OCCULTATIONS OF PLANETS AND BRIGHT STARS BY THE MOON

November 22, 2018

The moon, as our nearest neighbor, sometimes blocks the light coming from a planet, a star, or the sun. Occultations are listed below for 2018 through 2020. 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), then the angle of separation is also listed.

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 latitude and longitude 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 **Hidden Valley Observatory**, the times (MST) of the various stages are listed along with the altitude above the horizon of the object, the moon (with azimuth), and the sun respectively. For occultations, when the moon is above the horizon, but not the sun, this is noted with three asterisks (***). If, on the other hand, the Moon is visible at HVO 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.

Note: the data listed below depend on estimates of DUT1 and DUTC. Also, a number of other factors are involved in the computation of an occultation, and the results given here can easily be off by a few seconds. In addition, direct visual observation can be uncertain in terms of reaction time, and in establishing the accuracy of the clock you use.

N.B. This edition replaces all previous editions.

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Selected stars are magnitude 5.5 or brighter.
Lunar occultations of planets and bright stars.
Dates and times in MST
When DST (Summer Time) is required add one hour.

Reference location: HVO 44.108178 -103.297529


Occultation of 13 mu Sgr 3.84 by moon 34% illuminated at phase= 72 degrees
10/14/2018 19:09:27.1 Geocentric minimum 0.1 degrees
Global start/end: 10/14/2018 16:51:42.9   and   10/14/2018 21:27:13.3
Mid-occultation observing point (lat., long.) -15.107 -141.896
At HVO the miss angle is 1471.4 arc-sec at 10/14/2018 20:19:09.0

Occultation of 37 xi^2 Sgr 3.52 by moon 42% illuminated at phase= 81 degrees
10/15/2018 15:35:38.7 Geocentric minimum 0.1 degrees
Global start/end: 10/15/2018 13:16:36.0   and   10/15/2018 17:54:42.4
Mid-occultation observing point (lat., long.) -24.398 -78.55
At HVO the miss angle is 2109.5 arc-sec at 10/15/2018 14:37:03.6
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Occultation of 39 o Sgr 3.76 by moon 44% illuminated at phase= 83 degrees
10/15/2018 18:48:48.8 Geocentric minimum 0.6 degrees
Global start/end: 10/15/2018 16:51:09.5   and   10/15/2018 20:46:30.6
Mid-occultation observing point (lat., long.) 21.353 -126.505

---For observations at HVO:
10/15/2018 19:05:00.4 Start Total 20.03 19.81 (az206) -21.6 ***
10/15/2018 19:37:59.7 OCCULTATION MID-POINT 17.12 16.99 (az213) -27.4 ***
10/15/2018 20:09:39.7 End Total 13.73 13.73 (az220) -32.8 ***

Occultation of 41 pi Sgr 2.88 by moon 45% illuminated at phase= 84 degrees
10/15/2018 21:14:02.0 Geocentric minimum 0.1 degrees
Global start/end: 10/15/2018 18:54:51.6   and   10/15/2018 23:33:13.1
Mid-occultation observing point (lat., long.) -25.103 -160.273

Occultation of 56 Sgr 4.87 by moon 52% illuminated at phase= 92 degrees
10/16/2018 14:39:32.4 Geocentric minimum 0.8 degrees
Global start/end: 10/16/2018 12:56:51.0   and   10/16/2018 16:22:14.7
Mid-occultation observing point (lat., long.) -78.75 -29.246

Occultation of 15 upsilon Cap 5.15 by moon 62% illuminated at phase= 103 degrees
10/17/2018 16:35:12.5 Geocentric minimum 0.7 degrees
Global start/end: 10/17/2018 14:46:26.4   and   10/17/2018 18:23:57.8
Mid-occultation observing point (lat., long.) -69.658 -46.767
At HVO the miss angle is 4640.9 arc-sec at 10/17/2018 15:44:18.0

Occultation of 23 theta Cap 4.08 by moon 66% illuminated at phase= 109 degrees
10/18/2018 05:12:05.5 Geocentric minimum 0.5 degrees
Global start/end: 10/18/2018 03:03:46.7   and   10/18/2018 07:20:22.6
Mid-occultation observing point (lat., long.) -46.791 115.508

Occultation of 32 iota Cap 4.28 by moon 69% illuminated at phase= 113 degrees
10/18/2018 13:03:39.6 Geocentric minimum 0.0 degrees
Global start/end: 10/18/2018 10:44:07.5   and   10/18/2018 15:23:10.4
Mid-occultation observing point (lat., long.) -17.27 -7.253

Occultation of Nashira 3.69 by moon 72% illuminated at phase= 116 degrees
10/18/2018 21:30:35.4 Geocentric minimum 0.8 degrees
Global start/end: 10/18/2018 19:54:34.4   and   10/18/2018 23:06:34.5
Mid-occultation observing point (lat., long.) 48.642 -150.134

---For observations at HVO:
10/18/2018 22:32:03.7 Start Total 18.24 18.33 (az223) -53.0 ***
10/18/2018 22:41:11.5 OCCULTATION MID-POINT 17.11 17.25 (az225) -53.7 ***
10/18/2018 22:50:12.7 End Total 15.96 16.14 (az227) -54.3 ***

Occultation of Deneb Algedi 2.85 by moon 74% illuminated at phase= 118 degrees
10/19/2018 01:01:25.3 Geocentric minimum 0.7 degrees
Global start/end: 10/18/2018 23:14:21.7   and   10/19/2018 02:48:26.3
Mid-occultation observing point (lat., long.) 36.765 163.912

Occultation of 33 iota Aqr 4.29 by moon 77% illuminated at phase= 123 degrees
10/19/2018 11:16:08.2 Geocentric minimum 0.2 degrees
Global start/end: 10/19/2018 08:59:25.8   and   10/19/2018 13:32:47.9
Mid-occultation observing point (lat., long.) -25.977 33.499

Occultation of 91 psi^1 Aqr 4.24 by moon 88% illuminated at phase= 139 degrees
10/20/2018 22:09:08.6 Geocentric minimum 0.5 degrees
Global start/end: 10/20/2018 20:03:49.5   and   10/21/2018 00:14:23.2
Mid-occultation observing point (lat., long.) 20.189 -128.122

---For observations at HVO:
10/20/2018 22:39:38.1 Start Total 33.31 33.07 (az206) -54.3 ***
10/20/2018 23:16:43.6 OCCULTATION MID-POINT 29.84 29.79 (az216) -56.3 ***
10/20/2018 23:52:27.1 End Total 25.66 25.81 (az225) -56.5 ***

Occultation of 93 psi^2 Aqr 4.41 by moon 88% illuminated at phase= 139 degrees
10/20/2018 23:00:00.1 Geocentric minimum 0.7 degrees
Global start/end: 10/20/2018 21:12:37.0   and   10/21/2018 00:47:18.9
Mid-occultation observing point (lat., long.) 39.865 -149.956

---For observations at HVO:
10/20/2018 23:58:54.3 Start Total 25.0 25.02 (az226) -56.3 ***
10/21/2018 00:15:40.6 OCCULTATION MID-POINT 22.77 22.87 (az230) -55.6 ***
10/21/2018 00:32:06.7 End Total 20.45 20.65 (az234) -54.6 ***

Occultation of 27 Psc 4.88 by moon 93% illuminated at phase= 150 degrees
10/21/2018 21:05:46.9 Geocentric minimum 1.1 degrees
Global start/end: 10/21/2018 20:06:56.4   and   10/21/2018 22:04:35.8
Mid-occultation observing point (lat., long.) -68.858 10.14

Occultation of 89 Psc 5.13 by moon 99% illuminated at phase= 169 degrees
10/23/2018 12:34:11.0 Geocentric minimum 0.6 degrees
Global start/end: 10/23/2018 10:41:21.8   and   10/23/2018 14:26:56.0
Mid-occultation observing point (lat., long.) -35.51 71.224

Occultation of 106 nu Psc 4.45 by moon 100% illuminated at phase= 175 degrees
10/23/2018 23:53:11.5 Geocentric minimum 0.3 degrees
Global start/end: 10/23/2018 21:44:49.9   and   10/24/2018 02:01:30.2
Mid-occultation observing point (lat., long.) -10.928 -104.101
At HVO the miss angle is 1816.2 arc-sec at 10/24/2018 00:53:24.3

Occultation of 65 xi^1 Cet 4.36 by moon 100% illuminated at phase= 183 degrees
10/24/2018 15:18:40.6 Geocentric minimum 0.7 degrees
Global start/end: 10/24/2018 13:33:51.1   and   10/24/2018 17:03:26.9
Mid-occultation observing point (lat., long.) -38.037 44.72

Occultation of 73 xi^2 Cet 4.3 by moon 100% illuminated at phase= 186 degrees
10/24/2018 21:25:38.6 Geocentric minimum 0.9 degrees
Global start/end: 10/24/2018 19:55:24.9   and   10/24/2018 22:55:49.5
Mid-occultation observing point (lat., long.) 67.212 -113.479

---For observations at HVO:
10/24/2018 20:24:22.2 Start Total 30.04 30.26 (az109) -37.8 ***
10/24/2018 20:51:09.2 OCCULTATION MID-POINT 34.52 34.67 (az114) -42.2 ***
10/24/2018 21:18:50.7 End Total 38.92 39.04 (az121) -46.3 ***

Occultation of 87 mu Cet 4.27 by moon 99% illuminated at phase= 190 degrees
10/25/2018 05:23:12.3 Geocentric minimum 0.7 degrees
Global start/end: 10/25/2018 03:32:50.8   and   10/25/2018 07:13:31.0
Mid-occultation observing point (lat., long.) 50.202 162.373

Occultation of 61 delta Tau 3.77 by moon 92% illuminated at phase= 213 degrees
10/27/2018 01:04:56.0 Geocentric minimum 0.1 degrees
Global start/end: 10/26/2018 22:56:14.7   and   10/27/2018 03:13:37.8
Mid-occultation observing point (lat., long.) 13.05 -89.828
At HVO the miss angle is 1007.8 arc-sec at 10/27/2018 01:06:36.5

Occultation of 68v776 Tau 4.3 by moon 92% illuminated at phase= 214 degrees
10/27/2018 02:15:20.9 Geocentric minimum 0.3 degrees
Global start/end: 10/27/2018 00:10:59.0   and   10/27/2018 04:19:42.1
Mid-occultation observing point (lat., long.) -1.262 -103.823
At HVO the miss angle is 1658.3 arc-sec at 10/27/2018 02:44:21.7

Occultation of 97v480 Tau 5.08 by moon 89% illuminated at phase= 220 degrees
10/27/2018 12:58:47.8 Geocentric minimum 0.0 degrees
Global start/end: 10/27/2018 10:50:09.2   and   10/27/2018 15:07:27.5
Mid-occultation observing point (lat., long.) 17.362 97.597

Occultation of 123 zeta Tau 2.97 by moon 82% illuminated at phase= 230 degrees
10/28/2018 08:02:45.9 Geocentric minimum 0.7 degrees
Global start/end: 10/28/2018 06:19:33.0   and   10/28/2018 09:45:58.1
Mid-occultation observing point (lat., long.) -27.952 -172.588
At HVO the miss angle is 3756.4 arc-sec at 10/28/2018 09:07:16.3

Occultation of 54 chi^1 Ori 4.39 by moon 80% illuminated at phase= 233 degrees
10/28/2018 14:34:22.9 Geocentric minimum 0.5 degrees
Global start/end: 10/28/2018 12:36:51.7   and   10/28/2018 16:31:53.7
Mid-occultation observing point (lat., long.) 51.058 84.293

Occultation of 62 chi^2 Ori 4.64 by moon 78% illuminated at phase= 236 degrees
10/28/2018 18:22:20.0 Geocentric minimum 0.8 degrees
Global start/end: 10/28/2018 16:44:39.6   and   10/28/2018 19:59:59.9
Mid-occultation observing point (lat., long.) 75.629 20.461

Occultation of 18 nu Gem 4.13 by moon 74% illuminated at phase= 241 degrees
10/29/2018 04:24:10.5 Geocentric minimum 1.0 degrees
Global start/end: 10/29/2018 03:11:23.3   and   10/29/2018 05:36:57.4
Mid-occultation observing point (lat., long.) 68.626 73.133
At HVO the miss angle is 1337.7 arc-sec at 10/29/2018 04:42:32.0

Occultation of Mekbuda 4.01 by moon 68% illuminated at phase= 249 degrees
10/29/2018 18:26:11.0 Geocentric minimum 0.7 degrees
Global start/end: 10/29/2018 16:39:29.2   and   10/29/2018 20:12:52.6
Mid-occultation observing point (lat., long.) 65.516 49.089

Occultation of Wasat 3.5 by moon 66% illuminated at phase= 252 degrees
10/30/2018 00:41:14.8 Geocentric minimum 0.9 degrees
Global start/end: 10/29/2018 23:07:57.1   and   10/30/2018 02:14:32.2
Mid-occultation observing point (lat., long.) -38.91 -46.922
At HVO the miss angle is 4070.2 arc-sec at 10/29/2018 23:44:52.8

Occultation of 33 eta Cnc 5.33 by moon 52% illuminated at phase= 268 degrees
10/31/2018 05:31:19.5 Geocentric minimum 1.1 degrees
Global start/end: 10/31/2018 04:34:15.2   and   10/31/2018 06:28:23.8
Mid-occultation observing point (lat., long.) -68.961 -125.701
At HVO the miss angle is 4489.8 arc-sec at 10/31/2018 05:04:23.0

Occultation of Asellus Australis 3.94 by moon 50% illuminated at phase= 271 degrees
10/31/2018 10:54:11.2 Geocentric minimum 0.7 degrees
Global start/end: 10/31/2018 09:05:00.7   and   10/31/2018 12:43:21.6
Mid-occultation observing point (lat., long.) 58.788 -163.944

Occultation of 53 Leo 5.32 by moon 25% illuminated at phase= 299 degrees
11/02/2018 15:40:47.3 Geocentric minimum 0.4 degrees
Global start/end: 11/02/2018 13:38:55.5   and   11/02/2018 17:42:39.0
Mid-occultation observing point (lat., long.) 32.277 148.587

Occultation of 3 nu Vir 4.04 by moon 16% illuminated at phase= 313 degrees
11/03/2018 16:29:26.7 Geocentric minimum 0.5 degrees
Global start/end: 11/03/2018 14:32:34.6   and   11/03/2018 18:26:19.3
Mid-occultation observing point (lat., long.) -23.3 129.612

Occultation of 16 Vir 4.97 by moon 11% illuminated at phase= 321 degrees
11/04/2018 08:14:36.5 Geocentric minimum 0.6 degrees
Global start/end: 11/04/2018 06:20:25.1   and   11/04/2018 10:08:49.0
Mid-occultation observing point (lat., long.) -30.106 -101.272
At HVO the miss angle is 2788.1 arc-sec at 11/04/2018 06:59:30.5

Occultation of 46 theta Lib 4.13 by moon 1% illuminated at phase= 14 degrees
11/08/2018 12:17:27.8 Geocentric minimum 0.9 degrees
Global start/end: 11/08/2018 10:45:12.7   and   11/08/2018 13:49:46.5
Mid-occultation observing point (lat., long.) 47.618 -78.803

Occultation of 49 Lib 5.47 by moon 2% illuminated at phase= 15 degrees
11/08/2018 14:59:15.8 Geocentric minimum 0.3 degrees
Global start/end: 11/08/2018 12:50:08.9   and   11/08/2018 17:08:26.2
Mid-occultation observing point (lat., long.) 0.934 -133.225
At HVO the miss angle is 1113.4 arc-sec at 11/08/2018 15:26:34.6

Occultation of 7 chi Oph 4.22 by moon 3% illuminated at phase= 21 degrees
11/09/2018 03:21:29.1 Geocentric minimum 0.7 degrees
Global start/end: 11/09/2018 01:33:50.9   and   11/09/2018 05:09:11.9
Mid-occultation observing point (lat., long.) 29.888 53.593

Occultation of BSC6196 4.91 by moon 4% illuminated at phase= 24 degrees
11/09/2018 09:27:10.8 Geocentric minimum 0.7 degrees
Global start/end: 11/09/2018 07:37:41.6   and   11/09/2018 11:16:44.6
Mid-occultation observing point (lat., long.) -63.861 -63.549

Occultation of 40 xi Oph 4.39 by moon 8% illuminated at phase= 33 degrees
11/10/2018 03:56:46.7 Geocentric minimum 1.1 degrees
Global start/end: 11/10/2018 03:10:08.5   and   11/10/2018 04:43:26.0
Mid-occultation observing point (lat., long.) 68.819 68.322

Occultation of 58 Oph 4.86 by moon 11% illuminated at phase= 38 degrees
11/10/2018 14:03:44.2 Geocentric minimum 1.0 degrees
Global start/end: 11/10/2018 13:02:23.5   and   11/10/2018 15:05:06.7
Mid-occultation observing point (lat., long.) 68.865 -83.791

Occultation of 13 mu Sgr 3.84 by moon 14% illuminated at phase= 44 degrees
11/11/2018 03:40:29.0 Geocentric minimum 0.1 degrees
Global start/end: 11/11/2018 01:24:14.8   and   11/11/2018 05:56:46.1
Mid-occultation observing point (lat., long.) -29.615 62.541

Occultation of 37 xi^2 Sgr 3.52 by moon 21% illuminated at phase= 54 degrees
11/11/2018 23:54:20.3 Geocentric minimum 0.3 degrees
Global start/end: 11/11/2018 21:40:46.5   and   11/12/2018 02:07:57.6
Mid-occultation observing point (lat., long.) -40.543 130.14

Occultation of 39 o Sgr 3.76 by moon 22% illuminated at phase= 55 degrees
11/12/2018 03:05:58.0 Geocentric minimum 0.4 degrees
Global start/end: 11/12/2018 00:54:36.5   and   11/12/2018 05:17:23.2
Mid-occultation observing point (lat., long.) 1.989 82.83

Occultation of 41 pi Sgr 2.88 by moon 22% illuminated at phase= 56 degrees
11/12/2018 05:29:49.1 Geocentric minimum 0.3 degrees
Global start/end: 11/12/2018 03:16:33.3   and   11/12/2018 07:43:08.4
Mid-occultation observing point (lat., long.) -41.595 49.585

Occultation of 56 Sgr 4.87 by moon 28% illuminated at phase= 64 degrees
11/12/2018 22:48:11.8 Geocentric minimum 1.0 degrees
Global start/end: 11/12/2018 21:49:24.3   and   11/12/2018 23:47:00.3
Mid-occultation observing point (lat., long.) -68.637 -36.973

Occultation of 15 upsilon Cap 5.15 by moon 38% illuminated at phase= 76 degrees
11/14/2018 00:40:08.5 Geocentric minimum 1.0 degrees
Global start/end: 11/13/2018 23:29:35.5   and   11/14/2018 01:50:41.8
Mid-occultation observing point (lat., long.) -68.601 -65.931

Occultation of 23 theta Cap 4.08 by moon 43% illuminated at phase= 82 degrees
11/14/2018 13:18:24.3 Geocentric minimum 0.7 degrees
Global start/end: 11/14/2018 11:29:38.3   and   11/14/2018 15:07:10.5
Mid-occultation observing point (lat., long.) -68.089 -15.482

Occultation of 32 iota Cap 4.28 by moon 46% illuminated at phase= 85 degrees
11/14/2018 21:11:50.9 Geocentric minimum 0.3 degrees
Global start/end: 11/14/2018 18:55:51.4   and   11/14/2018 23:27:50.2
Mid-occultation observing point (lat., long.) -33.996 -151.601

Occultation of Nashira 3.69 by moon 49% illuminated at phase= 89 degrees
11/15/2018 05:41:31.7 Geocentric minimum 0.6 degrees
Global start/end: 11/15/2018 03:40:11.0   and   11/15/2018 07:42:51.3
Mid-occultation observing point (lat., long.) 21.691 70.596

Occultation of Deneb Algedi 2.85 by moon 51% illuminated at phase= 91 degrees
11/15/2018 09:13:47.9 Geocentric minimum 0.5 degrees
Global start/end: 11/15/2018 07:06:29.4   and   11/15/2018 11:21:05.0
Mid-occultation observing point (lat., long.) 14.824 20.841

Occultation of Mars -0.3 by moon 56% illuminated at phase= 96 degrees
11/15/2018 21:52:00.0 Geocentric minimum 1.0 degrees
Global start/end: 11/15/2018 20:28:52.8   and   11/15/2018 23:15:05.8
Mid-occultation observing point (lat., long.) -68.901 -24.803

Occultation of 33 iota Aqr 4.29 by moon 55% illuminated at phase= 95 degrees
11/15/2018 19:33:35.7 Geocentric minimum 0.5 degrees
Global start/end: 11/15/2018 17:25:11.3   and   11/15/2018 21:41:57.9
Mid-occultation observing point (lat., long.) -42.461 -110.829
At HVO the miss angle is 2871.8 arc-sec at 11/15/2018 21:09:32.6

Occultation of 91 psi^1 Aqr 4.24 by moon 68% illuminated at phase= 111 degrees
11/17/2018 06:48:36.0 Geocentric minimum 0.3 degrees
Global start/end: 11/17/2018 04:33:48.7   and   11/17/2018 09:03:19.8
Mid-occultation observing point (lat., long.) 6.005 80.221

Occultation of 93 psi^2 Aqr 4.41 by moon 69% illuminated at phase= 112 degrees
11/17/2018 07:39:58.0 Geocentric minimum 0.5 degrees
Global start/end: 11/17/2018 05:35:39.3   and   11/17/2018 09:44:12.3
Mid-occultation observing point (lat., long.) 22.592 61.534

Occultation of 95 psi^3 Aqr 4.99 by moon 69% illuminated at phase= 112 degrees
11/17/2018 07:52:03.4 Geocentric minimum 1.0 degrees
Global start/end: 11/17/2018 06:40:29.4   and   11/17/2018 09:03:35.3
Mid-occultation observing point (lat., long.) 68.844 2.269

Occultation of 89 Psc 5.13 by moon 89% illuminated at phase= 142 degrees
11/19/2018 21:44:59.9 Geocentric minimum 0.7 degrees
Global start/end: 11/19/2018 20:00:41.2   and   11/19/2018 23:29:13.1
Mid-occultation observing point (lat., long.) -44.447 -86.982
At HVO the miss angle is 3516.8 arc-sec at 11/19/2018 22:59:04.0

Occultation of 106 nu Psc 4.45 by moon 92% illuminated at phase= 147 degrees
11/20/2018 09:04:04.7 Geocentric minimum 0.4 degrees
Global start/end: 11/20/2018 06:58:21.0   and   11/20/2018 11:09:42.9
Mid-occultation observing point (lat., long.) -16.268 93.413

Occultation of 65 xi^1 Cet 4.36 by moon 95% illuminated at phase= 155 degrees
11/21/2018 00:26:12.3 Geocentric minimum 0.8 degrees
Global start/end: 11/20/2018 22:46:00.4   and   11/21/2018 02:06:19.3
Mid-occultation observing point (lat., long.) -42.55 -115.968
At HVO the miss angle is 3233.7 arc-sec at 11/21/2018 01:49:37.6

Occultation of 73 xi^2 Cet 4.3 by moon 96% illuminated at phase= 159 degrees
11/21/2018 06:29:43.3 Geocentric minimum 0.8 degrees
Global start/end: 11/21/2018 04:54:58.3   and   11/21/2018 08:04:23.9
Mid-occultation observing point (lat., long.) 63.087 94.796

Occultation of 87 mu Cet 4.27 by moon 98% illuminated at phase= 163 degrees
11/21/2018 14:22:42.9 Geocentric minimum 0.6 degrees
Global start/end: 11/21/2018 12:31:11.9   and   11/21/2018 16:14:08.9
Mid-occultation observing point (lat., long.) 48.303 1.822

Occultation of 61 delta Tau 3.77 by moon 100% illuminated at phase= 186 degrees
11/23/2018 09:17:51.0 Geocentric minimum 0.0 degrees
Global start/end: 11/23/2018 07:10:32.6   and   11/23/2018 11:25:09.7
Mid-occultation observing point (lat., long.) 17.738 118.951

Occultation of 68v776 Tau 4.3 by moon 100% illuminated at phase= 186 degrees
11/23/2018 10:26:40.9 Geocentric minimum 0.2 degrees
Global start/end: 11/23/2018 08:21:50.2   and   11/23/2018 12:31:30.1
Mid-occultation observing point (lat., long.) 3.988 105.39

Occultation of 97v480 Tau 5.08 by moon 99% illuminated at phase= 192 degrees
11/23/2018 20:53:52.0 Geocentric minimum 0.1 degrees
Global start/end: 11/23/2018 18:47:16.1   and   11/23/2018 23:00:27.8
Mid-occultation observing point (lat., long.) 23.542 -49.3
At HVO the miss angle is 1164.0 arc-sec at 11/23/2018 20:06:27.4

Occultation of 123 zeta Tau 2.97 by moon 96% illuminated at phase= 203 degrees
11/24/2018 15:26:54.5 Geocentric minimum 0.6 degrees
Global start/end: 11/24/2018 13:35:26.3   and   11/24/2018 17:18:21.8
Mid-occultation observing point (lat., long.) -15.577 48.126

Occultation of 54 chi^1 Ori 4.39 by moon 95% illuminated at phase= 206 degrees
11/24/2018 21:47:05.4 Geocentric minimum 0.7 degrees
Global start/end: 11/24/2018 19:59:21.2   and   11/24/2018 23:34:49.1
Mid-occultation observing point (lat., long.) 61.863 -53.845

---For observations at HVO:
11/24/2018 20:15:16.7 Start Total 21.5 21.7 (az82) -41.9 ***
11/24/2018 20:43:50.9 OCCULTATION MID-POINT 26.61 26.64 (az87) -46.8 ***
11/24/2018 21:13:36.5 End Total 31.96 31.82 (az92) -51.8 ***

Occultation of 62 chi^2 Ori 4.64 by moon 94% illuminated at phase= 208 degrees
11/25/2018 01:28:30.5 Geocentric minimum 1.0 degrees
Global start/end: 11/25/2018 00:08:05.9   and   11/25/2018 02:48:54.8
Mid-occultation observing point (lat., long.) 79.445 101.961
At HVO the miss angle is 1100.8 arc-sec at 11/25/2018 01:23:10.1

Occultation of Propus 3.31 by moon 93% illuminated at phase= 211 degrees
11/25/2018 05:57:21.2 Geocentric minimum 1.2 degrees
Global start/end: 11/25/2018 05:24:51.9   and   11/25/2018 06:29:50.4
Mid-occultation observing point (lat., long.) -68.686 -156.308

Occultation of 13 mu Gem 2.87 by moon 92% illuminated at phase= 212 degrees
11/25/2018 09:03:07.5 Geocentric minimum 1.1 degrees
Global start/end: 11/25/2018 08:07:48.2   and   11/25/2018 09:58:26.7
Mid-occultation observing point (lat., long.) -68.772 157.142

Occultation of 18 nu Gem 4.13 by moon 92% illuminated at phase= 214 degrees
11/25/2018 11:13:24.7 Geocentric minimum 1.2 degrees
Global start/end: 11/25/2018 10:36:53.4   and   11/25/2018 11:49:56.1
Mid-occultation observing point (lat., long.) 68.599 -55.628

Occultation of Mekbuda 4.01 by moon 88% illuminated at phase= 221 degrees
11/26/2018 00:52:47.0 Geocentric minimum 0.9 degrees
Global start/end: 11/25/2018 23:23:34.8   and   11/26/2018 02:21:59.7
Mid-occultation observing point (lat., long.) 84.945 -62.423
At HVO the miss angle is 687.0 arc-sec at 11/26/2018 00:03:25.2

Occultation of Wasat 3.5 by moon 86% illuminated at phase= 225 degrees
11/26/2018 06:58:36.9 Geocentric minimum 0.6 degrees
Global start/end: 11/26/2018 05:10:02.7   and   11/26/2018 08:47:12.0
Mid-occultation observing point (lat., long.) -18.6 -166.759
At HVO the miss angle is 3574.8 arc-sec at 11/26/2018 07:49:19.8

Occultation of 33 eta Cnc 5.33 by moon 75% illuminated at phase= 240 degrees
11/27/2018 11:11:54.8 Geocentric minimum 0.9 degrees
Global start/end: 11/27/2018 09:41:19.1   and   11/27/2018 12:42:31.9
Mid-occultation observing point (lat., long.) -41.994 137.783

Occultation of Asellus Australis 3.94 by moon 73% illuminated at phase= 243 degrees
11/27/2018 16:29:28.4 Geocentric minimum 0.9 degrees
Global start/end: 11/27/2018 14:59:59.8   and   11/27/2018 17:58:58.4
Mid-occultation observing point (lat., long.) 78.246 123.666

