

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 |

September 2009

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| ----- | | | | | | |
| | | 1 | 2 | 3 | 4 | 5 |
| | | SR: 5:53 | SR: 5:54 | SR: 5:55 | SR: 5:56 | SR: 5:57 |
| | | SS: 18:57 | SS: 18:56 | SS: 18:54 | SS: 18:53 | SS: 18:51 |
| | | MR: 17:31 | MR: 17:56 | MR: 18:19 | MR: 18:42 | MR: 19:04 |
| | | MS: 2:55 | MS: 3:56 | MS: 4:57 | MS: 5:59 | MS: 7:01 |
| | | | | | FM: 9:04 | |
| | | | | | | |
| | | | | | | |
| ----- | | | | | | |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| SR: 5:58 | SR: 5:59 | SR: 6:00 | SR: 6:01 | SR: 6:02 | SR: 6:03 | SR: 6:04 |
| SS: 18:49 | SS: 18:48 | SS: 18:46 | SS: 18:44 | SS: 18:43 | SS: 18:41 | SS: 18:39 |
| MR: 19:28 | MR: 19:54 | MR: 20:25 | MR: 21:02 | MR: 21:48 | MR: 22:44 | MR: 23:50 |
| MS: 8:04 | MS: 9:09 | MS: 10:16 | MS: 11:24 | MS: 12:33 | MS: 13:39 | MS: 14:38 |
| | | | | | LQ: 19:17 | |
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| | | | | | | |
| ----- | | | | | | |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| SR: 6:05 | SR: 6:06 | SR: 6:07 | SR: 6:08 | SR: 6:09 | SR: 6:10 | SR: 6:11 |
| SS: 18:38 | SS: 18:36 | SS: 18:34 | SS: 18:33 | SS: 18:31 | SS: 18:29 | SS: 18:28 |
| MR: None | MR: 1:03 | MR: 2:19 | MR: 3:36 | MR: 4:52 | MR: 6:06 | MR: 7:18 |
| MS: 15:29 | MS: 16:11 | MS: 16:46 | MS: 17:17 | MS: 17:45 | MS: 18:11 | MS: 18:39 |
| | | | | | NM: 11:45 | |
| | | | | | | |
| | | | | | | |
| ----- | | | | | | |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| SR: 6:12 | SR: 6:13 | SR: 6:14 | SR: 6:15 | SR: 6:16 | SR: 6:17 | SR: 6:18 |
| SS: 18:26 | SS: 18:24 | SS: 18:22 | SS: 18:21 | SS: 18:19 | SS: 18:17 | SS: 18:16 |
| MR: 8:30 | MR: 9:41 | MR: 10:49 | MR: 11:53 | MR: 12:51 | MR: 13:42 | MR: 14:25 |
| MS: 19:08 | MS: 19:40 | MS: 20:18 | MS: 21:01 | MS: 21:50 | MS: 22:45 | MS: 23:44 |
| | | | | | FQ: 21:50 | |
| | | | | | | |
| | | SEQ:14:20 | | | | |
| ----- | | | | | | |
| 27 | 28 | 29 | 30 | | | |
| SR: 6:19 | SR: 6:20 | SR: 6:21 | SR: 6:22 | | | |
| SS: 18:14 | SS: 18:12 | SS: 18:11 | SS: 18:09 | | | |
| MR: 15:01 | MR: 15:32 | MR: 15:58 | MR: 16:23 | | | |
| MS: None | MS: 0:44 | MS: 1:45 | MS: 2:46 | | | |
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October 2009

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | | | 1 | 2 | 3 |
| | | | | SR: 6:23 | SR: 6:24 | SR: 6:25 |
| | | | | SS: 18:07 | SS: 18:06 | SS: 18:04 |
| | | | | MR: 16:45 | MR: 17:08 | MR: 17:31 |
| | | | | MS: 3:48 | MS: 4:49 | MS: 5:53 |
| | | | | | | FM: 23:12 |
| | | | | | | |
| | | | | | | |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| SR: 6:26 | SR: 6:27 | SR: 6:28 | SR: 6:29 | SR: 6:30 | SR: 6:31 | SR: 6:32 |
| SS: 18:03 | SS: 18:01 | SS: 17:59 | SS: 17:58 | SS: 17:56 | SS: 17:55 | SS: 17:53 |
| MR: 17:57 | MR: 18:27 | MR: 19:03 | MR: 19:47 | MR: 20:40 | MR: 21:42 | MR: 22:52 |
| MS: 6:58 | MS: 8:05 | MS: 9:15 | MS: 10:24 | MS: 11:32 | MS: 12:33 | MS: 13:25 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| SR: 6:33 | SR: 6:34 | SR: 6:35 | SR: 6:36 | SR: 6:37 | SR: 6:38 | SR: 6:39 |
| SS: 17:51 | SS: 17:50 | SS: 17:48 | SS: 17:47 | SS: 17:45 | SS: 17:44 | SS: 17:42 |
| MR: None | MR: 0:06 | MR: 1:20 | MR: 2:34 | MR: 3:46 | MR: 4:58 | MR: 6:09 |
| MS: 14:09 | MS: 14:46 | MS: 15:17 | MS: 15:45 | MS: 16:12 | MS: 16:38 | MS: 17:06 |
| LQ: 1:57 | | | | | | NM: 22:33 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| SR: 6:40 | SR: 6:42 | SR: 6:43 | SR: 6:44 | SR: 6:45 | SR: 6:46 | SR: 6:47 |
| SS: 17:41 | SS: 17:39 | SS: 17:38 | SS: 17:37 | SS: 17:35 | SS: 17:34 | SS: 17:32 |
| MR: 7:19 | MR: 8:29 | MR: 9:36 | MR: 10:37 | MR: 11:32 | MR: 12:19 | MR: 12:58 |
| MS: 17:37 | MS: 18:12 | MS: 18:54 | MS: 19:41 | MS: 20:35 | MS: 21:32 | MS: 22:32 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| SR: 6:48 | SR: 6:49 | SR: 6:50 | SR: 6:52 | SR: 6:53 | SR: 6:54 | SR: 6:55 |
| SS: 17:31 | SS: 17:30 | SS: 17:28 | SS: 17:27 | SS: 17:26 | SS: 17:25 | SS: 17:23 |
| MR: 13:31 | MR: 13:59 | MR: 14:24 | MR: 14:47 | MR: 15:10 | MR: 15:33 | MR: 15:58 |
| MS: 23:33 | MS: None | MS: 0:34 | MS: 1:34 | MS: 2:35 | MS: 3:37 | MS: 4:41 |
| FQ: 17:42 | | | | | | |
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November 2009

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| SR: 6:56 | SR: 6:57 | SR: 6:59 | SR: 7:00 | SR: 7:01 | SR: 7:02 | SR: 7:03 |
| SS: 17:22 | SS: 17:21 | SS: 17:20 | SS: 17:19 | SS: 17:18 | SS: 17:17 | SS: 17:15 |
| MR: 16:26 | MR: 17:01 | MR: 17:42 | MR: 18:33 | MR: 19:35 | MR: 20:44 | MR: 21:57 |
| MS: 5:48 | MS: 6:58 | MS: 8:10 | MS: 9:20 | MS: 10:25 | MS: 11:21 | MS: 12:08 |
| | FM: 12:15 | | | | | |
| | | | | | | |
| | | | | | | |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| SR: 7:04 | SR: 7:06 | SR: 7:07 | SR: 7:08 | SR: 7:09 | SR: 7:10 | SR: 7:11 |
| SS: 17:14 | SS: 17:13 | SS: 17:12 | SS: 17:12 | SS: 17:11 | SS: 17:10 | SS: 17:09 |
| MR: 23:12 | MR: None | MR: 0:24 | MR: 1:35 | MR: 2:45 | MR: 3:54 | MR: 5:03 |
| MS: 12:47 | MS: 13:20 | MS: 13:48 | MS: 14:14 | MS: 14:40 | MS: 15:07 | MS: 15:36 |
| | LQ: 8:58 | | | | | |
| | | | | | | |
| | | | | | | |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| SR: 7:13 | SR: 7:14 | SR: 7:15 | SR: 7:16 | SR: 7:17 | SR: 7:18 | SR: 7:19 |
| SS: 17:08 | SS: 17:07 | SS: 17:07 | SS: 17:06 | SS: 17:05 | SS: 17:04 | SS: 17:04 |
| MR: 6:12 | MR: 7:20 | MR: 8:23 | MR: 9:21 | MR: 10:11 | MR: 10:54 | MR: 11:29 |
| MS: 16:09 | MS: 16:48 | MS: 17:33 | MS: 18:24 | MS: 19:21 | MS: 20:20 | MS: 21:21 |
| | NM: 12:14 | | | | | |
| | | | | | | |
| | | | | | | |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| SR: 7:21 | SR: 7:22 | SR: 7:23 | SR: 7:24 | SR: 7:25 | SR: 7:26 | SR: 7:27 |
| SS: 17:03 | SS: 17:03 | SS: 17:02 | SS: 17:02 | SS: 17:01 | SS: 17:01 | SS: 17:00 |
| MR: 11:59 | MR: 12:25 | MR: 12:48 | MR: 13:11 | MR: 13:33 | MR: 13:57 | MR: 14:23 |
| MS: 22:22 | MS: 23:22 | MS: None | MS: 0:21 | MS: 1:22 | MS: 2:24 | MS: 3:28 |
| | | FQ: 14:39 | | | | |
| | | | | | | |
| | | | | | | |
| 29 | 30 | | | | | |
| SR: 7:28 | SR: 7:29 | | | | | |
| SS: 17:00 | SS: 17:00 | | | | | |
| MR: 14:55 | MR: 15:33 | | | | | |
| MS: 4:36 | MS: 5:47 | | | | | |
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December 2009

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

Midway, UT Latitude: 40°31'00" N Longitude: 111°27'30" W
Local Time = UT - 7.00 hours Elevation: 1707 meters Year 2009
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Seasons Report for 2009

| | | |
|-----------------------|----------------|------------|
| MEQ: 3/20/2009 4:43 | Winter Length: | 88.99 days |
| JSO: 6/20/2009 22:43 | Spring Length: | 92.75 days |
| SEQ: 9/22/2009 14:20 | Summer Length: | 93.65 days |
| DSO: 12/21/2009 10:45 | Autumn Length: | 89.85 days |

Dates of Easter Report for 2009

4/12/2009

Lunar Eclipse Report for 2009

Lunar eclipse on 12/31/2009
Moon rise: 17:16
Moon set: 7:49
Magnitude: 0.07
Partial phase begins: 11:57
Time of maximum eclipse: 12:25
Partial phase ends: 12:53

Solar Eclipse Report for 2009

Solar eclipse on 1/26/2009
Sun rise: 7:40
Sun set: 17:37
Time of maximum eclipse: 0:57
Eclipse is annular
Eclipse is visible in the southern hemisphere

