

## LUNAR OCCULTATIONS OF PLANETS, BRIGHT STARS, AND THE SUN

### January 4, 2024

The moon, as our nearest neighbor, sometimes blocks the light coming from a planet, a star, or the sun. Occultations and solar eclipses are listed below for 2024 through 2025. The name of the planet or star, along with its visual magnitude, is listed along with the percentage of the moon's disk that is illuminated at the time, and the phase of the moon. The date and time (MST) when the geocentric angle between the center of the moon and the center of the planet or star is minimal (mid-point of the occultation), and the angle of separation are also listed. **NOTE: previous editions of this listing should be discarded.**

The date and times (MST) when the occultation first commences, and last ends, for the first and last observations on earth are listed, followed by the longitude and latitude of the location where the line from the object's center through the moon's center strikes the surface of the earth at mid-occultation.

If the occultation is visible, in whole or in part, from **The Journey Museum and Learning Center (JMLC)**, the times (MST) of the various stages are listed along with the altitude above the horizon, and the azimuth, of the object, and the altitude of the sun with respect to the horizon. For occultations of Venus and solar eclipses, when the object is above the horizon, and for other objects when the object is above the horizon, but not the sun (this is noted with three asterisks (\*\*\*)). If, on the other hand, the Moon is visible when the object in question appears closest to the Moon, but the planet or star is not occulted because of perspective, then the angle between the edge of the Moon and the edge of the object (the miss angle) is listed. *If MDT is required, add one hour to the listed time. For UTC, add 7 hours.*

Note: The calculations for "global events" are made in terms of Terrestrial Time (TT), but listed in UTC or a derivative such as MST or EST. Therefore, they are dependent on DUTC ( $DUTC = TT - UTC$ ) which for dates more than a few months into the future can only be predicted. For observations at a particular location, and for predictions of where to observe an occultation or eclipse, the Earth's rotational position is also needed, and thus DUT1 ( $DUT1 = TT - UT1$ ) is involved which again can only be estimated for dates in the future. Also, a number of other factors are involved in the computation of an occultation, and the results given here for more than a year in the future could be off by a few seconds. In addition, direct visual observation can be uncertain in terms of reaction time, plus establishing the accuracy of the clock an observer uses can require considerable effort.

The values of DUTC ( $TT - UTC$ ) and DUT1 ( $TT - UT1$ ), are shown in seconds.

**N.B. This edition replaces all previous editions.**

**Reference location: Journey Museum 103.2187W 44.0866N**  
**A "miss angle" is the angle between the edges of the Moon and the object.**  
**Selected stars are magnitude 3.5 or brighter.**

Occultation of 30 eta Leonis 3.48 by moon 83% illuminated at phase= 229 degrees  
12/31/2023 01:15:15.6 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.175  
Global start/end: 12/30/2023 23:41:41.4 and 12/31/2023 02:48:51.7  
Mid-occultation observing point 105.124W 47.375S  
At Journey Museum, the miss angle is 3066.7 arc-sec at 12/30/2023 23:51:23.5

Occultation of 20 sigma Scorpii 2.9 by moon 11% illuminated at phase= 320 degrees  
01/08/2024 04:45:39.4 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.176  
Global start/end: 01/08/2024 02:40:13.2 and 01/08/2024 06:51:00.0  
Mid-occultation observing point 33.685W 5.215S

Occultation of Antares 1.06 by moon 10% illuminated at phase= 322 degrees  
01/08/2024 08:16:42.0 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.176  
Global start/end: 01/08/2024 06:34:28.0 and 01/08/2024 09:58:50.1  
Mid-occultation observing point 78.675W 24.887N

**---For observations at Journey Museum:**

**01/08/2024 06:47:13.7 Start Total (elev 12 az 147 deg.) -7.3 \*\*\***  
01/08/2024 07:23:48.8 OCCULTATION MID-POINT (elev 15 az 155 deg.) -0.8  
01/08/2024 08:01:54.3 End Total (elev 18 az 163 deg.) 4.5

Occultation of Alcyone 2.85 by moon 75% illuminated at phase= 120 degrees  
01/20/2024 07:39:36.9 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.178  
Global start/end: 01/20/2024 05:56:21.6 and 01/20/2024 09:22:55.0  
Mid-occultation observing point 92.364E 27.19S

Occultation of Elnath 1.65 by moon 89% illuminated at phase= 141 degrees  
01/22/2024 01:32:17.0 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.178  
Global start/end: 01/22/2024 00:03:13.9 and 01/22/2024 03:01:21.9  
Mid-occultation observing point 160.185W 43.986S  
At Journey Museum, the miss angle is 3950.6 arc-sec at 01/22/2024 02:28:24.3

Occultation of 30 eta Leonis 3.48 by moon 97% illuminated at phase= 201 degrees  
01/27/2024 08:32:31.3 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.179  
Global start/end: 01/27/2024 07:26:36.9 and 01/27/2024 09:38:26.5  
Mid-occultation observing point 93.507E 61.964S

Occultation of 20 sigma Scorpii 2.9 by moon 31% illuminated at phase= 293 degrees  
02/04/2024 14:27:42.0 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.18  
Global start/end: 02/04/2024 12:15:38.3 and 02/04/2024 16:39:42.4  
Mid-occultation observing point 150.888E 18.646S

Occultation of Antares 1.06 by moon 29% illuminated at phase= 294 degrees  
02/04/2024 18:04:15.0 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.18  
Global start/end: 02/04/2024 16:05:52.2 and 02/04/2024 20:02:31.0  
Mid-occultation observing point 103.772E 7.688N

Occultation of 27 phi Sagittarii 3.17 by moon 10% illuminated at phase= 323 degrees  
02/06/2024 22:57:38.8 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.18  
Global start/end: 02/06/2024 21:52:36.7 and 02/07/2024 00:02:38.1  
Mid-occultation observing point 133.159W 61.659S

Occultation of 40 tau Sagittarii 3.32 by moon 8% illuminated at phase= 327 degrees  
02/07/2024 06:43:54.9 Geocentric minimum 0.0 degrees. DUTC= 69.184 DUT1= 69.18  
Global start/end: 02/07/2024 04:37:25.9 and 02/07/2024 08:50:22.5  
Mid-occultation observing point 56.201W 26.669S

Occultation of Alcyone 2.85 by moon 53% illuminated at phase= 93 degrees  
02/16/2024 13:18:41.8 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.181  
Global start/end: 02/16/2024 11:19:03.3 and 02/16/2024 15:18:25.1  
Mid-occultation observing point 25.07W 7.446S  
At Journey Museum, the miss angle is 3556.8 arc-sec at 02/16/2024 12:44:17.8

Occultation of Elnath 1.65 by moon 70% illuminated at phase= 114 degrees  
02/18/2024 07:01:57.3 Geocentric minimum 0.7 degrees. DUTC= 69.184 DUT1= 69.181  
Global start/end: 02/18/2024 05:12:06.4 and 02/18/2024 08:51:51.7  
Mid-occultation observing point 87.51E 19.007S

Occultation of 30 eta Leonis 3.48 by moon 100% illuminated at phase= 173 degrees  
02/23/2024 14:57:45.6 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.182  
Global start/end: 02/23/2024 13:57:52.6 and 02/23/2024 15:57:38.9  
Mid-occultation observing point 29.921W 61.793S

Occultation of 20 sigma Scorpii 2.9 by moon 54% illuminated at phase= 265 degrees  
03/02/2024 22:19:05.6 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.183  
Global start/end: 03/02/2024 20:04:44.6 and 03/03/2024 00:33:25.5  
Mid-occultation observing point 3.114E 30.814S

Occultation of Antares 1.06 by moon 53% illuminated at phase= 267 degrees  
03/03/2024 02:01:56.5 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.183  
Global start/end: 03/02/2024 23:53:04.8 and 03/03/2024 04:10:44.0  
Mid-occultation observing point 45.112W 5.68S

Occultation of 27 phi Sagittarii 3.17 by moon 29% illuminated at phase= 295 degrees  
03/05/2024 08:40:19.8 Geocentric minimum 1.2 degrees. DUTC= 69.184 DUT1= 69.184  
Global start/end: 03/05/2024 08:34:27.7 and 03/05/2024 08:46:12.0  
Mid-occultation observing point 0.0E 0.0N

Occultation of 40 tau Sagittarii 3.32 by moon 26% illuminated at phase= 299 degrees  
03/05/2024 16:41:27.6 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.184  
Global start/end: 03/05/2024 14:33:22.9 and 03/05/2024 18:49:29.1  
Mid-occultation observing point 128.611E 35.258S

Occultation of Alcyone 2.85 by moon 29% illuminated at phase= 65 degrees  
03/14/2024 20:52:19.8 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.186  
Global start/end: 03/14/2024 18:47:49.3 and 03/14/2024 22:56:56.0  
Mid-occultation observing point 168.273W 3.547N  
At Journey Museum, the miss angle is 1782.2 arc-sec at 03/14/2024 22:10:53.7

Occultation of Elnath 1.65 by moon 47% illuminated at phase= 86 degrees  
03/16/2024 13:30:44.3 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.186  
Global start/end: 03/16/2024 11:30:54.3 and 03/16/2024 15:30:40.1  
Mid-occultation observing point 37.716W 5.7S  
At Journey Museum, the miss angle is 3038.5 arc-sec at 03/16/2024 12:43:27.9

Occultation of 30 eta Leonis 3.48 by moon 91% illuminated at phase= 146 degrees  
03/21/2024 21:01:13.8 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.188  
Global start/end: 03/21/2024 19:49:02.7 and 03/21/2024 22:13:24.9  
Mid-occultation observing point 147.791W 61.694S

Occultation of 20 sigma Scorpii 2.9 by moon 77% illuminated at phase= 238 degrees  
03/30/2024 04:23:29.3 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.19  
Global start/end: 03/30/2024 02:09:32.5 and 03/30/2024 06:37:25.7  
Mid-occultation observing point 116.286W 35.804S  
At Journey Museum, the miss angle is 2804.6 arc-sec at 03/30/2024 03:53:53.2

Occultation of Antares 1.06 by moon 75% illuminated at phase= 240 degrees  
03/30/2024 08:09:12.4 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.19  
Global start/end: 03/30/2024 05:57:21.8 and 03/30/2024 10:21:01.5  
Mid-occultation observing point 164.754W 10.757S

Occultation of 40 tau Sagittarii 3.32 by moon 48% illuminated at phase= 272 degrees  
04/02/2024 00:18:58.4 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.19  
Global start/end: 04/01/2024 22:09:48.0 and 04/02/2024 02:28:05.9  
Mid-occultation observing point 11.929W 39.794S

Occultation of Saturn 1.1 by moon 8% illuminated at phase= 327 degrees  
04/06/2024 03:18:39.4 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.192  
Global start/end: 04/06/2024 02:10:23.3 and 04/06/2024 04:26:54.0  
Mid-occultation observing point 103.473E 61.456S

Occultation of Venus -3.9 by moon 2% illuminated at phase= 345 degrees  
04/07/2024 09:18:10.5 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.192  
Global start/end: 04/07/2024 07:08:44.7 and 04/07/2024 11:27:35.6  
Mid-occultation observing point 87.424W 17.187N  
At Journey Museum, the miss angle is 461.5 arc-sec at 04/07/2024 09:38:54.2

Eclipse of the Sun -- Global data; DUTC= 69.184 DUT1= 69.193  
04/08/2024 08:42:15.1 Start Partial Solar  
04/08/2024 09:38:52.5 Start Total Solar  
04/08/2024 11:17:19.5 TOTAL SOLAR ECLIPSE MID-POINT  
04/08/2024 12:55:35.7 End Total Solar  
04/08/2024 13:52:20.4 End Partial Solar  
Mid-eclipse observing point 104.151W 25.286N