Occultation of 53 Leo 5.32 by moon 48% illuminated at phase= 272 degrees
11/29/2018 21:02:27.2 Geocentric minimum 0.6 degrees
Global start/end: 11/29/2018 19:10:52.1   and   11/29/2018 22:54:04.5
Mid-occultation observing point (lat., long.) 47.172 50.064

Occultation of 3 nu Vir 4.04 by moon 37% illuminated at phase= 285 degrees
11/30/2018 22:07:13.3 Geocentric minimum 0.3 degrees
Global start/end: 11/30/2018 20:01:37.3   and   12/01/2018 00:12:50.5
Mid-occultation observing point (lat., long.) -10.467 23.527

Occultation of 16 Vir 4.97 by moon 30% illuminated at phase= 294 degrees
12/01/2018 14:08:27.2 Geocentric minimum 0.4 degrees
Global start/end: 12/01/2018 12:04:41.5   and   12/01/2018 16:12:14.4
Mid-occultation observing point (lat., long.) -18.236 148.95

Occultation of 15 xi^2 Lib 5.48 by moon 6% illuminated at phase= 333 degrees
12/04/2018 16:45:46.0 Geocentric minimum 0.3 degrees
Global start/end: 12/04/2018 14:36:52.6   and   12/04/2018 18:54:40.5
Mid-occultation observing point (lat., long.) -28.083 148.208

Occultation of 38 gamma Lib 3.91 by moon 3% illuminated at phase= 342 degrees
12/05/2018 11:15:23.5 Geocentric minimum 0.2 degrees
Global start/end: 12/05/2018 09:03:21.3   and   12/05/2018 13:27:26.2
Mid-occultation observing point (lat., long.) -5.08 -111.425
At HVO the miss angle is 1329.9 arc-sec at 12/05/2018 10:47:14.3

Occultation of 46 theta Lib 4.13 by moon 1% illuminated at phase= 346 degrees
12/05/2018 20:07:40.2 Geocentric minimum 0.9 degrees
Global start/end: 12/05/2018 18:35:44.6   and   12/05/2018 21:39:38.1
Mid-occultation observing point (lat., long.) 48.618 137.623

Occultation of 49 Lib 5.47 by moon 1% illuminated at phase= 348 degrees
12/05/2018 22:51:02.9 Geocentric minimum 0.3 degrees
Global start/end: 12/05/2018 20:41:12.3   and   12/06/2018 01:00:55.1
Mid-occultation observing point (lat., long.) 0.807 81.936

Occultation of 13 mu Sgr 3.84 by moon 2% illuminated at phase= 17 degrees
12/08/2018 11:45:36.4 Geocentric minimum 0.2 degrees
Global start/end: 12/08/2018 09:32:05.5   and   12/08/2018 13:59:10.1
Mid-occultation observing point (lat., long.) -36.988 -86.279
At HVO the miss angle is 2798.8 arc-sec at 12/08/2018 10:43:28.5

Occultation of Saturn 0.5 by moon 4% illuminated at phase= 22 degrees
12/08/2018 22:20:10.7 Geocentric minimum 1.1 degrees
Global start/end: 12/08/2018 21:46:02.5   and   12/08/2018 22:54:19.3
Mid-occultation observing point (lat., long.) 68.625 124.688

Occultation of 37 xi^2 Sgr 3.52 by moon 5% illuminated at phase= 26 degrees
12/09/2018 07:55:09.6 Geocentric minimum 0.4 degrees
Global start/end: 12/09/2018 05:48:03.9   and   12/09/2018 10:02:18.8
Mid-occultation observing point (lat., long.) -50.548 -16.832

Occultation of 39 o Sgr 3.76 by moon 6% illuminated at phase= 28 degrees
12/09/2018 11:06:09.9 Geocentric minimum 0.2 degrees
Global start/end: 12/09/2018 08:50:50.3   and   12/09/2018 13:21:32.4
Mid-occultation observing point (lat., long.) -7.946 -63.871
At HVO the miss angle is 963.5 arc-sec at 12/09/2018 09:54:45.5

Occultation of 41 pi Sgr 2.88 by moon 6% illuminated at phase= 29 degrees
12/09/2018 13:29:07.8 Geocentric minimum 0.5 degrees
Global start/end: 12/09/2018 11:23:03.6   and   12/09/2018 15:35:15.6
Mid-occultation observing point (lat., long.) -52.239 -96.569
At HVO the miss angle is 3783.2 arc-sec at 12/09/2018 13:21:41.7

Occultation of 23 theta Cap 4.08 by moon 21% illuminated at phase= 54 degrees
12/11/2018 21:06:56.3 Geocentric minimum 0.9 degrees
Global start/end: 12/11/2018 19:44:35.6   and   12/11/2018 22:29:17.8
Mid-occultation observing point (lat., long.) -68.421 -39.502

Occultation of 32 iota Cap 4.28 by moon 23% illuminated at phase= 57 degrees
12/12/2018 05:00:58.0 Geocentric minimum 0.5 degrees
Global start/end: 12/12/2018 02:53:54.9   and   12/12/2018 07:08:02.5
Mid-occultation observing point (lat., long.) -48.044 69.808

Occultation of Nashira 3.69 by moon 26% illuminated at phase= 61 degrees
12/12/2018 13:32:09.1 Geocentric minimum 0.4 degrees
Global start/end: 12/12/2018 11:19:20.0   and   12/12/2018 15:44:59.2
Mid-occultation observing point (lat., long.) 6.447 -69.999
At HVO the miss angle is 765.3 arc-sec at 12/12/2018 12:55:47.0

Occultation of Deneb Algedi 2.85 by moon 27% illuminated at phase= 63 degrees
12/12/2018 17:05:17.6 Geocentric minimum 0.3 degrees
Global start/end: 12/12/2018 14:49:04.8   and   12/12/2018 19:21:31.4
Mid-occultation observing point (lat., long.) 0.479 -120.249
At HVO the miss angle is 513.5 arc-sec at 12/12/2018 18:15:20.9

Occultation of 33 iota Aqr 4.29 by moon 31% illuminated at phase= 68 degrees
12/13/2018 03:28:39.4 Geocentric minimum 0.7 degrees
Global start/end: 12/13/2018 01:34:40.7   and   12/13/2018 05:22:37.9
Mid-occultation observing point (lat., long.) -58.489 115.681

Occultation of 91 psi^1 Aqr 4.24 by moon 45% illuminated at phase= 84 degrees
12/14/2018 15:07:42.8 Geocentric minimum 0.0 degrees
Global start/end: 12/14/2018 12:48:38.4   and   12/14/2018 17:26:47.1
Mid-occultation observing point (lat., long.) -6.759 -67.051
At HVO the miss angle is 1876.5 arc-sec at 12/14/2018 14:54:38.3

Occultation of 93 psi^2 Aqr 4.41 by moon 45% illuminated at phase= 84 degrees
12/14/2018 15:59:51.2 Geocentric minimum 0.3 degrees
Global start/end: 12/14/2018 13:45:17.1   and   12/14/2018 18:14:23.4
Mid-occultation observing point (lat., long.) 8.754 -85.131
At HVO the miss angle is 806.1 arc-sec at 12/14/2018 16:07:33.0

Occultation of 95 psi^3 Aqr 4.99 by moon 45% illuminated at phase= 84 degrees
12/14/2018 16:12:05.2 Geocentric minimum 0.8 degrees
Global start/end: 12/14/2018 14:29:50.1   and   12/14/2018 17:54:17.9
Mid-occultation observing point (lat., long.) 46.21 -106.461

---For observations at HVO:
12/14/2018 15:32:24.9 Start Total 29.24 29.26 (az144) 5.5
12/14/2018 16:14:18.3 OCCULTATION MID-POINT 33.09 33.11 (az155) -0.1
12/14/2018 16:57:09.6 End Total 35.58 35.69 (az167) -7.5 ***

Occultation of 30 YY Psc 4.37 by moon 54% illuminated at phase= 95 degrees
12/15/2018 14:31:12.1 Geocentric minimum 1.1 degrees
Global start/end: 12/15/2018 13:59:49.2   and   12/15/2018 15:02:34.6
Mid-occultation observing point (lat., long.) 68.672 -124.579

Occultation of 33 BC Psc 4.61 by moon 55% illuminated at phase= 95 degrees
12/15/2018 16:16:45.3 Geocentric minimum 1.2 degrees
Global start/end: 12/15/2018 15:53:42.2   and   12/15/2018 16:39:48.2
Mid-occultation observing point (lat., long.) 68.67 -151.003
At HVO the miss angle is 457.5 arc-sec at 12/15/2018 15:58:23.9

Occultation of 89 Psc 5.13 by moon 70% illuminated at phase= 114 degrees
12/17/2018 07:18:03.2 Geocentric minimum 0.9 degrees
Global start/end: 12/17/2018 05:51:15.3   and   12/17/2018 08:44:46.6
Mid-occultation observing point (lat., long.) -63.473 131.692

Occultation of 106 nu Psc 4.45 by moon 75% illuminated at phase= 120 degrees
12/17/2018 18:50:22.3 Geocentric minimum 0.5 degrees
Global start/end: 12/17/2018 16:50:05.9   and   12/17/2018 20:50:32.2
Mid-occultation observing point (lat., long.) -26.169 -75.715
At HVO the miss angle is 3115.8 arc-sec at 12/17/2018 19:28:22.1

Occultation of 65 xi^1 Cet 4.36 by moon 80% illuminated at phase= 128 degrees
12/18/2018 10:28:36.5 Geocentric minimum 0.9 degrees
Global start/end: 12/18/2018 09:01:50.7   and   12/18/2018 11:55:17.6
Mid-occultation observing point (lat., long.) -58.581 83.4

Occultation of 73 xi^2 Cet 4.3 by moon 83% illuminated at phase= 131 degrees
12/18/2018 16:36:59.7 Geocentric minimum 0.7 degrees
Global start/end: 12/18/2018 14:50:44.2   and   12/18/2018 18:23:08.8
Mid-occultation observing point (lat., long.) 53.409 -69.253

Occultation of 87 mu Cet 4.27 by moon 85% illuminated at phase= 135 degrees
12/19/2018 00:36:04.9 Geocentric minimum 0.5 degrees
Global start/end: 12/18/2018 22:37:34.4   and   12/19/2018 02:34:28.6
Mid-occultation observing point (lat., long.) 41.099 -173.697

---For observations at HVO:
12/19/2018 01:41:18.2 Start Total 18.99 18.85 (az266) -59.3 ***
12/19/2018 02:07:24.4 OCCULTATION MID-POINT 14.31 14.38 (az271) -55.2 ***
12/19/2018 02:32:35.1 End Total 9.82 10.07 (az275) -51.0 ***

Occultation of 61 delta Tau 3.77 by moon 96% illuminated at phase= 158 degrees
12/20/2018 19:40:05.3 Geocentric minimum 0.0 degrees
Global start/end: 12/20/2018 17:33:02.5   and   12/20/2018 21:47:06.7
Mid-occultation observing point (lat., long.) 15.794 -63.192
At HVO the miss angle is 1385.9 arc-sec at 12/20/2018 19:08:46.3

Occultation of 68v776 Tau 4.3 by moon 97% illuminated at phase= 159 degrees
12/20/2018 20:48:36.1 Geocentric minimum 0.3 degrees
Global start/end: 12/20/2018 18:44:39.6   and   12/20/2018 22:52:28.7
Mid-occultation observing point (lat., long.) 2.161 -76.691
At HVO the miss angle is 1908.2 arc-sec at 12/20/2018 20:39:11.7

Occultation of 97v480 Tau 5.08 by moon 98% illuminated at phase= 164 degrees
12/21/2018 07:10:22.5 Geocentric minimum 0.1 degrees
Global start/end: 12/21/2018 05:04:17.7   and   12/21/2018 09:16:26.0
Mid-occultation observing point (lat., long.) 22.783 129.681

Occultation of 123 zeta Tau 2.97 by moon 100% illuminated at phase= 175 degrees
12/22/2018 01:27:13.3 Geocentric minimum 0.6 degrees
Global start/end: 12/21/2018 23:35:25.0   and   12/22/2018 03:18:58.4
Mid-occultation observing point (lat., long.) -13.674 -129.071
At HVO the miss angle is 2542.1 arc-sec at 12/22/2018 02:12:59.2

Occultation of 54 chi^1 Ori 4.39 by moon 100% illuminated at phase= 178 degrees
12/22/2018 07:39:29.0 Geocentric minimum 0.7 degrees
Global start/end: 12/22/2018 05:54:27.8   and   12/22/2018 09:24:27.6
Mid-occultation observing point (lat., long.) 63.8 130.057

Occultation of 62 chi^2 Ori 4.64 by moon 100% illuminated at phase= 180 degrees
12/22/2018 11:15:59.8 Geocentric minimum 1.0 degrees
Global start/end: 12/22/2018 09:59:57.3   and   12/22/2018 12:32:00.6
Mid-occultation observing point (lat., long.) 68.332 -82.666

Occultation of Propus 3.31 by moon 100% illuminated at phase= 183 degrees
12/22/2018 15:39:11.4 Geocentric minimum 1.2 degrees
Global start/end: 12/22/2018 14:49:56.3 and 12/22/2018 16:28:25.8
Mid-occultation observing point (lat., long.) -68.676 31.721

Occultation of 13 mu Gem 2.87 by moon 100% illuminated at phase= 185 degrees
12/22/2018 18:40:21.1 Geocentric minimum 1.1 degrees
Global start/end: 12/22/2018 17:34:13.5 and 12/22/2018 19:46:27.6
Mid-occultation observing point (lat., long.) -68.768 -13.68
At HVO the miss angle is 5496.8 arc-sec at 12/22/2018 17:51:16.2

Occultation of 18 nu Gem 4.13 by moon 100% illuminated at phase= 186 degrees
12/22/2018 20:46:40.8 Geocentric minimum 1.3 degrees
Global start/end: 12/22/2018 20:28:02.1 and 12/22/2018 21:05:19.3
Mid-occultation observing point (lat., long.) 68.572 134.433

Occultation of Mekbuda 4.01 by moon 99% illuminated at phase= 193 degrees
12/23/2018 10:03:14.5 Geocentric minimum 1.0 degrees
Global start/end: 12/23/2018 08:42:12.9 and 12/23/2018 11:24:15.5
Mid-occultation observing point (lat., long.) 84.041 -73.729

Occultation of Wasat 3.5 by moon 98% illuminated at phase= 197 degrees
12/23/2018 15:58:15.3 Geocentric minimum 0.6 degrees
Global start/end: 12/23/2018 14:06:30.2 and 12/23/2018 17:50:00.2
Mid-occultation observing point (lat., long.) -11.697 31.781

Occultation of 33 eta Cnc 5.33 by moon 92% illuminated at phase= 213 degrees
12/24/2018 19:14:57.9 Geocentric minimum 0.8 degrees
Global start/end: 12/24/2018 17:34:42.7 and 12/24/2018 20:55:14.6
Mid-occultation observing point (lat., long.) -28.078 -6.625

Occultation of Asellus Australis 3.94 by moon 91% illuminated at phase= 215 degrees
12/25/2018 00:21:10.8 Geocentric minimum 1.0 degrees
Global start/end: 12/24/2018 23:06:13.8 and 12/25/2018 01:36:09.0
Mid-occultation observing point (lat., long.) 68.364 79.17
At HVO the miss angle is 1249.3 arc-sec at 12/24/2018 23:20:23.8

Occultation of 53 Leo 5.32 by moon 72% illuminated at phase= 244 degrees
12/27/2018 03:15:33.4 Geocentric minimum 0.8 degrees
Global start/end: 12/27/2018 01:35:57.1 and 12/27/2018 04:55:13.6
Mid-occultation observing point (lat., long.) 58.212 -59.016
At HVO the miss angle is 313.8 arc-sec at 12/27/2018 02:29:05.5

Occultation of 3 nu Vir 4.04 by moon 61% illuminated at phase= 258 degrees
12/28/2018 03:49:18.6 Geocentric minimum 0.1 degrees
Global start/end: 12/28/2018 01:41:35.3 and 12/28/2018 05:57:03.9
Mid-occultation observing point (lat., long.) -1.087 -85.307
At HVO the miss angle is 1063.6 arc-sec at 12/28/2018 02:39:49.5

Occultation of 16 Vir 4.97 by moon 53% illuminated at phase= 266 degrees
12/28/2018 19:38:22.0 Geocentric minimum 0.2 degrees
Global start/end: 12/28/2018 17:30:51.3 and 12/28/2018 21:45:55.4
Mid-occultation observing point (lat., long.) -8.904 43.478

Occultation of 15 xi^2 Lib 5.48 by moon 22% illuminated at phase= 305 degrees
12/31/2018 22:32:25.5 Geocentric minimum 0.2 degrees
Global start/end: 12/31/2018 20:20:07.6 and 01/01/2019 00:44:43.9
Mid-occultation observing point (lat., long.) -22.035 37.052

Occultation of 38 gamma Lib 3.91 by moon 15% illuminated at phase= 314 degrees
01/01/2019 17:17:59.5 Geocentric minimum 0.2 degrees
Global start/end: 01/01/2019 15:06:21.1 and 01/01/2019 19:29:38.6
Mid-occultation observing point (lat., long.) 0.018 132.49

Occultation of 46 theta Lib 4.13 by moon 13% illuminated at phase= 319 degrees
01/02/2019 02:18:25.8 Geocentric minimum 0.9 degrees
Global start/end: 01/02/2019 00:55:55.6   and   01/02/2019 03:40:57.7
Mid-occultation observing point (lat., long.) 68.797 41.919

Occultation of 49 Lib 5.47 by moon 12% illuminated at phase= 320 degrees
01/02/2019 05:04:07.4 Geocentric minimum 0.4 degrees
Global start/end: 01/02/2019 02:55:20.8   and   01/02/2019 07:12:55.4
Mid-occultation observing point (lat., long.) 5.374 -37.048

Occultation of 7 chi Oph 4.22 by moon 9% illuminated at phase= 326 degrees
01/02/2019 17:44:39.4 Geocentric minimum 0.7 degrees
Global start/end: 01/02/2019 15:58:45.4   and   01/02/2019 19:30:35.5
Mid-occultation observing point (lat., long.) 33.124 145.227

Occultation of BSC6196 4.91 by moon 7% illuminated at phase= 329 degrees
01/02/2019 23:57:10.5 Geocentric minimum 0.7 degrees
Global start/end: 01/02/2019 22:06:24.3   and   01/03/2019 01:47:58.8
Mid-occultation observing point (lat., long.) -63.636 24.783

Occultation of 40 xi Oph 4.39 by moon 4% illuminated at phase= 338 degrees
01/03/2019 18:46:35.2 Geocentric minimum 1.1 degrees
Global start/end: 01/03/2019 17:48:42.3   and   01/03/2019 19:44:28.8
Mid-occultation observing point (lat., long.) 68.694 152.89

Occultation of 58 Oph 4.86 by moon 2% illuminated at phase= 343 degrees
01/04/2019 05:00:25.9 Geocentric minimum 1.0 degrees
Global start/end: 01/04/2019 03:44:48.8   and   01/04/2019 06:16:04.1
Mid-occultation observing point (lat., long.) 68.773 -0.946

Eclipse of the Sun by moon 0% illuminated at phase= 0 degrees
01/05/2019 18:41:26.9 Geocentric minimum 1.0 degrees
Global start/end: 01/05/2019 16:33:53.3   and   01/05/2019 20:49:04.9
Mid-occultation observing point (lat., long.) 68.72 153.431

Occultation of 23 theta Cap 4.08 by moon 5% illuminated at phase= 26 degrees
01/08/2019 04:10:32.9 Geocentric minimum 1.0 degrees
Global start/end: 01/08/2019 03:01:14.7   and   01/08/2019 05:19:51.6
Mid-occultation observing point (lat., long.) -68.459 -172.15

Occultation of 32 iota Cap 4.28 by moon 7% illuminated at phase= 30 degrees
01/08/2019 12:04:00.5 Geocentric minimum 0.6 degrees
Global start/end: 01/08/2019 10:01:46.3   and   01/08/2019 14:06:16.3
Mid-occultation observing point (lat., long.) -53.314 -59.908
At HVO the miss angle is 4054.5 arc-sec at 01/08/2019 11:39:31.5

Occultation of Nashira 3.69 by moon 8% illuminated at phase= 34 degrees
01/08/2019 20:34:51.8 Geocentric minimum 0.3 degrees
Global start/end: 01/08/2019 18:19:46.5   and   01/08/2019 22:49:58.6
Mid-occultation observing point (lat., long.) 1.51 158.643

Occultation of Deneb Algedi 2.85 by moon 9% illuminated at phase= 35 degrees
01/09/2019 00:07:55.6 Geocentric minimum 0.2 degrees
Global start/end: 01/08/2019 21:50:13.8   and   01/09/2019 02:25:39.0
Mid-occultation observing point (lat., long.) -4.384 108.428

Occultation of 33 iota Aqr 4.29 by moon 12% illuminated at phase= 40 degrees
01/09/2019 10:31:31.0 Geocentric minimum 0.7 degrees
Global start/end: 01/09/2019 08:45:41.4   and   01/09/2019 12:17:21.3
Mid-occultation observing point (lat., long.) -65.538 -6.359

Occultation of 91 psi^1 Aqr 4.24 by moon 22% illuminated at phase= 56 degrees
01/10/2019 22:20:46.1 Geocentric minimum 0.1 degrees
Global start/end: 01/10/2019 20:01:23.5   and   01/11/2019 00:40:10.1
Mid-occultation observing point (lat., long.) -12.119 159.706

Occultation of 93 psi^2 Aqr 4.41 by moon 22% illuminated at phase= 56 degrees
01/10/2019 23:13:22.3 Geocentric minimum 0.2 degrees
Global start/end: 01/10/2019 20:56:05.1 and 01/11/2019 01:30:40.0
Mid-occultation observing point (lat., long.) 3.266 141.526

Occultation of 95 psi^3 Aqr 4.99 by moon 22% illuminated at phase= 56 degrees
01/10/2019 23:25:43.0 Geocentric minimum 0.7 degrees
Global start/end: 01/10/2019 21:34:35.0 and 01/11/2019 01:16:50.2
Mid-occultation observing point (lat., long.) 37.761 123.919

Occultation of 30 YY Psc 4.37 by moon 30% illuminated at phase= 67 degrees
01/11/2019 22:01:13.2 Geocentric minimum 1.0 degrees
Global start/end: 01/11/2019 21:01:47.2 and 01/11/2019 23:00:38.2
Mid-occultation observing point (lat., long.) 68.653 96.012

Occultation of 33 BC Psc 4.61 by moon 31% illuminated at phase= 67 degrees
01/11/2019 23:48:25.6 Geocentric minimum 1.1 degrees
Global start/end: 01/11/2019 22:52:50.4 and 01/12/2019 00:44:00.0
Mid-occultation observing point (lat., long.) 68.65 69.173

Occultation of 20 Cet 4.78 by moon 41% illuminated at phase= 79 degrees
01/13/2019 01:02:18.2 Geocentric minimum 1.2 degrees
Global start/end: 01/13/2019 00:42:22.0 and 01/13/2019 01:22:14.3
Mid-occultation observing point (lat., long.) 68.647 49.866

Occultation of 89 Psc 5.13 by moon 47% illuminated at phase= 86 degrees
01/13/2019 15:39:43.8 Geocentric minimum 1.0 degrees
Global start/end: 01/13/2019 14:26:51.5 and 01/13/2019 16:52:33.6
Mid-occultation observing point (lat., long.) -68.543 10.441
At HVO the miss angle is 5169.4 arc-sec at 01/13/2019 16:09:02.5

Occultation of 106 nu Psc 4.45 by moon 52% illuminated at phase= 92 degrees
01/14/2019 03:30:52.6 Geocentric minimum 0.6 degrees
Global start/end: 01/14/2019 01:34:10.7 and 01/14/2019 05:27:29.3
Mid-occultation observing point (lat., long.) -32.352 130.381

Occultation of 65 xi^1 Cet 4.36 by moon 58% illuminated at phase= 100 degrees
01/14/2019 19:36:30.6 Geocentric minimum 1.0 degrees
Global start/end: 01/14/2019 18:20:54.9 and 01/14/2019 20:52:02.8
Mid-occultation observing point (lat., long.) -68.589 -49.809

Occultation of 73 xi^2 Cet 4.3 by moon 61% illuminated at phase= 103 degrees
01/15/2019 01:55:47.4 Geocentric minimum 0.6 degrees
Global start/end: 01/15/2019 00:02:57.9 and 01/15/2019 03:48:30.6
Mid-occultation observing point (lat., long.) 48.704 128.574

Occultation of 87 mu Cet 4.27 by moon 65% illuminated at phase= 107 degrees
01/15/2019 10:09:20.0 Geocentric minimum 0.5 degrees
Global start/end: 01/15/2019 08:05:51.4 and 01/15/2019 12:12:42.2
Mid-occultation observing point (lat., long.) 37.137 18.213

Occultation of 5 Tau 4.14 by moon 73% illuminated at phase= 118 degrees
01/16/2019 07:05:22.5 Geocentric minimum 1.2 degrees
Global start/end: 01/16/2019 06:33:21.1 and 01/16/2019 07:37:23.2
Mid-occultation observing point (lat., long.) 68.63 -44.31

Occultation of 61 delta Tau 3.77 by moon 82% illuminated at phase= 130 degrees
01/17/2019 06:23:31.5 Geocentric minimum 0.1 degrees
Global start/end: 01/17/2019 04:15:00.2 and 01/17/2019 08:32:00.1
Mid-occultation observing point (lat., long.) 13.278 109.478

Occultation of 68v776 Tau 4.3 by moon 83% illuminated at phase= 131 degrees
01/17/2019 07:33:34.0 Geocentric minimum 0.3 degrees
Global start/end: 01/17/2019 05:29:09.1 and 01/17/2019 09:37:53.4
Mid-occultation observing point (lat., long.) -0.557 95.611

Occultation of 97v480 Tau 5.08 by moon 86% illuminated at phase= 136 degrees
01/17/2019 18:07:33.6 Geocentric minimum 0.0 degrees
Global start/end: 01/17/2019 15:59:58.6   and   01/17/2019 20:15:06.8
Mid-occultation observing point (lat., long.) 20.734 -61.268
At HVO the miss angle is 1111.8 arc-sec at 01/17/2019 17:28:56.4

Occultation of 123 zeta Tau 2.97 by moon 92% illuminated at phase= 147 degrees
01/18/2019 12:39:39.6 Geocentric minimum 0.6 degrees
Global start/end: 01/18/2019 10:48:28.8   and   01/18/2019 14:30:44.9
Mid-occultation observing point (lat., long.) -15.527 36.012

Occultation of 54 chi^1 Ori 4.39 by moon 93% illuminated at phase= 150 degrees
01/18/2019 18:54:48.9 Geocentric minimum 0.7 degrees
Global start/end: 01/18/2019 17:08:06.8   and   01/18/2019 20:41:25.9
Mid-occultation observing point (lat., long.) 62.336 -65.306

---For observations at HVO:
01/18/2019 17:28:26.3 Start Total 30.36 30.59 (az91) -8.1 ***
01/18/2019 17:57:14.2 OCCULTATION MID-POINT 35.52 35.6 (az96) -13.0 ***
01/18/2019 18:27:13.0 End Total 40.85 40.78 (az101) -18.2 ***

Occultation of 62 chi^2 Ori 4.64 by moon 94% illuminated at phase= 152 degrees
01/18/2019 22:32:32.4 Geocentric minimum 1.0 degrees
Global start/end: 01/18/2019 21:14:06.8   and   01/18/2019 23:50:54.8
Mid-occultation observing point (lat., long.) 75.018 86.13
At HVO the miss angle is 1189.4 arc-sec at 01/18/2019 22:48:40.8

Occultation of Propus 3.31 by moon 95% illuminated at phase= 155 degrees
01/19/2019 02:56:55.5 Geocentric minimum 1.2 degrees
Global start/end: 01/19/2019 02:11:14.2   and   01/19/2019 03:42:35.6
Mid-occultation observing point (lat., long.) -68.664 -164.561

Occultation of 13 mu Gem 2.87 by moon 96% illuminated at phase= 157 degrees
01/19/2019 05:58:23.2 Geocentric minimum 1.1 degrees
Global start/end: 01/19/2019 04:54:12.0   and   01/19/2019 07:02:32.4
Mid-occultation observing point (lat., long.) -68.759 149.965

Occultation of 18 nu Gem 4.13 by moon 96% illuminated at phase= 158 degrees
01/19/2019 08:04:32.6 Geocentric minimum 1.3 degrees
Global start/end: 01/19/2019 07:38:45.9   and   01/19/2019 08:30:19.0
Mid-occultation observing point (lat., long.) 68.568 -62.029

Occultation of Mekbuda 4.01 by moon 98% illuminated at phase= 165 degrees
01/19/2019 21:18:14.5 Geocentric minimum 1.0 degrees
Global start/end: 01/19/2019 19:56:33.9   and   01/19/2019 22:39:52.7
Mid-occultation observing point (lat., long.) 85.692 86.209
At HVO the miss angle is 911.2 arc-sec at 01/19/2019 20:30:19.8