Solar eclipse on 7/21/2009
Sun rise: 5:13
Sun set: 19:51
Time of maximum eclipse: 19:37
Eclipse is total
Eclipse is visible in the northern hemisphere

Midway, UT Latitude: 40°31'00" N Longitude: 111°27'30" W
 Local Time = UT - 7.00 hours Elevation: 1707 meters Year 2009

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| | | | | | | | |
|------------|------|-------|-----------|------------|-----------|-------|---------|
| 12/24/2009 | 9:04 | 18:26 | 19h32m10s | -22°30'33" | 18°54'36" | 0.408 | 0.87081 |
| 12/31/2009 | 8:19 | 17:54 | 19h25m24s | -20°39'44" | 10°34'03" | 0.095 | 0.71747 |

Venus

| Date | Rise | Set | RA | Dec | Elongation | Ill Fr | DIST(AU) |
|------------|-------|-------|-----------|------------|------------|--------|----------|
| 1/ 1/2009 | 10:27 | 20:59 | 21h59m55s | -13°49'06" | 46°34'00" | 0.577 | 0.78785 |
| 1/ 8/2009 | 10:16 | 21:11 | 22h28m04s | -10°39'50" | 46°58'29" | 0.545 | 0.73634 |
| 1/15/2009 | 10:03 | 21:21 | 22h54m30s | -7°22'00" | 47°07'17" | 0.511 | 0.68452 |
| 1/22/2009 | 9:48 | 21:30 | 23h19m06s | -4°00'18" | 46°56'24" | 0.473 | 0.63268 |
| 1/29/2009 | 9:32 | 21:36 | 23h41m45s | -0°39'28" | 46°20'55" | 0.431 | 0.58106 |
| 2/ 5/2009 | 9:13 | 21:39 | 0h02m05s | 2°35'16" | 45°13'46" | 0.386 | 0.52999 |
| 2/12/2009 | 8:52 | 21:39 | 0h19m35s | 5°38'04" | 43°25'04" | 0.335 | 0.48010 |
| 2/19/2009 | 8:29 | 21:34 | 0h33m28s | 8°22'07" | 40°42'09" | 0.279 | 0.43226 |
| 2/26/2009 | 8:02 | 21:22 | 0h42m43s | 10°38'51" | 36°49'40" | 0.218 | 0.38759 |
| 3/ 5/2009 | 7:32 | 21:02 | 0h46m05s | 12°16'23" | 31°30'02" | 0.154 | 0.34768 |
| 3/12/2009 | 6:58 | 20:32 | 0h42m31s | 12°59'23" | 24°30'26" | 0.090 | 0.31483 |
| 3/19/2009 | 6:21 | 19:51 | 0h32m12s | 12°33'25" | 16°07'17" | 0.038 | 0.29196 |
| 3/26/2009 | 5:45 | 19:02 | 0h17m32s | 10°56'39" | 8°47'38" | 0.011 | 0.28180 |
| 4/ 2/2009 | 5:12 | 18:12 | 0h02m59s | 8°31'17" | 11°10'42" | 0.018 | 0.28592 |
| 4/ 9/2009 | 4:44 | 17:27 | 23h52m59s | 5°58'19" | 19°28'29" | 0.057 | 0.30398 |
| 4/16/2009 | 4:21 | 16:51 | 23h49m59s | 3°55'15" | 27°14'26" | 0.114 | 0.33387 |
| 4/23/2009 | 4:02 | 16:24 | 23h54m07s | 2°40'27" | 33°23'19" | 0.178 | 0.37267 |
| 4/30/2009 | 3:46 | 16:07 | 0h04m16s | 2°15'34" | 37°56'52" | 0.240 | 0.41779 |
| 5/ 7/2009 | 3:32 | 15:56 | 0h19m05s | 2°34'32" | 41°11'06" | 0.299 | 0.46732 |
| 5/14/2009 | 3:20 | 15:50 | 0h37m26s | 3°29'29" | 43°22'41" | 0.352 | 0.51985 |
| 5/21/2009 | 3:09 | 15:49 | 0h58m27s | 4°52'20" | 44°45'58" | 0.401 | 0.57428 |
| 5/28/2009 | 2:58 | 15:51 | 1h21m33s | 6°35'30" | 45°32'28" | 0.445 | 0.62979 |
| 6/ 4/2009 | 2:49 | 15:55 | 1h46m18s | 8°32'13" | 45°50'27" | 0.486 | 0.68590 |
| 6/11/2009 | 2:40 | 16:01 | 2h12m30s | 10°36'39" | 45°45'48" | 0.523 | 0.74221 |
| 6/18/2009 | 2:32 | 16:09 | 2h40m03s | 12°43'22" | 45°23'09" | 0.558 | 0.79833 |
| 6/25/2009 | 2:26 | 16:18 | 3h08m51s | 14°47'06" | 44°46'18" | 0.591 | 0.85389 |
| 7/ 2/2009 | 2:21 | 16:28 | 3h38m52s | 16°42'56" | 43°57'55" | 0.622 | 0.90870 |
| 7/ 9/2009 | 2:18 | 16:39 | 4h10m03s | 18°26'21" | 42°59'51" | 0.651 | 0.96261 |
| 7/16/2009 | 2:17 | 16:49 | 4h42m21s | 19°53'03" | 41°53'43" | 0.678 | 1.01541 |
| 7/23/2009 | 2:18 | 16:59 | 5h15m41s | 20°59'07" | 40°41'02" | 0.704 | 1.06686 |
| 7/30/2009 | 2:22 | 17:09 | 5h49m50s | 21°41'10" | 39°22'52" | 0.729 | 1.11684 |
| 8/ 6/2009 | 2:28 | 17:17 | 6h24m37s | 21°56'35" | 37°59'52" | 0.753 | 1.16527 |
| 8/13/2009 | 2:37 | 17:23 | 6h59m46s | 21°43'37" | 36°32'44" | 0.775 | 1.21205 |
| 8/20/2009 | 2:48 | 17:28 | 7h35m02s | 21°01'31" | 35°02'15" | 0.797 | 1.25699 |
| 8/27/2009 | 3:00 | 17:30 | 8h10m09s | 19°50'36" | 33°28'56" | 0.817 | 1.29999 |
| 9/ 3/2009 | 3:14 | 17:30 | 8h44m53s | 18°12'11" | 31°53'06" | 0.836 | 1.34102 |
| 9/10/2009 | 3:29 | 17:28 | 9h19m07s | 16°08'24" | 30°15'05" | 0.855 | 1.38005 |
| 9/17/2009 | 3:44 | 17:25 | 9h52m47s | 13°42'00" | 28°35'23" | 0.872 | 1.41696 |
| 9/24/2009 | 4:00 | 17:20 | 10h25m52s | 10°56'21" | 26°54'21" | 0.888 | 1.45165 |
| 10/ 1/2009 | 4:16 | 17:14 | 10h58m27s | 7°55'07" | 25°12'09" | 0.902 | 1.48413 |
| 10/ 8/2009 | 4:31 | 17:08 | 11h30m39s | 4°42'07" | 23°28'58" | 0.916 | 1.51444 |
| 10/15/2009 | 4:47 | 17:00 | 12h02m39s | 1°21'18" | 21°45'10" | 0.929 | 1.54253 |
| 10/22/2009 | 5:03 | 16:53 | 12h34m39s | -2°03'14" | 20°01'02" | 0.940 | 1.56832 |
| 10/29/2009 | 5:20 | 16:46 | 13h06m50s | -5°27'12" | 18°16'38" | 0.951 | 1.59185 |
| 11/ 5/2009 | 5:36 | 16:40 | 13h39m26s | -8°46'19" | 16°32'06" | 0.960 | 1.61319 |
| 11/12/2009 | 5:53 | 16:34 | 14h12m40s | -11°56'14" | 14°47'40" | 0.968 | 1.63237 |
| 11/19/2009 | 6:11 | 16:30 | 14h46m42s | -14°52'22" | 13°03'35" | 0.975 | 1.64935 |
| 11/26/2009 | 6:28 | 16:28 | 15h21m39s | -17°30'06" | 11°19'50" | 0.982 | 1.66414 |
| 12/ 3/2009 | 6:45 | 16:28 | 15h57m35s | -19°44'56" | 9°36'29" | 0.987 | 1.67687 |
| 12/10/2009 | 7:02 | 16:30 | 16h34m27s | -21°32'40" | 7°53'43" | 0.991 | 1.68758 |

Midway, UT Latitude: 40°31'00" N Longitude: 111°27'30" W
 Local Time = UT - 7.00 hours Elevation: 1707 meters Year 2009

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| | | | | | | | |
|------------|------|-------|-----------|------------|----------|-------|---------|
| 12/17/2009 | 7:17 | 16:35 | 17h12m07s | -22°49'33" | 6°11'46" | 0.995 | 1.69627 |
| 12/24/2009 | 7:31 | 16:43 | 17h50m22s | -23°32'43" | 4°30'50" | 0.997 | 1.70291 |
| 12/31/2009 | 7:42 | 16:54 | 18h28m50s | -23°40'24" | 2°51'44" | 0.999 | 1.70759 |

