257° |
| 12/13/2010 | Geminids       | 75 | 7h28m  | 32°  | 0.51 | 262° |
| 12/22/2010 | Ursids         | 5  | 14h28m | 78°  | 0.98 | 271° |
| 12/25/2010 | Puppids-Velids | 15 | 9h20m  | -65° | 0.77 | 274° |

Twilight Report for 1/ 1/2010 to 12/31/2010

| Date       | Sun  |       | Astronomical |       | Nautical |       | Civil |       |
|------------|------|-------|--------------|-------|----------|-------|-------|-------|
|            | Rise | Set   | Begin        | End   | Begin    | End   | Begin | End   |
| 1/ 1/2010  | 7:49 | 17:10 | 6:06         | 18:53 | 6:40     | 18:20 | 7:14  | 17:46 |
| 1/ 8/2010  | 7:49 | 17:16 | 6:07         | 18:58 | 6:40     | 18:26 | 7:14  | 17:52 |
| 1/15/2010  | 7:47 | 17:24 | 6:06         | 19:05 | 6:39     | 18:32 | 7:12  | 17:59 |
| 1/22/2010  | 7:43 | 17:32 | 6:04         | 19:12 | 6:36     | 18:39 | 7:09  | 18:06 |
| 1/29/2010  | 7:38 | 17:40 | 6:00         | 19:19 | 6:32     | 18:47 | 7:04  | 18:14 |
| 2/ 5/2010  | 7:31 | 17:49 | 5:54         | 19:26 | 6:26     | 18:54 | 6:58  | 18:22 |
| 2/12/2010  | 7:23 | 17:57 | 5:47         | 19:34 | 6:18     | 19:02 | 6:51  | 18:30 |
| 2/19/2010  | 7:14 | 18:06 | 5:39         | 19:41 | 6:10     | 19:10 | 6:42  | 18:38 |
| 2/26/2010  | 7:04 | 18:14 | 5:29         | 19:49 | 6:01     | 19:17 | 6:32  | 18:46 |
| 3/ 5/2010  | 6:53 | 18:22 | 5:19         | 19:57 | 5:50     | 19:25 | 6:22  | 18:53 |
| 3/12/2010  | 6:42 | 18:29 | 5:07         | 20:04 | 5:39     | 19:33 | 6:11  | 19:01 |
| 3/19/2010  | 6:31 | 18:37 | 4:55         | 20:12 | 5:28     | 19:40 | 5:59  | 19:08 |
| 3/26/2010  | 6:19 | 18:44 | 4:43         | 20:21 | 5:16     | 19:48 | 5:48  | 19:16 |
| 4/ 2/2010  | 6:08 | 18:52 | 4:30         | 20:30 | 5:03     | 19:56 | 5:36  | 19:23 |
| 4/ 9/2010  | 5:57 | 18:59 | 4:17         | 20:39 | 4:51     | 20:04 | 5:24  | 19:31 |
| 4/16/2010  | 5:46 | 19:06 | 4:03         | 20:49 | 4:39     | 20:13 | 5:13  | 19:39 |
| 4/23/2010  | 5:36 | 19:13 | 3:50         | 20:59 | 4:27     | 20:22 | 5:02  | 19:47 |
| 4/30/2010  | 5:26 | 19:21 | 3:37         | 21:09 | 4:16     | 20:31 | 4:52  | 19:55 |
| 5/ 7/2010  | 5:18 | 19:28 | 3:25         | 21:20 | 4:06     | 20:40 | 4:43  | 20:03 |
| 5/14/2010  | 5:10 | 19:35 | 3:14         | 21:31 | 3:56     | 20:49 | 4:35  | 20:10 |
| 5/21/2010  | 5:04 | 19:41 | 3:04         | 21:41 | 3:48     | 20:57 | 4:28  | 20:18 |
| 5/28/2010  | 4:59 | 19:47 | 2:56         | 21:51 | 3:42     | 21:05 | 4:22  | 20:24 |
| 6/ 4/2010  | 4:56 | 19:52 | 2:50         | 21:59 | 3:37     | 21:11 | 4:19  | 20:30 |
| 6/11/2010  | 4:55 | 19:56 | 2:46         | 22:06 | 3:35     | 21:16 | 4:17  | 20:35 |