Occultation of Wasat 3.5 by moon 99% illuminated at phase= 169 degrees
01/20/2019 03:10:18.0 Geocentric minimum 0.6 degrees
Global start/end: 01/20/2019 01:18:58.3   and   01/20/2019 05:01:35.0
Mid-occultation observing point (lat., long.) -11.549 -163.251
At HVO the miss angle is 3223.9 arc-sec at 01/20/2019 04:00:29.7

Occultation of 33 eta Cnc 5.33 by moon 100% illuminated at phase= 185 degrees
01/21/2019 05:59:20.3 Geocentric minimum 0.7 degrees
Global start/end: 01/21/2019 04:18:51.4   and   01/21/2019 07:39:48.9
Mid-occultation observing point (lat., long.) -26.309 165.617
At HVO the miss angle is 4582.3 arc-sec at 01/21/2019 06:44:20.8

Occultation of Asellus Australis 3.94 by moon 100% illuminated at phase= 187
degrees
01/21/2019 10:58:00.3 Geocentric minimum 1.0 degrees
Global start/end: 01/21/2019 09:44:22.9   and   01/21/2019 12:11:37.8
Mid-occultation observing point (lat., long.) 68.358 -107.026

Occultation of 53 Leo 5.32 by moon 90% illuminated at phase= 216 degrees
01/23/2019 12:11:43.4 Geocentric minimum 0.8 degrees
Global start/end: 01/23/2019 10:35:16.4 and 01/23/2019 13:48:14.0
Mid-occultation observing point (lat., long.) 59.317 141.533

Occultation of 3 nu Vir 4.04 by moon 82% illuminated at phase= 230 degrees
01/24/2019 11:49:55.5 Geocentric minimum 0.1 degrees
Global start/end: 01/24/2019 09:44:25.1 and 01/24/2019 13:55:28.5
Mid-occultation observing point (lat., long.) 0.692 128.264

Occultation of 16 Vir 4.97 by moon 76% illuminated at phase= 238 degrees
01/25/2019 03:04:54.3 Geocentric minimum 0.2 degrees
Global start/end: 01/25/2019 00:59:09.0 and 01/25/2019 05:10:43.1
Mid-occultation observing point (lat., long.) -7.05 -94.338
At HVO the miss angle is 1468.6 arc-sec at 01/25/2019 01:59:50.4

Occultation of 15 xi^2 Lib 5.48 by moon 44% illuminated at phase= 277 degrees
01/28/2019 04:15:22.6 Geocentric minimum 0.2 degrees
Global start/end: 01/28/2019 02:03:09.8 and 01/28/2019 06:27:37.5
Mid-occultation observing point (lat., long.) -20.883 -75.107
At HVO the miss angle is 1516.3 arc-sec at 01/28/2019 02:41:49.4

Occultation of 38 gamma Lib 3.91 by moon 36% illuminated at phase= 286 degrees
01/28/2019 22:53:48.0 Geocentric minimum 0.3 degrees
Global start/end: 01/28/2019 20:42:25.0 and 01/29/2019 01:05:13.5
Mid-occultation observing point (lat., long.) 0.875 21.934

Occultation of 46 theta Lib 4.13 by moon 32% illuminated at phase= 291 degrees
01/29/2019 07:53:14.3 Geocentric minimum 1.0 degrees
Global start/end: 01/29/2019 06:32:08.5 and 01/29/2019 09:14:22.6
Mid-occultation observing point (lat., long.) 68.798 -68.614

Occultation of 49 Lib 5.47 by moon 31% illuminated at phase= 292 degrees
01/29/2019 10:38:54.1 Geocentric minimum 0.4 degrees
Global start/end: 01/29/2019 08:30:13.5 and 01/29/2019 12:47:37.5
Mid-occultation observing point (lat., long.) 6.152 -147.389
At HVO the miss angle is 759.4 arc-sec at 01/29/2019 11:26:59.9

Occultation of 7 chi Oph 4.22 by moon 27% illuminated at phase= 298 degrees
01/29/2019 23:20:50.4 Geocentric minimum 0.7 degrees
Global start/end: 01/29/2019 21:35:24.8 and 01/30/2019 01:06:19.0
Mid-occultation observing point (lat., long.) 34.131 34.646

Occultation of BSC6196 4.91 by moon 24% illuminated at phase= 301 degrees
01/30/2019 05:34:48.2 Geocentric minimum 0.7 degrees
Global start/end: 01/30/2019 03:42:39.0 and 01/30/2019 07:27:00.2
Mid-occultation observing point (lat., long.) -62.782 -85.651
At HVO the miss angle is 3636.6 arc-sec at 01/30/2019 03:51:09.6

Occultation of Venus -4.3 by moon 15% illuminated at phase= 315 degrees
01/31/2019 10:35:51.4 Geocentric minimum 0.1 degrees
Global start/end: 01/31/2019 08:04:38.5 and 01/31/2019 13:07:04.9
Mid-occultation observing point (lat., long.) -15.275 -127.867
At HVO the miss angle is 1718.7 arc-sec at 01/31/2019 11:22:19.4

Occultation of 40 xi Oph 4.39 by moon 18% illuminated at phase= 310 degrees
01/31/2019 00:31:08.8 Geocentric minimum 1.1 degrees
Global start/end: 01/30/2019 23:35:09.9 and 01/31/2019 01:27:08.5
Mid-occultation observing point (lat., long.) 68.692 39.906

Occultation of 58 Oph 4.86 by moon 15% illuminated at phase= 315 degrees
01/31/2019 10:49:44.7 Geocentric minimum 1.0 degrees
Global start/end: 01/31/2019 09:35:09.8 and 01/31/2019 12:04:20.7
Mid-occultation observing point (lat., long.) 68.771 -115.124

Occultation of 13 mu Sgr 3.84 by moon 11% illuminated at phase= 321 degrees
02/01/2019 00:38:24.7 Geocentric minimum 0.2 degrees
Global start/end: 01/31/2019 22:23:25.1 and 02/01/2019 02:53:24.5
Mid-occultation observing point (lat., long.) -36.579 26.765

Occultation of Saturn 0.6 by moon 6% illuminated at phase= 332 degrees
02/02/2019 00:03:45.2 Geocentric minimum 0.6 degrees
Global start/end: 02/01/2019 22:05:44.1 and 02/02/2019 02:01:47.2
Mid-occultation observing point (lat., long.) 21.331 47.298

Occultation of 37 xi^2 Sgr 3.52 by moon 7% illuminated at phase= 331 degrees
02/01/2019 21:04:22.8 Geocentric minimum 0.5 degrees
Global start/end: 02/01/2019 18:57:15.0 and 02/01/2019 23:11:31.4
Mid-occultation observing point (lat., long.) -51.62 92.054

Occultation of 39 o Sgr 3.76 by moon 6% illuminated at phase= 332 degrees
02/02/2019 00:17:36.1 Geocentric minimum 0.2 degrees
Global start/end: 02/01/2019 22:01:13.0 and 02/02/2019 02:33:58.9
Mid-occultation observing point (lat., long.) -8.867 44.551

Occultation of 41 pi Sgr 2.88 by moon 5% illuminated at phase= 333 degrees
02/02/2019 02:41:52.7 Geocentric minimum 0.5 degrees
Global start/end: 02/02/2019 00:36:14.6 and 02/02/2019 04:47:31.4
Mid-occultation observing point (lat., long.) -53.705 11.516

Occultation of 91 psi^1 Aqr 4.24 by moon 6% illuminated at phase= 28 degrees
02/07/2019 04:35:24.8 Geocentric minimum 0.0 degrees
Global start/end: 02/07/2019 02:16:21.0 and 02/07/2019 06:54:29.9
Mid-occultation observing point (lat., long.) -9.988 38.4

Occultation of 93 psi^2 Aqr 4.41 by moon 6% illuminated at phase= 29 degrees
02/07/2019 05:27:56.9 Geocentric minimum 0.2 degrees
Global start/end: 02/07/2019 03:11:57.5 and 02/07/2019 07:43:56.9
Mid-occultation observing point (lat., long.) 5.519 20.203

Occultation of 95 psi^3 Aqr 4.99 by moon 6% illuminated at phase= 29 degrees
02/07/2019 05:40:14.0 Geocentric minimum 0.7 degrees
Global start/end: 02/07/2019 03:53:03.0 and 02/07/2019 07:27:24.5
Mid-occultation observing point (lat., long.) 41.288 1.186

Occultation of 30 YY Psc 4.37 by moon 11% illuminated at phase= 39 degrees
02/08/2019 04:16:51.9 Geocentric minimum 1.1 degrees
Global start/end: 02/08/2019 03:31:48.2 and 02/08/2019 05:01:55.3
Mid-occultation observing point (lat., long.) 68.6 -24.791

Occultation of 33 BC Psc 4.61 by moon 12% illuminated at phase= 40 degrees
02/08/2019 06:04:23.8 Geocentric minimum 1.1 degrees
Global start/end: 02/08/2019 05:25:06.4 and 02/08/2019 06:43:40.9
Mid-occultation observing point (lat., long.) 68.596 -51.708

Occultation of 89 Psc 5.13 by moon 24% illuminated at phase= 58 degrees
02/09/2019 22:15:50.0 Geocentric minimum 0.9 degrees
Global start/end: 02/09/2019 20:54:01.1 and 02/09/2019 23:37:37.0
Mid-occultation observing point (lat., long.) -68.525 -115.49

Occultation of 106 nu Psc 4.45 by moon 28% illuminated at phase= 64 degrees
02/10/2019 10:18:28.2 Geocentric minimum 0.5 degrees
Global start/end: 02/10/2019 08:17:14.6 and 02/10/2019 12:19:38.7
Mid-occultation observing point (lat., long.) -28.306 -0.523

Occultation of 65 xi^1 Cet 4.36 by moon 35% illuminated at phase= 72 degrees
02/11/2019 02:44:12.0 Geocentric minimum 0.9 degrees
Global start/end: 02/11/2019 01:19:23.7 and 02/11/2019 04:08:57.4
Mid-occultation observing point (lat., long.) -66.319 164.852

Occultation of 73 xi^2 Cet 4.3 by moon 37% illuminated at phase= 75 degrees
02/11/2019 09:12:43.2 Geocentric minimum 0.7 degrees
Global start/end: 02/11/2019 07:24:30.2   and   02/11/2019 11:00:52.1
Mid-occultation observing point (lat., long.) 54.438 -13.391

Occultation of 87 mu Cet 4.27 by moon 41% illuminated at phase= 79 degrees
02/11/2019 17:39:28.2 Geocentric minimum 0.5 degrees
Global start/end: 02/11/2019 15:38:02.7   and   02/11/2019 19:40:49.2
Mid-occultation observing point (lat., long.) 42.008 -124.096

---For observations at HVO:
02/11/2019 17:38:29.6 Start Total 55.61 55.55 (az192) -4.5 ***
02/11/2019 18:17:48.0 OCCULTATION MID-POINT 53.22 53.29 (az208) -11.5 ***
02/11/2019 18:56:33.5 End Total 49.24 49.49 (az222) -18.4 ***

Occultation of 61 delta Tau 3.77 by moon 61% illuminated at phase= 102 degrees
02/13/2019 15:21:00.8 Geocentric minimum 0.0 degrees
Global start/end: 02/13/2019 13:09:46.5   and   02/13/2019 17:32:14.5
Mid-occultation observing point (lat., long.) 17.192 -52.784
At HVO the miss angle is 1473.9 arc-sec at 02/13/2019 14:40:02.7

Occultation of 68v776 Tau 4.3 by moon 61% illuminated at phase= 103 degrees
02/13/2019 16:33:34.7 Geocentric minimum 0.3 degrees
Global start/end: 02/13/2019 14:25:10.3   and   02/13/2019 18:41:54.8
Mid-occultation observing point (lat., long.) 3.291 -67.195
At HVO the miss angle is 1988.6 arc-sec at 02/13/2019 16:12:20.5

Occultation of 97v480 Tau 5.08 by moon 66% illuminated at phase= 109 degrees
02/14/2019 03:30:33.8 Geocentric minimum 0.1 degrees
Global start/end: 02/14/2019 01:20:49.8   and   02/14/2019 05:40:15.3
Mid-occultation observing point (lat., long.) 24.605 130.195

Occultation of 123 zeta Tau 2.97 by moon 74% illuminated at phase= 119 degrees
02/14/2019 22:41:52.7 Geocentric minimum 0.5 degrees
Global start/end: 02/14/2019 20:45:59.8   and   02/15/2019 00:37:39.3
Mid-occultation observing point (lat., long.) -11.926 -141.999
At HVO the miss angle is 2543.9 arc-sec at 02/14/2019 23:39:10.2

Occultation of 54 chi^1 Ori 4.39 by moon 77% illuminated at phase= 122 degrees
02/15/2019 05:09:40.4 Geocentric minimum 0.7 degrees
Global start/end: 02/15/2019 03:25:30.3   and   02/15/2019 06:53:44.6
Mid-occultation observing point (lat., long.) 67.669 111.525

Occultation of 62 chi^2 Ori 4.64 by moon 78% illuminated at phase= 124 degrees
02/15/2019 08:54:27.4 Geocentric minimum 1.1 degrees
Global start/end: 02/15/2019 07:44:08.8   and   02/15/2019 10:04:42.8
Mid-occultation observing point (lat., long.) 68.355 -101.462

Occultation of Propus 3.31 by moon 80% illuminated at phase= 127 degrees
02/15/2019 13:26:53.0 Geocentric minimum 1.1 degrees
Global start/end: 02/15/2019 12:31:56.5   and   02/15/2019 14:21:47.5
Mid-occultation observing point (lat., long.) -68.652 10.801

Occultation of 13 mu Gem 2.87 by moon 81% illuminated at phase= 129 degrees
02/15/2019 16:33:48.3 Geocentric minimum 1.0 degrees
Global start/end: 02/15/2019 15:22:47.7   and   02/15/2019 17:44:45.8
Mid-occultation observing point (lat., long.) -68.747 -36.045
At HVO the miss angle is 4972.0 arc-sec at 02/15/2019 15:48:04.4

Occultation of Mekbuda 4.01 by moon 87% illuminated at phase= 138 degrees
02/16/2019 08:18:36.5 Geocentric minimum 1.0 degrees
Global start/end: 02/16/2019 07:01:53.1   and   02/16/2019 09:35:16.7
Mid-occultation observing point (lat., long.) 68.277 -93.301

Occultation of Wasat 3.5 by moon 89% illuminated at phase= 141 degrees
02/16/2019 14:18:26.2 Geocentric minimum 0.5 degrees
Global start/end: 02/16/2019 12:24:20.4   and   02/16/2019 16:12:27.2
Mid-occultation observing point (lat., long.) -9.421 2.715

Occultation of 33 eta Cnc 5.33 by moon 96% illuminated at phase= 157 degrees
02/17/2019 17:31:09.1 Geocentric minimum 0.7 degrees
Global start/end: 02/17/2019 15:49:28.4   and   02/17/2019 19:12:47.0
Mid-occultation observing point (lat., long.) -25.402 -34.301
At HVO the miss angle is 3659.9 arc-sec at 02/17/2019 16:24:35.2

Occultation of Asellus Australis 3.94 by moon 97% illuminated at phase= 160 degrees
02/17/2019 22:31:59.0 Geocentric minimum 1.1 degrees
Global start/end: 02/17/2019 21:19:31.8   and   02/17/2019 23:44:24.7
Mid-occultation observing point (lat., long.) 68.308 52.111
At HVO the miss angle is 1281.3 arc-sec at 02/17/2019 22:19:50.0

Occultation of 53 Leo 5.32 by moon 99% illuminated at phase= 189 degrees
02/19/2019 23:20:49.0 Geocentric minimum 0.8 degrees
Global start/end: 02/19/2019 21:41:50.7   and   02/20/2019 00:59:48.9
Mid-occultation observing point (lat., long.) 55.622 -57.462
At HVO the miss angle is 248.8 arc-sec at 02/19/2019 22:28:49.9

Occultation of 3 nu Vir 4.04 by moon 96% illuminated at phase= 202 degrees
02/20/2019 22:22:29.6 Geocentric minimum 0.2 degrees
Global start/end: 02/20/2019 20:19:43.9   and   02/21/2019 00:25:17.5
Mid-occultation observing point (lat., long.) -2.736 -58.213
At HVO the miss angle is 1013.4 arc-sec at 02/20/2019 20:57:45.3

Occultation of 16 Vir 4.97 by moon 93% illuminated at phase= 211 degrees
02/21/2019 13:08:16.2 Geocentric minimum 0.3 degrees
Global start/end: 02/21/2019 11:06:12.8   and   02/21/2019 15:10:23.3
Mid-occultation observing point (lat., long.) -11.205 86.115

Occultation of 15 xi^2 Lib 5.48 by moon 68% illuminated at phase= 250 degrees
02/24/2019 11:45:29.7 Geocentric minimum 0.3 degrees
Global start/end: 02/24/2019 09:37:44.0   and   02/24/2019 13:53:20.5
Mid-occultation observing point (lat., long.) -27.756 142.736

Occultation of 38 gamma Lib 3.91 by moon 60% illuminated at phase= 259 degrees
02/25/2019 05:52:40.2 Geocentric minimum 0.1 degrees
Global start/end: 02/25/2019 03:40:30.4   and   02/25/2019 08:04:52.9
Mid-occultation observing point (lat., long.) -6.783 -111.789
At HVO the miss angle is 1445.9 arc-sec at 02/25/2019 05:23:27.7

Occultation of 46 theta Lib 4.13 by moon 56% illuminated at phase= 263 degrees
02/25/2019 14:39:11.9 Geocentric minimum 0.8 degrees
Global start/end: 02/25/2019 13:01:57.9   and   02/25/2019 16:16:30.9
Mid-occultation observing point (lat., long.) 42.348 135.993

Occultation of 49 Lib 5.47 by moon 55% illuminated at phase= 265 degrees
02/25/2019 17:21:13.9 Geocentric minimum 0.2 degrees
Global start/end: 02/25/2019 15:09:59.5   and   02/25/2019 19:32:32.3
Mid-occultation observing point (lat., long.) -1.968 83.162

Occultation of 7 chi Oph 4.22 by moon 50% illuminated at phase= 271 degrees
02/26/2019 05:48:17.9 Geocentric minimum 0.6 degrees
Global start/end: 02/26/2019 03:53:06.6   and   02/26/2019 07:43:34.6
Mid-occultation observing point (lat., long.) 22.429 -92.274

---For observations at HVO:
02/26/2019 04:38:00.8 Start Total 24.86 24.86 (az160) -21.9 ***
02/26/2019 05:11:04.7 OCCULTATION MID-POINT 26.55 26.41 (az168) -16.0 ***
02/26/2019 05:44:52.5 End Total 27.37 27.14 (az177) -9.9 ***

Occultation of BSC6196 4.91 by moon 47% illuminated at phase= 274 degrees
02/26/2019 11:56:10.1 Geocentric minimum 0.8 degrees
Global start/end: 02/26/2019 10:15:11.6   and   02/26/2019 13:37:13.1
Mid-occultation observing point (lat., long.) -72.882 135.756

Occultation of 40 xi Oph 4.39 by moon 39% illuminated at phase= 283 degrees
02/27/2019 06:38:28.1 Geocentric minimum 0.9 degrees
Global start/end: 02/27/2019 05:17:40.1   and   02/27/2019 07:59:18.7
Mid-occultation observing point (lat., long.) 68.72 -78.93

---For observations at HVO:
02/27/2019 05:40:12.0 Start Total 23.03 23.24 (az163) -10.5 ***
02/27/2019 06:16:15.9 OCCULTATION MID-POINT 24.42 24.55 (az172) -3.7 ***
02/27/2019 06:52:54.4 End Total 24.78 24.87 (az181) 2.8

Occultation of 58 Oph 4.86 by moon 35% illuminated at phase= 287 degrees
02/27/2019 16:52:12.9 Geocentric minimum 0.9 degrees
Global start/end: 02/27/2019 15:19:37.9   and   02/27/2019 18:24:50.6
Mid-occultation observing point (lat., long.) 48.559 119.076

Occultation of 13 mu Sgr 3.84 by moon 30% illuminated at phase= 294 degrees
02/28/2019 06:37:13.1 Geocentric minimum 0.3 degrees
Global start/end: 02/28/2019 04:25:20.2   and   02/28/2019 08:49:08.0
Mid-occultation observing point (lat., long.) -43.524 -90.421
At HVO the miss angle is 3192.6 arc-sec at 02/28/2019 05:38:35.0

Occultation of Saturn 0.6 by moon 20% illuminated at phase= 307 degrees
03/01/2019 11:26:21.1 Geocentric minimum 0.3 degrees
Global start/end: 03/01/2019 09:11:10.9   and   03/01/2019 13:41:31.7
Mid-occultation observing point (lat., long.) -1.746 -147.45

Occultation of 37 xi^2 Sgr 3.52 by moon 23% illuminated at phase= 303 degrees
03/01/2019 03:02:10.0 Geocentric minimum 0.5 degrees
Global start/end: 03/01/2019 00:59:56.6   and   03/01/2019 05:04:25.1
Mid-occultation observing point (lat., long.) -58.555 -23.943

Occultation of 39 o Sgr 3.76 by moon 22% illuminated at phase= 305 degrees
03/01/2019 06:15:30.2 Geocentric minimum 0.1 degrees
Global start/end: 03/01/2019 03:57:09.3   and   03/01/2019 08:33:50.4
Mid-occultation observing point (lat., long.) -14.683 -71.662
At HVO the miss angle is 1447.8 arc-sec at 03/01/2019 05:09:53.6

Occultation of 41 pi Sgr 2.88 by moon 21% illuminated at phase= 306 degrees
03/01/2019 08:40:06.4 Geocentric minimum 0.6 degrees
Global start/end: 03/01/2019 06:39:27.4   and   03/01/2019 10:40:46.7
Mid-occultation observing point (lat., long.) -60.494 -104.138
At HVO the miss angle is 4136.6 arc-sec at 03/01/2019 09:03:49.5

Occultation of 23 theta Cap 4.08 by moon 6% illuminated at phase= 331 degrees
03/03/2019 16:39:32.4 Geocentric minimum 1.0 degrees
Global start/end: 03/03/2019 15:34:18.4   and   03/03/2019 17:44:46.3
Mid-occultation observing point (lat., long.) -68.374 -53.51

Occultation of 32 iota Cap 4.28 by moon 5% illuminated at phase= 334 degrees
03/04/2019 00:33:39.9 Geocentric minimum 0.6 degrees
Global start/end: 03/03/2019 22:31:52.5   and   03/04/2019 02:35:26.5
Mid-occultation observing point (lat., long.) -53.831 59.471

Occultation of Nashira 3.69 by moon 4% illuminated at phase= 338 degrees
03/04/2019 09:04:16.7 Geocentric minimum 0.3 degrees
Global start/end: 03/04/2019 06:49:30.9   and   03/04/2019 11:19:01.3
Mid-occultation observing point (lat., long.) 1.87 -82.592
At HVO the miss angle is 993.2 arc-sec at 03/04/2019 08:54:44.1

Occultation of Deneb Algedi 2.85 by moon 3% illuminated at phase= 340 degrees
03/04/2019 12:37:09.7 Geocentric minimum 0.2 degrees
Global start/end: 03/04/2019 10:19:55.3 and 03/04/2019 14:54:22.9
Mid-occultation observing point (lat., long.) -3.697 -132.831
At HVO the miss angle is 473.0 arc-sec at 03/04/2019 14:03:31.9

Occultation of 33 iota Aqr 4.29 by moon 2% illuminated at phase= 345 degrees
03/04/2019 22:59:43.3 Geocentric minimum 0.7 degrees
Global start/end: 03/04/2019 21:11:32.6 and 03/05/2019 00:47:52.8
Mid-occultation observing point (lat., long.) -63.135 108.892

Occultation of 89 Psc 5.13 by moon 7% illuminated at phase= 31 degrees
03/09/2019 03:58:15.1 Geocentric minimum 0.8 degrees
Global start/end: 03/09/2019 02:19:24.0 and 03/09/2019 05:37:04.6
Mid-occultation observing point (lat., long.) -52.219 80.141

Occultation of 106 nu Psc 4.45 by moon 10% illuminated at phase= 37 degrees
03/09/2019 15:59:31.0 Geocentric minimum 0.4 degrees
Global start/end: 03/09/2019 13:51:15.8 and 03/09/2019 18:07:44.7
Mid-occultation observing point (lat., long.) -18.63 -117.041
At HVO the miss angle is 1948.2 arc-sec at 03/09/2019 17:22:29.0

Occultation of 65 xi^1 Cet 4.36 by moon 14% illuminated at phase= 45 degrees
03/10/2019 08:26:40.6 Geocentric minimum 0.8 degrees
Global start/end: 03/10/2019 06:43:15.4 and 03/10/2019 10:10:03.6
Mid-occultation observing point (lat., long.) -42.968 16.816

Occultation of 73 xi^2 Cet 4.3 by moon 16% illuminated at phase= 48 degrees
03/10/2019 14:56:39.7 Geocentric minimum 0.9 degrees
Global start/end: 03/10/2019 13:26:23.7 and 03/10/2019 16:26:53.7
Mid-occultation observing point (lat., long.) 68.98 -162.592
At HVO the miss angle is 474.2 arc-sec at 03/10/2019 15:10:39.8

Occultation of 87 mu Cet 4.27 by moon 19% illuminated at phase= 52 degrees
03/10/2019 23:26:53.5 Geocentric minimum 0.7 degrees
Global start/end: 03/10/2019 21:37:17.7 and 03/11/2019 01:16:26.7
Mid-occultation observing point (lat., long.) 54.669 111.527

Occultation of 61 delta Tau 3.77 by moon 37% illuminated at phase= 75 degrees
03/12/2019 21:52:53.9 Geocentric minimum 0.2 degrees
Global start/end: 03/12/2019 19:41:42.4 and 03/13/2019 00:04:03.8
Mid-occultation observing point (lat., long.) 28.742 179.434
At HVO the miss angle is 140.4 arc-sec at 03/12/2019 23:18:05.0

Occultation of 68v776 Tau 4.3 by moon 37% illuminated at phase= 75 degrees
03/12/2019 23:07:12.2 Geocentric minimum 0.1 degrees
Global start/end: 03/12/2019 20:54:39.8 and 03/13/2019 01:19:44.6
Mid-occultation observing point (lat., long.) 14.814 165.008

Occultation of Ain 3.53 by moon 38% illuminated at phase= 76 degrees
03/13/2019 00:56:12.7 Geocentric minimum 1.1 degrees
Global start/end: 03/13/2019 00:04:24.9 and 03/13/2019 01:47:59.3
Mid-occultation observing point (lat., long.) -68.413 173.15

Occultation of 97v480 Tau 5.08 by moon 42% illuminated at phase= 81 degrees
03/13/2019 10:21:47.5 Geocentric minimum 0.3 degrees
Global start/end: 03/13/2019 08:13:40.0 and 03/13/2019 12:29:52.0
Mid-occultation observing point (lat., long.) 36.471 -2.31

Occultation of 123 zeta Tau 2.97 by moon 51% illuminated at phase= 91 degrees
03/14/2019 06:09:04.9 Geocentric minimum 0.3 degrees
Global start/end: 03/14/2019 04:03:48.1 and 03/14/2019 08:14:17.8
Mid-occultation observing point (lat., long.) 0.267 77.926

Occultation of 54 chi^1 Ori 4.39 by moon 54% illuminated at phase= 95 degrees
03/14/2019 12:50:25.8 Geocentric minimum 0.9 degrees
Global start/end: 03/14/2019 11:23:07.3   and   03/14/2019 14:17:40.6
Mid-occultation observing point (lat., long.) 85.127 -127.329

Occultation of 62 chi^2 Ori 4.64 by moon 56% illuminated at phase= 97 degrees
03/14/2019 16:43:15.0 Geocentric minimum 1.2 degrees
Global start/end: 03/14/2019 16:36:34.7   and   03/14/2019 16:49:55.3
Mid-occultation observing point (lat., long.) 0.0 0.0

Occultation of Propus 3.31 by moon 58% illuminated at phase= 99 degrees
03/14/2019 21:25:16.1 Geocentric minimum 1.0 degrees
Global start/end: 03/14/2019 20:02:33.1   and   03/14/2019 22:47:55.6
Mid-occultation observing point (lat., long.) -56.383 -139.083
At HVO the miss angle is 4110.9 arc-sec at 03/14/2019 22:11:22.4

Occultation of 13 mu Gem 2.87 by moon 60% illuminated at phase= 101 degrees
03/15/2019 00:39:04.5 Geocentric minimum 0.9 degrees
Global start/end: 03/14/2019 23:06:23.9   and   03/15/2019 02:11:40.9
Mid-occultation observing point (lat., long.) -40.248 171.529
At HVO the miss angle is 4560.9 arc-sec at 03/15/2019 01:35:59.4