Mars

| Date | Rise | Set | RA | Dec | Elongation | Ill Fr | DIST(AU) |
|------------|-------|-------|-----------|------------|------------|--------|----------|
| 1/ 1/2009 | 7:24 | 16:31 | 18h15m27s | -24°05'39" | 7°12'34" | 0.998 | 2.42856 |
| 1/ 8/2009 | 7:19 | 16:28 | 18h38m35s | -23°54'22" | 9°03'23" | 0.997 | 2.41270 |
| 1/15/2009 | 7:12 | 16:25 | 19h01m45s | -23°30'11" | 10°52'00" | 0.996 | 2.39588 |
| 1/22/2009 | 7:05 | 16:23 | 19h24m53s | -22°53'14" | 12°38'30" | 0.994 | 2.37823 |
| 1/29/2009 | 6:57 | 16:22 | 19h47m54s | -22°03'49" | 14°22'50" | 0.993 | 2.35981 |
| 2/ 5/2009 | 6:48 | 16:22 | 20h10m43s | -21°02'26" | 16°04'50" | 0.991 | 2.34075 |
| 2/12/2009 | 6:38 | 16:22 | 20h33m18s | -19°49'46" | 17°44'26" | 0.989 | 2.32125 |
| 2/19/2009 | 6:27 | 16:22 | 20h55m35s | -18°26'34" | 19°21'50" | 0.986 | 2.30142 |
| 2/26/2009 | 6:16 | 16:23 | 21h17m34s | -16°53'46" | 20°57'10" | 0.984 | 2.28128 |
| 3/ 5/2009 | 6:03 | 16:23 | 21h39m14s | -15°12'23" | 22°30'25" | 0.981 | 2.26090 |
| 3/12/2009 | 5:50 | 16:24 | 22h00m34s | -13°23'31" | 24°01'37" | 0.978 | 2.24042 |
| 3/19/2009 | 5:37 | 16:24 | 22h21m35s | -11°28'13" | 25°31'01" | 0.976 | 2.21992 |
| 3/26/2009 | 5:23 | 16:24 | 22h42m20s | -9°27'37" | 26°58'59" | 0.973 | 2.19935 |
| 4/ 2/2009 | 5:08 | 16:24 | 23h02m49s | -7°22'54" | 28°25'37" | 0.970 | 2.17871 |
| 4/ 9/2009 | 4:53 | 16:24 | 23h23m04s | -5°15'14" | 29°51'04" | 0.966 | 2.15808 |
| 4/16/2009 | 4:38 | 16:24 | 23h43m08s | -3°05'40" | 31°15'38" | 0.963 | 2.13747 |
| 4/23/2009 | 4:23 | 16:24 | 0h03m04s | -0°55'19" | 32°39'47" | 0.960 | 2.11678 |
| 4/30/2009 | 4:08 | 16:24 | 0h22m54s | 1°14'43" | 34°03'50" | 0.956 | 2.09592 |
| 5/ 7/2009 | 3:53 | 16:23 | 0h42m40s | 3°23'20" | 35°27'55" | 0.953 | 2.07489 |
| 5/14/2009 | 3:38 | 16:23 | 1h02m25s | 5°29'35" | 36°52'22" | 0.950 | 2.05367 |
| 5/21/2009 | 3:23 | 16:22 | 1h22m11s | 7°32'29" | 38°17'42" | 0.946 | 2.03211 |
| 5/28/2009 | 3:08 | 16:21 | 1h42m00s | 9°31'04" | 39°44'20" | 0.942 | 2.01006 |
| 6/ 4/2009 | 2:54 | 16:20 | 2h01m53s | 11°24'25" | 41°12'27" | 0.939 | 1.98746 |
| 6/11/2009 | 2:40 | 16:19 | 2h21m51s | 13°11'42" | 42°42'21" | 0.935 | 1.96426 |
| 6/18/2009 | 2:26 | 16:18 | 2h41m55s | 14°52'12" | 44°14'31" | 0.932 | 1.94030 |
| 6/25/2009 | 2:13 | 16:16 | 3h02m06s | 16°25'09" | 45°49'27" | 0.928 | 1.91539 |
| 7/ 2/2009 | 2:00 | 16:14 | 3h22m22s | 17°49'54" | 47°27'23" | 0.924 | 1.88943 |
| 7/ 9/2009 | 1:47 | 16:12 | 3h42m42s | 19°05'55" | 49°08'33" | 0.921 | 1.86239 |
| 7/16/2009 | 1:36 | 16:09 | 4h03m05s | 20°12'49" | 50°53'23" | 0.917 | 1.83411 |
| 7/23/2009 | 1:25 | 16:06 | 4h23m29s | 21°10'13" | 52°42'29" | 0.913 | 1.80439 |
| 7/30/2009 | 1:14 | 16:02 | 4h43m50s | 21°57'56" | 54°36'08" | 0.910 | 1.77315 |
| 8/ 6/2009 | 1:04 | 15:57 | 5h04m04s | 22°35'53" | 56°34'33" | 0.906 | 1.74038 |
| 8/13/2009 | 0:54 | 15:52 | 5h24m09s | 23°04'11" | 58°38'10" | 0.903 | 1.70595 |
| 8/20/2009 | 0:45 | 15:45 | 5h44m01s | 23°23'01" | 60°47'38" | 0.900 | 1.66971 |
| 8/27/2009 | 0:37 | 15:38 | 6h03m34s | 23°32'45" | 63°03'26" | 0.897 | 1.63160 |
| 9/ 3/2009 | 0:28 | 15:29 | 6h22m45s | 23°33'52" | 65°25'49" | 0.894 | 1.59166 |
| 9/10/2009 | 0:20 | 15:20 | 6h41m30s | 23°27'00" | 67°55'18" | 0.891 | 1.54986 |
| 9/17/2009 | 0:11 | 15:09 | 6h59m45s | 23°12'53" | 70°32'44" | 0.889 | 1.50610 |
| 9/24/2009 | 0:03 | 14:58 | 7h17m24s | 22°52'22" | 73°18'53" | 0.887 | 1.46040 |
| 10/ 1/2009 | 23:53 | 14:45 | 7h34m25s | 22°26'28" | 76°14'17" | 0.885 | 1.41290 |
| 10/ 8/2009 | 23:44 | 14:32 | 7h50m43s | 21°56'11" | 79°19'43" | 0.884 | 1.36369 |
| 10/15/2009 | 23:34 | 14:17 | 8h06m13s | 21°22'40" | 82°36'25" | 0.884 | 1.31279 |
| 10/22/2009 | 23:23 | 14:02 | 8h20m52s | 20°47'13" | 86°05'51" | 0.884 | 1.26036 |
| 10/29/2009 | 23:12 | 13:45 | 8h34m33s | 20°11'11" | 89°49'14" | 0.886 | 1.20671 |
| 11/ 5/2009 | 22:59 | 13:28 | 8h47m10s | 19°35'57" | 93°48'01" | 0.888 | 1.15211 |
| 11/12/2009 | 22:45 | 13:09 | 8h58m38s | 19°03'03" | 98°04'26" | 0.892 | 1.09685 |
| 11/19/2009 | 22:29 | 12:50 | 9h08m46s | 18°34'12" | 102°41'13" | 0.897 | 1.04132 |
| 11/26/2009 | 22:11 | 12:29 | 9h17m24s | 18°11'09" | 107°41'02" | 0.904 | 0.98616 |
| 12/ 3/2009 | 21:51 | 12:07 | 9h24m21s | 17°55'36" | 113°06'39" | 0.912 | 0.93205 |

Midway, UT Latitude: 40°31'00" N Longitude: 111°27'30" W
Local Time = UT - 7.00 hours Elevation: 1707 meters Year 2009

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| | | | | | | | |
|------------|-------|-------|----------|-----------|------------|-------|---------|
| 12/10/2009 | 21:29 | 11:44 | 9h29m23s | 17°49'20" | 119°01'47" | 0.922 | 0.87970 |
| 12/17/2009 | 21:03 | 11:20 | 9h32m14s | 17°54'02" | 125°30'33" | 0.934 | 0.83007 |
| 12/24/2009 | 20:34 | 10:53 | 9h32m38s | 18°10'53" | 132°36'10" | 0.947 | 0.78442 |
| 12/31/2009 | 20:02 | 10:25 | 9h30m26s | 18°40'05" | 140°20'07" | 0.961 | 0.74407 |

Jupiter

| Date | Rise | Set | RA | Dec | Elongation | Ill Fr | DIST(AU) |
|------------|-------|-------|-----------|------------|------------|--------|----------|
| 1/ 1/2009 | 8:58 | 18:32 | 20h04m49s | -20°46'07" | 18°16'35" | 0.999 | 6.03831 |
| 1/ 8/2009 | 8:36 | 18:13 | 20h11m36s | -20°26'04" | 12°46'00" | 1.000 | 6.06586 |
| 1/15/2009 | 8:13 | 17:54 | 20h18m26s | -20°04'51" | 7°17'01" | 1.000 | 6.08319 |
| 1/22/2009 | 7:51 | 17:34 | 20h25m17s | -19°42'32" | 1°51'00" | 1.000 | 6.09020 |
| 1/29/2009 | 7:29 | 17:15 | 20h32m07s | -19°19'16" | 3°41'35" | 1.000 | 6.08674 |
| 2/ 5/2009 | 7:07 | 16:56 | 20h38m54s | -18°55'10" | 9°07'48" | 1.000 | 6.07285 |
| 2/12/2009 | 6:44 | 16:37 | 20h45m36s | -18°30'25" | 14°34'20" | 0.999 | 6.04873 |
| 2/19/2009 | 6:21 | 16:17 | 20h52m12s | -18°05'10" | 20°01'07" | 0.999 | 6.01462 |
| 2/26/2009 | 5:59 | 15:58 | 20h58m39s | -17°39'36" | 25°28'27" | 0.998 | 5.97071 |
| 3/ 5/2009 | 5:36 | 15:38 | 21h04m56s | -17°13'56" | 30°56'29" | 0.997 | 5.91738 |
| 3/12/2009 | 5:13 | 15:18 | 21h11m01s | -16°48'23" | 36°25'25" | 0.997 | 5.85516 |
| 3/19/2009 | 4:49 | 14:58 | 21h16m53s | -16°23'10" | 41°55'50" | 0.996 | 5.78459 |
| 3/26/2009 | 4:26 | 14:38 | 21h22m29s | -15°58'30" | 47°28'21" | 0.995 | 5.70618 |
| 4/ 2/2009 | 4:02 | 14:17 | 21h27m48s | -15°34'39" | 53°03'16" | 0.994 | 5.62060 |
| 4/ 9/2009 | 3:38 | 13:56 | 21h32m48s | -15°11'54" | 58°40'56" | 0.993 | 5.52870 |
| 4/16/2009 | 3:14 | 13:34 | 21h37m27s | -14°50'27" | 64°21'59" | 0.992 | 5.43129 |
| 4/23/2009 | 2:49 | 13:12 | 21h41m43s | -14°30'35" | 70°07'16" | 0.991 | 5.32918 |
| 4/30/2009 | 2:25 | 12:50 | 21h45m34s | -14°12'35" | 75°57'18" | 0.991 | 5.22333 |
| 5/ 7/2009 | 1:59 | 12:26 | 21h48m58s | -13°56'43" | 81°52'30" | 0.990 | 5.11487 |
| 5/14/2009 | 1:34 | 12:02 | 21h51m54s | -13°43'13" | 87°53'34" | 0.990 | 5.00491 |
| 5/21/2009 | 1:08 | 11:38 | 21h54m19s | -13°32'20" | 94°01'23" | 0.990 | 4.89453 |
| 5/28/2009 | 0:42 | 11:13 | 21h56m12s | -13°24'16" | 100°16'37" | 0.990 | 4.78500 |
| 6/ 4/2009 | 0:15 | 10:47 | 21h57m30s | -13°19'15" | 106°39'35" | 0.991 | 4.67774 |
| 6/11/2009 | 23:45 | 10:20 | 21h58m13s | -13°17'22" | 113°10'44" | 0.991 | 4.57408 |
| 6/18/2009 | 23:17 | 9:52 | 21h58m21s | -13°18'42" | 119°50'42" | 0.992 | 4.47537 |
| 6/25/2009 | 22:49 | 9:24 | 21h57m51s | -13°23'17" | 126°39'50" | 0.993 | 4.38307 |
| 7/ 2/2009 | 22:21 | 8:55 | 21h56m46s | -13°31'01" | 133°37'52" | 0.995 | 4.29870 |
| 7/ 9/2009 | 21:53 | 8:25 | 21h55m07s | -13°41'40" | 140°44'25" | 0.996 | 4.22365 |
| 7/16/2009 | 21:24 | 7:54 | 21h52m55s | -13°54'56" | 147°59'12" | 0.997 | 4.15917 |
| 7/23/2009 | 20:54 | 7:23 | 21h50m15s | -14°10'27" | 155°21'32" | 0.998 | 4.10650 |
| 7/30/2009 | 20:25 | 6:52 | 21h47m12s | -14°27'39" | 162°49'53" | 0.999 | 4.06678 |
| 8/ 6/2009 | 19:55 | 6:20 | 21h43m52s | -14°45'56" | 170°21'54" | 1.000 | 4.04079 |
| 8/13/2009 | 19:25 | 5:47 | 21h40m21s | -15°04'38" | 177°45'43" | 1.000 | 4.02901 |
| 8/20/2009 | 18:55 | 5:15 | 21h36m47s | -15°23'07" | 174°12'48" | 1.000 | 4.03176 |
| 8/27/2009 | 18:25 | 4:43 | 21h33m17s | -15°40'43" | 166°37'57" | 0.999 | 4.04909 |
| 9/ 3/2009 | 17:56 | 4:11 | 21h30m00s | -15°56'48" | 159°02'56" | 0.999 | 4.08056 |
| 9/10/2009 | 17:26 | 3:40 | 21h27m03s | -16°10'54" | 151°31'14" | 0.998 | 4.12547 |
| 9/17/2009 | 16:57 | 3:09 | 21h24m31s | -16°22'37" | 144°04'18" | 0.997 | 4.18297 |
| 9/24/2009 | 16:28 | 2:39 | 21h22m30s | -16°31'38" | 136°43'31" | 0.995 | 4.25200 |
| 10/ 1/2009 | 15:59 | 2:10 | 21h21m04s | -16°37'44" | 129°30'06" | 0.994 | 4.33117 |
| 10/ 8/2009 | 15:31 | 1:41 | 21h20m14s | -16°40'50" | 122°24'32" | 0.993 | 4.41901 |
| 10/15/2009 | 15:04 | 1:14 | 21h20m04s | -16°40'53" | 115°26'49" | 0.992 | 4.51410 |
| 10/22/2009 | 14:37 | 0:47 | 21h20m32s | -16°37'53" | 108°37'08" | 0.991 | 4.61495 |
| 10/29/2009 | 14:10 | 0:21 | 21h21m39s | -16°31'52" | 101°55'40" | 0.991 | 4.71996 |
| 11/ 5/2009 | 13:44 | 23:52 | 21h23m23s | -16°22'56" | 95°22'10" | 0.990 | 4.82757 |
| 11/12/2009 | 13:18 | 23:28 | 21h25m42s | -16°11'12" | 88°56'01" | 0.990 | 4.93643 |
| 11/19/2009 | 12:52 | 23:04 | 21h28m35s | -15°56'44" | 82°36'48" | 0.990 | 5.04517 |
| 11/26/2009 | 12:27 | 22:41 | 21h31m59s | -15°39'40" | 76°24'19" | 0.991 | 5.15240 |