**---For observations at Journey Museum:**

**04/08/2024 10:38:50.9 Start Partial (elev 50 az 150 deg.) 50.0 \*\*\***  
**04/08/2024 11:48:27.8 ECLIPSE MID-POINT (58.0%) (elev 54 az 177 deg.) 53.5 \*\*\***  
**04/08/2024 12:58:49.0 End Partial (elev 51 az 206 deg.) 50.9 \*\*\***

Occultation of Alcyone 2.85 by moon 11% illuminated at phase= 38 degrees  
04/11/2024 06:33:45.3 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.194  
Global start/end: 04/11/2024 04:30:22.9 and 04/11/2024 08:37:12.9  
Mid-occultation observing point 18.845E 5.531N

Occultation of Elnath 1.65 by moon 25% illuminated at phase= 59 degrees  
04/12/2024 21:57:39.2 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.194  
Global start/end: 04/12/2024 19:57:56.2 and 04/12/2024 23:57:29.0  
Mid-occultation observing point 168.386E 3.158S  
At Journey Museum, the miss angle is 3134.2 arc-sec at 04/12/2024 22:58:25.0

Occultation of 30 eta Leonis 3.48 by moon 74% illuminated at phase= 119 degrees  
04/18/2024 03:29:59.7 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.196  
Global start/end: 04/18/2024 02:15:31.9 and 04/18/2024 04:44:28.1  
Mid-occultation observing point 88.106E 61.677S

Occultation of 20 sigma Scorpii 2.9 by moon 93% illuminated at phase= 211 degrees  
04/26/2024 10:02:01.8 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.199  
Global start/end: 04/26/2024 07:48:22.1 and 04/26/2024 12:15:41.5  
Mid-occultation observing point 132.871E 33.7S

Occultation of Antares 1.06 by moon 92% illuminated at phase= 213 degrees  
04/26/2024 13:46:16.0 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.199  
Global start/end: 04/26/2024 11:36:06.9 and 04/26/2024 15:56:23.9  
Mid-occultation observing point 84.557E 8.491S

Occultation of 40 tau Sagittarii 3.32 by moon 71% illuminated at phase= 245 degrees  
04/29/2024 06:04:15.4 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.2  
Global start/end: 04/29/2024 03:53:37.3 and 04/29/2024 08:14:52.9  
Mid-occultation observing point 125.644W 36.546S  
At Journey Museum, the miss angle is 2378.3 arc-sec at 04/29/2024 07:21:51.8

Occultation of Saturn 1.2 by moon 23% illuminated at phase= 303 degrees  
05/03/2024 16:10:36.4 Geocentric minimum 0.7 degrees. DUTC= 69.184 DUT1= 69.2  
Global start/end: 05/03/2024 14:27:30.3 and 05/03/2024 17:53:39.6  
Mid-occultation observing point 169.4E 47.556S

Occultation of Mars 1.1 by moon 13% illuminated at phase= 318 degrees  
05/04/2024 19:15:48.8 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.2  
Global start/end: 05/04/2024 17:04:57.6 and 05/04/2024 21:26:38.0  
Mid-occultation observing point 101.471E 8.865N

Occultation of Alcyone 2.85 by moon 1% illuminated at phase= 11 degrees  
05/08/2024 16:55:40.8 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.2  
Global start/end: 05/08/2024 14:54:19.2 and 05/08/2024 18:57:06.0  
Mid-occultation observing point 163.028W 2.968N  
At Journey Museum, the miss angle is 1752.1 arc-sec at 05/08/2024 18:12:09.2

Occultation of Elnath 1.65 by moon 8% illuminated at phase= 33 degrees  
05/10/2024 07:42:22.1 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.2  
Global start/end: 05/10/2024 05:47:49.7 and 05/10/2024 09:37:00.4  
Mid-occultation observing point 4.439W 8.254S  
At Journey Museum, the miss angle is 3865.9 arc-sec at 05/10/2024 06:55:55.2

Occultation of 30 eta Leonis 3.48 by moon 52% illuminated at phase= 93 degrees  
05/15/2024 10:53:02.6 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.2  
Global start/end: 05/15/2024 10:05:33.8 and 05/15/2024 11:40:31.9  
Mid-occultation observing point 49.575W 61.686S

Occultation of 20 sigma Scorpii 2.9 by moon 100% illuminated at phase= 185 degrees  
05/23/2024 16:37:26.8 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.2  
Global start/end: 05/23/2024 14:24:21.4 and 05/23/2024 18:50:31.7  
Mid-occultation observing point 8.048E 30.489S

Occultation of Antares 1.06 by moon 100% illuminated at phase= 187 degrees  
05/23/2024 20:18:23.4 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.2  
Global start/end: 05/23/2024 18:11:05.2 and 05/23/2024 22:25:39.0  
Mid-occultation observing point 39.731W 4.9S

Occultation of 27 phi Sagittarii 3.17 by moon 91% illuminated at phase= 215 degrees  
05/26/2024 03:25:37.0 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.2  
Global start/end: 05/26/2024 02:38:51.5 and 05/26/2024 04:12:21.9  
Mid-occultation observing point 51.699E 61.663S

Occultation of 40 tau Sagittarii 3.32 by moon 89% illuminated at phase= 219 degrees  
05/26/2024 11:41:31.8 Geocentric minimum 0.0 degrees. DUTC= 69.184 DUT1= 69.2  
Global start/end: 05/26/2024 09:30:57.5 and 05/26/2024 13:52:07.4  
Mid-occultation observing point 122.033E 28.674S

Occultation of Saturn 1.2 by moon 43% illuminated at phase= 278 degrees  
05/31/2024 01:26:38.4 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.2  
Global start/end: 05/30/2024 23:22:59.5 and 05/31/2024 03:30:15.9  
Mid-occultation observing point 15.676W 23.736S

Occultation of Alcyone 2.85 by moon 2% illuminated at phase= 345 degrees  
06/05/2024 02:11:50.6 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.198  
Global start/end: 06/05/2024 00:09:49.3 and 06/05/2024 04:13:53.6  
Mid-occultation observing point 30.936E 2.736N

Occultation of Spica 0.98 by moon 74% illuminated at phase= 118 degrees  
06/16/2024 12:14:28.1 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.192  
Global start/end: 06/16/2024 11:17:02.0 and 06/16/2024 13:11:53.2  
Mid-occultation observing point 78.433E 61.768N

Occultation of 20 sigma Scorpii 2.9 by moon 97% illuminated at phase= 159 degrees  
06/20/2024 00:39:31.5 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.19  
Global start/end: 06/19/2024 22:27:05.2 and 06/20/2024 02:51:55.5  
Mid-occultation observing point 139.893W 32.363S  
At Journey Museum, the miss angle is 2653.7 arc-sec at 06/20/2024 01:20:30.5

Occultation of Antares 1.06 by moon 97% illuminated at phase= 161 degrees  
06/20/2024 04:18:33.5 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.19  
Global start/end: 06/20/2024 02:10:50.2 and 06/20/2024 06:26:12.7  
Mid-occultation observing point 172.908E 6.571S

Occultation of 27 phi Sagittarii 3.17 by moon 99% illuminated at phase= 189 degrees  
06/22/2024 10:38:33.8 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.189  
Global start/end: 06/22/2024 09:31:39.4 and 06/22/2024 11:45:26.7  
Mid-occultation observing point 83.87W 61.622S

Occultation of 40 tau Sagittarii 3.32 by moon 99% illuminated at phase= 193 degrees  
06/22/2024 18:44:08.7 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.189  
Global start/end: 06/22/2024 16:35:22.5 and 06/22/2024 20:52:54.6  
Mid-occultation observing point 11.316W 22.664S

Occultation of Deneb Algedi 2.85 by moon 83% illuminated at phase= 229 degrees  
06/25/2024 12:54:37.6 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.187  
Global start/end: 06/25/2024 11:56:19.7 and 06/25/2024 13:52:55.3  
Mid-occultation observing point 120.767W 61.684S

Occultation of Saturn 1.1 by moon 65% illuminated at phase= 253 degrees  
06/27/2024 07:56:28.1 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.186  
Global start/end: 06/27/2024 05:48:54.7 and 06/27/2024 10:04:02.1  
Mid-occultation observing point 151.125W 2.504S

Occultation of Alcyone 2.85 by moon 12% illuminated at phase= 319 degrees  
07/02/2024 09:26:05.2 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.183  
Global start/end: 07/02/2024 07:19:36.4 and 07/02/2024 11:32:34.4  
Mid-occultation observing point 106.251W 9.142N  
At Journey Museum, the miss angle is 997.3 arc-sec at 07/02/2024 09:58:32.1

Occultation of Elnath 1.65 by moon 3% illuminated at phase= 340 degrees  
07/04/2024 01:12:27.1 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.182  
Global start/end: 07/03/2024 23:20:20.2 and 07/04/2024 03:04:36.6  
Mid-occultation observing point 39.169E 12.255S

Occultation of Spica 0.98 by moon 52% illuminated at phase= 92 degrees  
07/13/2024 20:19:52.4 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.173  
Global start/end: 07/13/2024 18:40:31.2 and 07/13/2024 21:59:11.7  
Mid-occultation observing point 106.949W 44.229N

**---For observations at Journey Museum:**

07/13/2024 19:44:36.0 Start Total (elev 29 az 213 deg.) -1.8  
**07/13/2024 20:25:13.4 OCCULTATION MID-POINT (elev 24 az 223 deg.) -8.2 \*\*\***  
**07/13/2024 21:04:25.9 End Total (elev 19 az 231 deg.) -13.2 \*\*\***

Occultation of 20 sigma Scorpii 2.9 by moon 84% illuminated at phase= 133 degrees  
07/17/2024 09:39:23.8 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.17  
Global start/end: 07/17/2024 07:28:42.2 and 07/17/2024 11:50:00.7  
Mid-occultation observing point 55.525E 41.204S

Occultation of Antares 1.06 by moon 85% illuminated at phase= 134 degrees  
07/17/2024 13:19:43.7 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.17  
Global start/end: 07/17/2024 11:07:56.7 and 07/17/2024 15:31:26.7  
Mid-occultation observing point 8.979E 15.23S

Occultation of 27 phi Sagittarii 3.17 by moon 98% illuminated at phase= 163 degrees  
07/19/2024 19:37:08.0 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.168  
Global start/end: 07/19/2024 18:33:38.6 and 07/19/2024 20:40:35.4  
Mid-occultation observing point 113.993E 61.577S

Occultation of 40 tau Sagittarii 3.32 by moon 99% illuminated at phase= 167 degrees  
07/20/2024 03:37:01.2 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.168  
Global start/end: 07/20/2024 01:28:55.9 and 07/20/2024 05:45:05.0  
Mid-occultation observing point 171.494W 22.958S

Occultation of Deneb Algedi 2.85 by moon 96% illuminated at phase= 203 degrees  
07/22/2024 20:26:02.1 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.166  
Global start/end: 07/22/2024 19:05:17.9 and 07/22/2024 21:46:45.7  
Mid-occultation observing point 71.176E 67.383S

Occultation of Saturn 0.9 by moon 85% illuminated at phase= 226 degrees  
07/24/2024 13:28:24.4 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.164  
Global start/end: 07/24/2024 11:27:30.1 and 07/24/2024 15:29:20.1  
Mid-occultation observing point 90.934E 11.726N