Occultation of Mekbuda 4.01 by moon 67% illuminated at phase= 110 degrees
03/15/2019 16:59:45.3 Geocentric minimum 1.2 degrees
Global start/end: 03/15/2019 16:15:34.0   and   03/15/2019 17:43:55.5
Mid-occultation observing point (lat., long.) 68.293 109.176

Occultation of Wasat 3.5 by moon 70% illuminated at phase= 113 degrees
03/15/2019 23:12:52.7 Geocentric minimum 0.4 degrees
Global start/end: 03/15/2019 21:10:46.3   and   03/16/2019 01:14:54.9
Mid-occultation observing point (lat., long.) 0.479 -157.48
At HVO the miss angle is 2399.3 arc-sec at 03/16/2019 00:04:07.3

Occultation of 33 eta Cnc 5.33 by moon 82% illuminated at phase= 129 degrees
03/17/2019 03:24:15.1 Geocentric minimum 0.6 degrees
Global start/end: 03/17/2019 01:34:00.7   and   03/17/2019 05:14:25.4
Mid-occultation observing point (lat., long.) -16.872 151.789

Occultation of Asellus Australis 3.94 by moon 84% illuminated at phase= 132 degrees
03/17/2019 08:35:22.4 Geocentric minimum 1.2 degrees
Global start/end: 03/17/2019 07:43:19.3   and   03/17/2019 09:27:24.4
Mid-occultation observing point (lat., long.) 68.246 -126.197

Occultation of 53 Leo 5.32 by moon 97% illuminated at phase= 161 degrees
03/19/2019 10:28:31.0 Geocentric minimum 0.8 degrees
Global start/end: 03/19/2019 08:50:22.2   and   03/19/2019 12:06:39.3
Mid-occultation observing point (lat., long.) 56.894 110.481

Occultation of 3 nu Vir 4.04 by moon 100% illuminated at phase= 175 degrees
03/20/2019 09:35:44.9 Geocentric minimum 0.2 degrees
Global start/end: 03/20/2019 07:33:41.7   and   03/20/2019 11:37:48.6
Mid-occultation observing point (lat., long.) -4.693 105.628

Occultation of 16 Vir 4.97 by moon 100% illuminated at phase= 183 degrees
03/21/2019 00:16:35.3 Geocentric minimum 0.3 degrees
Global start/end: 03/20/2019 22:16:48.2   and   03/21/2019 02:16:24.3
Mid-occultation observing point (lat., long.) -14.929 -109.636
At HVO the miss angle is 2258.5 arc-sec at 03/20/2019 23:24:47.1

Occultation of 15 xi^2 Lib 5.48 by moon 87% illuminated at phase= 222 degrees
03/23/2019 21:19:59.9 Geocentric minimum 0.5 degrees
Global start/end: 03/23/2019 19:20:39.1   and   03/23/2019 23:19:26.9
Mid-occultation observing point (lat., long.) -38.817 -33.238

Occultation of 38 gamma Lib 3.91 by moon 81% illuminated at phase= 231 degrees
03/24/2019 14:53:57.0 Geocentric minimum 0.1 degrees
Global start/end: 03/24/2019 12:43:23.1   and   03/24/2019 17:04:33.4
Mid-occultation observing point (lat., long.) -18.912 82.372

Occultation of 46 theta Lib 4.13 by moon 78% illuminated at phase= 236 degrees
03/24/2019 23:24:31.3 Geocentric minimum 0.6 degrees
Global start/end: 03/24/2019 21:30:38.4   and   03/25/2019 01:18:31.0
Mid-occultation observing point (lat., long.) 21.703 -29.713

Occultation of 49 Lib 5.47 by moon 77% illuminated at phase= 237 degrees
03/25/2019 02:01:35.1 Geocentric minimum 0.0 degrees
Global start/end: 03/24/2019 23:49:44.6   and   03/25/2019 04:13:27.5
Mid-occultation observing point (lat., long.) -15.063 -77.151
At HVO the miss angle is 1228.1 arc-sec at 03/25/2019 00:38:29.7

Occultation of 7 chi Oph 4.22 by moon 73% illuminated at phase= 243 degrees
03/25/2019 14:06:47.1 Geocentric minimum 0.4 degrees
Global start/end: 03/25/2019 12:01:11.2   and   03/25/2019 16:12:29.1
Mid-occultation observing point (lat., long.) 5.784 112.495

Occultation of BSC6196 4.91 by moon 70% illuminated at phase= 246 degrees
03/25/2019 20:04:09.7 Geocentric minimum 1.0 degrees
Global start/end: 03/25/2019 18:53:18.3   and   03/25/2019 21:15:04.4
Mid-occultation observing point (lat., long.) -68.075 -126.842

Occultation of 40 xi Oph 4.39 by moon 63% illuminated at phase= 255 degrees
03/26/2019 14:17:56.7 Geocentric minimum 0.7 degrees
Global start/end: 03/26/2019 12:30:02.7   and   03/26/2019 16:05:56.3
Mid-occultation observing point (lat., long.) 28.722 123.963

Occultation of 58 Oph 4.86 by moon 59% illuminated at phase= 260 degrees
03/27/2019 00:18:02.8 Geocentric minimum 0.6 degrees
Global start/end: 03/26/2019 22:23:06.7   and   03/27/2019 02:13:04.4
Mid-occultation observing point (lat., long.) 21.168 -23.456

Occultation of 13 mu Sgr 3.84 by moon 53% illuminated at phase= 267 degrees
03/27/2019 13:47:20.9 Geocentric minimum 0.6 degrees
Global start/end: 03/27/2019 11:47:55.6   and   03/27/2019 15:46:51.0
Mid-occultation observing point (lat., long.) -59.865 132.752

Occultation of 37 xi^2 Sgr 3.52 by moon 45% illuminated at phase= 276 degrees
03/28/2019 09:54:49.0 Geocentric minimum 0.8 degrees
Global start/end: 03/28/2019 08:11:04.5   and   03/28/2019 11:38:36.6
Mid-occultation observing point (lat., long.) -78.726 -151.565

Occultation of 39 o Sgr 3.76 by moon 44% illuminated at phase= 277 degrees
03/28/2019 13:05:57.1 Geocentric minimum 0.1 degrees
Global start/end: 03/28/2019 10:48:02.9   and   03/28/2019 15:23:52.2
Mid-occultation observing point (lat., long.) -28.561 159.204

Occultation of 41 pi Sgr 2.88 by moon 43% illuminated at phase= 278 degrees
03/28/2019 15:29:07.8 Geocentric minimum 0.8 degrees
Global start/end: 03/28/2019 13:47:38.3   and   03/28/2019 17:10:40.1
Mid-occultation observing point (lat., long.) -81.267 135.132

Occultation of Saturn 0.6 by moon 40% illuminated at phase= 281 degrees
03/28/2019 21:59:19.5 Geocentric minimum 0.1 degrees
Global start/end: 03/28/2019 19:39:44.8   and   03/29/2019 00:18:54.1
Mid-occultation observing point (lat., long.) -25.075 30.316

Occultation of 32 iota Cap 4.28 by moon 20% illuminated at phase= 307 degrees
03/31/2019 07:09:11.4 Geocentric minimum 0.7 degrees
Global start/end: 03/31/2019 05:19:03.2   and   03/31/2019 08:59:19.0
Mid-occultation observing point (lat., long.) -65.78 -54.003
At HVO the miss angle is 4605.5 arc-sec at 03/31/2019 07:09:38.1

Occultation of Nashira 3.69 by moon 17% illuminated at phase= 311 degrees
03/31/2019 15:39:54.8 Geocentric minimum 0.2 degrees
Global start/end: 03/31/2019 13:21:23.8   and   03/31/2019 17:58:24.1
Mid-occultation observing point (lat., long.) -6.958 153.76

Occultation of Deneb Algedi 2.85 by moon 16% illuminated at phase= 313 degrees
03/31/2019 19:13:02.0 Geocentric minimum 0.1 degrees
Global start/end: 03/31/2019 16:53:30.2   and   03/31/2019 21:32:32.0
Mid-occultation observing point (lat., long.) -11.955 103.453

Occultation of 33 iota Aqr 4.29 by moon 13% illuminated at phase= 317 degrees
04/01/2019 05:36:32.1 Geocentric minimum 0.8 degrees
Global start/end: 04/01/2019 04:00:52.6   and   04/01/2019 07:12:10.5
Mid-occultation observing point (lat., long.) -72.612 14.231

Occultation of 91 psi^1 Aqr 4.24 by moon 5% illuminated at phase= 334 degrees
04/02/2019 17:13:40.7 Geocentric minimum 0.0 degrees
Global start/end: 04/02/2019 14:55:05.6   and   04/02/2019 19:32:14.2
Mid-occultation observing point (lat., long.) -10.078 155.132

Occultation of 93 psi^2 Aqr 4.41 by moon 5% illuminated at phase= 334 degrees
04/02/2019 18:05:38.4 Geocentric minimum 0.2 degrees
Global start/end: 04/02/2019 15:50:08.5   and   04/02/2019 20:21:05.8
Mid-occultation observing point (lat., long.) 5.508 136.939

Occultation of 95 psi^3 Aqr 4.99 by moon 5% illuminated at phase= 334 degrees
04/02/2019 18:17:27.5 Geocentric minimum 0.7 degrees
Global start/end: 04/02/2019 16:30:35.4   and   04/02/2019 20:04:17.1
Mid-occultation observing point (lat., long.) 41.083 117.834

Occultation of 65 xi^1 Cet 4.36 by moon 2% illuminated at phase= 18 degrees
04/06/2019 14:17:38.7 Geocentric minimum 0.6 degrees
Global start/end: 04/06/2019 12:23:43.6   and   04/06/2019 16:11:31.3
Mid-occultation observing point (lat., long.) -31.346 -104.581
At HVO the miss angle is 2778.6 arc-sec at 04/06/2019 15:32:27.9

Occultation of 73 xi^2 Cet 4.3 by moon 3% illuminated at phase= 21 degrees
04/06/2019 20:42:42.6 Geocentric minimum 1.0 degrees
Global start/end: 04/06/2019 19:35:07.3   and   04/06/2019 21:50:16.6
Mid-occultation observing point (lat., long.) 68.121 31.191

Occultation of 87 mu Cet 4.27 by moon 5% illuminated at phase= 25 degrees
04/07/2019 05:07:38.8 Geocentric minimum 0.9 degrees
Global start/end: 04/07/2019 03:34:06.1   and   04/07/2019 06:41:09.5
Mid-occultation observing point (lat., long.) 67.493 -26.867

Occultation of 61 delta Tau 3.77 by moon 16% illuminated at phase= 48 degrees
04/09/2019 03:16:37.6 Geocentric minimum 0.4 degrees
Global start/end: 04/09/2019 01:12:01.4   and   04/09/2019 05:21:12.0
Mid-occultation observing point (lat., long.) 42.584 67.009

Occultation of 68v776 Tau 4.3 by moon 17% illuminated at phase= 48 degrees
04/09/2019 04:30:56.9 Geocentric minimum 0.2 degrees
Global start/end: 04/09/2019 02:19:52.3   and   04/09/2019 06:42:01.3
Mid-occultation observing point (lat., long.) 28.163 53.946

Occultation of Ain 3.53 by moon 17% illuminated at phase= 49 degrees
04/09/2019 06:20:07.2 Geocentric minimum 0.9 degrees
Global start/end: 04/09/2019 04:50:22.9   and   04/09/2019 07:49:49.4
Mid-occultation observing point (lat., long.) -48.697 47.705

Occultation of 97v480 Tau 5.08 by moon 21% illuminated at phase= 54 degrees
04/09/2019 15:46:33.5 Geocentric minimum 0.5 degrees
Global start/end: 04/09/2019 13:47:43.9   and   04/09/2019 17:45:20.7
Mid-occultation observing point (lat., long.) 51.896 -115.834

Occultation of 123 zeta Tau 2.97 by moon 28% illuminated at phase= 64 degrees
04/10/2019 11:42:15.7 Geocentric minimum 0.1 degrees
Global start/end: 04/10/2019 09:31:36.2   and   04/10/2019 13:52:55.1
Mid-occultation observing point (lat., long.) 15.499 -33.883
At HVO the miss angle is 1828.4 arc-sec at 04/10/2019 10:46:17.3

Occultation of 54 chi^1 Ori 4.39 by moon 31% illuminated at phase= 68 degrees
04/10/2019 18:28:22.1 Geocentric minimum 1.2 degrees
Global start/end: 04/10/2019 17:48:52.9   and   04/10/2019 19:07:50.8
Mid-occultation observing point (lat., long.) 68.074 61.296

Occultation of Propus 3.31 by moon 35% illuminated at phase= 73 degrees
04/11/2019 03:10:58.5 Geocentric minimum 0.7 degrees
Global start/end: 04/11/2019 01:23:42.1   and   04/11/2019 04:58:12.1
Mid-occultation observing point (lat., long.) -23.961 104.484

Occultation of 13 mu Gem 2.87 by moon 36% illuminated at phase= 74 degrees
04/11/2019 06:28:07.0 Geocentric minimum 0.6 degrees
Global start/end: 04/11/2019 04:34:59.8   and   04/11/2019 08:21:11.3
Mid-occultation observing point (lat., long.) -16.699 56.16

Occultation of Wasat 3.5 by moon 47% illuminated at phase= 86 degrees
04/12/2019 05:31:42.9 Geocentric minimum 0.1 degrees
Global start/end: 04/12/2019 03:23:05.0   and   04/12/2019 07:40:19.9
Mid-occultation observing point (lat., long.) 15.598 81.631

Occultation of 33 eta Cnc 5.33 by moon 61% illuminated at phase= 102 degrees
04/13/2019 10:33:35.6 Geocentric minimum 0.4 degrees
Global start/end: 04/13/2019 08:31:49.2   and   04/13/2019 12:35:19.2
Mid-occultation observing point (lat., long.) -2.006 19.837

Occultation of 46 Leo 5.43 by moon 82% illuminated at phase= 129 degrees
04/15/2019 11:09:25.3 Geocentric minimum 1.2 degrees
Global start/end: 04/15/2019 10:18:05.8   and   04/15/2019 12:00:44.2
Mid-occultation observing point (lat., long.) -68.184 -13.654

Occultation of 53 Leo 5.32 by moon 85% illuminated at phase= 134 degrees
04/15/2019 19:31:23.9 Geocentric minimum 0.9 degrees
Global start/end: 04/15/2019 18:04:36.2   and   04/15/2019 20:58:10.3
Mid-occultation observing point (lat., long.) 68.237 -25.642
At HVO the miss angle is 898.5 arc-sec at 04/15/2019 18:34:08.4

Occultation of 3 nu Vir 4.04 by moon 92% illuminated at phase= 148 degrees
04/16/2019 19:17:25.8 Geocentric minimum 0.1 degrees
Global start/end: 04/16/2019 17:12:48.6   and   04/16/2019 21:22:01.9
Mid-occultation observing point (lat., long.) -0.46 -65.229
At HVO the miss angle is 850.3 arc-sec at 04/16/2019 17:54:47.9

Occultation of 16 Vir 4.97 by moon 96% illuminated at phase= 156 degrees
04/17/2019 10:17:15.6 Geocentric minimum 0.3 degrees
Global start/end: 04/17/2019 08:15:22.4   and   04/17/2019 12:19:08.8
Mid-occultation observing point (lat., long.) -12.741 74.02

Occultation of 15 xi^2 Lib 5.48 by moon 98% illuminated at phase= 195 degrees
04/20/2019 07:34:54.1 Geocentric minimum 0.6 degrees
Global start/end: 04/20/2019 05:42:50.5   and   04/20/2019 09:27:02.5
Mid-occultation observing point (lat., long.) -47.07 140.52

Occultation of 38 gamma Lib 3.91 by moon 96% illuminated at phase= 204 degrees
04/21/2019 00:54:39.2 Geocentric minimum 0.2 degrees
Global start/end: 04/20/2019 22:47:38.1   and   04/21/2019 03:01:44.2
Mid-occultation observing point (lat., long.) -28.506 -98.104
At HVO the miss angle is 2422.3 arc-sec at 04/20/2019 23:42:50.1

Occultation of 46 theta Lib 4.13 by moon 94% illuminated at phase= 209 degrees
04/21/2019 09:16:43.7 Geocentric minimum 0.4 degrees
Global start/end: 04/21/2019 07:14:47.7   and   04/21/2019 11:18:45.1
Mid-occultation observing point (lat., long.) 8.763 151.789

Occultation of 49 Lib 5.47 by moon 93% illuminated at phase= 210 degrees
04/21/2019 11:50:38.5 Geocentric minimum 0.2 degrees
Global start/end: 04/21/2019 09:41:25.2   and   04/21/2019 13:59:55.1
Mid-occultation observing point (lat., long.) -25.931 105.466

Occultation of 7 chi Oph 4.22 by moon 90% illuminated at phase= 216 degrees
04/21/2019 23:41:38.1 Geocentric minimum 0.2 degrees
Global start/end: 04/21/2019 21:31:54.9   and   04/22/2019 01:51:25.2
Mid-occultation observing point (lat., long.) -7.277 -60.898
At HVO the miss angle is 482.7 arc-sec at 04/21/2019 22:14:38.4

Occultation of 40 xi Oph 4.39 by moon 83% illuminated at phase= 228 degrees
04/22/2019 23:21:09.2 Geocentric minimum 0.5 degrees
Global start/end: 04/22/2019 21:18:51.4   and   04/23/2019 01:23:33.3
Mid-occultation observing point (lat., long.) 9.254 -41.613

Occultation of 58 Oph 4.86 by moon 80% illuminated at phase= 233 degrees
04/23/2019 09:07:50.0 Geocentric minimum 0.4 degrees
Global start/end: 04/23/2019 07:00:46.6   and   04/23/2019 11:14:59.1
Mid-occultation observing point (lat., long.) 2.545 175.271

Occultation of 13 mu Sgr 3.84 by moon 75% illuminated at phase= 240 degrees
04/23/2019 22:19:20.4 Geocentric minimum 0.8 degrees
Global start/end: 04/23/2019 20:42:55.7   and   04/23/2019 23:55:49.8
Mid-occultation observing point (lat., long.) -83.937 -48.149

Occultation of Saturn 0.5 by moon 63% illuminated at phase= 255 degrees
04/25/2019 07:29:18.9 Geocentric minimum 0.4 degrees
Global start/end: 04/25/2019 05:18:21.7   and   04/25/2019 09:40:20.2
Mid-occultation observing point (lat., long.) -45.627 -136.507
At HVO the miss angle is 2941.2 arc-sec at 04/25/2019 08:58:39.4

Occultation of 37 xi^2 Sgr 3.52 by moon 68% illuminated at phase= 249 degrees
04/24/2019 18:03:03.2 Geocentric minimum 1.0 degrees
Global start/end: 04/24/2019 16:58:16.8   and   04/24/2019 19:07:51.6
Mid-occultation observing point (lat., long.) -67.873 -125.711

Occultation of 39 o Sgr 3.76 by moon 67% illuminated at phase= 251 degrees
04/24/2019 21:10:50.0 Geocentric minimum 0.4 degrees
Global start/end: 04/24/2019 19:00:45.5   and   04/24/2019 23:20:59.1
Mid-occultation observing point (lat., long.) -45.723 11.65

Occultation of 41 pi Sgr 2.88 by moon 66% illuminated at phase= 252 degrees
04/24/2019 23:31:30.0 Geocentric minimum 1.1 degrees
Global start/end: 04/24/2019 22:32:16.5   and   04/25/2019 00:30:45.2
Mid-occultation observing point (lat., long.) -67.901 151.961

Occultation of 32 iota Cap 4.28 by moon 41% illuminated at phase= 281 degrees
04/27/2019 14:33:02.9 Geocentric minimum 0.9 degrees
Global start/end: 04/27/2019 13:13:54.9   and   04/27/2019 15:52:11.3
Mid-occultation observing point (lat., long.) -67.856 -75.837

Occultation of Nashira 3.69 by moon 38% illuminated at phase= 284 degrees
04/27/2019 23:02:18.9 Geocentric minimum 0.1 degrees
Global start/end: 04/27/2019 20:42:40.6   and   04/28/2019 01:21:56.6
Mid-occultation observing point (lat., long.) -21.486 20.133

Occultation of Deneb Algedi 2.85 by moon 36% illuminated at phase= 286 degrees
04/28/2019 02:35:08.0 Geocentric minimum 0.2 degrees
Global start/end: 04/28/2019 00:16:34.5   and   04/28/2019 04:53:40.9
Mid-occultation observing point (lat., long.) -26.182 -29.808

Occultation of 33 iota Aqr 4.29 by moon 32% illuminated at phase= 291 degrees
04/28/2019 12:58:35.2 Geocentric minimum 1.1 degrees
Global start/end: 04/28/2019 12:02:50.1   and   04/28/2019 13:54:20.1
Mid-occultation observing point (lat., long.) -67.94 -53.317

Occultation of 91 psi^1 Aqr 4.24 by moon 20% illuminated at phase= 307 degrees
04/30/2019 00:38:46.7 Geocentric minimum 0.2 degrees
Global start/end: 04/29/2019 22:21:30.8   and   04/30/2019 02:56:00.0
Mid-occultation observing point (lat., long.) -20.196 20.906

Occultation of 93 psi^2 Aqr 4.41 by moon 20% illuminated at phase= 307 degrees
04/30/2019 01:30:43.5 Geocentric minimum 0.1 degrees
Global start/end: 04/29/2019 23:11:57.7   and   04/30/2019 03:49:27.3
Mid-occultation observing point (lat., long.) -4.711 2.411

Occultation of 95 psi^3 Aqr 4.99 by moon 20% illuminated at phase= 307 degrees
04/30/2019 01:42:22.5 Geocentric minimum 0.6 degrees
Global start/end: 04/29/2019 23:41:13.3   and   04/30/2019 03:43:28.7
Mid-occultation observing point (lat., long.) 26.842 -12.684

Occultation of 30 YY Psc 4.37 by moon 13% illuminated at phase= 318 degrees
05/01/2019 00:07:38.3 Geocentric minimum 1.0 degrees
Global start/end: 04/30/2019 23:05:52.6   and   05/01/2019 01:09:22.7
Mid-occultation observing point (lat., long.) 68.042 -43.508

Occultation of 33 BC Psc 4.61 by moon 13% illuminated at phase= 319 degrees
05/01/2019 01:53:57.3 Geocentric minimum 1.1 degrees
Global start/end: 05/01/2019 00:58:23.8   and   05/01/2019 02:49:29.7
Mid-occultation observing point (lat., long.) 68.035 -70.099

Occultation of 89 Psc 5.13 by moon 4% illuminated at phase= 337 degrees
05/02/2019 17:29:48.2 Geocentric minimum 0.8 degrees
Global start/end: 05/02/2019 15:47:42.7   and   05/02/2019 19:11:50.0
Mid-occultation observing point (lat., long.) -48.121 179.716

Occultation of 106 nu Psc 4.45 by moon 2% illuminated at phase= 343 degrees
05/03/2019 05:17:48.9 Geocentric minimum 0.3 degrees
Global start/end: 05/03/2019 03:07:49.7   and   05/03/2019 07:27:44.6
Mid-occultation observing point (lat., long.) -13.294 -12.438

Occultation of 61 delta Tau 3.77 by moon 3% illuminated at phase= 21 degrees
05/06/2019 09:27:14.8 Geocentric minimum 0.5 degrees
Global start/end: 05/06/2019 07:30:18.0   and   05/06/2019 11:24:09.2
Mid-occultation observing point (lat., long.) 51.627 -57.065

Occultation of 68v776 Tau 4.3 by moon 4% illuminated at phase= 22 degrees
05/06/2019 10:40:23.1 Geocentric minimum 0.3 degrees
Global start/end: 05/06/2019 08:33:44.0   and   05/06/2019 12:47:00.8
Mid-occultation observing point (lat., long.) 36.647 -67.908
At HVO the miss angle is 112.9 arc-sec at 05/06/2019 10:01:12.1

Occultation of Ain 3.53 by moon 4% illuminated at phase= 23 degrees
05/06/2019 12:28:02.3 Geocentric minimum 0.7 degrees
Global start/end: 05/06/2019 10:44:20.4   and   05/06/2019 14:11:41.9
Mid-occultation observing point (lat., long.) -30.824 -77.504
At HVO the miss angle is 3353.3 arc-sec at 05/06/2019 12:39:03.1

Occultation of 97v480 Tau 5.08 by moon 6% illuminated at phase= 28 degrees
05/06/2019 21:44:32.2 Geocentric minimum 0.7 degrees
Global start/end: 05/06/2019 19:56:42.8   and   05/06/2019 23:32:19.5
Mid-occultation observing point (lat., long.) 63.516 119.841

Occultation of 123 zeta Tau 2.97 by moon 11% illuminated at phase= 38 degrees
05/07/2019 17:22:17.6 Geocentric minimum 0.1 degrees
Global start/end: 05/07/2019 15:12:46.3   and   05/07/2019 19:31:49.4
Mid-occultation observing point (lat., long.) 26.941 -147.171
At HVO the miss angle is 241.1 arc-sec at 05/07/2019 18:28:00.7

Occultation of Propus 3.31 by moon 15% illuminated at phase= 46 degrees
05/08/2019 08:40:00.7 Geocentric minimum 0.5 degrees
Global start/end: 05/08/2019 06:41:03.1 and 05/08/2019 10:38:57.2
Mid-occultation observing point (lat., long.) -7.687 -5.484

Occultation of 13 mu Gem 2.87 by moon 16% illuminated at phase= 48 degrees
05/08/2019 11:55:13.8 Geocentric minimum 0.4 degrees
Global start/end: 05/08/2019 09:52:37.3 and 05/08/2019 13:57:49.3
Mid-occultation observing point (lat., long.) -1.501 -53.043
At HVO the miss angle is 2399.6 arc-sec at 05/08/2019 11:05:42.6

Occultation of Wasat 3.5 by moon 25% illuminated at phase= 60 degrees
05/09/2019 10:50:55.4 Geocentric minimum 0.1 degrees
Global start/end: 05/09/2019 08:42:44.3 and 05/09/2019 12:59:06.9
Mid-occultation observing point (lat., long.) 29.505 -24.247
At HVO the miss angle is 836.1 arc-sec at 05/09/2019 09:41:07.5

Occultation of 33 eta Cnc 5.33 by moon 38% illuminated at phase= 76 degrees
05/10/2019 15:59:06.6 Geocentric minimum 0.1 degrees
Global start/end: 05/10/2019 13:51:35.2 and 05/10/2019 18:06:38.1
Mid-occultation observing point (lat., long.) 12.645 -86.097
At HVO the miss angle is 834.7 arc-sec at 05/10/2019 15:17:56.5

Occultation of 46 Leo 5.43 by moon 61% illuminated at phase= 103 degrees
05/12/2019 17:27:02.4 Geocentric minimum 0.9 degrees
Global start/end: 05/12/2019 16:02:46.1 and 05/12/2019 18:51:18.1
Mid-occultation observing point (lat., long.) -54.495 -109.716
At HVO the miss angle is 3783.1 arc-sec at 05/12/2019 16:19:44.8

Occultation of 53 Leo 5.32 by moon 65% illuminated at phase= 108 degrees
05/13/2019 02:02:37.9 Geocentric minimum 1.1 degrees
Global start/end: 05/13/2019 01:06:14.2 and 05/13/2019 02:59:01.3
Mid-occultation observing point (lat., long.) 67.82 -83.405

Occultation of 3 nu Vir 4.04 by moon 76% illuminated at phase= 121 degrees
05/14/2019 02:29:20.4 Geocentric minimum 0.0 degrees
Global start/end: 05/14/2019 00:22:09.0 and 05/14/2019 04:36:30.7
Mid-occultation observing point (lat., long.) 8.799 163.457

Occultation of 16 Vir 4.97 by moon 82% illuminated at phase= 130 degrees
05/14/2019 17:55:42.4 Geocentric minimum 0.2 degrees
Global start/end: 05/14/2019 15:49:22.0 and 05/14/2019 20:02:02.0
Mid-occultation observing point (lat., long.) -4.958 -64.362
At HVO the miss angle is 938.2 arc-sec at 05/14/2019 16:28:01.1

Occultation of 15 xi^2 Lib 5.48 by moon 99% illuminated at phase= 169 degrees
05/17/2019 16:45:14.4 Geocentric minimum 0.6 degrees
Global start/end: 05/17/2019 14:53:20.5 and 05/17/2019 18:37:10.9
Mid-occultation observing point (lat., long.) -47.9 -24.907

Occultation of 38 gamma Lib 3.91 by moon 100% illuminated at phase= 178 degrees
05/18/2019 10:14:08.5 Geocentric minimum 0.3 degrees
Global start/end: 05/18/2019 08:08:00.2 and 05/18/2019 12:20:19.1
Mid-occultation observing point (lat., long.) -31.339 93.88