Midway, UT Latitude: 40°31'00" N Longitude: 111°27'30" W
Local Time = UT - 7.00 hours Elevation: 1707 meters Year 2009

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|------------|-------|-------|-----------|------------|-----------|-------|---------|
| 12/ 3/2009 | 12:02 | 22:19 | 21h35m50s | -15°20'07" | 70°18'13" | 0.991 | 5.25686 |
| 12/10/2009 | 11:37 | 21:57 | 21h40m07s | -14°58'14" | 64°17'47" | 0.992 | 5.35750 |
| 12/17/2009 | 11:13 | 21:36 | 21h44m47s | -14°34'08" | 58°22'30" | 0.993 | 5.45331 |
| 12/24/2009 | 10:49 | 21:15 | 21h49m47s | -14°07'57" | 52°32'09" | 0.994 | 5.54323 |
| 12/31/2009 | 10:25 | 20:54 | 21h55m05s | -13°39'50" | 46°46'28" | 0.995 | 5.62642 |

Saturn

| Date | Rise | Set | RA | Dec | Elongation | Ill Fr | DIST(AU) |
|------------|-------|-------|-----------|----------|------------|--------|----------|
| 1/ 1/2009 | 22:51 | 11:34 | 11h33m28s | 5°06'07" | 108°48'16" | 0.998 | 9.00966 |
| 1/ 8/2009 | 22:23 | 11:06 | 11h33m21s | 5°08'58" | 115°58'49" | 0.998 | 8.90251 |
| 1/15/2009 | 21:55 | 10:38 | 11h32m54s | 5°13'52" | 123°14'19" | 0.998 | 8.80181 |
| 1/22/2009 | 21:26 | 10:11 | 11h32m08s | 5°20'44" | 130°34'37" | 0.998 | 8.70917 |
| 1/29/2009 | 20:57 | 9:42 | 11h31m04s | 5°29'23" | 137°59'09" | 0.999 | 8.62628 |
| 2/ 5/2009 | 20:27 | 9:14 | 11h29m44s | 5°39'37" | 145°26'54" | 0.999 | 8.55467 |
| 2/12/2009 | 19:57 | 8:46 | 11h28m10s | 5°51'09" | 152°56'48" | 0.999 | 8.49561 |
| 2/19/2009 | 19:27 | 8:17 | 11h26m24s | 6°03'42" | 160°27'45" | 1.000 | 8.45009 |
| 2/26/2009 | 18:57 | 7:48 | 11h24m29s | 6°16'57" | 167°57'08" | 1.000 | 8.41905 |
| 3/ 5/2009 | 18:27 | 7:20 | 11h22m29s | 6°30'31" | 175°10'21" | 1.000 | 8.40309 |
| 3/12/2009 | 17:56 | 6:51 | 11h20m26s | 6°44'01" | 175°59'55" | 1.000 | 8.40240 |
| 3/19/2009 | 17:26 | 6:22 | 11h18m24s | 6°57'08" | 168°57'02" | 1.000 | 8.41691 |
| 3/26/2009 | 16:56 | 5:53 | 11h16m26s | 7°09'30" | 161°34'16" | 1.000 | 8.44635 |
| 4/ 2/2009 | 16:26 | 5:25 | 11h14m36s | 7°20'49" | 154°11'59" | 0.999 | 8.49018 |
| 4/ 9/2009 | 15:56 | 4:56 | 11h12m56s | 7°30'46" | 146°53'22" | 0.999 | 8.54744 |
| 4/16/2009 | 15:27 | 4:28 | 11h11m28s | 7°39'11" | 139°39'27" | 0.999 | 8.61703 |
| 4/23/2009 | 14:58 | 3:59 | 11h10m16s | 7°45'51" | 132°30'45" | 0.998 | 8.69777 |
| 4/30/2009 | 14:29 | 3:31 | 11h09m20s | 7°50'38" | 125°27'52" | 0.998 | 8.78831 |
| 5/ 7/2009 | 14:01 | 3:03 | 11h08m42s | 7°53'26" | 118°31'20" | 0.998 | 8.88705 |
| 5/14/2009 | 13:33 | 2:35 | 11h08m22s | 7°54'15" | 111°41'10" | 0.998 | 8.99241 |
| 5/21/2009 | 13:06 | 2:08 | 11h08m21s | 7°53'03" | 104°57'05" | 0.997 | 9.10289 |
| 5/28/2009 | 12:39 | 1:40 | 11h08m39s | 7°49'50" | 98°19'03" | 0.997 | 9.21693 |
| 6/ 4/2009 | 12:12 | 1:13 | 11h09m15s | 7°44'41" | 91°47'05" | 0.997 | 9.33286 |
| 6/11/2009 | 11:46 | 0:46 | 11h10m10s | 7°37'40" | 85°20'54" | 0.997 | 9.44915 |
| 6/18/2009 | 11:20 | 0:19 | 11h11m22s | 7°28'53" | 78°59'50" | 0.997 | 9.56443 |
| 6/25/2009 | 10:55 | 23:49 | 11h12m50s | 7°18'24" | 72°43'29" | 0.997 | 9.67732 |
| 7/ 2/2009 | 10:30 | 23:22 | 11h14m34s | 7°06'22" | 66°31'39" | 0.998 | 9.78641 |
| 7/ 9/2009 | 10:05 | 22:56 | 11h16m32s | 6°52'53" | 60°23'56" | 0.998 | 9.89049 |
| 7/16/2009 | 9:40 | 22:30 | 11h18m43s | 6°38'05" | 54°19'36" | 0.998 | 9.98850 |
| 7/23/2009 | 9:16 | 22:04 | 11h21m07s | 6°22'05" | 48°18'03" | 0.998 | 10.07939 |
| 7/30/2009 | 8:52 | 21:38 | 11h23m41s | 6°05'02" | 42°19'01" | 0.999 | 10.16214 |
| 8/ 6/2009 | 8:29 | 21:12 | 11h26m24s | 5°47'03" | 36°22'09" | 0.999 | 10.23590 |
| 8/13/2009 | 8:05 | 20:46 | 11h29m15s | 5°28'18" | 30°26'49" | 0.999 | 10.30001 |
| 8/20/2009 | 7:41 | 20:21 | 11h32m14s | 5°08'53" | 24°32'29" | 1.000 | 10.35379 |
| 8/27/2009 | 7:18 | 19:55 | 11h35m17s | 4°48'58" | 18°39'04" | 1.000 | 10.39661 |
| 9/ 3/2009 | 6:55 | 19:30 | 11h38m26s | 4°28'42" | 12°47'06" | 1.000 | 10.42804 |
| 9/10/2009 | 6:32 | 19:04 | 11h41m36s | 4°08'14" | 6°59'34" | 1.000 | 10.44781 |
| 9/17/2009 | 6:09 | 18:38 | 11h44m49s | 3°47'41" | 2°07'02" | 1.000 | 10.45567 |
| 9/24/2009 | 5:45 | 18:13 | 11h48m02s | 3°27'13" | 5°34'05" | 1.000 | 10.45139 |
| 10/ 1/2009 | 5:22 | 17:48 | 11h51m14s | 3°06'59" | 11°22'44" | 1.000 | 10.43501 |
| 10/ 8/2009 | 4:59 | 17:22 | 11h54m23s | 2°47'10" | 17°21'23" | 1.000 | 10.40671 |
| 10/15/2009 | 4:36 | 16:56 | 11h57m29s | 2°27'52" | 23°24'45" | 1.000 | 10.36669 |
| 10/22/2009 | 4:12 | 16:31 | 12h00m29s | 2°09'18" | 29°32'06" | 0.999 | 10.31523 |
| 10/29/2009 | 3:49 | 16:05 | 12h03m23s | 1°51'35" | 35°43'10" | 0.999 | 10.25286 |
| 11/ 5/2009 | 3:25 | 15:39 | 12h06m08s | 1°34'55" | 41°58'07" | 0.999 | 10.18028 |
| 11/12/2009 | 3:01 | 15:14 | 12h08m44s | 1°19'25" | 48°17'25" | 0.998 | 10.09823 |
| 11/19/2009 | 2:36 | 14:48 | 12h11m09s | 1°05'16" | 54°41'23" | 0.998 | 10.00751 |