Occultation of Alcyone 2.85 by moon 30% illuminated at phase= 293 degrees  
07/29/2024 15:03:17.6 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.16  
Global start/end: 07/29/2024 12:52:59.9 and 07/29/2024 17:13:35.1  
Mid-occultation observing point 139.482E 20.549N

Occultation of Elnath 1.65 by moon 15% illuminated at phase= 314 degrees  
07/31/2024 07:26:57.9 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.158  
Global start/end: 07/31/2024 05:26:26.1 and 07/31/2024 09:27:31.9  
Mid-occultation observing point 82.126W 2.722S  
At Journey Museum, the miss angle is 1968.5 arc-sec at 07/31/2024 07:10:46.4

Occultation of Spica 0.98 by moon 30% illuminated at phase= 66 degrees  
08/10/2024 03:52:15.6 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.153  
Global start/end: 08/10/2024 01:51:57.8 and 08/10/2024 05:52:32.7  
Mid-occultation observing point 97.822E 24.885N

Occultation of 20 sigma Scorpii 2.9 by moon 64% illuminated at phase= 106 degrees  
08/13/2024 18:32:18.5 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.151  
Global start/end: 08/13/2024 16:27:06.8 and 08/13/2024 20:37:24.5  
Mid-occultation observing point 110.147W 53.956S  
At Journey Museum, the miss angle is 3629.1 arc-sec at 08/13/2024 17:22:21.5

Occultation of Antares 1.06 by moon 66% illuminated at phase= 108 degrees  
08/13/2024 22:16:57.5 Geocentric minimum 0.0 degrees. DUTC= 69.184 DUT1= 69.151  
Global start/end: 08/13/2024 20:01:56.0 and 08/14/2024 00:31:58.2  
Mid-occultation observing point 154.689W 26.892S

Occultation of 27 phi Sagittarii 3.17 by moon 86% illuminated at phase= 136 degrees  
08/16/2024 05:29:30.5 Geocentric minimum 1.2 degrees. DUTC= 69.184 DUT1= 69.15  
Global start/end: 08/16/2024 04:56:32.4 and 08/16/2024 06:02:27.8  
Mid-occultation observing point 61.519W 61.551S

Occultation of 40 tau Sagittarii 3.32 by moon 89% illuminated at phase= 141 degrees  
08/16/2024 13:33:29.8 Geocentric minimum 0.0 degrees. DUTC= 69.184 DUT1= 69.15  
Global start/end: 08/16/2024 11:24:24.2 and 08/16/2024 15:42:34.0  
Mid-occultation observing point 13.188E 28.88S

Occultation of Deneb Algedi 2.85 by moon 100% illuminated at phase= 177 degrees  
08/19/2024 06:06:03.5 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.149  
Global start/end: 08/19/2024 04:41:41.4 and 08/19/2024 07:30:23.5  
Mid-occultation observing point 121.822W 67.596S

Occultation of Saturn 0.7 by moon 97% illuminated at phase= 199 degrees  
08/20/2024 19:41:37.6 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.148  
Global start/end: 08/20/2024 17:44:26.1 and 08/20/2024 21:38:49.6  
Mid-occultation observing point 32.238W 14.019N

Occultation of Alcyone 2.85 by moon 53% illuminated at phase= 267 degrees  
08/25/2024 20:38:25.0 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.146  
Global start/end: 08/25/2024 18:29:11.1 and 08/25/2024 22:47:40.5  
Mid-occultation observing point 25.422E 31.448N

Occultation of Elnath 1.65 by moon 35% illuminated at phase= 288 degrees  
08/27/2024 12:52:22.3 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.145  
Global start/end: 08/27/2024 10:44:54.8 and 08/27/2024 14:59:52.5  
Mid-occultation observing point 168.885E 8.314N  
At Journey Museum, the miss angle is 2505.1 arc-sec at 08/27/2024 13:55:23.3

Occultation of Venus -3.8 by moon 5% illuminated at phase= 25 degrees  
09/05/2024 01:58:27.5 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.143  
Global start/end: 09/05/2024 00:50:48.5 and 09/05/2024 03:06:06.9  
Mid-occultation observing point 28.432W 61.072S

Occultation of Spica 0.98 by moon 12% illuminated at phase= 40 degrees  
09/06/2024 10:33:04.8 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.144  
Global start/end: 09/06/2024 08:25:33.4 and 09/06/2024 12:40:36.7  
Mid-occultation observing point 33.875W 16.722N

Occultation of 6 pi Scorpii 2.89 by moon 38% illuminated at phase= 76 degrees  
09/09/2024 16:57:54.6 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.144  
Global start/end: 09/09/2024 16:02:49.5 and 09/09/2024 17:52:58.5  
Mid-occultation observing point 77.506W 61.535N

Occultation of 20 sigma Scorpii 2.9 by moon 41% illuminated at phase= 80 degrees  
09/10/2024 02:15:28.9 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.144  
Global start/end: 09/10/2024 00:17:14.9 and 09/10/2024 04:13:38.7  
Mid-occultation observing point 99.23E 64.185S

Occultation of Antares 1.06 by moon 43% illuminated at phase= 82 degrees  
09/10/2024 06:05:16.7 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.144  
Global start/end: 09/10/2024 03:49:38.9 and 09/10/2024 08:20:52.8  
Mid-occultation observing point 59.265E 35.454S

Occultation of Kaus Media 2.72 by moon 63% illuminated at phase= 105 degrees  
09/12/2024 04:39:31.2 Geocentric minimum 1.2 degrees. DUTC= 69.184 DUT1= 69.144  
Global start/end: 09/12/2024 04:24:07.7 and 09/12/2024 04:54:54.5  
Mid-occultation observing point 104.613E 61.489N

Occultation of 40 tau Sagittarii 3.32 by moon 70% illuminated at phase= 114 degrees  
09/12/2024 23:04:41.9 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.145  
Global start/end: 09/12/2024 20:54:16.1 and 09/13/2024 01:15:04.5  
Mid-occultation observing point 155.575W 35.213S

Occultation of Deneb Algedi 2.85 by moon 93% illuminated at phase= 150 degrees  
09/15/2024 16:51:04.7 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.145  
Global start/end: 09/15/2024 15:30:49.1 and 09/15/2024 18:11:17.0  
Mid-occultation observing point 71.614E 66.965S

Occultation of Saturn 0.6 by moon 99% illuminated at phase= 170 degrees  
09/17/2024 03:08:24.5 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.145  
Global start/end: 09/17/2024 01:08:14.2 and 09/17/2024 05:08:33.3  
Mid-occultation observing point 168.746W 5.927N

**---For observations at Journey Museum:**

**09/17/2024 04:13:15.9 Start Partial (elev 6 az 254 deg.) -15.3 \*\*\***  
**09/17/2024 04:13:47.8 Start Total (elev 5 az 254 deg.) -15.2 \*\*\***  
**09/17/2024 04:40:37.0 OCCULTATION MID-POINT (elev 1 az 258 deg.) -10.6 \*\*\***  
09/17/2024 05:06:38.0 End Total (elev -4 az 263 deg.) -5.9  
09/17/2024 05:07:08.1 End Partial (elev -4 az 263 deg.) -5.9

Occultation of Alcyone 2.85 by moon 75% illuminated at phase= 240 degrees  
09/22/2024 03:57:32.9 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.146  
Global start/end: 09/22/2024 01:51:41.2 and 09/22/2024 06:03:28.5  
Mid-occultation observing point 113.189W 36.577N

**---For observations at Journey Museum:**

**09/22/2024 03:43:51.9 Start Total (elev 70 az 186 deg.) -21.3 \*\*\***  
**09/22/2024 04:21:37.0 OCCULTATION MID-POINT (elev 68 az 210 deg.) -14.9 \*\*\***  
**09/22/2024 04:59:13.3 End Total (elev 64 az 228 deg.) -8.3 \*\*\***



Occultation of Elnath 1.65 by moon 57% illuminated at phase= 261 degrees  
09/23/2024 19:09:08.3 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.146  
Global start/end: 09/23/2024 17:00:25.3 and 09/23/2024 21:17:55.2  
Mid-occultation observing point 47.402E 14.239N

Eclipse of the Sun -- Global data; DUTC= 69.184 DUT1= 69.147  
10/02/2024 08:42:59.6 Start Partial Solar  
10/02/2024 09:50:39.2 Start Annular Solar  
10/02/2024 11:44:42.4 SOLAR ECLIPSE MAXIMUM 87.1%  
10/02/2024 11:45:04.1 ANNULAR SOLAR ECLIPSE MID-POINT  
10/02/2024 13:39:15.4 End Annular Solar  
10/02/2024 14:46:59.9 End Partial Solar  
Mid-eclipse observing point 114.519W 21.953S  
At Journey Museum, the miss angle is 1024.3 arc-sec at 10/02/2024 10:07:10.5

Occultation of Spica 0.98 by moon 1% illuminated at phase= 13 degrees  
10/03/2024 16:38:18.1 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.147  
Global start/end: 10/03/2024 14:30:38.7 and 10/03/2024 18:45:57.3  
Mid-occultation observing point 152.377W 16.073N  
At Journey Museum, the miss angle is 565.5 arc-sec at 10/03/2024 17:09:12.0

Occultation of 6 pi Scorpii 2.89 by moon 17% illuminated at phase= 49 degrees  
10/06/2024 23:09:13.6 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.148  
Global start/end: 10/06/2024 22:11:22.5 and 10/07/2024 00:07:03.9  
Mid-occultation observing point 162.755E 61.537N

Occultation of 20 sigma Scorpii 2.9 by moon 20% illuminated at phase= 53 degrees  
10/07/2024 08:32:20.9 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.148  
Global start/end: 10/07/2024 06:35:07.8 and 10/07/2024 10:29:31.5  
Mid-occultation observing point 23.631W 65.715S

Occultation of Antares 1.06 by moon 22% illuminated at phase= 55 degrees  
10/07/2024 12:24:51.5 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.148  
Global start/end: 10/07/2024 10:08:53.8 and 10/07/2024 14:40:49.1  
Mid-occultation observing point 62.788W 36.515S

Occultation of Kaus Media 2.72 by moon 40% illuminated at phase= 78 degrees  
10/09/2024 11:53:41.1 Geocentric minimum 1.2 degrees. DUTC= 69.184 DUT1= 69.148  
Global start/end: 10/09/2024 11:44:43.7 and 10/09/2024 12:02:38.5  
Mid-occultation observing point 30.898W 61.471N

Occultation of 40 tau Sagittarii 3.32 by moon 48% illuminated at phase= 87 degrees  
10/10/2024 06:50:56.7 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.148  
Global start/end: 10/10/2024 04:38:32.6 and 10/10/2024 09:03:18.8  
Mid-occultation observing point 61.03E 35.77S

Occultation of Deneb Algedi 2.85 by moon 78% illuminated at phase= 123 degrees  
10/13/2024 02:49:44.6 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.148  
Global start/end: 10/13/2024 01:29:33.5 and 10/13/2024 04:09:51.8  
Mid-occultation observing point 95.559W 65.718S

Occultation of Saturn 0.7 by moon 89% illuminated at phase= 142 degrees  
10/14/2024 11:07:59.9 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.149  
Global start/end: 10/14/2024 09:03:50.1 and 10/14/2024 13:12:07.8  
Mid-occultation observing point 47.265E 3.419S

Occultation of Alcyone 2.85 by moon 92% illuminated at phase= 213 degrees  
10/19/2024 13:39:42.2 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.149  
Global start/end: 10/19/2024 11:35:36.1 and 10/19/2024 15:43:51.7  
Mid-occultation observing point 74.879E 35.027N