Occultation of 46 theta Lib 4.13 by moon 100% illuminated at phase= 182 degrees
05/18/2019 18:38:34.3 Geocentric minimum 0.4 degrees
Global start/end: 05/18/2019 16:34:18.1 and 05/18/2019 20:42:53.8
Mid-occultation observing point (lat., long.) 4.661 -16.639

Occultation of 49 Lib 5.47 by moon 100% illuminated at phase= 184 degrees
05/18/2019 21:12:35.1 Geocentric minimum 0.2 degrees
Global start/end: 05/18/2019 19:04:38.2 and 05/18/2019 23:20:34.4
Mid-occultation observing point (lat., long.) -30.088 -63.412
At HVO the miss angle is 1796.4 arc-sec at 05/18/2019 19:36:56.0

Occultation of 7 chi Oph 4.22 by moon 99% illuminated at phase= 190 degrees
05/19/2019 09:03:40.4 Geocentric minimum 0.1 degrees
Global start/end: 05/19/2019 06:53:04.8   and   05/19/2019 11:14:17.6
Mid-occultation observing point (lat., long.) -12.883 130.408

Occultation of 40 xi Oph 4.39 by moon 96% illuminated at phase= 202 degrees
05/20/2019 08:35:52.1 Geocentric minimum 0.3 degrees
Global start/end: 05/20/2019 06:28:48.2   and   05/20/2019 10:43:00.3
Mid-occultation observing point (lat., long.) 0.03 151.567

Occultation of 58 Oph 4.86 by moon 95% illuminated at phase= 207 degrees
05/20/2019 18:17:07.4 Geocentric minimum 0.2 degrees
Global start/end: 05/20/2019 16:06:24.5   and   05/20/2019 20:27:54.2
Mid-occultation observing point (lat., long.) -7.307 10.038

Occultation of 13 mu Sgr 3.84 by moon 92% illuminated at phase= 213 degrees
05/21/2019 07:19:26.6 Geocentric minimum 1.0 degrees
Global start/end: 05/21/2019 06:06:57.1   and   05/21/2019 08:31:58.7
Mid-occultation observing point (lat., long.) -67.629 9.218

Occultation of Saturn 0.3 by moon 83% illuminated at phase= 229 degrees
05/22/2019 15:17:02.0 Geocentric minimum 0.5 degrees
Global start/end: 05/22/2019 13:14:36.9   and   05/22/2019 17:19:32.1
Mid-occultation observing point (lat., long.) -56.004 80.464

Occultation of 39 o Sgr 3.76 by moon 86% illuminated at phase= 224 degrees
05/22/2019 05:53:22.4 Geocentric minimum 0.6 degrees
Global start/end: 05/22/2019 03:54:11.8   and   05/22/2019 07:52:38.1
Mid-occultation observing point (lat., long.) -59.697 -145.204

Occultation of Nashira 3.69 by moon 61% illuminated at phase= 258 degrees
05/25/2019 06:59:45.7 Geocentric minimum 0.3 degrees
Global start/end: 05/25/2019 04:45:00.5   and   05/25/2019 09:14:32.4
Mid-occultation observing point (lat., long.) -35.516 -121.524
At HVO the miss angle is 2321.5 arc-sec at 05/25/2019 08:37:09.1

Occultation of Deneb Algedi 2.85 by moon 59% illuminated at phase= 260 degrees
05/25/2019 10:31:43.5 Geocentric minimum 0.4 degrees
Global start/end: 05/25/2019 08:20:06.2   and   05/25/2019 12:43:22.3
Mid-occultation observing point (lat., long.) -40.428 -170.434

Occultation of 91 psi^1 Aqr 4.24 by moon 41% illuminated at phase= 280 degrees
05/27/2019 08:37:14.0 Geocentric minimum 0.4 degrees
Global start/end: 05/27/2019 06:25:44.2   and   05/27/2019 10:48:42.0
Mid-occultation observing point (lat., long.) -32.712 -119.813
At HVO the miss angle is 2207.6 arc-sec at 05/27/2019 10:19:02.9

Occultation of 93 psi^2 Aqr 4.41 by moon 41% illuminated at phase= 281 degrees
05/27/2019 09:29:21.6 Geocentric minimum 0.1 degrees
Global start/end: 05/27/2019 07:10:36.4   and   05/27/2019 11:48:05.7
Mid-occultation observing point (lat., long.) -16.714 -139.632
At HVO the miss angle is 1080.2 arc-sec at 05/27/2019 11:11:43.1

Occultation of 95 psi^3 Aqr 4.99 by moon 41% illuminated at phase= 281 degrees
05/27/2019 09:40:57.2 Geocentric minimum 0.4 degrees
Global start/end: 05/27/2019 07:28:32.9   and   05/27/2019 11:53:19.7
Mid-occultation observing point (lat., long.) 12.896 -153.5

Occultation of 30 YY Psc 4.37 by moon 32% illuminated at phase= 291 degrees
05/28/2019 08:13:42.5 Geocentric minimum 0.9 degrees
Global start/end: 05/28/2019 06:40:17.1   and   05/28/2019 09:47:05.3
Mid-occultation observing point (lat., long.) 57.069 -153.35
At HVO the miss angle is 257.2 arc-sec at 05/28/2019 09:06:30.1

Occultation of 33 BC Psc 4.61 by moon 31% illuminated at phase= 292 degrees
05/28/2019 10:00:42.5 Geocentric minimum 0.9 degrees
Global start/end: 05/28/2019 08:30:55.4   and   05/28/2019 11:30:27.2
Mid-occultation observing point (lat., long.) 61.336 171.899
At HVO the miss angle is 827.6 arc-sec at 05/28/2019 11:25:08.1

Occultation of 20 Cet 4.78 by moon 22% illuminated at phase= 304 degrees
05/29/2019 11:11:52.6 Geocentric minimum 1.1 degrees
Global start/end: 05/29/2019 10:47:06.9   and   05/29/2019 11:36:38.0
Mid-occultation observing point (lat., long.) 67.866 123.013

Occultation of 89 Psc 5.13 by moon 17% illuminated at phase= 311 degrees
05/30/2019 01:51:44.4 Geocentric minimum 0.9 degrees
Global start/end: 05/30/2019 00:24:25.8   and   05/30/2019 03:18:59.6
Mid-occultation observing point (lat., long.) -63.387 54.586

Occultation of 106 nu Psc 4.45 by moon 14% illuminated at phase= 317 degrees
05/30/2019 13:42:17.4 Geocentric minimum 0.4 degrees
Global start/end: 05/30/2019 11:36:04.6   and   05/30/2019 15:48:25.0
Mid-occultation observing point (lat., long.) -20.179 -162.448

Occultation of 65 xi^1 Cet 4.36 by moon 9% illuminated at phase= 325 degrees
05/31/2019 05:50:28.6 Geocentric minimum 0.7 degrees
Global start/end: 05/31/2019 04:01:58.6   and   05/31/2019 07:38:53.3
Mid-occultation observing point (lat., long.) -36.403 -28.428
At HVO the miss angle is 4406.1 arc-sec at 05/31/2019 05:30:03.7

Occultation of 73 xi^2 Cet 4.3 by moon 8% illuminated at phase= 328 degrees
05/31/2019 12:09:12.3 Geocentric minimum 1.0 degrees
Global start/end: 05/31/2019 10:52:35.3   and   05/31/2019 13:25:46.3
Mid-occultation observing point (lat., long.) 67.764 106.149

Occultation of 87 mu Cet 4.27 by moon 6% illuminated at phase= 332 degrees
05/31/2019 20:26:14.7 Geocentric minimum 0.8 degrees
Global start/end: 05/31/2019 18:51:06.5   and   05/31/2019 22:01:18.6
Mid-occultation observing point (lat., long.) 65.453 55.174

Occultation of Propus 3.31 by moon 3% illuminated at phase= 20 degrees
06/04/2019 15:41:00.2 Geocentric minimum 0.4 degrees
Global start/end: 06/04/2019 13:39:35.5   and   06/04/2019 17:42:23.4
Mid-occultation observing point (lat., long.) -0.944 -137.937
At HVO the miss angle is 1977.0 arc-sec at 06/04/2019 16:29:36.5

Occultation of 13 mu Gem 2.87 by moon 3% illuminated at phase= 21 degrees
06/04/2019 18:51:43.6 Geocentric minimum 0.3 degrees
Global start/end: 06/04/2019 16:47:34.2   and   06/04/2019 20:55:52.1
Mid-occultation observing point (lat., long.) 5.161 175.701
At HVO the miss angle is 2396.1 arc-sec at 06/04/2019 19:55:33.8

Occultation of Wasat 3.5 by moon 8% illuminated at phase= 34 degrees
06/05/2019 17:15:51.6 Geocentric minimum 0.3 degrees
Global start/end: 06/05/2019 15:11:21.1   and   06/05/2019 19:20:22.0
Mid-occultation observing point (lat., long.) 37.25 -146.882

Occultation of 33 eta Cnc 5.33 by moon 18% illuminated at phase= 49 degrees
06/06/2019 21:48:45.8 Geocentric minimum 0.0 degrees
Global start/end: 06/06/2019 19:41:48.2   and   06/06/2019 23:55:44.6
Mid-occultation observing point (lat., long.) 21.867 161.199

Occultation of 46 Leo 5.43 by moon 39% illuminated at phase= 77 degrees
06/08/2019 22:47:35.6 Geocentric minimum 0.8 degrees
Global start/end: 06/08/2019 21:06:41.1   and   06/09/2019 00:28:31.3
Mid-occultation observing point (lat., long.) -34.563 156.969
At HVO the miss angle is 4916.5 arc-sec at 06/08/2019 23:24:59.0

Occultation of 3 nu Vir 4.04 by moon 55% illuminated at phase= 95 degrees
06/10/2019 08:00:03.4 Geocentric minimum 0.2 degrees
Global start/end: 06/10/2019 05:53:44.8   and   06/10/2019 10:06:22.6
Mid-occultation observing point (lat., long.) 17.815 57.638

Occultation of 8 pi Vir 4.65 by moon 57% illuminated at phase= 98 degrees
06/10/2019 13:51:14.1 Geocentric minimum 1.2 degrees
Global start/end: 06/10/2019 13:36:37.1   and   06/10/2019 14:05:51.1
Mid-occultation observing point (lat., long.) -67.76 -108.585

Occultation of 16 Vir 4.97 by moon 62% illuminated at phase= 104 degrees
06/10/2019 23:38:52.3 Geocentric minimum 0.0 degrees
Global start/end: 06/10/2019 21:30:27.2   and   06/11/2019 01:47:16.8
Mid-occultation observing point (lat., long.) 3.365 -173.649
At HVO the miss angle is 2220.5 arc-sec at 06/11/2019 00:15:46.0

Occultation of 15 xi^2 Lib 5.48 by moon 90% illuminated at phase= 142 degrees
06/13/2019 23:57:23.6 Geocentric minimum 0.5 degrees
Global start/end: 06/13/2019 22:00:32.4   and   06/14/2019 01:54:16.6
Mid-occultation observing point (lat., long.) -43.603 -156.845
At HVO the miss angle is 4162.4 arc-sec at 06/14/2019 00:12:20.6

Occultation of 38 gamma Lib 3.91 by moon 94% illuminated at phase= 152 degrees
06/14/2019 17:47:38.1 Geocentric minimum 0.2 degrees
Global start/end: 06/14/2019 15:39:13.0   and   06/14/2019 19:56:04.0
Mid-occultation observing point (lat., long.) -28.809 -45.478

Occultation of 46 theta Lib 4.13 by moon 96% illuminated at phase= 156 degrees
06/15/2019 02:21:19.2 Geocentric minimum 0.4 degrees
Global start/end: 06/15/2019 00:17:11.5   and   06/15/2019 04:25:28.8
Mid-occultation observing point (lat., long.) 6.924 -158.596

Occultation of 49 Lib 5.47 by moon 96% illuminated at phase= 157 degrees
06/15/2019 04:57:46.0 Geocentric minimum 0.2 degrees
Global start/end: 06/15/2019 02:48:10.5   and   06/15/2019 07:07:22.4
Mid-occultation observing point (lat., long.) -28.45 153.878

Occultation of 7 chi Oph 4.22 by moon 98% illuminated at phase= 164 degrees
06/15/2019 16:59:45.7 Geocentric minimum 0.1 degrees
Global start/end: 06/15/2019 14:48:23.3   and   06/15/2019 19:11:08.4
Mid-occultation observing point (lat., long.) -12.11 -15.36

Occultation of 40 xi Oph 4.39 by moon 100% illuminated at phase= 176 degrees
06/16/2019 16:47:18.7 Geocentric minimum 0.3 degrees
Global start/end: 06/16/2019 14:39:15.7   and   06/16/2019 18:55:24.1
Mid-occultation observing point (lat., long.) -1.153 1.653

Occultation of 58 Oph 4.86 by moon 100% illuminated at phase= 181 degrees
06/17/2019 02:32:20.4 Geocentric minimum 0.2 degrees
Global start/end: 06/17/2019 00:20:45.5   and   06/17/2019 04:43:57.2
Mid-occultation observing point (lat., long.) -9.274 -140.886
At HVO the miss angle is 1267.8 arc-sec at 06/17/2019 03:29:45.8

Occultation of 13 mu Sgr 3.84 by moon 100% illuminated at phase= 187 degrees
06/17/2019 15:37:17.0 Geocentric minimum 1.0 degrees
Global start/end: 06/17/2019 14:34:36.0   and   06/17/2019 16:39:59.4
Mid-occultation observing point (lat., long.) -67.615 -141.901

Occultation of 39 o Sgr 3.76 by moon 98% illuminated at phase= 198 degrees
06/18/2019 14:11:07.3 Geocentric minimum 0.6 degrees
Global start/end: 06/18/2019 12:17:17.6   and   06/18/2019 16:05:01.0
Mid-occultation observing point (lat., long.) -65.644 63.829

Occultation of Saturn 0.2 by moon 97% illuminated at phase= 201 degrees
06/18/2019 20:48:43.4 Geocentric minimum 0.4 degrees
Global start/end: 06/18/2019 18:43:10.1   and   06/18/2019 22:54:20.7
Mid-occultation observing point (lat., long.) -50.551 -32.129

Occultation of Nashira 3.69 by moon 81% illuminated at phase= 232 degrees
06/21/2019 14:56:01.1 Geocentric minimum 0.4 degrees
Global start/end: 06/21/2019 12:46:36.6 and 06/21/2019 17:05:28.5
Mid-occultation observing point (lat., long.) -43.44 95.871

Occultation of Deneb Algedi 2.85 by moon 80% illuminated at phase= 233 degrees
06/21/2019 18:27:08.7 Geocentric minimum 0.5 degrees
Global start/end: 06/21/2019 16:22:11.6 and 06/21/2019 20:32:08.5
Mid-occultation observing point (lat., long.) -48.745 48.187

Occultation of 91 psi^1 Aqr 4.24 by moon 64% illuminated at phase= 254 degrees
06/23/2019 16:32:27.5 Geocentric minimum 0.5 degrees
Global start/end: 06/23/2019 14:27:20.1 and 06/23/2019 18:37:34.7
Mid-occultation observing point (lat., long.) -41.179 99.483

Occultation of 30 YY Psc 4.37 by moon 54% illuminated at phase= 265 degrees
06/24/2019 16:17:56.5 Geocentric minimum 0.7 degrees
Global start/end: 06/24/2019 14:30:19.8 and 06/24/2019 18:05:31.4
Mid-occultation observing point (lat., long.) 43.747 73.897

Occultation of 93 psi^2 Aqr 4.41 by moon 63% illuminated at phase= 255 degrees
06/23/2019 17:24:48.2 Geocentric minimum 0.3 degrees
Global start/end: 06/23/2019 15:08:22.1 and 06/23/2019 19:41:14.6
Mid-occultation observing point (lat., long.) -24.401 77.809

Occultation of 95 psi^3 Aqr 4.99 by moon 63% illuminated at phase= 255 degrees
06/23/2019 17:36:25.6 Geocentric minimum 0.2 degrees
Global start/end: 06/23/2019 15:19:36.9 and 06/23/2019 19:53:14.4
Mid-occultation observing point (lat., long.) 4.921 63.679

Occultation of 33 BC Psc 4.61 by moon 54% illuminated at phase= 266 degrees
06/24/2019 18:05:52.5 Geocentric minimum 0.8 degrees
Global start/end: 06/24/2019 16:21:04.1 and 06/24/2019 19:50:39.2
Mid-occultation observing point (lat., long.) 46.581 45.233

Occultation of 20 Cet 4.78 by moon 43% illuminated at phase= 278 degrees
06/25/2019 19:33:22.0 Geocentric minimum 1.0 degrees
Global start/end: 06/25/2019 18:30:38.6 and 06/25/2019 20:36:04.1
Mid-occultation observing point (lat., long.) 67.812 -29.302

Occultation of 89 Psc 5.13 by moon 38% illuminated at phase= 285 degrees
06/26/2019 10:25:00.0 Geocentric minimum 1.0 degrees
Global start/end: 06/26/2019 09:15:13.5 and 06/26/2019 11:34:44.3
Mid-occultation observing point (lat., long.) -67.729 -72.063

Occultation of 106 nu Psc 4.45 by moon 33% illuminated at phase= 290 degrees
06/26/2019 22:25:13.5 Geocentric minimum 0.5 degrees
Global start/end: 06/26/2019 20:23:04.6 and 06/27/2019 00:27:17.2
Mid-occultation observing point (lat., long.) -26.854 43.096

Occultation of 65 xi^1 Cet 4.36 by moon 26% illuminated at phase= 298 degrees
06/27/2019 14:46:28.5 Geocentric minimum 0.8 degrees
Global start/end: 06/27/2019 13:05:21.1 and 06/27/2019 16:27:30.8
Mid-occultation observing point (lat., long.) -44.657 176.395

Occultation of 73 xi^2 Cet 4.3 by moon 24% illuminated at phase= 301 degrees
06/27/2019 21:09:42.3 Geocentric minimum 0.9 degrees
Global start/end: 06/27/2019 19:40:59.7 and 06/27/2019 22:38:20.6
Mid-occultation observing point (lat., long.) 69.023 -8.933

Occultation of 87 mu Cet 4.27 by moon 21% illuminated at phase= 306 degrees
06/28/2019 05:32:35.6 Geocentric minimum 0.8 degrees
Global start/end: 06/28/2019 03:49:15.9 and 06/28/2019 07:15:49.8
Mid-occultation observing point (lat., long.) 59.301 -95.038

Occultation of 61 delta Tau 3.77 by moon 7% illuminated at phase= 329 degrees
06/30/2019 02:47:14.6 Geocentric minimum 0.5 degrees
Global start/end: 06/30/2019 00:49:52.2   and   06/30/2019 04:44:31.2
Mid-occultation observing point (lat., long.) 50.083 -10.341

Occultation of 68v776 Tau 4.3 by moon 7% illuminated at phase= 329 degrees
06/30/2019 03:59:19.5 Geocentric minimum 0.3 degrees
Global start/end: 06/30/2019 01:53:03.8   and   06/30/2019 06:05:30.5
Mid-occultation observing point (lat., long.) 35.612 -21.328
At HVO the miss angle is 901.1 arc-sec at 06/30/2019 03:08:55.0

Occultation of Ain 3.53 by moon 7% illuminated at phase= 330 degrees
06/30/2019 05:45:43.7 Geocentric minimum 0.8 degrees
Global start/end: 06/30/2019 04:02:54.8   and   06/30/2019 07:28:27.1
Mid-occultation observing point (lat., long.) -30.917 -30.553
At HVO the miss angle is 4302.8 arc-sec at 06/30/2019 05:10:33.7

Occultation of 97v480 Tau 5.08 by moon 5% illuminated at phase= 335 degrees
06/30/2019 14:50:31.4 Geocentric minimum 0.7 degrees
Global start/end: 06/30/2019 13:04:19.5   and   06/30/2019 16:36:38.1
Mid-occultation observing point (lat., long.) 64.008 168.51

Occultation of 123 zeta Tau 2.97 by moon 2% illuminated at phase= 345 degrees
07/01/2019 09:56:32.2 Geocentric minimum 0.2 degrees
Global start/end: 07/01/2019 07:49:48.7   and   07/01/2019 12:03:13.3
Mid-occultation observing point (lat., long.) 30.688 -90.211

Eclipse of the Sun by moon 0% illuminated at phase= 0 degrees
07/02/2019 12:22:59.2 Geocentric minimum 0.6 degrees
Global start/end: 07/02/2019 09:55:10.0   and   07/02/2019 14:50:40.5
Mid-occultation observing point (lat., long.) -17.394 -108.986
At HVO the miss angle is 1709.3 arc-sec at 07/02/2019 12:33:23.2

Occultation of Mars 1.8 by moon 3% illuminated at phase= 19 degrees
07/03/2019 22:40:21.0 Geocentric minimum 0.1 degrees
Global start/end: 07/03/2019 20:29:53.7   and   07/04/2019 00:50:48.5
Mid-occultation observing point (lat., long.) 26.087 117.644

Occultation of 33 eta Cnc 5.33 by moon 4% illuminated at phase= 23 degrees
07/04/2019 05:36:30.5 Geocentric minimum 0.1 degrees
Global start/end: 07/04/2019 03:31:36.1   and   07/04/2019 07:41:25.5
Mid-occultation observing point (lat., long.) 24.404 17.787

Occultation of 46 Leo 5.43 by moon 18% illuminated at phase= 51 degrees
07/06/2019 05:14:55.1 Geocentric minimum 0.7 degrees
Global start/end: 07/06/2019 03:30:08.5   and   07/06/2019 06:59:44.0
Mid-occultation observing point (lat., long.) -28.605 35.917

Occultation of 3 nu Vir 4.04 by moon 32% illuminated at phase= 69 degrees
07/07/2019 13:45:50.1 Geocentric minimum 0.3 degrees
Global start/end: 07/07/2019 11:41:53.5   and   07/07/2019 15:49:49.2
Mid-occultation observing point (lat., long.) 21.511 -54.037

Occultation of 8 pi Vir 4.65 by moon 35% illuminated at phase= 72 degrees
07/07/2019 19:31:41.0 Geocentric minimum 1.2 degrees
Global start/end: 07/07/2019 18:45:39.3   and   07/07/2019 20:17:43.4
Mid-occultation observing point (lat., long.) -67.74 139.42
At HVO the miss angle is 6044.6 arc-sec at 07/07/2019 19:23:02.1

Occultation of 16 Vir 4.97 by moon 39% illuminated at phase= 78 degrees
07/08/2019 05:12:04.5 Geocentric minimum 0.1 degrees
Global start/end: 07/08/2019 03:04:31.0   and   07/08/2019 07:19:39.2
Mid-occultation observing point (lat., long.) 7.012 77.69

Occultation of 15 xi^2 Lib 5.48 by moon 72% illuminated at phase= 116 degrees
07/11/2019 05:37:39.5 Geocentric minimum 0.5 degrees
Global start/end: 07/11/2019 03:37:39.4   and   07/11/2019 07:37:42.2
Mid-occultation observing point (lat., long.) -40.74 93.036

Occultation of 38 gamma Lib 3.91 by moon 79% illuminated at phase= 126 degrees
07/11/2019 23:42:18.6 Geocentric minimum 0.2 degrees
Global start/end: 07/11/2019 21:31:57.0   and   07/12/2019 01:52:40.9
Mid-occultation observing point (lat., long.) -26.579 -160.186
At HVO the miss angle is 2893.8 arc-sec at 07/12/2019 00:29:51.6

Occultation of 46 theta Lib 4.13 by moon 82% illuminated at phase= 130 degrees
07/12/2019 08:23:47.1 Geocentric minimum 0.4 degrees
Global start/end: 07/12/2019 06:19:58.4   and   07/12/2019 10:27:37.7
Mid-occultation observing point (lat., long.) 9.375 84.6

Occultation of 49 Lib 5.47 by moon 83% illuminated at phase= 132 degrees
07/12/2019 11:02:36.8 Geocentric minimum 0.2 degrees
Global start/end: 07/12/2019 08:51:13.0   and   07/12/2019 13:14:00.9
Mid-occultation observing point (lat., long.) -26.482 36.437

Occultation of 7 chi Oph 4.22 by moon 87% illuminated at phase= 138 degrees
07/12/2019 23:16:01.2 Geocentric minimum 0.1 degrees
Global start/end: 07/12/2019 21:03:44.0   and   07/13/2019 01:28:18.4
Mid-occultation observing point (lat., long.) -10.318 -135.886
At HVO the miss angle is 1686.5 arc-sec at 07/12/2019 23:47:52.2

Occultation of 40 xi Oph 4.39 by moon 93% illuminated at phase= 150 degrees
07/13/2019 23:25:34.7 Geocentric minimum 0.3 degrees
Global start/end: 07/13/2019 21:17:09.7   and   07/14/2019 01:34:01.3
Mid-occultation observing point (lat., long.) 0.246 -124.592
At HVO the miss angle is 924.4 arc-sec at 07/13/2019 23:52:35.4

Occultation of 58 Oph 4.86 by moon 95% illuminated at phase= 154 degrees
07/14/2019 09:18:48.2 Geocentric minimum 0.2 degrees
Global start/end: 07/14/2019 07:06:34.7   and   07/14/2019 11:31:02.6
Mid-occultation observing point (lat., long.) -8.207 90.731

Occultation of 13 mu Sgr 3.84 by moon 97% illuminated at phase= 161 degrees
07/14/2019 22:33:30.1 Geocentric minimum 1.0 degrees
Global start/end: 07/14/2019 21:29:16.2   and   07/14/2019 23:37:45.0
Mid-occultation observing point (lat., long.) -67.616 87.229
At HVO the miss angle is 5864.7 arc-sec at 07/14/2019 22:04:08.8

Occultation of Saturn 0.1 by moon 100% illuminated at phase= 173 degrees
07/16/2019 00:15:38.5 Geocentric minimum 0.2 degrees
Global start/end: 07/15/2019 22:02:31.5   and   07/16/2019 02:28:46.8
Mid-occultation observing point (lat., long.) -36.248 -114.108
At HVO the miss angle is 2843.3 arc-sec at 07/16/2019 00:57:16.9

Occultation of 39 o Sgr 3.76 by moon 99% illuminated at phase= 172 degrees
07/15/2019 21:20:26.7 Geocentric minimum 0.6 degrees
Global start/end: 07/15/2019 19:26:06.5   and   07/15/2019 23:14:49.5
Mid-occultation observing point (lat., long.) -65.515 -70.458
At HVO the miss angle is 4163.7 arc-sec at 07/15/2019 20:03:26.0

Occultation of Nashira 3.69 by moon 95% illuminated at phase= 206 degrees
07/18/2019 22:15:12.8 Geocentric minimum 0.4 degrees
Global start/end: 07/18/2019 20:06:31.5   and   07/19/2019 00:23:56.7
Mid-occultation observing point (lat., long.) -43.94 -40.594

Occultation of Deneb Algedi 2.85 by moon 94% illuminated at phase= 207 degrees
07/19/2019 01:46:04.2 Geocentric minimum 0.5 degrees
Global start/end: 07/18/2019 23:41:56.0   and   07/19/2019 03:50:15.0
Mid-occultation observing point (lat., long.) -49.285 -88.115
At HVO the miss angle is 3579.7 arc-sec at 07/19/2019 02:54:53.1

Occultation of 91 psi^1 Aqr 4.24 by moon 83% illuminated at phase= 228 degrees
07/20/2019 23:50:32.9 Geocentric minimum 0.5 degrees
Global start/end: 07/20/2019 21:45:57.2   and   07/21/2019 01:55:09.7
Mid-occultation observing point (lat., long.) -41.628 -36.638
At HVO the miss angle is 3954.5 arc-sec at 07/20/2019 23:17:24.3

Occultation of 93 psi^2 Aqr 4.41 by moon 83% illuminated at phase= 229 degrees
07/21/2019 00:42:59.7 Geocentric minimum 0.3 degrees
Global start/end: 07/20/2019 22:26:50.7   and   07/21/2019 02:59:10.0
Mid-occultation observing point (lat., long.) -24.751 -58.489
At HVO the miss angle is 2948.8 arc-sec at 07/21/2019 00:33:30.2

Occultation of 95 psi^3 Aqr 4.99 by moon 83% illuminated at phase= 229 degrees
07/21/2019 00:54:37.9 Geocentric minimum 0.2 degrees
Global start/end: 07/20/2019 22:37:50.2   and   07/21/2019 03:11:26.9
Mid-occultation observing point (lat., long.) 4.656 -72.689
At HVO the miss angle is 1154.9 arc-sec at 07/21/2019 00:43:56.8