Midway, UT Latitude: 40°31'00" N Longitude: 111°27'30" W
 Local Time = UT - 7.00 hours Elevation: 1707 meters Year 2009

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| | | | | | | | |
|------------|------|-------|-----------|----------|-----------|-------|---------|
| 11/26/2009 | 2:12 | 14:22 | 12h13m22s | 0°52'36" | 61°10'02" | 0.998 | 9.90922 |
| 12/ 3/2009 | 1:47 | 13:55 | 12h15m20s | 0°41'34" | 67°43'28" | 0.998 | 9.80461 |
| 12/10/2009 | 1:21 | 13:29 | 12h17m04s | 0°32'18" | 74°22'02" | 0.997 | 9.69493 |
| 12/17/2009 | 0:56 | 13:03 | 12h18m31s | 0°24'54" | 81°06'03" | 0.997 | 9.58152 |
| 12/24/2009 | 0:30 | 12:36 | 12h19m41s | 0°19'29" | 87°55'25" | 0.997 | 9.46599 |
| 12/31/2009 | 0:03 | 12:09 | 12h20m32s | 0°16'07" | 94°49'56" | 0.997 | 9.35002 |

Uranus

| Date | Rise | Set | RA | Dec | Elongation | Ill Fr | DIST(AU) |
|------------|-------|-------|-----------|-----------|------------|--------|----------|
| 1/ 1/2009 | 11:15 | 22:46 | 23h21m37s | -4°57'13" | 68°32'00" | 0.999 | 20.43923 |
| 1/ 8/2009 | 10:48 | 22:19 | 23h22m24s | -4°51'52" | 61°37'01" | 1.000 | 20.54903 |
| 1/15/2009 | 10:21 | 21:53 | 23h23m20s | -4°45'44" | 54°44'23" | 1.000 | 20.65201 |
| 1/22/2009 | 9:55 | 21:27 | 23h24m22s | -4°38'52" | 47°53'50" | 1.000 | 20.74683 |
| 1/29/2009 | 9:28 | 21:01 | 23h25m31s | -4°31'21" | 41°05'25" | 1.000 | 20.83216 |
| 2/ 5/2009 | 9:01 | 20:35 | 23h26m45s | -4°23'17" | 34°19'23" | 1.000 | 20.90680 |
| 2/12/2009 | 8:34 | 20:09 | 23h28m03s | -4°14'44" | 27°35'44" | 1.000 | 20.96987 |
| 2/19/2009 | 8:08 | 19:44 | 23h29m26s | -4°05'48" | 20°54'12" | 1.000 | 21.02065 |
| 2/26/2009 | 7:41 | 19:18 | 23h30m51s | -3°56'35" | 14°14'42" | 1.000 | 21.05846 |
| 3/ 5/2009 | 7:14 | 18:53 | 23h32m18s | -3°47'10" | 7°37'48" | 1.000 | 21.08284 |
| 3/12/2009 | 6:48 | 18:27 | 23h33m46s | -3°37'40" | 1°14'03" | 1.000 | 21.09361 |
| 3/19/2009 | 6:21 | 18:02 | 23h35m15s | -3°28'11" | 5°37'24" | 1.000 | 21.09076 |
| 3/26/2009 | 5:55 | 17:36 | 23h36m42s | -3°18'47" | 12°08'58" | 1.000 | 21.07435 |
| 4/ 2/2009 | 5:28 | 17:11 | 23h38m08s | -3°09'35" | 18°40'23" | 1.000 | 21.04459 |
| 4/ 9/2009 | 5:01 | 16:45 | 23h39m32s | -3°00'40" | 25°10'53" | 1.000 | 21.00203 |
| 4/16/2009 | 4:35 | 16:19 | 23h40m52s | -2°52'07" | 31°40'41" | 1.000 | 20.94729 |
| 4/23/2009 | 4:08 | 15:53 | 23h42m08s | -2°44'02" | 38°10'13" | 1.000 | 20.88106 |
| 4/30/2009 | 3:41 | 15:27 | 23h43m20s | -2°36'30" | 44°39'38" | 1.000 | 20.80418 |
| 5/ 7/2009 | 3:14 | 15:01 | 23h44m26s | -2°29'34" | 51°08'57" | 1.000 | 20.71773 |
| 5/14/2009 | 2:47 | 14:35 | 23h45m25s | -2°23'20" | 57°38'31" | 1.000 | 20.62289 |
| 5/21/2009 | 2:20 | 14:09 | 23h46m18s | -2°17'50" | 64°08'52" | 0.999 | 20.52079 |
| 5/28/2009 | 1:53 | 13:42 | 23h47m04s | -2°13'09" | 70°40'14" | 0.999 | 20.41275 |
| 6/ 4/2009 | 1:26 | 13:16 | 23h47m42s | -2°09'19" | 77°12'39" | 0.999 | 20.30025 |
| 6/11/2009 | 0:59 | 12:49 | 23h48m12s | -2°06'22" | 83°46'22" | 0.999 | 20.18479 |
| 6/18/2009 | 0:32 | 12:22 | 23h48m33s | -2°04'20" | 90°21'52" | 0.999 | 20.06783 |
| 6/25/2009 | 0:04 | 11:54 | 23h48m46s | -2°03'15" | 96°59'27" | 0.999 | 19.95089 |
| 7/ 2/2009 | 23:33 | 11:27 | 23h48m50s | -2°03'06" | 103°39'03" | 0.999 | 19.83568 |
| 7/ 9/2009 | 23:05 | 10:59 | 23h48m45s | -2°03'53" | 110°20'45" | 0.999 | 19.72379 |
| 7/16/2009 | 22:38 | 10:31 | 23h48m32s | -2°05'35" | 117°04'56" | 0.999 | 19.61671 |
| 7/23/2009 | 22:10 | 10:03 | 23h48m10s | -2°08'10" | 123°51'50" | 1.000 | 19.51597 |
| 7/30/2009 | 21:42 | 9:35 | 23h47m41s | -2°11'35" | 130°41'17" | 1.000 | 19.42314 |
| 8/ 6/2009 | 21:14 | 9:07 | 23h47m04s | -2°15'45" | 137°33'07" | 1.000 | 19.33962 |
| 8/13/2009 | 20:46 | 8:38 | 23h46m21s | -2°20'36" | 144°27'31" | 1.000 | 19.26660 |
| 8/20/2009 | 20:18 | 8:10 | 23h45m32s | -2°26'03" | 151°24'36" | 1.000 | 19.20525 |
| 8/27/2009 | 19:50 | 7:41 | 23h44m38s | -2°31'59" | 158°24'02" | 1.000 | 19.15666 |
| 9/ 3/2009 | 19:22 | 7:12 | 23h43m40s | -2°38'17" | 165°25'19" | 1.000 | 19.12163 |
| 9/10/2009 | 18:54 | 6:43 | 23h42m40s | -2°44'49" | 172°27'47" | 1.000 | 19.10071 |
| 9/17/2009 | 18:26 | 6:14 | 23h41m39s | -2°51'28" | 179°06'22" | 1.000 | 19.09432 |
| 9/24/2009 | 17:58 | 5:45 | 23h40m37s | -2°58'06" | 173°13'44" | 1.000 | 19.10274 |
| 10/ 1/2009 | 17:29 | 5:16 | 23h39m36s | -3°04'33" | 166°06'44" | 1.000 | 19.12589 |
| 10/ 8/2009 | 17:01 | 4:48 | 23h38m38s | -3°10'42" | 158°57'52" | 1.000 | 19.16338 |
| 10/15/2009 | 16:33 | 4:19 | 23h37m44s | -3°16'26" | 151°47'57" | 1.000 | 19.21473 |
| 10/22/2009 | 16:05 | 3:50 | 23h36m54s | -3°21'37" | 144°37'27" | 1.000 | 19.27927 |
| 10/29/2009 | 15:37 | 3:22 | 23h36m10s | -3°26'07" | 137°27'01" | 1.000 | 19.35597 |
| 11/ 5/2009 | 15:09 | 2:53 | 23h35m32s | -3°29'53" | 130°17'01" | 1.000 | 19.44358 |
| 11/12/2009 | 14:41 | 2:25 | 23h35m03s | -3°32'48" | 123°07'29" | 1.000 | 19.54080 |

Midway, UT Latitude: 40°31'00" N Longitude: 111°27'30" W
 Local Time = UT - 7.00 hours Elevation: 1707 meters Year 2009

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| | | | | | | | |
|------------|-------|-------|-----------|-----------|------------|-------|----------|
| 11/19/2009 | 14:14 | 1:57 | 23h34m41s | -3°34'49" | 115°58'38" | 1.000 | 19.64620 |
| 11/26/2009 | 13:46 | 1:29 | 23h34m29s | -3°35'53" | 108°50'59" | 0.999 | 19.75809 |
| 12/ 3/2009 | 13:18 | 1:02 | 23h34m25s | -3°35'57" | 101°44'54" | 0.999 | 19.87470 |
| 12/10/2009 | 12:51 | 0:34 | 23h34m31s | -3°35'02" | 94°40'21" | 0.999 | 19.99431 |
| 12/17/2009 | 12:24 | 0:07 | 23h34m46s | -3°33'07" | 87°37'24" | 0.999 | 20.11518 |
| 12/24/2009 | 11:56 | 23:36 | 23h35m10s | -3°30'13" | 80°36'25" | 0.999 | 20.23544 |
| 12/31/2009 | 11:29 | 23:10 | 23h35m43s | -3°26'22" | 73°37'43" | 0.999 | 20.35327 |