Occultation of Elnath 1.65 by moon 79% illuminated at phase= 234 degrees  
10/21/2024 03:33:33.5 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.149  
Global start/end: 10/21/2024 01:27:50.9 and 10/21/2024 05:39:21.2  
Mid-occultation observing point 105.527W 12.253N  
At Journey Museum, the miss angle is 965.3 arc-sec at 10/21/2024 03:44:15.5

Occultation of Spica 0.98 by moon 1% illuminated at phase= 346 degrees  
10/30/2024 22:47:50.5 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.15  
Global start/end: 10/30/2024 20:40:45.3 and 10/31/2024 00:54:54.2  
Mid-occultation observing point 88.609E 16.601N

Occultation of 6 pi Scorpii 2.89 by moon 4% illuminated at phase= 22 degrees  
11/03/2024 04:52:14.1 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.151  
Global start/end: 11/03/2024 04:16:49.1 and 11/03/2024 05:27:38.8  
Mid-occultation observing point 49.98E 61.583N

Occultation of 20 sigma Scorpii 2.9 by moon 5% illuminated at phase= 26 degrees  
11/03/2024 14:12:43.8 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.151  
Global start/end: 11/03/2024 12:11:06.1 and 11/03/2024 16:14:19.8  
Mid-occultation observing point 130.008W 60.2S  
At Journey Museum, the miss angle is 4132.3 arc-sec at 11/03/2024 13:48:19.8

Occultation of Antares 1.06 by moon 6% illuminated at phase= 28 degrees  
11/03/2024 18:04:09.7 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.151  
Global start/end: 11/03/2024 15:47:52.2 and 11/03/2024 20:20:27.8  
Mid-occultation observing point 173.22W 31.654S

Occultation of 40 tau Sagittarii 3.32 by moon 25% illuminated at phase= 60 degrees  
11/06/2024 12:45:51.4 Geocentric minimum 0.0 degrees. DUTC= 69.184 DUT1= 69.151  
Global start/end: 11/06/2024 10:31:55.7 and 11/06/2024 14:59:48.2  
Mid-occultation observing point 55.746W 28.543S

Occultation of Deneb Algedi 2.85 by moon 55% illuminated at phase= 96 degrees  
11/09/2024 10:31:14.4 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.152  
Global start/end: 11/09/2024 08:57:08.2 and 11/09/2024 12:05:16.7  
Mid-occultation observing point 70.585E 65.128S

Occultation of Saturn 0.8 by moon 70% illuminated at phase= 114 degrees  
11/10/2024 18:38:53.2 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.152  
Global start/end: 11/10/2024 16:31:39.2 and 11/10/2024 20:46:05.6  
Mid-occultation observing point 92.642W 4.703S  
At Journey Museum, the miss angle is 1319.7 arc-sec at 11/10/2024 19:27:15.2

Occultation of Alcyone 2.85 by moon 100% illuminated at phase= 186 degrees  
11/16/2024 00:41:31.1 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.153  
Global start/end: 11/15/2024 22:37:31.3 and 11/16/2024 02:45:32.2  
Mid-occultation observing point 116.4W 31.726N

**---For observations at Journey Museum:**

**11/16/2024 00:41:36.5 Start Total (elev 68 az 207 deg.) -61.5 \*\*\***  
**11/16/2024 01:13:20.9 OCCULTATION MID-POINT (elev 65 az 224 deg.) -57.8 \*\*\***  
**11/16/2024 01:44:45.3 End Total (elev 61 az 236 deg.) -53.4 \*\*\***

Occultation of Elnath 1.65 by moon 95% illuminated at phase= 207 degrees  
11/17/2024 13:53:11.4 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.153  
Global start/end: 11/17/2024 11:52:22.2 and 11/17/2024 15:54:05.5  
Mid-occultation observing point 72.949E 5.45N

Occultation of Spica 0.98 by moon 13% illuminated at phase= 318 degrees  
11/27/2024 05:38:33.7 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.155  
Global start/end: 11/27/2024 03:26:52.0 and 11/27/2024 07:50:12.8  
Mid-occultation observing point 44.038W 10.837N

**---For observations at Journey Museum:**

11/27/2024 03:27:10.4 Start Total (elev -1 az 104 deg.) -38.4  
**11/27/2024 03:56:42.3 OCCULTATION MID-POINT (elev 4 az 109 deg.) -33.1 \*\*\***  
**11/27/2024 04:27:25.5 End Total (elev 9 az 115 deg.) -27.6 \*\*\***

Occultation of 27 phi Sagittarii 3.17 by moon 6% illuminated at phase= 29 degrees  
12/03/2024 09:44:59.7 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.154  
Global start/end: 12/03/2024 08:39:58.8 and 12/03/2024 10:49:59.6  
Mid-occultation observing point 126.437E 61.543S

Occultation of 40 tau Sagittarii 3.32 by moon 8% illuminated at phase= 33 degrees  
12/03/2024 18:18:09.6 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.154  
Global start/end: 12/03/2024 16:06:15.8 and 12/03/2024 20:30:03.2  
Mid-occultation observing point 167.097W 18.424S

Occultation of Deneb Algedi 2.85 by moon 32% illuminated at phase= 69 degrees  
12/06/2024 16:08:05.0 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.153  
Global start/end: 12/06/2024 14:15:33.1 and 12/06/2024 18:00:34.7  
Mid-occultation observing point 71.988W 51.365S  
At Journey Museum, the miss angle is 3951.5 arc-sec at 12/06/2024 17:25:38.5

Occultation of Saturn 0.9 by moon 47% illuminated at phase= 86 degrees  
12/08/2024 01:41:12.2 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.153  
Global start/end: 12/07/2024 23:34:42.7 and 12/08/2024 03:47:39.9  
Mid-occultation observing point 129.99E 5.889N

Occultation of Alcyone 2.85 by moon 96% illuminated at phase= 158 degrees  
12/13/2024 10:55:08.9 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.151  
Global start/end: 12/13/2024 08:50:24.7 and 12/13/2024 12:59:52.9  
Mid-occultation observing point 62.634E 33.356N

Occultation of Elnath 1.65 by moon 100% illuminated at phase= 179 degrees  
12/15/2024 00:26:24.5 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.151  
Global start/end: 12/14/2024 22:28:04.9 and 12/15/2024 02:24:47.0  
Mid-occultation observing point 112.224W 1.237N  
At Journey Museum, the miss angle is 1625.8 arc-sec at 12/15/2024 00:45:56.2

Occultation of Mars -0.9 by moon 89% illuminated at phase= 218 degrees  
12/18/2024 02:17:38.9 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.15  
Global start/end: 12/18/2024 00:46:44.7 and 12/18/2024 03:48:37.3  
Mid-occultation observing point 15.535W 74.226N  
At Journey Museum, the miss angle is 1108.6 arc-sec at 12/18/2024 02:02:38.0

Occultation of Spica 0.98 by moon 32% illuminated at phase= 291 degrees  
12/24/2024 13:20:22.9 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.148  
Global start/end: 12/24/2024 11:01:44.9 and 12/24/2024 15:38:59.4  
Mid-occultation observing point 167.007E 2.54S

Occultation of 6 pi Scorpii 2.89 by moon 8% illuminated at phase= 326 degrees  
12/27/2024 19:13:48.8 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.147  
Global start/end: 12/27/2024 18:17:42.3 and 12/27/2024 20:09:53.8  
Mid-occultation observing point 140.004E 61.781N

Occultation of 20 sigma Scorpii 2.9 by moon 6% illuminated at phase= 331 degrees  
12/28/2024 04:27:53.8 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.147  
Global start/end: 12/28/2024 02:28:03.5 and 12/28/2024 06:27:39.3  
Mid-occultation observing point 37.994W 61.389S

Occultation of Antares 1.06 by moon 6% illuminated at phase= 333 degrees  
12/28/2024 08:15:10.6 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.147  
Global start/end: 12/28/2024 06:00:01.1 and 12/28/2024 10:30:17.7  
Mid-occultation observing point 79.788W 31.904S  
At Journey Museum, the miss angle is 1888.9 arc-sec at 12/28/2024 06:47:21.2

Occultation of Deneb Algedi 2.85 by moon 12% illuminated at phase= 41 degrees  
01/02/2025 21:47:32.7 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.146  
Global start/end: 01/02/2025 19:45:22.4 and 01/02/2025 23:49:42.3  
Mid-occultation observing point 164.214E 38.093S

Occultation of Saturn 1.0 by moon 25% illuminated at phase= 60 degrees  
01/04/2025 09:50:58.2 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.146  
Global start/end: 01/04/2025 07:57:38.9 and 01/04/2025 11:44:17.0  
Mid-occultation observing point 29.038W 25.898N

Occultation of Alcyone 2.85 by moon 83% illuminated at phase= 130 degrees  
01/09/2025 18:40:24.5 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.146  
Global start/end: 01/09/2025 16:36:44.5 and 01/09/2025 20:44:04.1  
Mid-occultation observing point 84.21W 42.519N

**---For observations at Journey Museum:**

**01/09/2025 17:46:30.0 Start Total (elev 53 az 109 deg.) -12.8 \*\*\***  
**01/09/2025 18:16:14.8 OCCULTATION MID-POINT (elev 57 az 117 deg.) -17.9 \*\*\***  
**01/09/2025 18:46:58.4 End Total (elev 62 az 128 deg.) -23.3 \*\*\***

Occultation of Elnath 1.65 by moon 94% illuminated at phase= 151 degrees  
01/11/2025 09:13:58.1 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.145  
Global start/end: 01/11/2025 07:11:56.8 and 01/11/2025 11:16:00.4  
Mid-occultation observing point 88.575E 5.218N

Occultation of Mars -1.4 by moon 100% illuminated at phase= 183 degrees  
01/13/2025 20:48:52.5 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.145  
Global start/end: 01/13/2025 18:43:57.5 and 01/13/2025 22:53:49.3  
Mid-occultation observing point 47.161W 38.039N

**---For observations at Journey Museum:**

**01/13/2025 19:04:20.5 Start Partial (elev 25 az 79 deg.) -25.7 \*\*\***  
**01/13/2025 19:04:51.3 Start Total (elev 25 az 79 deg.) -25.8 \*\*\***  
**01/13/2025 19:31:41.0 OCCULTATION MID-POINT (elev 30 az 83 deg.) -30.6 \*\*\***  
**01/13/2025 19:59:33.5 End Total (elev 35 az 88 deg.) -35.6 \*\*\***  
**01/13/2025 20:00:06.8 End Partial (elev 35 az 88 deg.) -35.7 \*\*\***

Occultation of Spica 0.98 by moon 56% illuminated at phase= 263 degrees  
01/20/2025 21:30:29.1 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.145  
Global start/end: 01/20/2025 19:11:08.0 and 01/20/2025 23:49:50.6  
Mid-occultation observing point 9.843E 17.87S

Occultation of 6 pi Scorpii 2.89 by moon 26% illuminated at phase= 299 degrees  
01/24/2025 03:59:08.0 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.144  
Global start/end: 01/24/2025 02:27:31.3 and 01/24/2025 05:30:41.1  
Mid-occultation observing point 30.496W 43.873N

Occultation of 20 sigma Scorpii 2.9 by moon 23% illuminated at phase= 303 degrees  
01/24/2025 13:19:14.7 Geocentric minimum 0.7 degrees. DUTC= 69.184 DUT1= 69.144  
Global start/end: 01/24/2025 11:32:36.4 and 01/24/2025 15:05:48.3  
Mid-occultation observing point 138.822E 75.34S