Occultation of 30 YY Psc 4.37 by moon 76% illuminated at phase= 239 degrees
07/21/2019 23:41:33.2 Geocentric minimum 0.7 degrees
Global start/end: 07/21/2019 21:53:50.5   and   07/22/2019 01:29:15.6
Mid-occultation observing point (lat., long.) 43.809 -64.001

---For observations at HVO:
07/21/2019 22:29:46.9 Start Total 1.96 1.97 (az100) -22.4 ***
07/21/2019 22:59:53.9 OCCULTATION MID-POINT 7.07 6.98 (az105) -24.2 ***
07/21/2019 23:31:24.6 End Total 12.41 12.24 (az111) -25.3 ***

Occultation of 33 BC Psc 4.61 by moon 75% illuminated at phase= 240 degrees
07/22/2019 01:30:09.8 Geocentric minimum 0.8 degrees
Global start/end: 07/21/2019 23:45:17.2   and   07/22/2019 03:15:01.9
Mid-occultation observing point (lat., long.) 46.69 -92.888

---For observations at HVO:
07/22/2019 00:33:05.7 Start Total 21.98 22.0 (az123) -25.2 ***
07/22/2019 01:11:33.8 OCCULTATION MID-POINT 27.52 27.49 (az131) -23.6 ***
07/22/2019 01:51:44.9 End Total 32.53 32.51 (az141) -20.7 ***

Occultation of 20 Cet 4.78 by moon 66% illuminated at phase= 252 degrees
07/23/2019 03:11:37.9 Geocentric minimum 1.0 degrees
Global start/end: 07/23/2019 02:10:27.8   and   07/23/2019 04:12:47.1
Mid-occultation observing point (lat., long.) 67.785 -170.775
At HVO the miss angle is 357.1 arc-sec at 07/23/2019 03:03:18.8

Occultation of 89 Psc 5.13 by moon 60% illuminated at phase= 259 degrees
07/23/2019 18:15:23.4 Geocentric minimum 1.0 degrees
Global start/end: 07/23/2019 17:05:50.8   and   07/23/2019 19:24:54.5
Mid-occultation observing point (lat., long.) -67.72 143.386

Occultation of 106 nu Psc 4.45 by moon 55% illuminated at phase= 264 degrees
07/24/2019 06:27:18.4 Geocentric minimum 0.5 degrees
Global start/end: 07/24/2019 04:23:58.3   and   07/24/2019 08:30:34.8
Mid-occultation observing point (lat., long.) -26.771 -104.399
At HVO the miss angle is 2465.5 arc-sec at 07/24/2019 07:47:26.6

Occultation of 65 xi^1 Cet 4.36 by moon 48% illuminated at phase= 272 degrees
07/24/2019 23:06:53.9 Geocentric minimum 0.8 degrees
Global start/end: 07/24/2019 21:24:35.2   and   07/25/2019 00:49:08.3
Mid-occultation observing point (lat., long.) -44.575 24.285

Occultation of 73 xi^2 Cet 4.3 by moon 46% illuminated at phase= 275 degrees
07/25/2019 05:37:50.3 Geocentric minimum 0.9 degrees
Global start/end: 07/25/2019 04:10:18.6   and   07/25/2019 07:05:18.4
Mid-occultation observing point (lat., long.) 69.916 -174.751
At HVO the miss angle is 465.5 arc-sec at 07/25/2019 05:42:56.2

Occultation of 87 mu Cet 4.27 by moon 42% illuminated at phase= 280 degrees
07/25/2019 14:11:15.9 Geocentric minimum 0.8 degrees
Global start/end: 07/25/2019 12:28:14.7   and   07/25/2019 15:54:12.1
Mid-occultation observing point (lat., long.) 60.619 106.031

Occultation of 61 delta Tau 3.77 by moon 23% illuminated at phase= 303 degrees
07/27/2019 12:22:27.9 Geocentric minimum 0.5 degrees
Global start/end: 07/27/2019 10:24:33.5   and   07/27/2019 14:20:15.5
Mid-occultation observing point (lat., long.) 51.121 178.268

Occultation of 68v776 Tau 4.3 by moon 23% illuminated at phase= 303 degrees
07/27/2019 13:35:52.1 Geocentric minimum 0.3 degrees
Global start/end: 07/27/2019 11:28:33.4   and   07/27/2019 15:43:05.2
Mid-occultation observing point (lat., long.) 36.437 167.259

Occultation of Ain 3.53 by moon 22% illuminated at phase= 304 degrees
07/27/2019 15:24:11.9 Geocentric minimum 0.7 degrees
Global start/end: 07/27/2019 13:39:43.6   and   07/27/2019 17:08:33.9
Mid-occultation observing point (lat., long.) -30.337 157.66

Occultation of 97v480 Tau 5.08 by moon 19% illuminated at phase= 309 degrees
07/28/2019 00:38:14.8 Geocentric minimum 0.7 degrees
Global start/end: 07/27/2019 22:52:06.5   and   07/28/2019 02:24:16.7
Mid-occultation observing point (lat., long.) 65.214 -6.684

Occultation of 123 zeta Tau 2.97 by moon 12% illuminated at phase= 319 degrees
07/28/2019 19:59:21.8 Geocentric minimum 0.2 degrees
Global start/end: 07/28/2019 17:51:53.4   and   07/28/2019 22:06:46.6
Mid-occultation observing point (lat., long.) 31.255 91.979

Occultation of Propus 3.31 by moon 8% illuminated at phase= 327 degrees
07/29/2019 10:51:50.1 Geocentric minimum 0.4 degrees
Global start/end: 07/29/2019 08:50:24.7   and   07/29/2019 12:53:10.5
Mid-occultation observing point (lat., long.) -0.059 -119.666
At HVO the miss angle is 1746.5 arc-sec at 07/29/2019 11:21:14.4

Occultation of 13 mu Gem 2.87 by moon 7% illuminated at phase= 329 degrees
07/29/2019 14:00:15.9 Geocentric minimum 0.3 degrees
Global start/end: 07/29/2019 11:56:21.2   and   07/29/2019 16:04:06.4
Mid-occultation observing point (lat., long.) 6.114 -165.455
At HVO the miss angle is 2039.6 arc-sec at 07/29/2019 15:03:23.6

Occultation of Wasat 3.5 by moon 3% illuminated at phase= 341 degrees
07/30/2019 11:56:35.5 Geocentric minimum 0.3 degrees
Global start/end: 07/30/2019 09:54:16.8   and   07/30/2019 13:58:51.1
Mid-occultation observing point (lat., long.) 38.578 -120.966

Occultation of 46 Leo 5.43 by moon 5% illuminated at phase= 24 degrees
08/02/2019 13:56:27.9 Geocentric minimum 0.7 degrees
Global start/end: 08/02/2019 12:14:34.1   and   08/02/2019 15:38:23.2
Mid-occultation observing point (lat., long.) -30.005 -122.058
At HVO the miss angle is 3383.2 arc-sec at 08/02/2019 13:20:51.9

Occultation of 3 nu Vir 4.04 by moon 13% illuminated at phase= 43 degrees
08/03/2019 21:26:15.3 Geocentric minimum 0.2 degrees
Global start/end: 08/03/2019 19:23:30.4   and   08/03/2019 23:29:02.9
Mid-occultation observing point (lat., long.) 19.009 162.83

Occultation of 8 pi Vir 4.65 by moon 15% illuminated at phase= 46 degrees
08/04/2019 03:01:06.6 Geocentric minimum 1.2 degrees
Global start/end: 08/04/2019 02:23:03.7   and   08/04/2019 03:39:10.2
Mid-occultation observing point (lat., long.) -67.707 0.07

Occultation of 16 Vir 4.97 by moon 19% illuminated at phase= 51 degrees
08/04/2019 12:23:42.9 Geocentric minimum 0.0 degrees
Global start/end: 08/04/2019 10:18:01.7 and 08/04/2019 14:29:25.4
Mid-occultation observing point (lat., long.) 4.449 -58.172
At HVO the miss angle is 296.0 arc-sec at 08/04/2019 10:56:56.2

Occultation of 15 xi^2 Lib 5.48 by moon 50% illuminated at phase= 90 degrees
08/07/2019 11:16:03.5 Geocentric minimum 0.6 degrees
Global start/end: 08/07/2019 09:19:23.6 and 08/07/2019 13:12:48.2
Mid-occultation observing point (lat., long.) -44.343 -20.771

Occultation of 38 gamma Lib 3.91 by moon 59% illuminated at phase= 100 degrees
08/08/2019 05:12:53.9 Geocentric minimum 0.3 degrees
Global start/end: 08/08/2019 03:03:48.9 and 08/08/2019 07:22:01.7
Mid-occultation observing point (lat., long.) -29.962 89.048

Occultation of 46 theta Lib 4.13 by moon 62% illuminated at phase= 104 degrees
08/08/2019 13:52:49.7 Geocentric minimum 0.4 degrees
Global start/end: 08/08/2019 11:46:38.8 and 08/08/2019 15:59:03.8
Mid-occultation observing point (lat., long.) 5.614 -25.517

Occultation of 49 Lib 5.47 by moon 63% illuminated at phase= 105 degrees
08/08/2019 16:31:28.2 Geocentric minimum 0.2 degrees
Global start/end: 08/08/2019 14:20:54.1 and 08/08/2019 18:42:04.5
Mid-occultation observing point (lat., long.) -29.818 -73.725
At HVO the miss angle is 1930.1 arc-sec at 08/08/2019 14:56:49.4

Occultation of 7 chi Oph 4.22 by moon 69% illuminated at phase= 112 degrees
08/09/2019 04:45:28.1 Geocentric minimum 0.1 degrees
Global start/end: 08/09/2019 02:32:11.1 and 08/09/2019 06:58:45.2
Mid-occultation observing point (lat., long.) -13.562 114.174

Occultation of 40 xi Oph 4.39 by moon 78% illuminated at phase= 124 degrees
08/10/2019 05:02:13.9 Geocentric minimum 0.3 degrees
Global start/end: 08/10/2019 02:51:36.9 and 08/10/2019 07:12:52.7
Mid-occultation observing point (lat., long.) -2.734 123.976

Occultation of 58 Oph 4.86 by moon 81% illuminated at phase= 128 degrees
08/10/2019 15:00:07.5 Geocentric minimum 0.2 degrees
Global start/end: 08/10/2019 12:46:14.7 and 08/10/2019 17:14:00.9
Mid-occultation observing point (lat., long.) -10.838 -21.738

Occultation of 13 mu Sgr 3.84 by moon 85% illuminated at phase= 135 degrees
08/11/2019 04:22:07.1 Geocentric minimum 1.1 degrees
Global start/end: 08/11/2019 03:26:31.4 and 08/11/2019 05:17:43.7
Mid-occultation observing point (lat., long.) -67.627 -26.906

Occultation of Saturn 0.2 by moon 91% illuminated at phase= 146 degrees
08/12/2019 02:52:46.8 Geocentric minimum 0.0 degrees
Global start/end: 08/12/2019 00:36:21.0 and 08/12/2019 05:09:11.6
Mid-occultation observing point (lat., long.) -24.908 177.504

Occultation of 39 o Sgr 3.76 by moon 91% illuminated at phase= 146 degrees
08/12/2019 03:22:18.1 Geocentric minimum 0.7 degrees
Global start/end: 08/12/2019 01:29:11.9 and 08/12/2019 05:15:26.3
Mid-occultation observing point (lat., long.) -67.73 172.606

Occultation of Nashira 3.69 by moon 100% illuminated at phase= 180 degrees
08/15/2019 04:44:52.8 Geocentric minimum 0.4 degrees
Global start/end: 08/15/2019 02:34:49.2 and 08/15/2019 06:54:57.7
Mid-occultation observing point (lat., long.) -41.968 -165.773

Occultation of Deneb Algedi 2.85 by moon 100% illuminated at phase= 181 degrees
08/15/2019 08:16:11.1 Geocentric minimum 0.5 degrees
Global start/end: 08/15/2019 06:10:13.6 and 08/15/2019 10:22:10.0
Mid-occultation observing point (lat., long.) -47.027 146.184

Occultation of 91 psi^1 Aqr 4.24 by moon 96% illuminated at phase= 202 degrees
08/17/2019 06:21:20.7 Geocentric minimum 0.4 degrees
Global start/end: 08/17/2019 04:13:09.7   and   08/17/2019 08:29:32.7
Mid-occultation observing point (lat., long.) -36.947 -164.134

Occultation of 93 psi^2 Aqr 4.41 by moon 96% illuminated at phase= 203 degrees
08/17/2019 07:13:43.3 Geocentric minimum 0.2 degrees
Global start/end: 08/17/2019 04:56:12.9   and   08/17/2019 09:31:14.7
Mid-occultation observing point (lat., long.) -20.472 175.118

Occultation of 95 psi^3 Aqr 4.99 by moon 96% illuminated at phase= 203 degrees
08/17/2019 07:25:15.6 Geocentric minimum 0.3 degrees
Global start/end: 08/17/2019 05:10:52.7   and   08/17/2019 09:39:39.4
Mid-occultation observing point (lat., long.) 9.106 161.092

Occultation of 30 YY Psc 4.37 by moon 92% illuminated at phase= 213 degrees
08/18/2019 06:12:19.1 Geocentric minimum 0.8 degrees
Global start/end: 08/18/2019 04:34:48.6   and   08/18/2019 07:49:49.7
Mid-occultation observing point (lat., long.) 53.255 161.584

Occultation of 33 BC Psc 4.61 by moon 91% illuminated at phase= 214 degrees
08/18/2019 08:01:02.8 Geocentric minimum 0.8 degrees
Global start/end: 08/18/2019 06:27:13.6   and   08/18/2019 09:34:51.9
Mid-occultation observing point (lat., long.) 57.204 129.193

Occultation of 20 Cet 4.78 by moon 85% illuminated at phase= 226 degrees
08/19/2019 09:47:06.1 Geocentric minimum 1.1 degrees
Global start/end: 08/19/2019 09:32:05.4   and   08/19/2019 10:02:06.7
Mid-occultation observing point (lat., long.) 67.706 63.489

Occultation of 89 Psc 5.13 by moon 80% illuminated at phase= 233 degrees
08/20/2019 00:57:09.2 Geocentric minimum 0.9 degrees
Global start/end: 08/19/2019 23:28:43.2   and   08/20/2019 02:25:34.2
Mid-occultation observing point (lat., long.) -63.911 -10.169
At HVO the miss angle is 4854.4 arc-sec at 08/20/2019 01:18:17.6

Occultation of 106 nu Psc 4.45 by moon 76% illuminated at phase= 238 degrees
08/20/2019 13:16:09.4 Geocentric minimum 0.4 degrees
Global start/end: 08/20/2019 11:06:15.4   and   08/20/2019 15:26:02.0
Mid-occultation observing point (lat., long.) -18.914 122.782

Occultation of 65 xi^1 Cet 4.36 by moon 70% illuminated at phase= 246 degrees
08/21/2019 06:09:07.4 Geocentric minimum 0.7 degrees
Global start/end: 08/21/2019 04:15:02.8   and   08/21/2019 08:03:09.2
Mid-occultation observing point (lat., long.) -33.672 -115.388
At HVO the miss angle is 2714.5 arc-sec at 08/21/2019 07:36:09.8

Occultation of 73 xi^2 Cet 4.3 by moon 68% illuminated at phase= 249 degrees
08/21/2019 12:46:23.0 Geocentric minimum 1.0 degrees
Global start/end: 08/21/2019 11:42:14.1   and   08/21/2019 13:50:30.4
Mid-occultation observing point (lat., long.) 67.657 16.219

Occultation of 87 mu Cet 4.27 by moon 65% illuminated at phase= 253 degrees
08/21/2019 21:29:15.3 Geocentric minimum 0.9 degrees
Global start/end: 08/21/2019 20:01:46.6   and   08/21/2019 22:56:41.3
Mid-occultation observing point (lat., long.) 70.863 -83.167

Occultation of 61 delta Tau 3.77 by moon 45% illuminated at phase= 276 degrees
08/23/2019 20:48:03.4 Geocentric minimum 0.7 degrees
Global start/end: 08/23/2019 18:57:13.5   and   08/23/2019 22:38:47.5
Mid-occultation observing point (lat., long.) 61.112 17.196

Occultation of 68v776 Tau 4.3 by moon 44% illuminated at phase= 277 degrees
08/23/2019 22:03:30.8 Geocentric minimum 0.4 degrees
Global start/end: 08/23/2019 19:59:04.3   and   08/24/2019 00:07:51.8
Mid-occultation observing point (lat., long.) 44.908 10.114

Occultation of Ain 3.53 by moon 43% illuminated at phase= 278 degrees
08/23/2019 23:54:48.0 Geocentric minimum 0.6 degrees
Global start/end: 08/23/2019 21:59:49.3   and   08/24/2019 01:49:40.7
Mid-occultation observing point (lat., long.) -20.234 0.338

Occultation of 97v480 Tau 5.08 by moon 39% illuminated at phase= 283 degrees
08/24/2019 09:24:50.0 Geocentric minimum 0.8 degrees
Global start/end: 08/24/2019 07:49:15.1   and   08/24/2019 11:00:19.7
Mid-occultation observing point (lat., long.) 76.715 167.886
At HVO the miss angle is 673.2 arc-sec at 08/24/2019 10:44:32.7

Occultation of 123 zeta Tau 2.97 by moon 31% illuminated at phase= 293 degrees
08/25/2019 05:19:07.3 Geocentric minimum 0.3 degrees
Global start/end: 08/25/2019 03:11:57.7   and   08/25/2019 07:26:11.8
Mid-occultation observing point (lat., long.) 38.358 -76.11

---For observations at HVO:
08/25/2019 04:17:07.1 Start Total 46.26 46.19 (az107) -9.5 ***
08/25/2019 04:40:55.3 OCCULTATION MID-POINT 50.3 50.13 (az113) -5.5 ***
08/25/2019 05:05:24.8 End Total 54.27 54.01 (az119) -0.7

Occultation of 1 Gem 4.16 by moon 26% illuminated at phase= 299 degrees
08/25/2019 16:23:50.8 Geocentric minimum 1.2 degrees
Global start/end: 08/25/2019 15:53:17.9   and   08/25/2019 16:54:23.0
Mid-occultation observing point (lat., long.) -67.679 138.357

Occultation of Propus 3.31 by moon 24% illuminated at phase= 301 degrees
08/25/2019 20:35:36.7 Geocentric minimum 0.3 degrees
Global start/end: 08/25/2019 18:29:36.2   and   08/25/2019 22:41:32.2
Mid-occultation observing point (lat., long.) 6.153 67.001

Occultation of 13 mu Gem 2.87 by moon 23% illuminated at phase= 303 degrees
08/25/2019 23:48:51.3 Geocentric minimum 0.2 degrees
Global start/end: 08/25/2019 21:41:17.1   and   08/26/2019 01:56:21.7
Mid-occultation observing point (lat., long.) 12.025 20.096

Occultation of Wasat 3.5 by moon 15% illuminated at phase= 315 degrees
08/26/2019 22:14:36.1 Geocentric minimum 0.4 degrees
Global start/end: 08/26/2019 20:13:01.6   and   08/27/2019 00:16:05.6
Mid-occultation observing point (lat., long.) 43.448 57.942

Occultation of 33 eta Cnc 5.33 by moon 6% illuminated at phase= 331 degrees
08/28/2019 02:07:36.8 Geocentric minimum 0.1 degrees
Global start/end: 08/28/2019 00:03:20.3   and   08/28/2019 04:11:51.3
Mid-occultation observing point (lat., long.) 26.187 16.303

Occultation of 3 nu Vir 4.04 by moon 2% illuminated at phase= 17 degrees
08/31/2019 07:19:34.8 Geocentric minimum 0.2 degrees
Global start/end: 08/31/2019 05:17:19.3   and   08/31/2019 09:21:51.4
Mid-occultation observing point (lat., long.) 14.506 -14.406

Occultation of 16 Vir 4.97 by moon 5% illuminated at phase= 25 degrees
08/31/2019 21:52:01.1 Geocentric minimum 0.1 degrees
Global start/end: 08/31/2019 19:48:34.5   and   08/31/2019 23:55:29.2
Mid-occultation observing point (lat., long.) -0.965 130.545

Occultation of 15 xi^2 Lib 5.48 by moon 28% illuminated at phase= 64 degrees
09/03/2019 18:28:55.4 Geocentric minimum 0.7 degrees
Global start/end: 09/03/2019 16:44:02.4   and   09/03/2019 20:13:54.3
Mid-occultation observing point (lat., long.) -55.208 -165.738
At HVO the miss angle is 4846.6 arc-sec at 09/03/2019 18:39:21.1

Occultation of 38 gamma Lib 3.91 by moon 36% illuminated at phase= 73 degrees
09/04/2019 11:56:45.7 Geocentric minimum 0.4 degrees
Global start/end: 09/04/2019 09:54:36.0   and   09/04/2019 13:59:01.1
Mid-occultation observing point (lat., long.) -40.183 -43.367

Occultation of 46 theta Lib 4.13 by moon 40% illuminated at phase= 78 degrees
09/04/2019 20:24:31.3 Geocentric minimum 0.2 degrees
Global start/end: 09/04/2019 18:15:01.9   and   09/04/2019 22:34:04.3
Mid-occultation observing point (lat., long.) -5.3 -153.187
At HVO the miss angle is 1455.7 arc-sec at 09/04/2019 21:12:49.7

Occultation of 49 Lib 5.47 by moon 41% illuminated at phase= 79 degrees
09/04/2019 22:59:37.8 Geocentric minimum 0.4 degrees
Global start/end: 09/04/2019 20:55:20.0   and   09/05/2019 01:04:00.9
Mid-occultation observing point (lat., long.) -40.238 158.272

Occultation of 7 chi Oph 4.22 by moon 46% illuminated at phase= 85 degrees
09/05/2019 10:59:12.4 Geocentric minimum 0.1 degrees
Global start/end: 09/05/2019 08:47:02.3   and   09/05/2019 13:11:24.3
Mid-occultation observing point (lat., long.) -23.896 -8.646

Occultation of 40 xi Oph 4.39 by moon 57% illuminated at phase= 97 degrees
09/06/2019 10:55:30.9 Geocentric minimum 0.1 degrees
Global start/end: 09/06/2019 08:41:51.9   and   09/06/2019 13:09:11.6
Mid-occultation observing point (lat., long.) -13.322 7.313

Occultation of 58 Oph 4.86 by moon 61% illuminated at phase= 102 degrees
09/06/2019 20:48:08.5 Geocentric minimum 0.0 degrees
Global start/end: 09/06/2019 18:32:58.8   and   09/06/2019 23:03:17.8
Mid-occultation observing point (lat., long.) -20.91 -136.717
At HVO the miss angle is 2001.6 arc-sec at 09/06/2019 21:42:10.3

Occultation of Saturn 0.4 by moon 74% illuminated at phase= 118 degrees
09/08/2019 06:41:40.5 Geocentric minimum 0.0 degrees
Global start/end: 09/08/2019 04:24:32.4   and   09/08/2019 08:58:48.0
Mid-occultation observing point (lat., long.) -25.149 92.456

Occultation of 39 o Sgr 3.76 by moon 75% illuminated at phase= 119 degrees
09/08/2019 09:04:18.0 Geocentric minimum 0.8 degrees
Global start/end: 09/08/2019 07:23:12.2   and   09/08/2019 10:45:26.5
Mid-occultation observing point (lat., long.) -81.371 65.516

Occultation of Nashira 3.69 by moon 95% illuminated at phase= 153 degrees
09/11/2019 10:44:14.6 Geocentric minimum 0.4 degrees
Global start/end: 09/11/2019 08:35:42.2   and   09/11/2019 12:52:47.1
Mid-occultation observing point (lat., long.) -44.657 78.971

Occultation of Deneb Algedi 2.85 by moon 95% illuminated at phase= 155 degrees
09/11/2019 14:16:20.4 Geocentric minimum 0.5 degrees
Global start/end: 09/11/2019 12:12:04.6   and   09/11/2019 16:20:36.3
Mid-occultation observing point (lat., long.) -49.45 30.949

Occultation of 91 psi^1 Aqr 4.24 by moon 100% illuminated at phase= 176 degrees
09/13/2019 12:24:59.1 Geocentric minimum 0.4 degrees
Global start/end: 09/13/2019 10:15:02.7   and   09/13/2019 14:34:55.2
Mid-occultation observing point (lat., long.) -34.348 76.722

Occultation of 93 psi^2 Aqr 4.41 by moon 100% illuminated at phase= 176 degrees
09/13/2019 13:17:12.0 Geocentric minimum 0.1 degrees
Global start/end: 09/13/2019 10:59:08.9   and   09/13/2019 15:35:14.9
Mid-occultation observing point (lat., long.) -18.015 56.405

Occultation of 95 psi^3 Aqr 4.99 by moon 100% illuminated at phase= 176 degrees
09/13/2019 13:28:31.8 Geocentric minimum 0.3 degrees
Global start/end: 09/13/2019 11:15:47.7   and   09/13/2019 15:41:15.7
Mid-occultation observing point (lat., long.) 11.705 42.349

Occultation of 30 YY Psc 4.37 by moon 100% illuminated at phase= 187 degrees
09/14/2019 12:12:43.8 Geocentric minimum 0.9 degrees
Global start/end: 09/14/2019 10:46:08.8   and   09/14/2019 13:39:18.5
Mid-occultation observing point (lat., long.) 66.37 10.458

Occultation of 33 BC Psc 4.61 by moon 100% illuminated at phase= 187 degrees
09/14/2019 14:01:09.5 Geocentric minimum 0.9 degrees
Global start/end: 09/14/2019 12:39:36.4   and   09/14/2019 15:22:42.2
Mid-occultation observing point (lat., long.) 67.586 -26.661

Occultation of 89 Psc 5.13 by moon 95% illuminated at phase= 206 degrees
09/16/2019 06:51:28.0 Geocentric minimum 0.7 degrees
Global start/end: 09/16/2019 05:06:14.9   and   09/16/2019 08:36:40.0
Mid-occultation observing point (lat., long.) -46.919 -155.828

Occultation of 106 nu Psc 4.45 by moon 92% illuminated at phase= 212 degrees
09/16/2019 19:09:40.8 Geocentric minimum 0.2 degrees
Global start/end: 09/16/2019 16:54:37.5   and   09/16/2019 21:24:44.0
Mid-occultation observing point (lat., long.) -9.058 3.391

Occultation of 65 xi^1 Cet 4.36 by moon 88% illuminated at phase= 220 degrees
09/17/2019 12:04:06.1 Geocentric minimum 0.5 degrees
Global start/end: 09/17/2019 09:58:29.1   and   09/17/2019 14:09:41.7
Mid-occultation observing point (lat., long.) -20.602 122.693

Occultation of 87 mu Cet 4.27 by moon 84% illuminated at phase= 227 degrees
09/18/2019 03:28:14.0 Geocentric minimum 1.1 degrees
Global start/end: 09/18/2019 02:41:41.1   and   09/18/2019 04:14:46.4
Mid-occultation observing point (lat., long.) 67.477 128.414
At HVO the miss angle is 1590.4 arc-sec at 09/18/2019 03:59:22.5

Occultation of 61 delta Tau 3.77 by moon 67% illuminated at phase= 250 degrees
09/20/2019 03:25:21.9 Geocentric minimum 0.9 degrees
Global start/end: 09/20/2019 01:56:55.9   and   09/20/2019 04:53:44.9
Mid-occultation observing point (lat., long.) 77.148 172.35
At HVO the miss angle is 674.5 arc-sec at 09/20/2019 03:04:41.9

Occultation of 68v776 Tau 4.3 by moon 67% illuminated at phase= 251 degrees
09/20/2019 04:42:25.5 Geocentric minimum 0.7 degrees
Global start/end: 09/20/2019 02:50:28.9   and   09/20/2019 06:34:18.2
Mid-occultation observing point (lat., long.) 61.389 -127.579
At HVO the miss angle is 130.9 arc-sec at 09/20/2019 05:02:53.2

Occultation of Ain 3.53 by moon 66% illuminated at phase= 251 degrees
09/20/2019 06:36:05.4 Geocentric minimum 0.4 degrees
Global start/end: 09/20/2019 04:28:32.3   and   09/20/2019 08:43:35.2
Mid-occultation observing point (lat., long.) -4.545 -130.427
At HVO the miss angle is 1720.4 arc-sec at 09/20/2019 07:40:20.6

Occultation of 97v480 Tau 5.08 by moon 62% illuminated at phase= 256 degrees
09/20/2019 16:19:17.8 Geocentric minimum 1.1 degrees
Global start/end: 09/20/2019 15:18:47.7   and   09/20/2019 17:19:46.2
Mid-occultation observing point (lat., long.) 67.376 -66.913

Occultation of 102 iota Tau 4.62 by moon 60% illuminated at phase= 259 degrees
09/20/2019 22:16:58.7 Geocentric minimum 1.1 degrees
Global start/end: 09/20/2019 21:29:52.4   and   09/20/2019 23:04:03.9
Mid-occultation observing point (lat., long.) -67.492 23.985