Neptune

| Date | Rise | Set | RA | Dec | Elongation | Ill Fr | DIST(AU) |
|------------|-------|-------|-----------|------------|------------|--------|----------|
| 1/ 1/2009 | 10:07 | 20:31 | 21h39m40s | -14°22'08" | 41°44'21" | 1.000 | 30.76067 |
| 1/ 8/2009 | 9:40 | 20:04 | 21h40m31s | -14°17'51" | 34°49'29" | 1.000 | 30.83585 |
| 1/15/2009 | 9:13 | 19:38 | 21h41m26s | -14°13'17" | 27°55'47" | 1.000 | 30.89923 |
| 1/22/2009 | 8:46 | 19:12 | 21h42m24s | -14°08'28" | 21°03'03" | 1.000 | 30.94997 |
| 1/29/2009 | 8:20 | 18:45 | 21h43m24s | -14°03'28" | 14°11'20" | 1.000 | 30.98731 |
| 2/ 5/2009 | 7:53 | 18:19 | 21h44m25s | -13°58'20" | 7°21'03" | 1.000 | 31.01074 |
| 2/12/2009 | 7:26 | 17:53 | 21h45m27s | -13°53'08" | 0°37'58" | 1.000 | 31.02007 |
| 2/19/2009 | 6:59 | 17:27 | 21h46m29s | -13°47'54" | 6°17'31" | 1.000 | 31.01524 |
| 2/26/2009 | 6:32 | 17:01 | 21h47m31s | -13°42'44" | 13°04'27" | 1.000 | 30.99629 |
| 3/ 5/2009 | 6:05 | 16:34 | 21h48m31s | -13°37'40" | 19°50'30" | 1.000 | 30.96352 |
| 3/12/2009 | 5:39 | 16:08 | 21h49m29s | -13°32'47" | 26°35'26" | 1.000 | 30.91753 |
| 3/19/2009 | 5:12 | 15:42 | 21h50m24s | -13°28'06" | 33°19'31" | 1.000 | 30.85900 |
| 3/26/2009 | 4:45 | 15:15 | 21h51m16s | -13°23'42" | 40°03'00" | 1.000 | 30.78871 |
| 4/ 2/2009 | 4:18 | 14:49 | 21h52m05s | -13°19'38" | 46°45'50" | 1.000 | 30.70764 |
| 4/ 9/2009 | 3:51 | 14:22 | 21h52m49s | -13°15'56" | 53°27'55" | 1.000 | 30.61703 |
| 4/16/2009 | 3:24 | 13:56 | 21h53m28s | -13°12'39" | 60°09'33" | 1.000 | 30.51816 |
| 4/23/2009 | 2:57 | 13:29 | 21h54m02s | -13°09'49" | 66°51'06" | 1.000 | 30.41228 |
| 4/30/2009 | 2:29 | 13:02 | 21h54m31s | -13°07'29" | 73°32'37" | 1.000 | 30.30089 |
| 5/ 7/2009 | 2:02 | 12:35 | 21h54m53s | -13°05'39" | 80°14'01" | 1.000 | 30.18558 |
| 5/14/2009 | 1:35 | 12:08 | 21h55m10s | -13°04'21" | 86°55'32" | 1.000 | 30.06796 |
| 5/21/2009 | 1:07 | 11:40 | 21h55m21s | -13°03'36" | 93°37'33" | 1.000 | 29.94953 |
| 5/28/2009 | 0:40 | 11:13 | 21h55m25s | -13°03'23" | 100°20'13" | 1.000 | 29.83196 |
| 6/ 4/2009 | 0:12 | 10:45 | 21h55m23s | -13°03'43" | 107°03'24" | 1.000 | 29.71695 |
| 6/11/2009 | 23:41 | 10:18 | 21h55m16s | -13°04'35" | 113°47'12" | 1.000 | 29.60610 |
| 6/18/2009 | 23:13 | 9:50 | 21h55m02s | -13°05'58" | 120°32'01" | 1.000 | 29.50086 |
| 6/25/2009 | 22:45 | 9:22 | 21h54m43s | -13°07'49" | 127°18'00" | 1.000 | 29.40275 |
| 7/ 2/2009 | 22:18 | 8:54 | 21h54m18s | -13°10'08" | 134°04'58" | 1.000 | 29.31326 |
| 7/ 9/2009 | 21:50 | 8:26 | 21h53m49s | -13°12'51" | 140°52'53" | 1.000 | 29.23366 |
| 7/16/2009 | 21:22 | 7:57 | 21h53m15s | -13°15'55" | 147°42'02" | 1.000 | 29.16501 |
| 7/23/2009 | 20:54 | 7:29 | 21h52m38s | -13°19'17" | 154°32'35" | 1.000 | 29.10839 |
| 7/30/2009 | 20:26 | 7:01 | 21h51m58s | -13°22'54" | 161°24'17" | 1.000 | 29.06474 |
| 8/ 6/2009 | 19:58 | 6:32 | 21h51m16s | -13°26'41" | 168°16'54" | 1.000 | 29.03468 |
| 8/13/2009 | 19:30 | 6:04 | 21h50m33s | -13°30'35" | 175°10'12" | 1.000 | 29.01863 |
| 8/20/2009 | 19:02 | 5:35 | 21h49m48s | -13°34'30" | 177°50'59" | 1.000 | 29.01693 |
| 8/27/2009 | 18:34 | 5:07 | 21h49m04s | -13°38'23" | 170°56'31" | 1.000 | 29.02974 |
| 9/ 3/2009 | 18:06 | 4:38 | 21h48m21s | -13°42'08" | 163°59'40" | 1.000 | 29.05685 |
| 9/10/2009 | 17:38 | 4:10 | 21h47m40s | -13°45'44" | 157°01'50" | 1.000 | 29.09786 |
| 9/17/2009 | 17:10 | 3:41 | 21h47m01s | -13°49'04" | 150°03'00" | 1.000 | 29.15226 |
| 9/24/2009 | 16:42 | 3:13 | 21h46m26s | -13°52'06" | 143°03'23" | 1.000 | 29.21935 |
| 10/ 1/2009 | 16:14 | 2:45 | 21h45m55s | -13°54'46" | 136°03'23" | 1.000 | 29.29809 |
| 10/ 8/2009 | 15:46 | 2:17 | 21h45m29s | -13°57'01" | 129°03'03" | 1.000 | 29.38729 |
| 10/15/2009 | 15:19 | 1:49 | 21h45m07s | -13°58'49" | 122°02'16" | 1.000 | 29.48572 |
| 10/22/2009 | 14:51 | 1:21 | 21h44m52s | -14°00'07" | 115°01'09" | 1.000 | 29.59198 |
| 10/29/2009 | 14:23 | 0:53 | 21h44m43s | -14°00'53" | 108°00'06" | 1.000 | 29.70441 |
| 11/ 5/2009 | 13:56 | 0:26 | 21h44m39s | -14°01'07" | 100°59'16" | 1.000 | 29.82130 |

Midway, UT Latitude: 40°31'00" N Longitude: 111°27'30" W
 Local Time = UT - 7.00 hours Elevation: 1707 meters Year 2009

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|------------|-------|-------|-----------|------------|-----------|-------|----------|
| 11/12/2009 | 13:28 | 23:54 | 21h44m43s | -14°00'48" | 93°58'31" | 1.000 | 29.94101 |
| 11/19/2009 | 13:01 | 23:27 | 21h44m53s | -13°59'56" | 86°57'54" | 1.000 | 30.06179 |
| 11/26/2009 | 12:34 | 23:00 | 21h45m09s | -13°58'31" | 79°57'47" | 1.000 | 30.18178 |
| 12/ 3/2009 | 12:06 | 22:33 | 21h45m32s | -13°56'33" | 72°58'22" | 1.000 | 30.29917 |
| 12/10/2009 | 11:39 | 22:06 | 21h46m01s | -13°54'04" | 65°59'34" | 1.000 | 30.41232 |
| 12/17/2009 | 11:12 | 21:39 | 21h46m35s | -13°51'05" | 59°01'19" | 1.000 | 30.51961 |
| 12/24/2009 | 10:45 | 21:13 | 21h47m15s | -13°47'39" | 52°03'55" | 1.000 | 30.61938 |
| 12/31/2009 | 10:18 | 20:46 | 21h48m00s | -13°43'48" | 45°07'39" | 1.000 | 30.71020 |