Occultation of Antares 1.06 by moon 22% illuminated at phase= 305 degrees  
01/24/2025 17:08:26.3 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.144  
Global start/end: 01/24/2025 14:55:21.5 and 01/24/2025 19:21:26.6  
Mid-occultation observing point 117.105E 42.862S

Occultation of 27 phi Sagittarii 3.17 by moon 6% illuminated at phase= 333 degrees  
01/27/2025 01:59:29.9 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.144  
Global start/end: 01/27/2025 00:52:18.8 and 01/27/2025 03:06:38.3  
Mid-occultation observing point 172.092W 61.441S

Occultation of 40 tau Sagittarii 3.32 by moon 4% illuminated at phase= 337 degrees  
01/27/2025 10:19:08.3 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.144  
Global start/end: 01/27/2025 08:09:33.5 and 01/27/2025 12:28:39.6  
Mid-occultation observing point 101.623W 16.085S  
At Journey Museum, the miss angle is 1587.7 arc-sec at 01/27/2025 10:41:51.5

Occultation of Deneb Algedi 2.85 by moon 1% illuminated at phase= 13 degrees  
01/30/2025 05:34:54.6 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.144  
Global start/end: 01/30/2025 03:31:14.4 and 01/30/2025 07:38:33.6  
Mid-occultation observing point 16.58E 32.005S

Occultation of Saturn 1.1 by moon 9% illuminated at phase= 35 degrees  
01/31/2025 21:00:50.3 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.144  
Global start/end: 01/31/2025 19:37:39.0 and 01/31/2025 22:24:01.5  
Mid-occultation observing point 104.498E 55.265N

Occultation of Alcyone 2.85 by moon 61% illuminated at phase= 103 degrees  
02/06/2025 00:17:01.8 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.143  
Global start/end: 02/05/2025 22:19:56.3 and 02/06/2025 02:14:09.1  
Mid-occultation observing point 157.435E 55.087N

**---For observations at Journey Museum:**

**02/06/2025 01:17:08.5 Start Total (elev 10 az 295 deg.) -57.8 \*\*\***  
**02/06/2025 01:43:23.3 OCCULTATION MID-POINT (elev 5 az 299 deg.) -54.9 \*\*\***  
**02/06/2025 02:08:48.0 End Total (elev 2 az 303 deg.) -51.5 \*\*\***

Occultation of Elnath 1.65 by moon 78% illuminated at phase= 124 degrees  
02/07/2025 15:36:42.8 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.143  
Global start/end: 02/07/2025 13:28:54.5 and 02/07/2025 17:44:31.5  
Mid-occultation observing point 34.587W 14.599N  
At Journey Museum, the miss angle is 2048.0 arc-sec at 02/07/2025 14:41:23.9

Occultation of Mars -0.8 by moon 92% illuminated at phase= 147 degrees  
02/09/2025 12:50:01.3 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.143  
Global start/end: 02/09/2025 11:09:31.6 and 02/09/2025 14:30:33.1  
Mid-occultation observing point 70.567E 77.294N

Occultation of Spica 0.98 by moon 79% illuminated at phase= 235 degrees  
02/17/2025 05:28:05.6 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.142  
Global start/end: 02/17/2025 03:13:03.2 and 02/17/2025 07:43:10.1  
Mid-occultation observing point 142.555W 28.232S  
At Journey Museum, the miss angle is 2978.9 arc-sec at 02/17/2025 04:51:37.3

Occultation of 6 pi Scorpii 2.89 by moon 49% illuminated at phase= 271 degrees  
02/20/2025 12:30:18.4 Geocentric minimum 0.7 degrees. DUTC= 69.184 DUT1= 69.142  
Global start/end: 02/20/2025 10:39:10.8 and 02/20/2025 14:21:22.9  
Mid-occultation observing point 167.775E 22.361N

Occultation of 20 sigma Scorpii 2.9 by moon 46% illuminated at phase= 275 degrees  
02/20/2025 21:59:52.2 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.142  
Global start/end: 02/20/2025 20:33:01.1 and 02/20/2025 23:26:40.4  
Mid-occultation observing point 129.124W 68.597S

Occultation of Antares 1.06 by moon 44% illuminated at phase= 277 degrees  
02/21/2025 01:52:59.1 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.142  
Global start/end: 02/20/2025 23:44:46.9 and 02/21/2025 04:01:07.2  
Mid-occultation observing point 45.202W 54.112S

Occultation of 23 tau Scorpii 2.82 by moon 43% illuminated at phase= 279 degrees  
02/21/2025 05:16:38.2 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.142  
Global start/end: 02/21/2025 04:21:57.0 and 02/21/2025 06:11:18.1  
Mid-occultation observing point 66.101W 61.55N  
At Journey Museum, the miss angle is 202.4 arc-sec at 02/21/2025 04:29:50.7

Occultation of 27 phi Sagittarii 3.17 by moon 21% illuminated at phase= 305 degrees  
02/23/2025 11:45:57.2 Geocentric minimum 1.2 degrees. DUTC= 69.184 DUT1= 69.142  
Global start/end: 02/23/2025 11:09:21.2 and 02/23/2025 12:22:32.3  
Mid-occultation observing point 13.999E 61.421S

Occultation of 40 tau Sagittarii 3.32 by moon 18% illuminated at phase= 309 degrees  
02/23/2025 20:12:32.0 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.141  
Global start/end: 02/23/2025 18:00:24.0 and 02/23/2025 22:24:37.0  
Mid-occultation observing point 83.902E 22.465S

Occultation of Deneb Algedi 2.85 by moon 2% illuminated at phase= 345 degrees  
02/26/2025 15:37:22.0 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.141  
Global start/end: 02/26/2025 13:34:28.4 and 02/26/2025 17:40:12.0  
Mid-occultation observing point 160.753W 32.394S

Occultation of Alcyone 2.85 by moon 37% illuminated at phase= 75 degrees  
03/05/2025 06:01:18.6 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.141  
Global start/end: 03/05/2025 04:11:46.8 and 03/05/2025 07:50:54.4  
Mid-occultation observing point 36.571E 62.958N

Occultation of Elnath 1.65 by moon 55% illuminated at phase= 96 degrees  
03/06/2025 21:00:13.6 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.141  
Global start/end: 03/06/2025 18:50:30.1 and 03/06/2025 23:09:58.1  
Mid-occultation observing point 142.735W 21.546N  
At Journey Museum, the miss angle is 792.2 arc-sec at 03/06/2025 21:55:12.4

Occultation of Spica 0.98 by moon 94% illuminated at phase= 208 degrees  
03/16/2025 12:40:38.4 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.14  
Global start/end: 03/16/2025 10:27:30.4 and 03/16/2025 14:53:48.4  
Mid-occultation observing point 80.755E 30.7S

Occultation of 6 pi Scorpii 2.89 by moon 72% illuminated at phase= 244 degrees  
03/19/2025 19:56:44.6 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.139  
Global start/end: 03/19/2025 18:01:11.6 and 03/19/2025 21:52:16.1  
Mid-occultation observing point 28.189E 18.112N

Occultation of 20 sigma Scorpii 2.9 by moon 69% illuminated at phase= 248 degrees  
03/20/2025 05:33:13.3 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.139  
Global start/end: 03/20/2025 04:15:04.0 and 03/20/2025 06:51:21.2  
Mid-occultation observing point 82.669E 61.267S  
At Journey Museum, the miss angle is 5679.9 arc-sec at 03/20/2025 05:29:16.9

Occultation of Antares 1.06 by moon 67% illuminated at phase= 250 degrees  
03/20/2025 09:29:34.0 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.139  
Global start/end: 03/20/2025 07:23:15.2 and 03/20/2025 11:35:50.7  
Mid-occultation observing point 171.783E 57.817S

Occultation of 23 tau Scorpii 2.82 by moon 66% illuminated at phase= 251 degrees  
03/20/2025 12:56:10.0 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.139  
Global start/end: 03/20/2025 11:50:59.2 and 03/20/2025 14:01:19.7  
Mid-occultation observing point 152.032E 61.549N

Occultation of 40 tau Sagittarii 3.32 by moon 40% illuminated at phase= 282 degrees  
03/23/2025 05:15:43.9 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.139  
Global start/end: 03/23/2025 03:01:23.4 and 03/23/2025 07:30:02.8  
Mid-occultation observing point 78.562W 24.559S  
At Journey Museum, the miss angle is 2080.6 arc-sec at 03/23/2025 04:41:28.3

Occultation of Deneb Algedi 2.85 by moon 13% illuminated at phase= 318 degrees  
03/26/2025 02:14:46.6 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.139  
Global start/end: 03/26/2025 00:11:08.3 and 03/26/2025 04:18:19.7  
Mid-occultation observing point 13.416E 33.276S

Eclipse of the Sun -- Global data; DUTC= 69.184 DUT1= 69.139  
03/29/2025 01:50:44.6 Start Partial Solar  
03/29/2025 03:47:26.8 SOLAR ECLIPSE MAXIMUM 93.0%  
03/29/2025 03:47:27.3 PARTIAL SOLAR ECLIPSE MID-POINT  
03/29/2025 05:43:43.7 End Partial Solar  
Mid-eclipse observing point 79.817W 61.074N

Occultation of Alcyone 2.85 by moon 17% illuminated at phase= 48 degrees  
04/01/2025 13:56:20.2 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.138  
Global start/end: 04/01/2025 12:07:55.6 and 04/01/2025 15:44:49.5  
Mid-occultation observing point 107.792W 61.913N

Occultation of Elnath 1.65 by moon 32% illuminated at phase= 69 degrees  
04/03/2025 03:40:24.4 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.138  
Global start/end: 04/03/2025 01:32:36.4 and 04/03/2025 05:48:15.1  
Mid-occultation observing point 90.362E 20.981N

Occultation of Spica 0.98 by moon 100% illuminated at phase= 181 degrees  
04/12/2025 19:04:36.9 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.137  
Global start/end: 04/12/2025 16:50:44.8 and 04/12/2025 21:18:29.5  
Mid-occultation observing point 41.171W 29.336S

Occultation of 6 pi Scorpii 2.89 by moon 90% illuminated at phase= 217 degrees  
04/16/2025 02:18:01.0 Geocentric minimum 0.7 degrees. DUTC= 69.184 DUT1= 69.137  
Global start/end: 04/16/2025 00:28:39.2 and 04/16/2025 04:07:22.0  
Mid-occultation observing point 92.459W 24.522N

**---For observations at Journey Museum:**

**04/16/2025 01:01:14.5 Start Total (elev 18 az 163 deg.) -33.5 \*\*\***  
**04/16/2025 01:41:25.5 OCCULTATION MID-POINT (elev 19 az 172 deg.) -30.3 \*\*\***  
**04/16/2025 02:22:43.7 End Total (elev 20 az 182 deg.) -25.9 \*\*\***

Occultation of 20 sigma Scorpii 2.9 by moon 88% illuminated at phase= 221 degrees  
04/16/2025 11:56:02.6 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.137  
Global start/end: 04/16/2025 10:27:15.7 and 04/16/2025 13:24:48.7  
Mid-occultation observing point 25.735W 72.134S

Occultation of Antares 1.06 by moon 87% illuminated at phase= 223 degrees  
04/16/2025 15:53:11.6 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.137  
Global start/end: 04/16/2025 13:43:24.3 and 04/16/2025 18:02:58.3  
Mid-occultation observing point 51.552E 52.897S