Occultation of 123 zeta Tau 2.97 by moon 53% illuminated at phase= 266 degrees
09/21/2019 12:46:06.7 Geocentric minimum 0.5 degrees
Global start/end: 09/21/2019 10:45:49.0   and   09/21/2019 14:46:19.4
Mid-occultation observing point (lat., long.) 53.566 141.648

Occultation of 1 Gem 4.16 by moon 48% illuminated at phase= 272 degrees
09/22/2019 00:11:06.1 Geocentric minimum 1.0 degrees
Global start/end: 09/21/2019 22:52:42.7   and   09/22/2019 01:29:26.2
Mid-occultation observing point (lat., long.) -67.672 -5.545
At HVO the miss angle is 5163.5 arc-sec at 09/21/2019 23:22:39.3

Occultation of Propus 3.31 by moon 46% illuminated at phase= 275 degrees
09/22/2019 04:31:03.6 Geocentric minimum 0.1 degrees
Global start/end: 09/22/2019 02:19:47.8   and   09/22/2019 06:42:18.3
Mid-occultation observing point (lat., long.) 19.324 -79.583
At HVO the miss angle is 749.6 arc-sec at 09/22/2019 04:00:38.6

Occultation of 13 mu Gem 2.87 by moon 45% illuminated at phase= 276 degrees
09/22/2019 07:50:38.7 Geocentric minimum 0.0 degrees
Global start/end: 09/22/2019 05:39:35.4   and   09/22/2019 10:01:41.0
Mid-occultation observing point (lat., long.) 24.978 -127.917
At HVO the miss angle is 292.0 arc-sec at 09/22/2019 08:31:58.6

Occultation of Wasat 3.5 by moon 34% illuminated at phase= 288 degrees
09/23/2019 07:02:00.2 Geocentric minimum 0.6 degrees
Global start/end: 09/23/2019 05:06:36.3   and   09/23/2019 08:57:18.3
Mid-occultation observing point (lat., long.) 57.041 -99.184

Occultation of 33 eta Cnc 5.33 by moon 22% illuminated at phase= 304 degrees
09/24/2019 11:49:49.7 Geocentric minimum 0.3 degrees
Global start/end: 09/24/2019 09:45:45.9   and   09/24/2019 13:53:49.5
Mid-occultation observing point (lat., long.) 35.457 -154.224
At HVO the miss angle is 444.5 arc-sec at 09/24/2019 12:40:16.6

Occultation of Asellus Borealis 4.66 by moon 20% illuminated at phase= 306 degrees
09/24/2019 15:34:46.1 Geocentric minimum 1.2 degrees
Global start/end: 09/24/2019 14:48:14.3   and   09/24/2019 16:21:16.6
Mid-occultation observing point (lat., long.) -67.557 120.642

Occultation of 46 Leo 5.43 by moon 6% illuminated at phase= 331 degrees
09/26/2019 11:13:36.8 Geocentric minimum 0.7 degrees
Global start/end: 09/26/2019 09:29:47.0   and   09/26/2019 12:57:23.9
Mid-occultation observing point (lat., long.) -27.695 -134.74
At HVO the miss angle is 3556.5 arc-sec at 09/26/2019 10:54:08.4

Occultation of 15 xi^2 Lib 5.48 by moon 10% illuminated at phase= 37 degrees
10/01/2019 03:51:14.3 Geocentric minimum 0.9 degrees
Global start/end: 10/01/2019 02:24:09.1   and   10/01/2019 05:18:24.0
Mid-occultation observing point (lat., long.) -68.876 -5.858

Occultation of 38 gamma Lib 3.91 by moon 16% illuminated at phase= 47 degrees
10/01/2019 20:46:37.5 Geocentric minimum 0.6 degrees
Global start/end: 10/01/2019 18:57:05.4   and   10/01/2019 22:36:15.9
Mid-occultation observing point (lat., long.) -53.745 147.936

Occultation of 46 theta Lib 4.13 by moon 19% illuminated at phase= 51 degrees
10/02/2019 04:58:40.2 Geocentric minimum 0.0 degrees
Global start/end: 10/02/2019 02:49:41.0   and   10/02/2019 07:07:41.1
Mid-occultation observing point (lat., long.) -18.454 47.687

Occultation of 49 Lib 5.47 by moon 19% illuminated at phase= 52 degrees
10/02/2019 07:28:46.9 Geocentric minimum 0.6 degrees
Global start/end: 10/02/2019 05:37:16.2   and   10/02/2019 09:20:24.1
Mid-occultation observing point (lat., long.) -54.694 -4.793

Occultation of 7 chi Oph 4.22 by moon 24% illuminated at phase= 59 degrees
10/02/2019 19:06:26.8 Geocentric minimum 0.3 degrees
Global start/end: 10/02/2019 17:00:48.4   and   10/02/2019 21:12:11.0
Mid-occultation observing point (lat., long.) -37.963 -161.691

Occultation of 40 xi Oph 4.39 by moon 33% illuminated at phase= 71 degrees
10/03/2019 18:22:39.1 Geocentric minimum 0.1 degrees
Global start/end: 10/03/2019 16:10:37.8   and   10/03/2019 20:34:43.5
Mid-occultation observing point (lat., long.) -28.468 -133.789
At HVO the miss angle is 2616.0 arc-sec at 10/03/2019 19:02:35.9

Occultation of 58 Oph 4.86 by moon 38% illuminated at phase= 75 degrees
10/04/2019 04:00:43.6 Geocentric minimum 0.2 degrees
Global start/end: 10/04/2019 01:49:46.8   and   10/04/2019 06:11:44.8
Mid-occultation observing point (lat., long.) -36.315 86.121

Occultation of Saturn 0.5 by moon 52% illuminated at phase= 92 degrees
10/05/2019 13:36:50.8 Geocentric minimum 0.3 degrees
Global start/end: 10/05/2019 11:23:10.3   and   10/05/2019 15:50:34.8
Mid-occultation observing point (lat., long.) -38.684 -37.753

Occultation of 39 o Sgr 3.76 by moon 53% illuminated at phase= 93 degrees
10/05/2019 15:36:55.9 Geocentric minimum 1.0 degrees
Global start/end: 10/05/2019 14:31:20.4   and   10/05/2019 16:42:33.6
Mid-occultation observing point (lat., long.) -67.211 109.416

Occultation of Nashira 3.69 by moon 80% illuminated at phase= 127 degrees
10/08/2019 16:55:32.4 Geocentric minimum 0.6 degrees
Global start/end: 10/08/2019 14:56:41.9   and   10/08/2019 18:54:23.5
Mid-occultation observing point (lat., long.) -56.315 -32.609

Occultation of Deneb Algedi 2.85 by moon 81% illuminated at phase= 128 degrees
10/08/2019 20:27:54.3 Geocentric minimum 0.7 degrees
Global start/end: 10/08/2019 18:34:52.6   and   10/08/2019 22:20:56.5
Mid-occultation observing point (lat., long.) -61.296 -77.623
At HVO the miss angle is 4111.0 arc-sec at 10/08/2019 21:46:29.7

Occultation of 91 psi^1 Aqr 4.24 by moon 93% illuminated at phase= 149 degrees
10/10/2019 18:40:11.3 Geocentric minimum 0.5 degrees
Global start/end: 10/10/2019 16:33:56.5   and   10/10/2019 20:46:24.6
Mid-occultation observing point (lat., long.) -39.29 -40.806
At HVO the miss angle is 3834.0 arc-sec at 10/10/2019 18:14:16.9

Occultation of 93 psi^2 Aqr 4.41 by moon 93% illuminated at phase= 150 degrees
10/10/2019 19:32:17.4 Geocentric minimum 0.2 degrees
Global start/end: 10/10/2019 17:15:29.9   and   10/10/2019 21:49:03.3
Mid-occultation observing point (lat., long.) -22.472 -62.277
At HVO the miss angle is 2788.1 arc-sec at 10/10/2019 19:30:47.9

Occultation of 95 psi^3 Aqr 4.99 by moon 93% illuminated at phase= 150 degrees
10/10/2019 19:43:23.1 Geocentric minimum 0.3 degrees
Global start/end: 10/10/2019 17:27:56.1   and   10/10/2019 21:58:48.4
Mid-occultation observing point (lat., long.) 6.961 -76.497
At HVO the miss angle is 989.0 arc-sec at 10/10/2019 19:38:53.5

Occultation of 30 YY Psc 4.37 by moon 97% illuminated at phase= 160 degrees
10/11/2019 18:26:02.2 Geocentric minimum 0.9 degrees
Global start/end: 10/11/2019 16:55:12.2   and   10/11/2019 19:56:51.1
Mid-occultation observing point (lat., long.) 59.695 -87.401

---For observations at HVO:
10/11/2019 17:14:08.7 Start Total 3.09 3.21 (az101) 0.1
10/11/2019 17:46:19.5 OCCULTATION MID-POINT 8.58 8.61 (az107) -6.2 ***
10/11/2019 18:20:03.9 End Total 14.24 14.21 (az113) -12.3 ***

Occultation of 33 BC Psc 4.61 by moon 97% illuminated at phase= 161 degrees
10/11/2019 20:14:12.1 Geocentric minimum 0.9 degrees
Global start/end: 10/11/2019 18:48:33.8   and   10/11/2019 21:39:49.4
Mid-occultation observing point (lat., long.) 67.358 -146.918

---For observations at HVO:
10/11/2019 19:23:20.1 Start Total 23.87 24.02 (az125) -23.5 ***
10/11/2019 19:56:27.5 OCCULTATION MID-POINT 28.49 28.62 (az133) -29.2 ***
10/11/2019 20:30:45.5 End Total 32.68 32.82 (az141) -34.9 ***

Occultation of 89 Psc 5.13 by moon 100% illuminated at phase= 179 degrees
10/13/2019 12:53:48.5 Geocentric minimum 0.7 degrees
Global start/end: 10/13/2019 11:03:11.3 and 10/13/2019 14:44:23.7
Mid-occultation observing point (lat., long.) -41.35 82.148

Occultation of 106 nu Psc 4.45 by moon 100% illuminated at phase= 185 degrees
10/14/2019 01:06:28.2 Geocentric minimum 0.2 degrees
Global start/end: 10/13/2019 22:50:18.9 and 10/14/2019 03:22:36.7
Mid-occultation observing point (lat., long.) -3.895 -114.716
At HVO the miss angle is 1131.5 arc-sec at 10/14/2019 02:20:34.9

Occultation of 65 xi^1 Cet 4.36 by moon 99% illuminated at phase= 193 degrees
10/14/2019 17:53:05.9 Geocentric minimum 0.4 degrees
Global start/end: 10/14/2019 15:42:49.1 and 10/14/2019 20:03:21.3
Mid-occultation observing point (lat., long.) -12.722 5.406

Occultation of 61 delta Tau 3.77 by moon 87% illuminated at phase= 223 degrees
10/17/2019 08:55:48.6 Geocentric minimum 1.1 degrees
Global start/end: 10/17/2019 08:11:15.4 and 10/17/2019 09:40:21.1
Mid-occultation observing point (lat., long.) 67.175 17.719

Occultation of 68v776 Tau 4.3 by moon 86% illuminated at phase= 224 degrees
10/17/2019 10:13:02.7 Geocentric minimum 0.9 degrees
Global start/end: 10/17/2019 08:43:31.2 and 10/17/2019 11:42:32.2
Mid-occultation observing point (lat., long.) 77.482 52.219

Occultation of Ain 3.53 by moon 86% illuminated at phase= 225 degrees
10/17/2019 12:07:08.9 Geocentric minimum 0.2 degrees
Global start/end: 10/17/2019 09:53:47.3 and 10/17/2019 14:20:30.2
Mid-occultation observing point (lat., long.) 9.602 116.928

Occultation of 102 iota Tau 4.62 by moon 81% illuminated at phase= 232 degrees
10/18/2019 03:52:15.6 Geocentric minimum 0.9 degrees
Global start/end: 10/18/2019 02:22:00.9 and 10/18/2019 05:22:28.0
Mid-occultation observing point (lat., long.) -47.816 -99.394
At HVO the miss angle is 3485.5 arc-sec at 10/18/2019 04:27:17.1

Occultation of 123 zeta Tau 2.97 by moon 75% illuminated at phase= 240 degrees
10/18/2019 18:29:18.2 Geocentric minimum 0.8 degrees
Global start/end: 10/18/2019 16:46:26.5 and 10/18/2019 20:12:07.1
Mid-occultation observing point (lat., long.) 74.314 14.174

Occultation of 1 Gem 4.16 by moon 71% illuminated at phase= 245 degrees
10/19/2019 06:03:57.4 Geocentric minimum 0.7 degrees
Global start/end: 10/19/2019 04:17:26.7 and 10/19/2019 07:50:24.9
Mid-occultation observing point (lat., long.) -26.162 -128.577
At HVO the miss angle is 3019.4 arc-sec at 10/19/2019 06:45:11.0

Occultation of Propus 3.31 by moon 69% illuminated at phase= 248 degrees
10/19/2019 10:28:17.5 Geocentric minimum 0.2 degrees
Global start/end: 10/19/2019 08:17:48.1 and 10/19/2019 12:38:45.6
Mid-occultation observing point (lat., long.) 35.187 163.16

Occultation of 13 mu Gem 2.87 by moon 68% illuminated at phase= 249 degrees
10/19/2019 13:51:31.8 Geocentric minimum 0.3 degrees
Global start/end: 10/19/2019 11:43:26.4 and 10/19/2019 15:59:35.0
Mid-occultation observing point (lat., long.) 41.159 114.041

Occultation of Wasat 3.5 by moon 57% illuminated at phase= 262 degrees
10/20/2019 13:34:53.7 Geocentric minimum 0.8 degrees
Global start/end: 10/20/2019 11:57:47.6 and 10/20/2019 15:11:56.3
Mid-occultation observing point (lat., long.) 80.521 148.205

Occultation of 33 eta Cnc 5.33 by moon 44% illuminated at phase= 277 degrees
10/21/2019 19:16:11.9 Geocentric minimum 0.5 degrees
Global start/end: 10/21/2019 17:18:21.2 and 10/21/2019 21:13:58.3
Mid-occultation observing point (lat., long.) 51.19 72.234

Occultation of Asellus Borealis 4.66 by moon 42% illuminated at phase= 279 degrees
10/21/2019 23:08:36.0 Geocentric minimum 0.9 degrees
Global start/end: 10/21/2019 21:43:21.8   and   10/22/2019 00:33:47.1
Mid-occultation observing point (lat., long.) -50.315 -7.346

Occultation of 30 eta Leo 3.48 by moon 26% illuminated at phase= 298 degrees
10/23/2019 09:34:48.9 Geocentric minimum 1.2 degrees
Global start/end: 10/23/2019 08:47:52.9   and   10/23/2019 10:21:43.9
Mid-occultation observing point (lat., long.) -67.28 -177.803
At HVO the miss angle is 5304.8 arc-sec at 10/23/2019 09:18:48.5

Occultation of 46 Leo 5.43 by moon 22% illuminated at phase= 304 degrees
10/23/2019 20:21:16.7 Geocentric minimum 0.5 degrees
Global start/end: 10/23/2019 18:26:33.6   and   10/23/2019 22:15:56.0
Mid-occultation observing point (lat., long.) -16.242 65.605

Occultation of 3 nu Vir 4.04 by moon 10% illuminated at phase= 323 degrees
10/25/2019 04:21:13.4 Geocentric minimum 0.2 degrees
Global start/end: 10/25/2019 02:18:48.3   and   10/25/2019 06:23:36.8
Mid-occultation observing point (lat., long.) 19.339 -21.691

---For observations at HVO:
10/25/2019 02:29:54.3 Start Total -5.5 -5.34 (az76) -41.1
10/25/2019 02:51:36.1 OCCULTATION MID-POINT -1.09 -1.15 (az80) -37.6
10/25/2019 03:13:51.1 End Total 2.56 2.31 (az83) -33.9 ***

Occultation of 8 pi Vir 4.65 by moon 9% illuminated at phase= 326 degrees
10/25/2019 09:52:39.3 Geocentric minimum 1.2 degrees
Global start/end: 10/25/2019 09:22:54.3   and   10/25/2019 10:22:24.1
Mid-occultation observing point (lat., long.) -67.19 175.731

Occultation of 16 Vir 4.97 by moon 6% illuminated at phase= 331 degrees
10/25/2019 19:08:11.1 Geocentric minimum 0.1 degrees
Global start/end: 10/25/2019 17:04:02.7   and   10/25/2019 21:12:18.4
Mid-occultation observing point (lat., long.) -0.201 117.69

Occultation of 38 gamma Lib 3.91 by moon 3% illuminated at phase= 20 degrees
10/29/2019 07:08:28.1 Geocentric minimum 0.8 degrees
Global start/end: 10/29/2019 05:30:19.9   and   10/29/2019 08:46:40.7
Mid-occultation observing point (lat., long.) -63.957 -48.23

Occultation of 46 theta Lib 4.13 by moon 4% illuminated at phase= 24 degrees
10/29/2019 15:11:12.6 Geocentric minimum 0.2 degrees
Global start/end: 10/29/2019 13:05:17.7   and   10/29/2019 17:17:10.8
Mid-occultation observing point (lat., long.) -27.731 -135.468
At HVO the miss angle is 2976.4 arc-sec at 10/29/2019 15:20:01.7

Occultation of 49 Lib 5.47 by moon 5% illuminated at phase= 25 degrees
10/29/2019 17:38:00.5 Geocentric minimum 0.8 degrees
Global start/end: 10/29/2019 15:59:33.4   and   10/29/2019 19:16:32.4
Mid-occultation observing point (lat., long.) -66.606 160.159

Occultation of 4 psi Oph 4.48 by moon 7% illuminated at phase= 31 degrees
10/30/2019 04:28:43.2 Geocentric minimum 1.2 degrees
Global start/end: 10/30/2019 03:47:34.4   and   10/30/2019 05:09:53.1
Mid-occultation observing point (lat., long.) 67.196 72.081

Occultation of 7 chi Oph 4.22 by moon 7% illuminated at phase= 31 degrees
10/30/2019 05:00:05.0 Geocentric minimum 0.5 degrees
Global start/end: 10/30/2019 03:03:16.0   and   10/30/2019 06:57:00.0
Mid-occultation observing point (lat., long.) -49.628 17.644

Occultation of 40 xi Oph 4.39 by moon 14% illuminated at phase= 43 degrees
10/31/2019 03:41:01.8 Geocentric minimum 0.3 degrees
Global start/end: 10/31/2019 01:35:38.9   and   10/31/2019 05:46:30.4
Mid-occultation observing point (lat., long.) -42.003 56.706

Occultation of 58 Oph 4.86 by moon 17% illuminated at phase= 48 degrees
10/31/2019 13:03:46.7 Geocentric minimum 0.5 degrees
Global start/end: 10/31/2019 11:02:31.9   and   10/31/2019 15:05:08.0
Mid-occultation observing point (lat., long.) -51.225 -79.771
At HVO the miss angle is 3395.5 arc-sec at 10/31/2019 11:38:51.0

Occultation of Saturn 0.6 by moon 30% illuminated at phase= 66 degrees
11/02/2019 00:22:29.5 Geocentric minimum 0.6 degrees
Global start/end: 11/01/2019 22:24:36.0   and   11/02/2019 02:20:29.5
Mid-occultation observing point (lat., long.) -61.911 136.85

Occultation of Nashira 3.69 by moon 58% illuminated at phase= 99 degrees
11/05/2019 00:00:45.7 Geocentric minimum 0.8 degrees
Global start/end: 11/04/2019 22:25:14.8   and   11/05/2019 01:36:18.4
Mid-occultation observing point (lat., long.) -74.823 -115.835

Occultation of Deneb Algedi 2.85 by moon 60% illuminated at phase= 101 degrees
11/05/2019 03:32:00.4 Geocentric minimum 0.9 degrees
Global start/end: 11/05/2019 02:06:11.0   and   11/05/2019 04:57:51.1
Mid-occultation observing point (lat., long.) -66.935 -98.982

Occultation of 91 psi^1 Aqr 4.24 by moon 77% illuminated at phase= 122 degrees
11/07/2019 01:40:47.3 Geocentric minimum 0.7 degrees
Global start/end: 11/06/2019 23:46:56.5   and   11/07/2019 03:34:37.0
Mid-occultation observing point (lat., long.) -52.181 -161.658

Occultation of 93 psi^2 Aqr 4.41 by moon 77% illuminated at phase= 122 degrees
11/07/2019 02:32:51.5 Geocentric minimum 0.4 degrees
Global start/end: 11/07/2019 00:21:47.8   and   11/07/2019 04:43:53.6
Mid-occultation observing point (lat., long.) -33.618 171.286

Occultation of 95 psi^3 Aqr 4.99 by moon 77% illuminated at phase= 122 degrees
11/07/2019 02:43:47.1 Geocentric minimum 0.1 degrees
Global start/end: 11/07/2019 00:24:22.8   and   11/07/2019 05:03:09.8
Mid-occultation observing point (lat., long.) -4.027 155.617

Occultation of 30 YY Psc 4.37 by moon 84% illuminated at phase= 133 degrees
11/08/2019 01:28:03.5 Geocentric minimum 0.7 degrees
Global start/end: 11/07/2019 23:39:57.0   and   11/08/2019 03:16:08.1
Mid-occultation observing point (lat., long.) 42.909 161.7

Occultation of 33 BC Psc 4.61 by moon 85% illuminated at phase= 134 degrees
11/08/2019 03:16:19.9 Geocentric minimum 0.8 degrees
Global start/end: 11/08/2019 01:32:12.0   and   11/08/2019 05:00:25.9
Mid-occultation observing point (lat., long.) 46.804 131.924

Occultation of 89 Psc 5.13 by moon 94% illuminated at phase= 152 degrees
11/09/2019 19:54:41.0 Geocentric minimum 0.8 degrees
Global start/end: 11/09/2019 18:10:05.0   and   11/09/2019 21:39:14.0
Mid-occultation observing point (lat., long.) -46.789 -44.843
At HVO the miss angle is 4268.3 arc-sec at 11/09/2019 20:23:16.2

Occultation of 106 nu Psc 4.45 by moon 96% illuminated at phase= 158 degrees
11/10/2019 08:03:50.3 Geocentric minimum 0.2 degrees
Global start/end: 11/10/2019 05:48:41.8   and   11/10/2019 10:18:56.2
Mid-occultation observing point (lat., long.) -6.263 115.068

Occultation of 65 xi^1 Cet 4.36 by moon 98% illuminated at phase= 166 degrees
11/11/2019 00:43:37.0 Geocentric minimum 0.4 degrees
Global start/end: 11/10/2019 22:34:04.1   and   11/11/2019 02:53:06.6
Mid-occultation observing point (lat., long.) -13.032 -123.888
At HVO the miss angle is 1648.6 arc-sec at 11/11/2019 02:07:26.9

Occultation of 68v776 Tau 4.3 by moon 98% illuminated at phase= 196 degrees
11/13/2019 16:15:08.7 Geocentric minimum 1.0 degrees
Global start/end: 11/13/2019 15:02:57.8   and   11/13/2019 17:27:18.1
Mid-occultation observing point (lat., long.) 66.87 -118.961

Occultation of Ain 3.53 by moon 98% illuminated at phase= 197 degrees
11/13/2019 18:07:58.1 Geocentric minimum 0.0 degrees
Global start/end: 11/13/2019 15:54:42.4   and   11/13/2019 20:21:14.2
Mid-occultation observing point (lat., long.) 16.892 -1.8

Occultation of 102 iota Tau 4.62 by moon 95% illuminated at phase= 205 degrees
11/14/2019 09:40:04.4 Geocentric minimum 0.7 degrees
Global start/end: 11/14/2019 07:55:19.6   and   11/14/2019 11:24:46.9
Mid-occultation observing point (lat., long.) -29.251 141.77

Occultation of 123 zeta Tau 2.97 by moon 92% illuminated at phase= 212 degrees
11/15/2019 00:05:45.9 Geocentric minimum 0.9 degrees
Global start/end: 11/14/2019 22:41:49.2   and   11/15/2019 01:29:41.0
Mid-occultation observing point (lat., long.) 76.643 135.535
At HVO the miss angle is 747.6 arc-sec at 11/14/2019 23:17:03.0

Occultation of 1 Gem 4.16 by moon 89% illuminated at phase= 218 degrees
11/15/2019 11:33:45.3 Geocentric minimum 0.5 degrees
Global start/end: 11/15/2019 09:35:42.1   and   11/15/2019 13:31:46.6
Mid-occultation observing point (lat., long.) -11.151 120.995

Occultation of Propus 3.31 by moon 88% illuminated at phase= 220 degrees
11/15/2019 15:55:42.9 Geocentric minimum 0.4 degrees
Global start/end: 11/15/2019 13:51:14.6   and   11/15/2019 18:00:09.9
Mid-occultation observing point (lat., long.) 47.101 53.246

Occultation of 13 mu Gem 2.87 by moon 87% illuminated at phase= 222 degrees
11/15/2019 19:17:26.8 Geocentric minimum 0.5 degrees
Global start/end: 11/15/2019 17:17:17.9   and   11/15/2019 21:17:34.1
Mid-occultation observing point (lat., long.) 53.854 4.447

Occultation of 42 omega Gem 5.2 by moon 82% illuminated at phase= 230 degrees
11/16/2019 11:33:47.1 Geocentric minimum 1.1 degrees
Global start/end: 11/16/2019 10:28:24.6   and   11/16/2019 12:39:08.6
Mid-occultation observing point (lat., long.) -67.15 129.149

Occultation of Wasat 3.5 by moon 79% illuminated at phase= 234 degrees
11/16/2019 18:56:10.5 Geocentric minimum 1.0 degrees
Global start/end: 11/16/2019 17:46:37.3   and   11/16/2019 20:05:42.7
Mid-occultation observing point (lat., long.) 66.8 -161.883

Occultation of 33 eta Cnc 5.33 by moon 67% illuminated at phase= 250 degrees
11/18/2019 00:49:13.9 Geocentric minimum 0.7 degrees
Global start/end: 11/17/2019 23:04:51.6   and   11/18/2019 02:33:34.2
Mid-occultation observing point (lat., long.) 68.147 -25.886
At HVO the miss angle is 45.6 arc-sec at 11/17/2019 23:25:02.6

Occultation of Asellus Borealis 4.66 by moon 65% illuminated at phase= 252 degrees
11/18/2019 04:44:42.5 Geocentric minimum 0.7 degrees
Global start/end: 11/18/2019 02:58:22.4   and   11/18/2019 06:31:00.6
Mid-occultation observing point (lat., long.) -24.706 -110.772
At HVO the miss angle is 2917.7 arc-sec at 11/18/2019 04:21:25.0

Occultation of 30 eta Leo 3.48 by moon 49% illuminated at phase= 271 degrees
11/19/2019 15:53:46.8 Geocentric minimum 1.0 degrees
Global start/end: 11/19/2019 14:31:17.8   and   11/19/2019 17:16:14.3
Mid-occultation observing point (lat., long.) -56.652 78.36

Occultation of 46 Leo 5.43 by moon 44% illuminated at phase= 277 degrees
11/20/2019 02:58:47.5 Geocentric minimum 0.3 degrees
Global start/end: 11/20/2019 00:54:56.7 and 11/20/2019 05:02:36.6
Mid-occultation observing point (lat., long.) -3.759 -56.473
At HVO the miss angle is 1485.2 arc-sec at 11/20/2019 01:35:52.5

Occultation of 3 nu Vir 4.04 by moon 29% illuminated at phase= 295 degrees
11/21/2019 12:02:22.6 Geocentric minimum 0.4 degrees
Global start/end: 11/21/2019 10:02:24.7 and 11/21/2019 14:02:18.5
Mid-occultation observing point (lat., long.) 29.207 -158.989
At HVO the miss angle is 690.7 arc-sec at 11/21/2019 12:38:27.6

Occultation of 8 pi Vir 4.65 by moon 26% illuminated at phase= 298 degrees
11/21/2019 17:44:58.8 Geocentric minimum 1.1 degrees
Global start/end: 11/21/2019 16:39:36.1 and 11/21/2019 18:50:20.7
Mid-occultation observing point (lat., long.) -67.045 30.675

Occultation of 16 Vir 4.97 by moon 22% illuminated at phase= 304 degrees
11/22/2019 03:20:05.6 Geocentric minimum 0.1 degrees
Global start/end: 11/22/2019 01:13:46.8 and 11/22/2019 05:26:23.1
Mid-occultation observing point (lat., long.) 7.691 -28.912

Occultation of 15 xi^2 Lib 5.48 by moon 2% illuminated at phase= 343 degrees
11/25/2019 00:26:54.9 Geocentric minimum 1.0 degrees
Global start/end: 11/24/2019 23:11:55.2 and 11/25/2019 01:41:55.6
Mid-occultation observing point (lat., long.) -66.801 -73.065