Pluto

| Date | Rise | Set | RA | Dec | Elongation | Ill Fr | DIST(AU) |
|------------|-------|-------|-----------|------------|------------|--------|----------|
| 1/ 1/2009 | 6:46 | 16:44 | 18h05m15s | -17°44'38" | 11°00'52" | 1.000 | 32.54136 |
| 1/ 8/2009 | 6:20 | 16:17 | 18h06m18s | -17°44'53" | 17°15'54" | 1.000 | 32.51790 |
| 1/15/2009 | 5:53 | 15:51 | 18h07m19s | -17°44'59" | 23°51'47" | 1.000 | 32.48078 |
| 1/22/2009 | 5:26 | 15:24 | 18h08m18s | -17°44'54" | 30°35'22" | 1.000 | 32.43055 |
| 1/29/2009 | 5:00 | 14:58 | 18h09m14s | -17°44'41" | 37°22'38" | 1.000 | 32.36787 |
| 2/ 5/2009 | 4:33 | 14:31 | 18h10m06s | -17°44'21" | 44°11'44" | 1.000 | 32.29375 |
| 2/12/2009 | 4:06 | 14:04 | 18h10m53s | -17°43'54" | 51°01'50" | 1.000 | 32.20938 |
| 2/19/2009 | 3:40 | 13:38 | 18h11m36s | -17°43'22" | 57°52'44" | 1.000 | 32.11596 |
| 2/26/2009 | 3:13 | 13:11 | 18h12m13s | -17°42'45" | 64°44'16" | 1.000 | 32.01484 |
| 3/ 5/2009 | 2:46 | 12:44 | 18h12m44s | -17°42'06" | 71°36'00" | 1.000 | 31.90757 |
| 3/12/2009 | 2:18 | 12:17 | 18h13m10s | -17°41'25" | 78°27'42" | 1.000 | 31.79582 |
| 3/19/2009 | 1:51 | 11:50 | 18h13m28s | -17°40'43" | 85°19'27" | 1.000 | 31.68120 |
| 3/26/2009 | 1:24 | 11:22 | 18h13m41s | -17°40'03" | 92°11'21" | 1.000 | 31.56534 |
| 4/ 2/2009 | 0:56 | 10:55 | 18h13m47s | -17°39'25" | 99°03'08" | 1.000 | 31.45004 |
| 4/ 9/2009 | 0:29 | 10:27 | 18h13m46s | -17°38'51" | 105°54'33" | 1.000 | 31.33707 |
| 4/16/2009 | 0:01 | 10:00 | 18h13m39s | -17°38'20" | 112°45'38" | 1.000 | 31.22804 |
| 4/23/2009 | 23:29 | 9:32 | 18h13m25s | -17°37'56" | 119°36'31" | 1.000 | 31.12452 |
| 4/30/2009 | 23:01 | 9:04 | 18h13m06s | -17°37'38" | 126°26'57" | 1.000 | 31.02810 |
| 5/ 7/2009 | 22:33 | 8:36 | 18h12m41s | -17°37'27" | 133°16'28" | 1.000 | 30.94029 |
| 5/14/2009 | 22:05 | 8:08 | 18h12m12s | -17°37'24" | 140°04'49" | 1.000 | 30.86232 |
| 5/21/2009 | 21:37 | 7:40 | 18h11m38s | -17°37'29" | 146°51'38" | 1.000 | 30.79529 |
| 5/28/2009 | 21:09 | 7:12 | 18h11m00s | -17°37'43" | 153°35'43" | 1.000 | 30.74030 |
| 6/ 4/2009 | 20:41 | 6:44 | 18h10m19s | -17°38'06" | 160°14'00" | 1.000 | 30.69822 |
| 6/11/2009 | 20:13 | 6:15 | 18h09m36s | -17°38'38" | 166°38'22" | 1.000 | 30.66961 |
| 6/18/2009 | 19:45 | 5:47 | 18h08m52s | -17°39'19" | 172°14'13" | 1.000 | 30.65487 |
| 6/25/2009 | 19:16 | 5:19 | 18h08m07s | -17°40'09" | 174°00'31" | 1.000 | 30.65435 |
| 7/ 2/2009 | 18:48 | 4:51 | 18h07m22s | -17°41'08" | 169°44'28" | 1.000 | 30.66812 |
| 7/ 9/2009 | 18:20 | 4:22 | 18h06m38s | -17°42'15" | 163°37'48" | 1.000 | 30.69592 |
| 7/16/2009 | 17:52 | 3:54 | 18h05m56s | -17°43'31" | 157°06'38" | 1.000 | 30.73737 |
| 7/23/2009 | 17:24 | 3:26 | 18h05m17s | -17°44'53" | 150°27'10" | 1.000 | 30.79201 |
| 7/30/2009 | 16:56 | 2:57 | 18h04m40s | -17°46'23" | 143°44'16" | 1.000 | 30.85911 |
| 8/ 6/2009 | 16:28 | 2:29 | 18h04m08s | -17°48'00" | 136°59'53" | 1.000 | 30.93766 |
| 8/13/2009 | 16:00 | 2:01 | 18h03m41s | -17°49'41" | 130°14'36" | 1.000 | 31.02658 |
| 8/20/2009 | 15:32 | 1:33 | 18h03m18s | -17°51'28" | 123°28'37" | 1.000 | 31.12475 |
| 8/27/2009 | 15:05 | 1:05 | 18h03m01s | -17°53'18" | 116°42'20" | 1.000 | 31.23082 |
| 9/ 3/2009 | 14:37 | 0:37 | 18h02m50s | -17°55'11" | 109°56'05" | 1.000 | 31.34324 |
| 9/10/2009 | 14:10 | 0:10 | 18h02m46s | -17°57'05" | 103°09'46" | 1.000 | 31.46047 |
| 9/17/2009 | 13:42 | 23:38 | 18h02m47s | -17°59'01" | 96°23'11" | 1.000 | 31.58101 |
| 9/24/2009 | 13:15 | 23:11 | 18h02m55s | -18°00'56" | 89°36'25" | 1.000 | 31.70317 |
| 10/ 1/2009 | 12:48 | 22:43 | 18h03m10s | -18°02'50" | 82°49'42" | 1.000 | 31.82519 |
| 10/ 8/2009 | 12:21 | 22:16 | 18h03m31s | -18°04'41" | 76°03'00" | 1.000 | 31.94543 |
| 10/15/2009 | 11:54 | 21:49 | 18h03m58s | -18°06'28" | 69°16'01" | 1.000 | 32.06230 |
| 10/22/2009 | 11:27 | 21:22 | 18h04m31s | -18°08'11" | 62°28'48" | 1.000 | 32.17419 |
| 10/29/2009 | 11:00 | 20:55 | 18h05m10s | -18°09'48" | 55°41'40" | 1.000 | 32.27945 |

Midway, UT Latitude: 40°31'00" N Longitude: 111°27'30" W
Local Time = UT - 7.00 hours Elevation: 1707 meters Year 2009

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| | | | | | | | |
|------------|-------|-------|-----------|------------|-----------|-------|----------|
| 11/ 5/2009 | 10:33 | 20:28 | 18h05m54s | -18°11'18" | 48°54'43" | 1.000 | 32.37668 |
| 11/12/2009 | 10:07 | 20:01 | 18h06m43s | -18°12'41" | 42°07'53" | 1.000 | 32.46460 |
| 11/19/2009 | 9:40 | 19:34 | 18h07m36s | -18°13'55" | 35°21'28" | 1.000 | 32.54198 |
| 11/26/2009 | 9:14 | 19:08 | 18h08m32s | -18°15'01" | 28°36'25" | 1.000 | 32.60765 |
| 12/ 3/2009 | 8:47 | 18:41 | 18h09m31s | -18°15'56" | 21°54'26" | 1.000 | 32.66077 |
| 12/10/2009 | 8:21 | 18:15 | 18h10m33s | -18°16'43" | 15°19'42" | 1.000 | 32.70068 |
| 12/17/2009 | 7:54 | 17:48 | 18h11m36s | -18°17'19" | 9°09'00" | 1.000 | 32.72679 |
| 12/24/2009 | 7:28 | 17:22 | 18h12m40s | -18°17'45" | 5°09'38" | 1.000 | 32.73869 |
| 12/31/2009 | 7:02 | 16:55 | 18h13m44s | -18°18'02" | 7°59'31" | 1.000 | 32.73630 |

Planet Apsides Report for 2009

Earth

| | | | |
|-----------|------------|--------------------|---------|
| 1/ 3/2009 | Perihelion | Distance from Sun: | 0.98 AU |
| 7/ 4/2009 | Aphelion | Distance from Sun: | 1.02 AU |

Mercury

| | | | |
|------------|------------|--------------------|---------|
| 1/13/2009 | Perihelion | Distance from Sun: | 0.31 AU |
| 4/11/2009 | Perihelion | Distance from Sun: | 0.31 AU |
| 7/ 8/2009 | Perihelion | Distance from Sun: | 0.31 AU |
| 10/ 4/2009 | Perihelion | Distance from Sun: | 0.31 AU |
| 12/31/2009 | Perihelion | Distance from Sun: | 0.31 AU |
| 2/26/2009 | Aphelion | Distance from Sun: | 0.47 AU |
| 5/25/2009 | Aphelion | Distance from Sun: | 0.47 AU |
| 8/21/2009 | Aphelion | Distance from Sun: | 0.47 AU |
| 11/17/2009 | Aphelion | Distance from Sun: | 0.47 AU |

Venus

| | | | |
|------------|------------|--------------------|---------|
| 2/21/2009 | Perihelion | Distance from Sun: | 0.72 AU |
| 10/ 3/2009 | Perihelion | Distance from Sun: | 0.72 AU |
| 6/13/2009 | Aphelion | Distance from Sun: | 0.73 AU |

Mars

| | | | |
|-----------|------------|--------------------|---------|
| 4/21/2009 | Perihelion | Distance from Sun: | 1.38 AU |
|-----------|------------|--------------------|---------|

Jupiter

No Apsis

Saturn

No Apsis

Planet Conjunction/Opposition Report for 1/ 1/2009 to 12/31/2009

Mercury

| Date | Hour | Event |
|------------|------|------------------------------------|
| 1/20/2009 | 17 | Inferior Conjunction |
| 3/30/2009 | 20 | Superior Conjunction |
| 5/18/2009 | 3 | Inferior Conjunction |
| 7/13/2009 | 19 | Superior Conjunction |
| 9/20/2009 | 3 | Inferior Conjunction |
| 11/ 5/2009 | 1 | Superior Conjunction (Occultation) |

Venus

| Date | Hour | Event |
|------|------|-------|
|------|------|-------|

Midway, UT Latitude: 40°31'00" N Longitude: 111°27'30" W
 Local Time = UT - 7.00 hours Elevation: 1707 meters Year 2009

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Pluto 39.44 248 years 17.2° 2200-2300

Moon Apsides Report for 1/ 1/2009 to 12/31/2009

| Date | Hour | Apsis | Distance (km) | Diameter |
|------------|------|---------|---------------|----------|
| 1/10/2009 | 4 | Perigee | 357506 | 0.5571° |
| 1/22/2009 | 17 | Apogee | 406122 | 0.4904° |
| 2/ 7/2009 | 13 | Perigee | 361468 | 0.5510° |
| 2/19/2009 | 10 | Apogee | 405145 | 0.4916° |
| 3/ 7/2009 | 8 | Perigee | 367005 | 0.5427° |
| 3/19/2009 | 6 | Apogee | 404305 | 0.4926° |
| 4/ 1/2009 | 19 | Perigee | 370027 | 0.5382° |
| 4/16/2009 | 2 | Apogee | 404223 | 0.4927° |
| 4/27/2009 | 23 | Perigee | 366043 | 0.5441° |
| 5/13/2009 | 20 | Apogee | 404926 | 0.4918° |
| 5/25/2009 | 21 | Perigee | 361156 | 0.5514° |
| 6/10/2009 | 9 | Apogee | 405795 | 0.4908° |
| 6/23/2009 | 4 | Perigee | 358021 | 0.5563° |
| 7/ 7/2009 | 15 | Apogee | 406200 | 0.4903° |
| 7/21/2009 | 13 | Perigee | 357469 | 0.5571° |
| 8/ 3/2009 | 17 | Apogee | 406029 | 0.4905° |
| 8/18/2009 | 22 | Perigee | 359638 | 0.5538° |
| 8/31/2009 | 4 | Apogee | 405286 | 0.4914° |
| 9/16/2009 | 1 | Perigee | 364052 | 0.5471° |
| 9/27/2009 | 21 | Apogee | 404422 | 0.4924° |
| 10/13/2009 | 6 | Perigee | 369078 | 0.5396° |
| 10/25/2009 | 16 | Apogee | 404164 | 0.4928° |
| 11/ 7/2009 | 0 | Perigee | 368908 | 0.5399° |
| 11/22/2009 | 13 | Apogee | 404744 | 0.4921° |
| 12/ 4/2009 | 7 | Perigee | 363461 | 0.5479° |
| 12/20/2009 | 8 | Apogee | 405730 | 0.4909° |