Occultation of 23 tau Scorpii 2.82 by moon 86% illuminated at phase= 225 degrees  
04/16/2025 19:20:30.8 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.137  
Global start/end: 04/16/2025 18:37:43.3 and 04/16/2025 20:03:18.0  
Mid-occultation observing point 28.935E 61.564N

Occultation of 27 phi Sagittarii 3.17 by moon 67% illuminated at phase= 251 degrees  
04/19/2025 03:39:53.3 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.136  
Global start/end: 04/19/2025 02:51:16.2 and 04/19/2025 04:28:29.4  
Mid-occultation observing point 81.552E 61.439S  
At Journey Museum, the miss angle is 6218.3 arc-sec at 04/19/2025 03:00:30.4

Occultation of 40 tau Sagittarii 3.32 by moon 63% illuminated at phase= 255 degrees  
04/19/2025 12:30:42.4 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.136  
Global start/end: 04/19/2025 10:15:53.1 and 04/19/2025 14:45:30.3  
Mid-occultation observing point 144.893E 18.56S

Occultation of Deneb Algedi 2.85 by moon 32% illuminated at phase= 291 degrees  
04/22/2025 11:30:03.3 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.136  
Global start/end: 04/22/2025 09:22:15.1 and 04/22/2025 13:37:47.2  
Mid-occultation observing point 155.15W 28.657S

Occultation of Alcyone 2.85 by moon 3% illuminated at phase= 21 degrees  
04/29/2025 00:04:42.4 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.135  
Global start/end: 04/28/2025 22:13:35.6 and 04/29/2025 01:55:52.5  
Mid-occultation observing point 78.57E 56.638N

Occultation of Elnath 1.65 by moon 13% illuminated at phase= 42 degrees  
04/30/2025 12:37:33.7 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.135  
Global start/end: 04/30/2025 10:33:49.2 and 04/30/2025 14:41:22.1  
Mid-occultation observing point 70.539W 14.411N  
At Journey Museum, the miss angle is 1296.8 arc-sec at 04/30/2025 12:02:08.4

Occultation of Spica 0.98 by moon 95% illuminated at phase= 154 degrees  
05/10/2025 01:07:38.3 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.134  
Global start/end: 05/09/2025 22:54:34.0 and 05/10/2025 03:20:41.8  
Mid-occultation observing point 159.94W 31.17S  
At Journey Museum, the miss angle is 3375.1 arc-sec at 05/10/2025 01:10:05.2

Occultation of 6 pi Scorpii 2.89 by moon 99% illuminated at phase= 190 degrees  
05/13/2025 08:14:07.5 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.134  
Global start/end: 05/13/2025 06:33:25.0 and 05/13/2025 09:54:49.0  
Mid-occultation observing point 154.019E 33.457N

Occultation of 20 sigma Scorpii 2.9 by moon 98% illuminated at phase= 195 degrees  
05/13/2025 17:50:08.5 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.134  
Global start/end: 05/13/2025 16:09:50.0 and 05/13/2025 19:30:25.8  
Mid-occultation observing point 70.102W 79.912S

Occultation of Antares 1.06 by moon 98% illuminated at phase= 196 degrees  
05/13/2025 21:46:06.2 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.134  
Global start/end: 05/13/2025 19:33:01.0 and 05/13/2025 23:59:10.7  
Mid-occultation observing point 60.905W 46.336S

Occultation of 27 phi Sagittarii 3.17 by moon 86% illuminated at phase= 225 degrees  
05/16/2025 09:27:39.8 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.133  
Global start/end: 05/16/2025 08:04:56.4 and 05/16/2025 10:50:21.5  
Mid-occultation observing point 32.428W 61.426S

Occultation of 40 tau Sagittarii 3.32 by moon 83% illuminated at phase= 229 degrees  
05/16/2025 18:20:50.5 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.133  
Global start/end: 05/16/2025 16:10:06.9 and 05/16/2025 20:31:32.5  
Mid-occultation observing point 28.937E 7.259S

Occultation of Deneb Algedi 2.85 by moon 55% illuminated at phase= 265 degrees  
05/19/2025 18:32:03.0 Geocentric minimum 0.0 degrees. DUTC= 69.184 DUT1= 69.133  
Global start/end: 05/19/2025 16:20:12.9 and 05/19/2025 20:43:52.9  
Mid-occultation observing point 66.836E 17.636S

Occultation of Elnath 1.65 by moon 2% illuminated at phase= 16 degrees  
05/27/2025 23:01:28.4 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.132  
Global start/end: 05/27/2025 21:01:38.2 and 05/28/2025 01:01:21.7  
Mid-occultation observing point 106.744E 7.816N

Occultation of Spica 0.98 by moon 81% illuminated at phase= 128 degrees  
06/06/2025 07:30:35.0 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.131  
Global start/end: 06/06/2025 05:24:08.6 and 06/06/2025 09:37:01.0  
Mid-occultation observing point 70.602E 40.169S



Occultation of 6 pi Scorpii 2.89 by moon 98% illuminated at phase= 164 degrees  
06/09/2025 14:33:08.7 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.131  
Global start/end: 06/09/2025 12:51:22.3 and 06/09/2025 16:14:53.0  
Mid-occultation observing point 31.755E 32.111N

Occultation of 20 sigma Scorpii 2.9 by moon 99% illuminated at phase= 168 degrees  
06/10/2025 00:07:09.0 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.131  
Global start/end: 06/09/2025 22:25:51.2 and 06/10/2025 01:48:24.6  
Mid-occultation observing point 176.951E 79.652S  
At Journey Museum, the miss angle is 5049.0 arc-sec at 06/10/2025 00:03:40.3

Occultation of Antares 1.06 by moon 99% illuminated at phase= 170 degrees  
06/10/2025 04:01:34.0 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.131  
Global start/end: 06/10/2025 01:48:19.3 and 06/10/2025 06:14:46.6  
Mid-occultation observing point 178.843E 45.187S

Occultation of 27 phi Sagittarii 3.17 by moon 97% illuminated at phase= 198 degrees  
06/12/2025 15:14:09.5 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.131  
Global start/end: 06/12/2025 13:35:07.2 and 06/12/2025 16:53:09.7  
Mid-occultation observing point 111.852E 84.029S

Occultation of 40 tau Sagittarii 3.32 by moon 96% illuminated at phase= 203 degrees  
06/13/2025 00:02:14.5 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.131  
Global start/end: 06/12/2025 21:58:18.8 and 06/13/2025 02:06:08.0  
Mid-occultation observing point 84.649W 2.638N  
At Journey Museum, the miss angle is 560.2 arc-sec at 06/12/2025 23:37:56.6

Occultation of Deneb Algedi 2.85 by moon 76% illuminated at phase= 238 degrees  
06/16/2025 00:04:23.2 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.13  
Global start/end: 06/15/2025 21:54:12.2 and 06/16/2025 02:14:33.3  
Mid-occultation observing point 48.898W 4.422S  
At Journey Museum, the miss angle is 1565.9 arc-sec at 06/15/2025 23:29:30.3

Occultation of Alcyone 2.85 by moon 7% illuminated at phase= 328 degrees  
06/22/2025 20:28:42.2 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.13  
Global start/end: 06/22/2025 18:38:55.4 and 06/22/2025 22:18:28.3  
Mid-occultation observing point 76.172E 59.841N

Occultation of Mars 1.5 by moon 24% illuminated at phase= 59 degrees  
06/29/2025 18:15:44.1 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.129  
Global start/end: 06/29/2025 15:56:37.0 and 06/29/2025 20:34:56.7  
Mid-occultation observing point 132.506W 20.106N  
At Journey Museum, the miss angle is 826.3 arc-sec at 06/29/2025 18:15:22.3

Occultation of Spica 0.98 by moon 61% illuminated at phase= 102 degrees  
07/03/2025 14:40:57.7 Geocentric minimum 0.7 degrees. DUTC= 69.184 DUT1= 69.129  
Global start/end: 07/03/2025 12:51:41.1 and 07/03/2025 16:30:15.3  
Mid-occultation observing point 83.164W 55.21S

Occultation of 6 pi Scorpii 2.89 by moon 87% illuminated at phase= 138 degrees  
07/06/2025 21:43:05.2 Geocentric minimum 0.7 degrees. DUTC= 69.184 DUT1= 69.129  
Global start/end: 07/06/2025 19:49:16.2 and 07/06/2025 23:36:51.1  
Mid-occultation observing point 106.1W 19.399N

**---For observations at Journey Museum:**

**07/06/2025 21:03:35.3 Start Total (elev 20 az 183 deg.) -12.4 \*\*\***  
**07/06/2025 21:31:39.0 OCCULTATION MID-POINT (elev 19 az 189 deg.) -15.5 \*\*\***  
**07/06/2025 21:59:40.2 End Total (elev 18 az 196 deg.) -18.1 \*\*\***

Occultation of 20 sigma Scorpii 2.9 by moon 90% illuminated at phase= 142 degrees  
07/07/2025 07:17:34.1 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.129  
Global start/end: 07/07/2025 05:49:05.6 and 07/07/2025 08:46:00.2  
Mid-occultation observing point 37.53W 72.819S

Occultation of Antares 1.06 by moon 91% illuminated at phase= 144 degrees  
07/07/2025 11:11:30.8 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.129  
Global start/end: 07/07/2025 09:01:42.5 and 07/07/2025 13:21:15.5  
Mid-occultation observing point 42.312E 51.648S

Occultation of 23 tau Scorpii 2.82 by moon 91% illuminated at phase= 146 degrees  
07/07/2025 14:34:33.3 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.129  
Global start/end: 07/07/2025 14:05:01.1 and 07/07/2025 15:04:05.2  
Mid-occultation observing point 18.628E 61.742N

Occultation of 27 phi Sagittarii 3.17 by moon 100% illuminated at phase= 172 degrees  
07/09/2025 22:03:42.3 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.129  
Global start/end: 07/09/2025 20:22:45.4 and 07/09/2025 23:44:35.9  
Mid-occultation observing point 37.116W 82.337S  
At Journey Museum, the miss angle is 5062.0 arc-sec at 07/09/2025 21:21:30.9

Occultation of 40 tau Sagittarii 3.32 by moon 100% illuminated at phase= 177 degrees  
07/10/2025 06:45:17.8 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.129  
Global start/end: 07/10/2025 04:43:59.1 and 07/10/2025 08:46:33.0  
Mid-occultation observing point 147.243E 5.159N

Occultation of Deneb Algedi 2.85 by moon 92% illuminated at phase= 212 degrees  
07/13/2025 05:47:08.6 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.128  
Global start/end: 07/13/2025 03:42:31.0 and 07/13/2025 07:51:44.8  
Mid-occultation observing point 165.6W 5.31N

Occultation of Alcyone 2.85 by moon 23% illuminated at phase= 302 degrees  
07/20/2025 03:54:10.9 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.128  
Global start/end: 07/20/2025 02:13:38.3 and 07/20/2025 05:34:42.9  
Mid-occultation observing point 80.701W 71.184N

**---For observations at Journey Museum:**

**07/20/2025 02:33:09.7 Start Total (elev 24 az 79 deg.) -16.4 \*\*\***  
**07/20/2025 02:59:53.6 OCCULTATION MID-POINT (elev 29 az 84 deg.) -13.4 \*\*\***  
**07/20/2025 03:27:36.1 End Total (elev 34 az 88 deg.) -9.8 \*\*\***

Occultation of Elnath 1.65 by moon 10% illuminated at phase= 323 degrees  
07/21/2025 17:35:52.4 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.128  
Global start/end: 07/21/2025 15:32:16.5 and 07/21/2025 19:39:28.0  
Mid-occultation observing point 133.825E 11.998N