| 6/18/2010  | 4:55 | 19:59 | 2:45         | 22:09 | 3:34     | 21:20 | 4:17  | 20:37 |
| 6/25/2010  | 4:57 | 20:00 | 2:46         | 22:11 | 3:36     | 21:21 | 4:18  | 20:39 |
| 7/ 2/2010  | 5:00 | 20:00 | 2:51         | 22:09 | 3:40     | 21:20 | 4:22  | 20:38 |
| 7/ 9/2010  | 5:04 | 19:58 | 2:57         | 22:05 | 3:45     | 21:17 | 4:26  | 20:36 |
| 7/16/2010  | 5:09 | 19:55 | 3:06         | 21:58 | 3:52     | 21:12 | 4:32  | 20:32 |
| 7/23/2010  | 5:15 | 19:49 | 3:15         | 21:49 | 3:59     | 21:05 | 4:39  | 20:26 |
| 7/30/2010  | 5:21 | 19:43 | 3:26         | 21:38 | 4:08     | 20:56 | 4:46  | 20:18 |
| 8/ 6/2010  | 5:28 | 19:35 | 3:36         | 21:27 | 4:16     | 20:47 | 4:53  | 20:10 |
| 8/13/2010  | 5:35 | 19:26 | 3:46         | 21:14 | 4:25     | 20:36 | 5:01  | 20:00 |
| 8/20/2010  | 5:41 | 19:16 | 3:56         | 21:01 | 4:33     | 20:24 | 5:08  | 19:50 |
| 8/27/2010  | 5:48 | 19:06 | 4:06         | 20:48 | 4:42     | 20:12 | 5:16  | 19:38 |
| 9/ 3/2010  | 5:55 | 18:55 | 4:15         | 20:34 | 4:50     | 20:00 | 5:23  | 19:27 |
| 9/10/2010  | 6:02 | 18:43 | 4:24         | 20:21 | 4:57     | 19:47 | 5:30  | 19:15 |
| 9/17/2010  | 6:09 | 18:31 | 4:32         | 20:08 | 5:05     | 19:35 | 5:37  | 19:03 |
| 9/24/2010  | 6:15 | 18:20 | 4:40         | 19:55 | 5:12     | 19:23 | 5:44  | 18:51 |
| 10/ 1/2010 | 6:22 | 18:08 | 4:47         | 19:43 | 5:19     | 19:11 | 5:51  | 18:39 |
| 10/ 8/2010 | 6:29 | 17:57 | 4:55         | 19:31 | 5:26     | 19:00 | 5:58  | 18:28 |
| 10/15/2010 | 6:37 | 17:46 | 5:02         | 19:21 | 5:33     | 18:49 | 6:05  | 18:18 |
| 10/22/2010 | 6:45 | 17:35 | 5:09         | 19:11 | 5:41     | 18:39 | 6:12  | 18:08 |
| 10/29/2010 | 6:52 | 17:26 | 5:16         | 19:02 | 5:48     | 18:31 | 6:20  | 17:59 |
| 11/ 5/2010 | 7:01 | 17:18 | 5:23         | 18:55 | 5:55     | 18:23 | 6:27  | 17:51 |
| 11/12/2010 | 7:09 | 17:11 | 5:30         | 18:49 | 6:02     | 18:17 | 6:35  | 17:45 |
| 11/19/2010 | 7:17 | 17:05 | 5:37         | 18:45 | 6:10     | 18:13 | 6:43  | 17:40 |
| 11/26/2010 | 7:25 | 17:01 | 5:44         | 18:42 | 6:16     | 18:10 | 6:50  | 17:36 |
| 12/ 3/2010 | 7:32 | 16:59 | 5:50         | 18:41 | 6:23     | 18:08 | 6:57  | 17:35 |

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|            |      |       |      |       |      |       |      |       |
|------------|------|-------|------|-------|------|-------|------|-------|
| 12/10/2010 | 7:38 | 16:59 | 5:56 | 18:42 | 6:29 | 18:09 | 7:03 | 17:35 |
| 12/17/2010 | 7:44 | 17:01 | 6:00 | 18:44 | 6:33 | 18:11 | 7:08 | 17:36 |
| 12/24/2010 | 7:47 | 17:04 | 6:04 | 18:47 | 6:37 | 18:14 | 7:11 | 17:40 |
| 12/31/2010 | 7:49 | 17:09 | 6:06 | 18:52 | 6:39 | 18:19 | 7:13 | 17:45 |