Meteor Showers Report for 1/ 1/2009 to 12/31/2009

| Date | Meteor Shower | ZHR | RA | DEC | Illum. Frac. | Longitude |
|-----------|--------------------|-----|--------|------|--------------|-----------|
| 1/ 3/2009 | Quadrantids | 80 | 15h28m | 50° | 0.42 | 284° |
| 4/11/2009 | Virginids | 5 | 14h04m | -9° | 0.95 | 22° |
| 4/21/2009 | Lyrids | 12 | 18h08m | 32° | 0.14 | 32° |
| 4/27/2009 | alpha-Scorpiids | 5 | 16h32m | -24° | 0.09 | 38° |
| 5/ 4/2009 | eta-Aquarids | 35 | 22h20m | -1° | 0.80 | 45° |
| 5/12/2009 | alpha-Scorpiids | 5 | 16h04m | -24° | 0.88 | 52° |
| 6/ 9/2009 | Ophiuchids | 5 | 17h56m | -23° | 0.97 | 79° |
| 6/19/2009 | Ophiuchids | 5 | 17h20m | -20° | 0.14 | 89° |
| 7/ 7/2009 | Capricornids | 5 | | | 1.00 | 106° |
| 7/14/2009 | Capricornids | 5 | 20h44m | -15° | 0.57 | 113° |
| 7/20/2009 | alpha-Cygnids | 5 | 21h00m | 48° | 0.03 | 118° |
| 7/25/2009 | Capricornids | 5 | 21h00m | -15° | 0.18 | 123° |
| 7/28/2009 | delta-Aquarids | 20 | 22h36m | -17° | 0.48 | 126° |
| 7/30/2009 | Piscis Australids | 5 | 22h40m | -30° | 0.68 | 128° |
| 8/ 1/2009 | alpha-Capricornids | 5 | 20h36m | -10° | 0.84 | 130° |
| 8/ 5/2009 | iota-Aquarids | 8 | 22h10m | -15° | 1.00 | 134° |
| 8/12/2009 | Perseids | 75 | 3h04m | 58° | 0.62 | 140° |
| 8/20/2009 | alpha-Cygnids | 5 | 21h00m | 48° | 0.00 | 148° |
| 9/ 8/2009 | Piscids | 10 | 0h36m | 7° | 0.84 | 166° |
| 9/20/2009 | Piscids | 5 | 0h24m | 0° | 0.05 | 178° |

Midway, UT Latitude: 40°31'00" N Longitude: 111°27'30" W
 Local Time = UT - 7.00 hours Elevation: 1707 meters Year 2009

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| | | | | | | |
|------------|----------------|----|--------|------|------|------|
| 10/12/2009 | Piscids | ?? | 1h44m | 14° | 0.35 | 200° |
| 10/21/2009 | Orionids | 25 | 6h24m | 15° | 0.13 | 209° |
| 11/ 2/2009 | Taurids | 8 | 3h44m | 14° | 1.00 | 221° |
| 11/17/2009 | Leonids | 10 | 10h08m | 22° | 0.01 | 236° |
| 12/ 8/2009 | Puppids-Velids | 15 | 9h00m | -48° | 0.53 | 257° |
| 12/13/2009 | Geminids | 75 | 7h28m | 32° | 0.08 | 262° |
| 12/22/2009 | Ursids | 5 | 14h28m | 78° | 0.31 | 271° |
| 12/25/2009 | Puppids-Velids | 15 | 9h20m | -65° | 0.60 | 274° |

Twilight Report for 1/ 1/2009 to 12/31/2009

| Date | Sun | | Astronomical | | Nautical | | Civil | |
|------------|------|-------|--------------|-------|----------|-------|-------|-------|
| | Rise | Set | Begin | End | Begin | End | Begin | End |
| 1/ 1/2009 | 7:49 | 17:10 | 6:07 | 18:53 | 6:40 | 18:20 | 7:14 | 17:46 |
| 1/ 8/2009 | 7:49 | 17:17 | 6:07 | 18:59 | 6:40 | 18:26 | 7:14 | 17:52 |
| 1/15/2009 | 7:47 | 17:24 | 6:06 | 19:05 | 6:39 | 18:32 | 7:12 | 17:59 |
| 1/22/2009 | 7:43 | 17:32 | 6:04 | 19:12 | 6:36 | 18:40 | 7:09 | 18:07 |
| 1/29/2009 | 7:38 | 17:41 | 5:59 | 19:19 | 6:31 | 18:47 | 7:04 | 18:14 |
| 2/ 5/2009 | 7:31 | 17:49 | 5:54 | 19:27 | 6:26 | 18:55 | 6:58 | 18:22 |
| 2/12/2009 | 7:23 | 17:58 | 5:47 | 19:34 | 6:18 | 19:02 | 6:50 | 18:30 |
| 2/19/2009 | 7:14 | 18:06 | 5:38 | 19:42 | 6:10 | 19:10 | 6:41 | 18:38 |
| 2/26/2009 | 7:04 | 18:14 | 5:29 | 19:49 | 6:00 | 19:18 | 6:32 | 18:46 |
| 3/ 5/2009 | 6:53 | 18:22 | 5:18 | 19:57 | 5:50 | 19:25 | 6:21 | 18:54 |
| 3/12/2009 | 6:42 | 18:30 | 5:07 | 20:05 | 5:39 | 19:33 | 6:10 | 19:01 |
| 3/19/2009 | 6:30 | 18:37 | 4:55 | 20:13 | 5:27 | 19:40 | 5:59 | 19:09 |
| 3/26/2009 | 6:19 | 18:45 | 4:42 | 20:21 | 5:15 | 19:48 | 5:47 | 19:16 |
| 4/ 2/2009 | 6:07 | 18:52 | 4:29 | 20:30 | 5:03 | 19:56 | 5:36 | 19:24 |
| 4/ 9/2009 | 5:56 | 18:59 | 4:16 | 20:39 | 4:51 | 20:05 | 5:24 | 19:31 |
| 4/16/2009 | 5:45 | 19:06 | 4:03 | 20:49 | 4:39 | 20:13 | 5:13 | 19:39 |
| 4/23/2009 | 5:35 | 19:14 | 3:50 | 20:59 | 4:27 | 20:22 | 5:02 | 19:47 |
| 4/30/2009 | 5:26 | 19:21 | 3:37 | 21:10 | 4:16 | 20:31 | 4:52 | 19:55 |
| 5/ 7/2009 | 5:17 | 19:28 | 3:25 | 21:20 | 4:05 | 20:40 | 4:42 | 20:03 |
| 5/14/2009 | 5:10 | 19:35 | 3:14 | 21:31 | 3:56 | 20:49 | 4:34 | 20:11 |
| 5/21/2009 | 5:04 | 19:42 | 3:04 | 21:42 | 3:48 | 20:57 | 4:27 | 20:18 |
| 5/28/2009 | 4:59 | 19:47 | 2:56 | 21:51 | 3:42 | 21:05 | 4:22 | 20:25 |
| 6/ 4/2009 | 4:56 | 19:53 | 2:49 | 21:59 | 3:37 | 21:12 | 4:19 | 20:30 |
| 6/11/2009 | 4:55 | 19:57 | 2:46 | 22:06 | 3:35 | 21:17 | 4:17 | 20:35 |
| 6/18/2009 | 4:55 | 19:59 | 2:45 | 22:10 | 3:34 | 21:20 | 4:17 | 20:38 |
| 6/25/2009 | 4:57 | 20:00 | 2:46 | 22:11 | 3:36 | 21:21 | 4:18 | 20:39 |
| 7/ 2/2009 | 5:00 | 20:00 | 2:51 | 22:09 | 3:40 | 21:20 | 4:22 | 20:38 |
| 7/ 9/2009 | 5:04 | 19:58 | 2:58 | 22:04 | 3:45 | 21:17 | 4:26 | 20:36 |
| 7/16/2009 | 5:09 | 19:54 | 3:06 | 21:57 | 3:52 | 21:12 | 4:32 | 20:31 |
| 7/23/2009 | 5:15 | 19:49 | 3:16 | 21:48 | 4:00 | 21:05 | 4:39 | 20:25 |
| 7/30/2009 | 5:21 | 19:43 | 3:26 | 21:38 | 4:08 | 20:56 | 4:46 | 20:18 |
| 8/ 6/2009 | 5:28 | 19:35 | 3:36 | 21:26 | 4:17 | 20:46 | 4:53 | 20:09 |
| 8/13/2009 | 5:35 | 19:26 | 3:47 | 21:14 | 4:25 | 20:35 | 5:01 | 20:00 |
| 8/20/2009 | 5:42 | 19:16 | 3:57 | 21:01 | 4:34 | 20:24 | 5:08 | 19:49 |
| 8/27/2009 | 5:49 | 19:05 | 4:06 | 20:47 | 4:42 | 20:12 | 5:16 | 19:38 |
| 9/ 3/2009 | 5:55 | 18:54 | 4:15 | 20:34 | 4:50 | 19:59 | 5:23 | 19:26 |
| 9/10/2009 | 6:02 | 18:43 | 4:24 | 20:21 | 4:58 | 19:47 | 5:30 | 19:14 |
| 9/17/2009 | 6:09 | 18:31 | 4:32 | 20:07 | 5:05 | 19:35 | 5:37 | 19:03 |
| 9/24/2009 | 6:16 | 18:19 | 4:40 | 19:55 | 5:12 | 19:22 | 5:44 | 18:51 |
| 10/ 1/2009 | 6:23 | 18:07 | 4:48 | 19:42 | 5:20 | 19:11 | 5:51 | 18:39 |
| 10/ 8/2009 | 6:30 | 17:56 | 4:55 | 19:31 | 5:27 | 18:59 | 5:58 | 18:28 |
| 10/15/2009 | 6:37 | 17:45 | 5:02 | 19:20 | 5:34 | 18:49 | 6:05 | 18:17 |
| 10/22/2009 | 6:45 | 17:35 | 5:09 | 19:11 | 5:41 | 18:39 | 6:13 | 18:07 |

Midway, UT Latitude: 40°31'00" N Longitude: 111°27'30" W
Local Time = UT - 7.00 hours Elevation: 1707 meters Year 2009

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| | | | | | | | | |
|------------|------|-------|------|-------|------|-------|------|-------|
| 10/29/2009 | 6:53 | 17:26 | 5:16 | 19:02 | 5:48 | 18:30 | 6:20 | 17:58 |
| 11/ 5/2009 | 7:01 | 17:18 | 5:24 | 18:55 | 5:55 | 18:23 | 6:28 | 17:51 |
| 11/12/2009 | 7:09 | 17:11 | 5:31 | 18:49 | 6:03 | 18:17 | 6:35 | 17:44 |
| 11/19/2009 | 7:17 | 17:05 | 5:37 | 18:45 | 6:10 | 18:13 | 6:43 | 17:39 |
| 11/26/2009 | 7:25 | 17:01 | 5:44 | 18:42 | 6:17 | 18:10 | 6:50 | 17:36 |
| 12/ 3/2009 | 7:32 | 16:59 | 5:50 | 18:41 | 6:23 | 18:08 | 6:57 | 17:35 |
| 12/10/2009 | 7:39 | 16:59 | 5:56 | 18:42 | 6:29 | 18:09 | 7:03 | 17:35 |
| 12/17/2009 | 7:44 | 17:01 | 6:00 | 18:44 | 6:34 | 18:11 | 7:08 | 17:37 |
| 12/24/2009 | 7:47 | 17:04 | 6:04 | 18:47 | 6:37 | 18:14 | 7:11 | 17:40 |
| 12/31/2009 | 7:49 | 17:09 | 6:06 | 18:52 | 6:39 | 18:19 | 7:13 | 17:45 |