Occultation of Regulus 1.36 by moon 5% illuminated at phase= 26 degrees  
07/26/2025 14:26:22.0 Geocentric minimum 1.2 degrees. DUTC= 69.184 DUT1= 69.128  
Global start/end: 07/26/2025 14:10:37.1 and 07/26/2025 14:42:07.0  
Mid-occultation observing point 1.611E 61.709N  
At Journey Museum, the miss angle is 1587.9 arc-sec at 07/26/2025 14:32:44.6

Occultation of Mars 1.6 by moon 17% illuminated at phase= 48 degrees  
07/28/2025 11:29:38.4 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.128  
Global start/end: 07/28/2025 10:48:59.1 and 07/28/2025 12:10:18.7  
Mid-occultation observing point 136.281W 61.372S

Occultation of Spica 0.98 by moon 38% illuminated at phase= 76 degrees  
07/30/2025 22:34:55.6 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.128  
Global start/end: 07/30/2025 21:12:02.3 and 07/30/2025 23:57:50.5  
Mid-occultation observing point 54.716E 61.495S

Occultation of 6 pi Scorpii 2.89 by moon 69% illuminated at phase= 112 degrees  
08/03/2025 05:38:30.0 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.128  
Global start/end: 08/03/2025 03:32:32.5 and 08/03/2025 07:44:24.6  
Mid-occultation observing point 105.108E 5.864N

Occultation of 20 sigma Scorpii 2.9 by moon 72% illuminated at phase= 116 degrees  
08/03/2025 15:16:26.6 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.128  
Global start/end: 08/03/2025 14:17:14.4 and 08/03/2025 16:15:37.8  
Mid-occultation observing point 160.935E 61.531S

Occultation of Antares 1.06 by moon 74% illuminated at phase= 118 degrees  
08/03/2025 19:11:31.6 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.128  
Global start/end: 08/03/2025 17:09:12.5 and 08/03/2025 21:13:47.1  
Mid-occultation observing point 110.308W 62.562S  
At Journey Museum, the miss angle is 3947.9 arc-sec at 08/03/2025 17:58:16.9

Occultation of 23 tau Scorpii 2.82 by moon 75% illuminated at phase= 120 degrees  
08/03/2025 22:35:13.5 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.128  
Global start/end: 08/03/2025 21:21:54.2 and 08/03/2025 23:48:31.0  
Mid-occultation observing point 128.74W 61.777N

**---For observations at Journey Museum:**

**08/03/2025 22:58:01.7 Start Total (elev 5 az 223 deg.) -27.2 \*\*\***  
**08/03/2025 23:23:28.1 OCCULTATION MID-POINT (elev 2 az 227 deg.) -28.3 \*\*\***  
08/03/2025 23:47:59.4 End Total (elev -2 az 231 deg.) -28.7

Occultation of 27 phi Sagittarii 3.17 by moon 92% illuminated at phase= 146 degrees  
08/06/2025 06:13:52.4 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.127  
Global start/end: 08/06/2025 04:40:43.2 and 08/06/2025 07:46:57.7  
Mid-occultation observing point 107.581W 82.59S

Occultation of 40 tau Sagittarii 3.32 by moon 93% illuminated at phase= 150 degrees  
08/06/2025 14:53:36.6 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.127  
Global start/end: 08/06/2025 12:49:17.7 and 08/06/2025 16:57:50.5  
Mid-occultation observing point 1.257W 0.758N

Occultation of Deneb Algedi 2.85 by moon 100% illuminated at phase= 186 degrees  
08/09/2025 13:05:01.2 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.127  
Global start/end: 08/09/2025 11:03:33.6 and 08/09/2025 15:06:26.0  
Mid-occultation observing point 56.642E 8.346N

Occultation of Alcyone 2.85 by moon 45% illuminated at phase= 276 degrees  
08/16/2025 09:33:28.2 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.127  
Global start/end: 08/16/2025 08:06:29.3 and 08/16/2025 11:00:27.7  
Mid-occultation observing point 100.907E 76.564N

Occultation of Elnath 1.65 by moon 27% illuminated at phase= 297 degrees  
08/17/2025 23:58:34.9 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.127  
Global start/end: 08/17/2025 21:51:12.2 and 08/18/2025 02:05:57.3  
Mid-occultation observing point 10.927E 18.985N

Occultation of Spica 0.98 by moon 18% illuminated at phase= 50 degrees  
08/27/2025 06:39:45.0 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.127  
Global start/end: 08/27/2025 05:37:41.7 and 08/27/2025 07:41:49.5  
Mid-occultation observing point 93.399W 61.459S

Occultation of 6 pi Scorpii 2.89 by moon 46% illuminated at phase= 86 degrees  
08/30/2025 13:44:35.4 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.127  
Global start/end: 08/30/2025 11:32:48.1 and 08/30/2025 15:56:21.5  
Mid-occultation observing point 44.919W 1.694S

Occultation of 20 sigma Scorpii 2.9 by moon 50% illuminated at phase= 90 degrees  
08/30/2025 23:27:29.9 Geocentric minimum 1.2 degrees. DUTC= 69.184 DUT1= 69.127  
Global start/end: 08/30/2025 23:19:03.2 and 08/30/2025 23:35:56.7  
Mid-occultation observing point 0.0E 0.0N

Occultation of Antares 1.06 by moon 52% illuminated at phase= 92 degrees  
08/31/2025 03:24:46.8 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.127  
Global start/end: 08/31/2025 01:29:22.8 and 08/31/2025 05:20:08.5  
Mid-occultation observing point 90.976E 70.78S

Occultation of 23 tau Scorpii 2.82 by moon 53% illuminated at phase= 93 degrees  
08/31/2025 06:50:21.9 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.127  
Global start/end: 08/31/2025 05:20:19.5 and 08/31/2025 08:20:22.4  
Mid-occultation observing point 74.409E 47.643N

Occultation of 27 phi Sagittarii 3.17 by moon 75% illuminated at phase= 120 degrees  
09/02/2025 15:09:21.3 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.127  
Global start/end: 09/02/2025 13:45:38.3 and 09/02/2025 16:33:00.6  
Mid-occultation observing point 133.114E 61.28S

Occultation of 40 tau Sagittarii 3.32 by moon 78% illuminated at phase= 124 degrees  
09/02/2025 23:54:37.8 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.127  
Global start/end: 09/02/2025 21:46:33.3 and 09/03/2025 02:02:36.9  
Mid-occultation observing point 162.887W 3.797S

Occultation of Deneb Algedi 2.85 by moon 97% illuminated at phase= 160 degrees  
09/05/2025 22:15:39.6 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.127  
Global start/end: 09/05/2025 20:13:55.0 and 09/06/2025 00:17:19.4  
Mid-occultation observing point 107.563W 7.262N  
At Journey Museum, the miss angle is 201.3 arc-sec at 09/05/2025 23:05:57.6

Occultation of Alcyone 2.85 by moon 67% illuminated at phase= 250 degrees  
09/12/2025 15:10:57.9 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.126  
Global start/end: 09/12/2025 13:49:49.9 and 09/12/2025 16:32:07.7  
Mid-occultation observing point 40.094W 71.174N

Occultation of Elnath 1.65 by moon 49% illuminated at phase= 271 degrees  
09/14/2025 05:21:51.1 Geocentric minimum 0.1 degrees. DUTC= 69.184 DUT1= 69.126  
Global start/end: 09/14/2025 03:13:43.8 and 09/14/2025 07:29:59.3  
Mid-occultation observing point 96.857W 21.73N  
At Journey Museum, the miss angle is 433.4 arc-sec at 09/14/2025 05:15:37.6

Occultation of Venus -3.9 by moon 5% illuminated at phase= 333 degrees  
09/19/2025 05:30:22.5 Geocentric minimum 0.7 degrees. DUTC= 69.184 DUT1= 69.126  
Global start/end: 09/19/2025 03:33:24.3 and 09/19/2025 07:27:24.6  
Mid-occultation observing point 2.873E 54.903N  
At Journey Museum, the miss angle is 657.4 arc-sec at 09/19/2025 03:35:39.4

Occultation of Regulus 1.36 by moon 5% illuminated at phase= 333 degrees  
09/19/2025 05:55:07.8 Geocentric minimum 1.2 degrees. DUTC= 69.184 DUT1= 69.126  
Global start/end: 09/19/2025 05:36:26.0 and 09/19/2025 06:13:49.8  
Mid-occultation observing point 75.376E 61.571N

Eclipse of the Sun -- Global data; DUTC= 69.184 DUT1= 69.126  
09/21/2025 10:29:43.1 Start Partial Solar  
09/21/2025 12:41:53.6 SOLAR ECLIPSE MAXIMUM 79.7%  
09/21/2025 12:41:54.1 PARTIAL SOLAR ECLIPSE MID-POINT  
09/21/2025 14:53:44.9 End Partial Solar  
Mid-eclipse observing point 151.0E 61.051S  
At Journey Museum, the miss angle is 3650.7 arc-sec at 09/21/2025 11:02:40.3

Occultation of Spica 0.98 by moon 4% illuminated at phase= 23 degrees  
09/23/2025 14:14:18.5 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.126  
Global start/end: 09/23/2025 13:11:38.9 and 09/23/2025 15:16:59.1  
Mid-occultation observing point 126.031E 61.469S

Occultation of 6 pi Scorpii 2.89 by moon 24% illuminated at phase= 59 degrees  
09/26/2025 21:18:56.1 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.126  
Global start/end: 09/26/2025 19:07:46.0 and 09/26/2025 23:30:06.7  
Mid-occultation observing point 174.809E 0.446S

Occultation of 20 sigma Scorpii 2.9 by moon 28% illuminated at phase= 63 degrees  
09/27/2025 07:05:38.0 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.126  
Global start/end: 09/27/2025 06:43:08.7 and 09/27/2025 07:28:07.3  
Mid-occultation observing point 130.313W 61.554S

Occultation of Antares 1.06 by moon 29% illuminated at phase= 65 degrees  
09/27/2025 11:04:46.7 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.126  
Global start/end: 09/27/2025 09:07:43.9 and 09/27/2025 13:01:48.9  
Mid-occultation observing point 49.155W 69.509S

Occultation of 23 tau Scorpii 2.82 by moon 30% illuminated at phase= 67 degrees  
09/27/2025 14:32:05.3 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.126  
Global start/end: 09/27/2025 13:05:17.6 and 09/27/2025 15:58:52.4  
Mid-occultation observing point 61.998W 61.789N

Occultation of 27 phi Sagittarii 3.17 by moon 53% illuminated at phase= 93 degrees  
09/29/2025 23:42:18.1 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.126  
Global start/end: 09/29/2025 22:14:44.8 and 09/30/2025 01:09:48.2  
Mid-occultation observing point 30.094W 72.195S

Occultation of 40 tau Sagittarii 3.32 by moon 56% illuminated at phase= 97 degrees  
09/30/2025 08:38:22.8 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.126  
Global start/end: 09/30/2025 06:30:04.5 and 09/30/2025 10:46:36.5  
Mid-occultation observing point 38.895E 1.631S

Occultation of Deneb Algedi 2.85 by moon 84% illuminated at phase= 133 degrees  
10/03/2025 08:21:02.0 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.125  
Global start/end: 10/03/2025 06:19:11.2 and 10/03/2025 10:22:46.4  
Mid-occultation observing point 73.439E 8.746N

Occultation of Alcyone 2.85 by moon 87% illuminated at phase= 223 degrees  
10/09/2025 22:44:04.0 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.125  
Global start/end: 10/09/2025 21:16:09.8 and 10/10/2025 00:12:00.8  
Mid-occultation observing point 131.217W 77.267N

**---For observations at Journey Museum:**

**10/09/2025 21:34:22.0 Start Total (elev 29 az 83 deg.) -43.7 \*\*\***  
**10/09/2025 21:49:13.3 OCCULTATION MID-POINT (elev 31 az 85 deg.) -45.5 \*\*\***  
**10/09/2025 22:04:22.2 End Total (elev 34 az 88 deg.) -47.2 \*\*\***

Occultation of Elnath 1.65 by moon 72% illuminated at phase= 244 degrees  
10/11/2025 11:46:16.2 Geocentric minimum 0.2 degrees. DUTC= 69.184 DUT1= 69.125  
Global start/end: 10/11/2025 09:40:49.0 and 10/11/2025 13:51:46.3  
Mid-occultation observing point 140.364E 17.323N

Occultation of Regulus 1.36 by moon 20% illuminated at phase= 307 degrees  
10/16/2025 11:37:29.6 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.124  
Global start/end: 10/16/2025 10:52:46.7 and 10/16/2025 12:22:13.1  
Mid-occultation observing point 36.997W 61.635N  
At Journey Museum, the miss angle is 425.0 arc-sec at 10/16/2025 12:14:54.3

Occultation of 6 pi Scorpii 2.89 by moon 8% illuminated at phase= 32 degrees  
10/24/2025 04:00:55.0 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.124  
Global start/end: 10/24/2025 01:55:37.8 and 10/24/2025 06:06:13.2  
Mid-occultation observing point 48.94E 7.31N

Occultation of 20 sigma Scorpii 2.9 by moon 10% illuminated at phase= 36 degrees  
10/24/2025 13:48:31.2 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.124  
Global start/end: 10/24/2025 12:45:07.3 and 10/24/2025 14:51:55.1  
Mid-occultation observing point 101.907E 61.587S

Occultation of Antares 1.06 by moon 11% illuminated at phase= 38 degrees  
10/24/2025 17:48:01.5 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.124  
Global start/end: 10/24/2025 15:43:06.7 and 10/24/2025 19:52:56.7  
Mid-occultation observing point 168.749W 60.65S

Occultation of 23 tau Scorpii 2.82 by moon 12% illuminated at phase= 40 degrees  
10/24/2025 21:15:32.9 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.124  
Global start/end: 10/24/2025 20:12:12.3 and 10/24/2025 22:18:53.4  
Mid-occultation observing point 170.043E 61.813N

Occultation of 27 phi Sagittarii 3.17 by moon 30% illuminated at phase= 66 degrees  
10/27/2025 06:56:58.7 Geocentric minimum 0.7 degrees. DUTC= 69.184 DUT1= 69.124  
Global start/end: 10/27/2025 05:11:11.0 and 10/27/2025 08:42:43.9  
Mid-occultation observing point 72.291E 80.527S

Occultation of 40 tau Sagittarii 3.32 by moon 33% illuminated at phase= 70 degrees  
10/27/2025 16:02:29.0 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.124  
Global start/end: 10/27/2025 14:01:49.9 and 10/27/2025 18:03:05.1  
Mid-occultation observing point 100.761W 10.268N  
At Journey Museum, the miss angle is 177.4 arc-sec at 10/27/2025 16:13:37.7

Occultation of Deneb Algedi 2.85 by moon 64% illuminated at phase= 106 degrees  
10/30/2025 17:39:14.0 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.124  
Global start/end: 10/30/2025 15:43:03.1 and 10/30/2025 19:35:18.4  
Mid-occultation observing point 97.639W 18.786N

**---For observations at Journey Museum:**

**10/30/2025 17:45:17.3 Start Total (elev 27 az 159 deg.) -11.4 \*\*\***  
**10/30/2025 18:01:39.7 OCCULTATION MID-POINT (elev 28 az 163 deg.) -14.3 \*\*\***  
**10/30/2025 18:18:03.5 End Total (elev 29 az 168 deg.) -17.2 \*\*\***

Occultation of Alcyone 2.85 by moon 98% illuminated at phase= 196 degrees  
11/06/2025 08:52:21.1 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.123  
Global start/end: 11/06/2025 07:16:40.4 and 11/06/2025 10:28:03.3  
Mid-occultation observing point 92.885E 72.767N

Occultation of Elnath 1.65 by moon 90% illuminated at phase= 217 degrees  
11/07/2025 20:40:46.5 Geocentric minimum 0.3 degrees. DUTC= 69.184 DUT1= 69.123  
Global start/end: 11/07/2025 18:40:54.7 and 11/07/2025 22:40:42.2  
Mid-occultation observing point 19.901W 8.534N  
At Journey Museum, the miss angle is 2766.2 arc-sec at 11/07/2025 19:47:19.2

Occultation of Regulus 1.36 by moon 42% illuminated at phase= 279 degrees  
11/12/2025 17:21:48.3 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.122  
Global start/end: 11/12/2025 15:57:18.1 and 11/12/2025 18:46:21.9  
Mid-occultation observing point 167.197W 64.622N

Occultation of Spica 0.98 by moon 7% illuminated at phase= 329 degrees  
11/17/2025 02:53:34.4 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.122  
Global start/end: 11/17/2025 02:00:17.9 and 11/17/2025 03:46:51.1  
Mid-occultation observing point 117.812W 61.749S

Occultation of 23 tau Scorpii 2.82 by moon 1% illuminated at phase= 12 degrees  
11/21/2025 03:18:54.9 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.122  
Global start/end: 11/21/2025 02:57:15.7 and 11/21/2025 03:40:34.2  
Mid-occultation observing point 51.929E 61.868N

Occultation of 27 phi Sagittarii 3.17 by moon 11% illuminated at phase= 39 degrees  
11/23/2025 12:57:18.0 Geocentric minimum 0.6 degrees. DUTC= 69.184 DUT1= 69.121  
Global start/end: 11/23/2025 10:55:43.1 and 11/23/2025 14:58:51.6  
Mid-occultation observing point 70.97W 64.087S  
At Journey Museum, the miss angle is 4163.8 arc-sec at 11/23/2025 12:12:10.0

Occultation of Nunki 2.05 by moon 12% illuminated at phase= 41 degrees  
11/23/2025 17:22:16.7 Geocentric minimum 1.0 degrees. DUTC= 69.184 DUT1= 69.121  
Global start/end: 11/23/2025 16:06:23.7 and 11/23/2025 18:38:08.8  
Mid-occultation observing point 18.435E 61.671S

Occultation of 40 tau Sagittarii 3.32 by moon 13% illuminated at phase= 43 degrees  
11/23/2025 22:04:40.8 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.121  
Global start/end: 11/23/2025 20:22:01.4 and 11/23/2025 23:47:18.6  
Mid-occultation observing point 138.423E 30.296N

Occultation of Deneb Algedi 2.85 by moon 40% illuminated at phase= 79 degrees  
11/27/2025 00:54:25.0 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.121  
Global start/end: 11/26/2025 23:18:42.5 and 11/27/2025 02:30:03.5  
Mid-occultation observing point 112.749E 41.627N

Occultation of Alcyone 2.85 by moon 99% illuminated at phase= 168 degrees  
12/03/2025 20:20:28.3 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.12  
Global start/end: 12/03/2025 18:44:01.0 and 12/03/2025 21:56:54.8  
Mid-occultation observing point 103.172W 72.18N

**---For observations at Journey Museum:**

**12/03/2025 19:21:39.2 Start Total (elev 44 az 98 deg.) -32.8 \*\*\***  
**12/03/2025 19:36:11.8 OCCULTATION MID-POINT (elev 46 az 101 deg.) -35.4 \*\*\***  
**12/03/2025 19:51:00.6 End Total (elev 49 az 104 deg.) -38.0 \*\*\***

Occultation of Elnath 1.65 by moon 99% illuminated at phase= 189 degrees  
12/05/2025 07:44:08.7 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.12  
Global start/end: 12/05/2025 05:48:52.5 and 12/05/2025 09:39:27.0  
Mid-occultation observing point 147.351E 2.09N

Occultation of Regulus 1.36 by moon 66% illuminated at phase= 252 degrees  
12/10/2025 00:47:13.0 Geocentric minimum 0.7 degrees. DUTC= 69.184 DUT1= 69.12  
Global start/end: 12/09/2025 22:55:51.2 and 12/10/2025 02:38:41.4  
Mid-occultation observing point 16.574W 49.509N  
At Journey Museum, the miss angle is 437.2 arc-sec at 12/09/2025 23:08:09.2

Occultation of 6 pi Scorpii 2.89 by moon 4% illuminated at phase= 337 degrees  
12/17/2025 16:19:29.5 Geocentric minimum 0.5 degrees. DUTC= 69.184 DUT1= 69.119  
Global start/end: 12/17/2025 14:16:41.0 and 12/17/2025 18:22:16.3  
Mid-occultation observing point 170.862E 10.122N

Occultation of 20 sigma Scorpii 2.9 by moon 3% illuminated at phase= 341 degrees  
12/18/2025 02:06:19.8 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.119  
Global start/end: 12/18/2025 00:47:44.2 and 12/18/2025 03:24:54.4  
Mid-occultation observing point 137.179W 61.737S

Occultation of Antares 1.06 by moon 2% illuminated at phase= 343 degrees  
12/18/2025 06:04:09.3 Geocentric minimum 0.4 degrees. DUTC= 69.184 DUT1= 69.119  
Global start/end: 12/18/2025 03:54:51.2 and 12/18/2025 08:13:25.5  
Mid-occultation observing point 42.772W 54.192S

Occultation of 23 tau Scorpii 2.82 by moon 2% illuminated at phase= 345 degrees  
12/18/2025 09:29:04.3 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.119  
Global start/end: 12/18/2025 09:01:50.5 and 12/18/2025 09:56:17.9  
Mid-occultation observing point 67.983W 61.937N

Occultation of Nunki 2.05 by moon 1% illuminated at phase= 13 degrees  
12/20/2025 23:11:05.1 Geocentric minimum 0.8 degrees. DUTC= 69.184 DUT1= 69.119  
Global start/end: 12/20/2025 21:36:43.0 and 12/21/2025 00:45:25.6  
Mid-occultation observing point 140.13W 81.361S

Occultation of 40 tau Sagittarii 3.32 by moon 2% illuminated at phase= 15 degrees  
12/21/2025 03:50:32.3 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.119  
Global start/end: 12/21/2025 02:25:12.1 and 12/21/2025 05:15:51.1  
Mid-occultation observing point 15.791E 58.785N

Occultation of Deneb Algedi 2.85 by moon 18% illuminated at phase= 51 degrees  
12/24/2025 06:30:19.1 Geocentric minimum 1.1 degrees. DUTC= 69.184 DUT1= 69.118  
Global start/end: 12/24/2025 05:35:59.6 and 12/24/2025 07:24:37.7  
Mid-occultation observing point 29.45W 61.988N

Occultation of Alcyone 2.85 by moon 89% illuminated at phase= 140 degrees  
12/31/2025 06:46:33.9 Geocentric minimum 0.9 degrees. DUTC= 69.184 DUT1= 69.118  
Global start/end: 12/31/2025 05:19:45.7 and 12/31/2025 08:13:20.1  
Mid-occultation observing point 20.596E 77.86N

\*\*\* = The Moon is above the horizon, and the Sun is not an obstacle.

Program LOSP4 version 231216a + gglib version 231209a  
delta-T data as of 01/04/2024