Occultation of 40 xi Oph 4.39 by moon 2% illuminated at phase= 16 degrees
11/27/2019 13:45:44.1 Geocentric minimum 0.4 degrees
Global start/end: 11/27/2019 11:44:56.9 and 11/27/2019 15:46:35.9
Mid-occultation observing point (lat., long.) -48.577 -123.492
At HVO the miss angle is 3872.3 arc-sec at 11/27/2019 13:46:12.6

Occultation of Jupiter -1.8 by moon 4% illuminated at phase= 23 degrees
11/28/2019 03:56:48.8 Geocentric minimum 0.7 degrees
Global start/end: 11/28/2019 02:09:13.6 and 11/28/2019 05:44:29.7
Mid-occultation observing point (lat., long.) 25.726 42.353

Occultation of 58 Oph 4.86 by moon 3% illuminated at phase= 21 degrees
11/27/2019 23:02:01.7 Geocentric minimum 0.6 degrees
Global start/end: 11/27/2019 21:07:49.3 and 11/28/2019 00:56:19.4
Mid-occultation observing point (lat., long.) -59.421 100.73

Occultation of Saturn 0.6 by moon 12% illuminated at phase= 40 degrees
11/29/2019 14:07:06.5 Geocentric minimum 0.9 degrees
Global start/end: 11/29/2019 12:41:31.0 and 11/29/2019 15:32:46.3
Mid-occultation observing point (lat., long.) -76.506 74.312
At HVO the miss angle is 5534.5 arc-sec at 11/29/2019 13:53:54.0

Occultation of Nashira 3.69 by moon 35% illuminated at phase= 72 degrees
12/02/2019 08:11:22.9 Geocentric minimum 1.0 degrees
Global start/end: 12/02/2019 07:08:23.6 and 12/02/2019 09:14:23.6
Mid-occultation observing point (lat., long.) -66.878 164.501

Occultation of Deneb Algedi 2.85 by moon 36% illuminated at phase= 73 degrees
12/02/2019 11:40:13.5 Geocentric minimum 1.1 degrees
Global start/end: 12/02/2019 10:57:09.7 and 12/02/2019 12:23:18.0
Mid-occultation observing point (lat., long.) -66.933 112.032

Occultation of 71 tau Aqr 4.05 by moon 48% illuminated at phase= 87 degrees
12/03/2019 18:07:26.9 Geocentric minimum 1.1 degrees
Global start/end: 12/03/2019 17:36:31.6 and 12/03/2019 18:38:22.4
Mid-occultation observing point (lat., long.) 66.945 -166.275

Occultation of 91 psi^1 Aqr 4.24 by moon 54% illuminated at phase= 94 degrees
12/04/2019 09:33:20.2 Geocentric minimum 0.8 degrees
Global start/end: 12/04/2019 07:58:20.7   and   12/04/2019 11:08:20.1
Mid-occultation observing point (lat., long.) -66.843 86.208

Occultation of 93 psi^2 Aqr 4.41 by moon 54% illuminated at phase= 95 degrees
12/04/2019 10:25:21.0 Geocentric minimum 0.6 degrees
Global start/end: 12/04/2019 08:24:18.5   and   12/04/2019 12:26:23.8
Mid-occultation observing point (lat., long.) -45.552 34.395

Occultation of 95 psi^3 Aqr 4.99 by moon 54% illuminated at phase= 95 degrees
12/04/2019 10:36:12.7 Geocentric minimum 0.1 degrees
Global start/end: 12/04/2019 08:16:32.4   and   12/04/2019 12:55:52.7
Mid-occultation observing point (lat., long.) -14.617 14.713

Occultation of 30 YY Psc 4.37 by moon 63% illuminated at phase= 105 degrees
12/05/2019 09:22:35.5 Geocentric minimum 0.6 degrees
Global start/end: 12/05/2019 07:20:37.3   and   12/05/2019 11:24:32.4
Mid-occultation observing point (lat., long.) 29.711 24.9

Occultation of 33 BC Psc 4.61 by moon 64% illuminated at phase= 106 degrees
12/05/2019 11:11:13.9 Geocentric minimum 0.6 degrees
Global start/end: 12/05/2019 09:12:07.9   and   12/05/2019 13:10:18.4
Mid-occultation observing point (lat., long.) 32.954 -3.328

Occultation of 20 Cet 4.78 by moon 73% illuminated at phase= 118 degrees
12/06/2019 12:53:34.8 Geocentric minimum 1.1 degrees
Global start/end: 12/06/2019 11:58:50.7   and   12/06/2019 13:48:18.0
Mid-occultation observing point (lat., long.) 66.97 -90.699

Occultation of 89 Psc 5.13 by moon 78% illuminated at phase= 125 degrees
12/07/2019 04:01:46.9 Geocentric minimum 0.9 degrees
Global start/end: 12/07/2019 02:30:58.4   and   12/07/2019 05:32:32.7
Mid-occultation observing point (lat., long.) -60.271 -172.396

Occultation of 106 nu Psc 4.45 by moon 82% illuminated at phase= 130 degrees
12/07/2019 16:14:01.0 Geocentric minimum 0.3 degrees
Global start/end: 12/07/2019 14:01:06.6   and   12/07/2019 18:26:51.4
Mid-occultation observing point (lat., long.) -12.701 -31.65
At HVO the miss angle is 3131.0 arc-sec at 12/07/2019 15:42:49.6

Occultation of 65 xi^1 Cet 4.36 by moon 87% illuminated at phase= 138 degrees
12/08/2019 08:56:35.4 Geocentric minimum 0.5 degrees
Global start/end: 12/08/2019 06:50:23.3   and   12/08/2019 11:02:42.6
Mid-occultation observing point (lat., long.) -18.551 88.33

Occultation of 68v776 Tau 4.3 by moon 99% illuminated at phase= 169 degrees
12/11/2019 00:06:15.5 Geocentric minimum 1.0 degrees
Global start/end: 12/10/2019 22:53:18.5   and   12/11/2019 01:19:10.1
Mid-occultation observing point (lat., long.) 66.789 96.592
At HVO the miss angle is 1443.8 arc-sec at 12/11/2019 00:47:48.1

Occultation of Ain 3.53 by moon 99% illuminated at phase= 170 degrees
12/11/2019 01:57:48.3 Geocentric minimum 0.0 degrees
Global start/end: 12/10/2019 23:45:28.0   and   12/11/2019 04:10:07.6
Mid-occultation observing point (lat., long.) 17.027 -146.217
At HVO the miss angle is 521.2 arc-sec at 12/11/2019 03:12:13.2

Occultation of 102 iota Tau 4.62 by moon 100% illuminated at phase= 177 degrees
12/11/2019 17:15:29.1 Geocentric minimum 0.7 degrees
Global start/end: 12/11/2019 15:29:22.7   and   12/11/2019 19:01:31.9
Mid-occultation observing point (lat., long.) -26.586 0.545
At HVO the miss angle is 4511.2 arc-sec at 12/11/2019 16:31:49.2

Occultation of 123 zeta Tau 2.97 by moon 100% illuminated at phase= 185 degrees
12/12/2019 07:24:35.7 Geocentric minimum 1.0 degrees
Global start/end: 12/12/2019 06:05:59.1 and 12/12/2019 08:43:10.0
Mid-occultation observing point (lat., long.) 66.699 -14.162

Occultation of 1 Gem 4.16 by moon 99% illuminated at phase= 191 degrees
12/12/2019 18:38:42.0 Geocentric minimum 0.5 degrees
Global start/end: 12/12/2019 16:39:09.4 and 12/12/2019 20:38:12.1
Mid-occultation observing point (lat., long.) -6.941 -12.398
At HVO the miss angle is 3427.0 arc-sec at 12/12/2019 17:46:10.5

Occultation of Propus 3.31 by moon 99% illuminated at phase= 193 degrees
12/12/2019 22:54:49.6 Geocentric minimum 0.5 degrees
Global start/end: 12/12/2019 20:54:05.0 and 12/13/2019 00:55:31.8
Mid-occultation observing point (lat., long.) 50.783 -78.992

---For observations at HVO:
12/12/2019 21:36:39.8 Start Total 46.27 46.45 (az104) -56.1 ***
12/12/2019 22:12:32.5 OCCULTATION MID-POINT 52.39 52.41 (az113) -61.4 ***
12/12/2019 22:50:03.1 End Total 58.34 58.23 (az123) -66.0 ***

Occultation of 13 mu Gem 2.87 by moon 98% illuminated at phase= 194 degrees
12/13/2019 02:12:08.2 Geocentric minimum 0.6 degrees
Global start/end: 12/13/2019 00:16:26.8 and 12/13/2019 04:07:47.1
Mid-occultation observing point (lat., long.) 57.996 -126.814

---For observations at HVO:
12/13/2019 02:25:12.2 Start Total 60.89 60.93 (az230) -51.5 ***
12/13/2019 02:52:51.5 OCCULTATION MID-POINT 56.83 56.97 (az240) -46.8 ***
12/13/2019 03:19:45.6 End Total 52.5 52.77 (az247) -42.0 ***

Occultation of 42 omega Gem 5.2 by moon 96% illuminated at phase= 203 degrees
12/13/2019 18:07:05.5 Geocentric minimum 1.0 degrees
Global start/end: 12/13/2019 16:48:27.5 and 12/13/2019 19:25:42.2
Mid-occultation observing point (lat., long.) -67.166 4.185

Occultation of Wasat 3.5 by moon 95% illuminated at phase= 207 degrees
12/14/2019 01:19:22.5 Geocentric minimum 1.1 degrees
Global start/end: 12/14/2019 00:25:42.2 and 12/14/2019 02:13:02.2
Mid-occultation observing point (lat., long.) 66.801 75.69
At HVO the miss angle is 1826.4 arc-sec at 12/14/2019 01:04:26.0

Occultation of 33 eta Cnc 5.33 by moon 87% illuminated at phase= 222 degrees
12/15/2019 06:36:52.7 Geocentric minimum 0.8 degrees
Global start/end: 12/15/2019 05:02:31.1 and 12/15/2019 08:11:13.5
Mid-occultation observing point (lat., long.) 77.03 -119.621

Occultation of Asellus Borealis 4.66 by moon 86% illuminated at phase= 224 degrees
12/15/2019 10:28:35.6 Geocentric minimum 0.6 degrees
Global start/end: 12/15/2019 08:35:55.2 and 12/15/2019 12:21:15.3
Mid-occultation observing point (lat., long.) -15.613 138.231

Occultation of 30 eta Leo 3.48 by moon 73% illuminated at phase= 243 degrees
12/16/2019 21:15:34.4 Geocentric minimum 0.8 degrees
Global start/end: 12/16/2019 19:40:06.4 and 12/16/2019 22:51:02.3
Mid-occultation observing point (lat., long.) -38.85 -16.087

Occultation of 46 Leo 5.43 by moon 68% illuminated at phase= 249 degrees
12/17/2019 08:19:27.2 Geocentric minimum 0.2 degrees
Global start/end: 12/17/2019 06:13:00.8 and 12/17/2019 10:25:54.3
Mid-occultation observing point (lat., long.) 3.457 -161.106
At HVO the miss angle is 2470.5 arc-sec at 12/17/2019 08:48:33.9

Occultation of 3 nu Vir 4.04 by moon 52% illuminated at phase= 268 degrees
12/18/2019 17:38:20.3 Geocentric minimum 0.5 degrees
Global start/end: 12/18/2019 15:42:31.9 and 12/18/2019 19:34:08.9
Mid-occultation observing point (lat., long.) 36.513 94.521

Occultation of 8 pi Vir 4.65 by moon 49% illuminated at phase= 271 degrees
12/18/2019 23:26:12.5 Geocentric minimum 1.0 degrees
Global start/end: 12/18/2019 22:04:30.3 and 12/19/2019 00:47:54.7
Mid-occultation observing point (lat., long.) -61.712 -56.07

Occultation of 16 Vir 4.97 by moon 45% illuminated at phase= 276 degrees
12/19/2019 09:12:07.5 Geocentric minimum 0.2 degrees
Global start/end: 12/19/2019 07:05:42.9 and 12/19/2019 11:18:31.9
Mid-occultation observing point (lat., long.) 13.868 -141.063
At HVO the miss angle is 1237.7 arc-sec at 12/19/2019 09:26:34.9

Occultation of 15 xi^2 Lib 5.48 by moon 15% illuminated at phase= 315 degrees
12/22/2019 08:11:14.6 Geocentric minimum 1.0 degrees
Global start/end: 12/22/2019 06:48:57.9 and 12/22/2019 09:33:32.0
Mid-occultation observing point (lat., long.) -70.751 176.995

Occultation of 38 gamma Lib 3.91 by moon 10% illuminated at phase= 324 degrees
12/23/2019 01:29:52.4 Geocentric minimum 0.8 degrees
Global start/end: 12/22/2019 23:49:25.1 and 12/23/2019 03:10:21.0
Mid-occultation observing point (lat., long.) -63.222 -16.78

Occultation of 46 theta Lib 4.13 by moon 7% illuminated at phase= 329 degrees
12/23/2019 09:47:33.0 Geocentric minimum 0.2 degrees
Global start/end: 12/23/2019 07:40:02.0 and 12/23/2019 11:55:03.9
Mid-occultation observing point (lat., long.) -28.065 -108.716
At HVO the miss angle is 2582.6 arc-sec at 12/23/2019 08:54:00.5

Occultation of 49 Lib 5.47 by moon 7% illuminated at phase= 330 degrees
12/23/2019 12:17:59.3 Geocentric minimum 0.8 degrees
Global start/end: 12/23/2019 10:40:09.6 and 12/23/2019 13:55:50.5
Mid-occultation observing point (lat., long.) -68.112 -177.997
At HVO the miss angle is 5180.0 arc-sec at 12/23/2019 12:47:56.5

Occultation of 4 psi Oph 4.48 by moon 4% illuminated at phase= 336 degrees
12/23/2019 23:24:03.6 Geocentric minimum 1.1 degrees
Global start/end: 12/23/2019 22:34:17.2 and 12/24/2019 00:13:50.6
Mid-occultation observing point (lat., long.) 67.01 94.885

Occultation of 7 chi Oph 4.22 by moon 4% illuminated at phase= 336 degrees
12/23/2019 23:55:04.4 Geocentric minimum 0.6 degrees
Global start/end: 12/23/2019 21:59:49.2 and 12/24/2019 01:50:21.5
Mid-occultation observing point (lat., long.) -52.826 37.762

Eclipse of the Sun by moon 0% illuminated at phase= 0 degrees
12/25/2019 22:17:41.0 Geocentric minimum 0.4 degrees
Global start/end: 12/25/2019 19:29:49.1 and 12/26/2019 01:05:43.4
Mid-occultation observing point (lat., long.) 1.006 102.243

Occultation of Venus -3.9 by moon 8% illuminated at phase= 34 degrees
12/28/2019 18:55:40.9 Geocentric minimum 1.0 degrees
Global start/end: 12/28/2019 17:32:41.9 and 12/28/2019 20:18:43.6
Mid-occultation observing point (lat., long.) -67.007 -21.3

Occultation of Nashira 3.69 by moon 14% illuminated at phase= 44 degrees
12/29/2019 16:51:24.3 Geocentric minimum 1.1 degrees
Global start/end: 12/29/2019 16:04:00.5 and 12/29/2019 17:38:49.1
Mid-occultation observing point (lat., long.) -66.888 7.571

Occultation of Deneb Algedi 2.85 by moon 15% illuminated at phase= 46 degrees
12/29/2019 20:18:00.9 Geocentric minimum 1.2 degrees
Global start/end: 12/29/2019 20:11:45.8 and 12/29/2019 20:24:16.0
Mid-occultation observing point (lat., long.) 0.0 0.0

Occultation of 71 tau Aqr 4.05 by moon 25% illuminated at phase= 60 degrees
12/31/2019 02:28:53.8 Geocentric minimum 1.1 degrees
Global start/end: 12/31/2019 01:34:25.6   and   12/31/2019 03:23:22.8
Mid-occultation observing point (lat., long.) 66.937 41.388

Occultation of 91 psi^1 Aqr 4.24 by moon 30% illuminated at phase= 67 degrees
12/31/2019 17:49:57.7 Geocentric minimum 0.9 degrees
Global start/end: 12/31/2019 16:23:44.2   and   12/31/2019 19:16:12.5
Mid-occultation observing point (lat., long.) -66.822 -8.707

Occultation of 93 psi^2 Aqr 4.41 by moon 31% illuminated at phase= 67 degrees
12/31/2019 18:41:47.3 Geocentric minimum 0.6 degrees
Global start/end: 12/31/2019 16:45:36.4   and   12/31/2019 20:38:00.3
Mid-occultation observing point (lat., long.) -49.936 -112.61
At HVO the miss angle is 2969.3 arc-sec at 12/31/2019 20:31:39.8

Occultation of 95 psi^3 Aqr 4.99 by moon 31% illuminated at phase= 67 degrees
12/31/2019 18:52:36.6 Geocentric minimum 0.1 degrees
Global start/end: 12/31/2019 16:34:02.7   and   12/31/2019 21:11:12.3
Mid-occultation observing point (lat., long.) -18.218 -134.845
At HVO the miss angle is 1166.1 arc-sec at 12/31/2019 20:35:00.3

Occultation of 30 YY Psc 4.37 by moon 39% illuminated at phase= 77 degrees
01/01/2020 17:37:49.4 Geocentric minimum 0.5 degrees
Global start/end: 01/01/2020 15:32:05.7   and   01/01/2020 19:43:33.7
Mid-occultation observing point (lat., long.) 25.638 -123.694

---For observations at HVO:
01/01/2020 17:55:42.5 Start Total 39.03 38.83 (az194) -15.6 ***
01/01/2020 18:37:29.9 OCCULTATION MID-POINT 36.38 36.36 (az207) -22.9 ***
01/01/2020 19:18:01.1 End Total 32.46 32.65 (az218) -30.1 ***

Occultation of 33 BC Psc 4.61 by moon 40% illuminated at phase= 78 degrees
01/01/2020 19:26:40.8 Geocentric minimum 0.5 degrees
Global start/end: 01/01/2020 17:23:27.9   and   01/01/2020 21:29:54.2
Mid-occultation observing point (lat., long.) 28.765 -151.744

---For observations at HVO:
01/01/2020 20:25:51.9 Start Total 24.36 24.24 (az234) -42.2 ***
01/01/2020 20:55:31.2 OCCULTATION MID-POINT 19.88 19.93 (az241) -47.4 ***
01/01/2020 21:24:03.6 End Total 15.31 15.54 (az246) -52.3 ***

Occultation of 20 Cet 4.78 by moon 50% illuminated at phase= 90 degrees
01/02/2020 21:16:52.8 Geocentric minimum 1.0 degrees
Global start/end: 01/02/2020 20:09:47.8   and   01/02/2020 22:23:57.1
Mid-occultation observing point (lat., long.) 66.932 116.526

Occultation of 89 Psc 5.13 by moon 56% illuminated at phase= 97 degrees
01/03/2020 12:33:33.1 Geocentric minimum 0.9 degrees
Global start/end: 01/03/2020 11:09:31.2   and   01/03/2020 13:57:33.4
Mid-occultation observing point (lat., long.) -66.908 67.672

Occultation of 106 nu Psc 4.45 by moon 61% illuminated at phase= 102 degrees
01/04/2020 00:53:55.6 Geocentric minimum 0.4 degrees
Global start/end: 01/03/2020 22:41:31.4   and   01/04/2020 03:06:16.6
Mid-occultation observing point (lat., long.) -15.454 172.631

Occultation of 65 xi^1 Cet 4.36 by moon 67% illuminated at phase= 110 degrees
01/04/2020 17:48:55.6 Geocentric minimum 0.5 degrees
Global start/end: 01/04/2020 15:43:40.0   and   01/04/2020 19:54:06.7
Mid-occultation observing point (lat., long.) -21.206 -70.524
At HVO the miss angle is 2928.7 arc-sec at 01/04/2020 18:19:12.5

Occultation of 87 mu Cet 4.27 by moon 73% illuminated at phase= 117 degrees
01/05/2020 09:06:43.0 Geocentric minimum 1.2 degrees
Global start/end: 01/05/2020 08:55:56.5   and   01/05/2020 09:17:29.4
Mid-occultation observing point (lat., long.) 66.963 -63.117

Occultation of 68v776 Tau 4.3 by moon 89% illuminated at phase= 141 degrees
01/07/2020 09:34:49.4 Geocentric minimum 1.0 degrees
Global start/end: 01/07/2020 08:18:42.4   and   01/07/2020 10:50:52.9
Mid-occultation observing point (lat., long.) 66.78 -72.52

Occultation of Ain 3.53 by moon 89% illuminated at phase= 142 degrees
01/07/2020 11:26:43.9 Geocentric minimum 0.1 degrees
Global start/end: 01/07/2020 09:14:00.6   and   01/07/2020 13:39:24.8
Mid-occultation observing point (lat., long.) 16.038 44.793

Occultation of 102 iota Tau 4.62 by moon 93% illuminated at phase= 150 degrees
01/08/2020 02:44:40.1 Geocentric minimum 0.7 degrees
Global start/end: 01/08/2020 00:59:21.1   and   01/08/2020 04:29:53.5
Mid-occultation observing point (lat., long.) -27.547 -168.508
At HVO the miss angle is 3486.9 arc-sec at 01/08/2020 03:54:34.3

Occultation of 123 zeta Tau 2.97 by moon 96% illuminated at phase= 157 degrees
01/08/2020 16:49:41.0 Geocentric minimum 1.0 degrees
Global start/end: 01/08/2020 15:29:20.1   and   01/08/2020 18:09:58.4
Mid-occultation observing point (lat., long.) 66.692 177.571

Occultation of 1 Gem 4.16 by moon 98% illuminated at phase= 163 degrees
01/09/2020 03:57:36.1 Geocentric minimum 0.5 degrees
Global start/end: 01/09/2020 01:58:48.8   and   01/09/2020 05:56:18.4
Mid-occultation observing point (lat., long.) -7.214 -179.077
At HVO the miss angle is 2941.6 arc-sec at 01/09/2020 05:02:04.3

Occultation of Propus 3.31 by moon 98% illuminated at phase= 165 degrees
01/09/2020 08:10:37.1 Geocentric minimum 0.4 degrees
Global start/end: 01/09/2020 06:10:10.6   and   01/09/2020 10:10:59.0
Mid-occultation observing point (lat., long.) 50.15 115.16

Occultation of 13 mu Gem 2.87 by moon 99% illuminated at phase= 167 degrees
01/09/2020 11:25:17.8 Geocentric minimum 0.6 degrees
Global start/end: 01/09/2020 09:29:49.7   and   01/09/2020 13:20:41.2
Mid-occultation observing point (lat., long.) 57.282 68.021

Occultation of 42 omega Gem 5.2 by moon 100% illuminated at phase= 175 degrees
01/10/2020 03:04:25.7 Geocentric minimum 1.0 degrees
Global start/end: 01/10/2020 01:45:48.5   and   01/10/2020 04:23:00.3
Mid-occultation observing point (lat., long.) -67.178 -157.062
At HVO the miss angle is 4451.5 arc-sec at 01/10/2020 03:47:31.8

Occultation of Wasat 3.5 by moon 100% illuminated at phase= 179 degrees
01/10/2020 10:07:53.2 Geocentric minimum 1.1 degrees
Global start/end: 01/10/2020 09:11:37.4   and   01/10/2020 11:04:07.8
Mid-occultation observing point (lat., long.) 66.788 -83.426

Occultation of 33 eta Cnc 5.33 by moon 98% illuminated at phase= 194 degrees
01/11/2020 14:41:19.8 Geocentric minimum 0.8 degrees
Global start/end: 01/11/2020 13:07:12.7   and   01/11/2020 16:15:25.4
Mid-occultation observing point (lat., long.) 75.92 88.084

Occultation of Asellus Borealis 4.66 by moon 98% illuminated at phase= 197 degrees
01/11/2020 18:26:28.3 Geocentric minimum 0.6 degrees
Global start/end: 01/11/2020 16:35:15.5   and   01/11/2020 20:17:39.6
Mid-occultation observing point (lat., long.) -15.208 -8.099

Occultation of 30 eta Leo 3.48 by moon 91% illuminated at phase= 216 degrees
01/13/2020 04:11:40.1 Geocentric minimum 0.8 degrees
Global start/end: 01/13/2020 02:37:13.3   and   01/13/2020 05:46:07.2
Mid-occultation observing point (lat., long.) -38.221 -146.714
At HVO the miss angle is 4083.1 arc-sec at 01/13/2020 04:02:30.7

Occultation of 46 Leo 5.43 by moon 87% illuminated at phase= 222 degrees
01/13/2020 14:56:33.3 Geocentric minimum 0.2 degrees
Global start/end: 01/13/2020 12:52:08.6   and   01/13/2020 17:00:59.2
Mid-occultation observing point (lat., long.) 3.236 72.66

Occultation of 3 nu Vir 4.04 by moon 75% illuminated at phase= 240 degrees
01/14/2020 23:27:28.1 Geocentric minimum 0.5 degrees
Global start/end: 01/14/2020 21:32:08.0   and   01/15/2020 01:22:50.4
Mid-occultation observing point (lat., long.) 35.523 -20.248

---For observations at HVO:
01/14/2020 21:32:41.5 Start Total -0.48 -0.21 (az80) -51.6
01/14/2020 21:54:42.4 OCCULTATION MID-POINT 3.11 3.17 (az84) -55.1 ***
01/14/2020 22:17:21.2 End Total 7.06 6.92 (az88) -58.5 ***

Occultation of 8 pi Vir 4.65 by moon 73% illuminated at phase= 243 degrees
01/15/2020 05:08:58.8 Geocentric minimum 1.0 degrees
Global start/end: 01/15/2020 03:48:37.4   and   01/15/2020 06:29:21.5
Mid-occultation observing point (lat., long.) -62.607 -171.421
At HVO the miss angle is 4710.3 arc-sec at 01/15/2020 04:20:16.7

Occultation of 16 Vir 4.97 by moon 69% illuminated at phase= 248 degrees
01/15/2020 14:46:02.7 Geocentric minimum 0.2 degrees
Global start/end: 01/15/2020 12:40:17.8   and   01/15/2020 16:51:49.2
Mid-occultation observing point (lat., long.) 13.034 108.246

Occultation of 15 xi^2 Lib 5.48 by moon 36% illuminated at phase= 287 degrees
01/18/2020 13:50:57.5 Geocentric minimum 1.0 degrees
Global start/end: 01/18/2020 12:31:16.2   and   01/18/2020 15:10:40.4
Mid-occultation observing point (lat., long.) -66.73 32.337

Occultation of 38 gamma Lib 3.91 by moon 28% illuminated at phase= 296 degrees
01/19/2020 07:27:16.5 Geocentric minimum 0.8 degrees
Global start/end: 01/19/2020 05:47:53.1   and   01/19/2020 09:06:42.0
Mid-occultation observing point (lat., long.) -65.162 -136.911
At HVO the miss angle is 4545.0 arc-sec at 01/19/2020 06:08:54.6

Occultation of 46 theta Lib 4.13 by moon 25% illuminated at phase= 301 degrees
01/19/2020 15:54:46.6 Geocentric minimum 0.2 degrees
Global start/end: 01/19/2020 13:46:03.8   and   01/19/2020 18:03:29.8
Mid-occultation observing point (lat., long.) -29.256 132.19

Occultation of 49 Lib 5.47 by moon 24% illuminated at phase= 302 degrees
01/19/2020 18:28:18.9 Geocentric minimum 0.8 degrees
Global start/end: 01/19/2020 16:51:38.7   and   01/19/2020 20:05:01.1
Mid-occultation observing point (lat., long.) -70.063 56.894

Occultation of 4 psi Oph 4.48 by moon 19% illuminated at phase= 308 degrees
01/20/2020 05:48:32.0 Geocentric minimum 1.1 degrees
Global start/end: 01/20/2020 04:56:21.3   and   01/20/2020 06:40:43.5
Mid-occultation observing point (lat., long.) 67.014 -28.171

Occultation of 7 chi Oph 4.22 by moon 19% illuminated at phase= 308 degrees
01/20/2020 06:20:17.0 Geocentric minimum 0.6 degrees
Global start/end: 01/20/2020 04:24:45.9   and   01/20/2020 08:15:50.0
Mid-occultation observing point (lat., long.) -54.325 -86.408
At HVO the miss angle is 3367.5 arc-sec at 01/20/2020 04:42:29.3

Occultation of 40 xi Oph 4.39 by moon 12% illuminated at phase= 320 degrees
01/21/2020 05:44:41.1 Geocentric minimum 0.5 degrees
Global start/end: 01/21/2020 03:42:28.4   and   01/21/2020 07:46:55.6
Mid-occultation observing point (lat., long.) -49.735 -57.528

Occultation of 58 Oph 4.86 by moon 9% illuminated at phase= 325 degrees
01/21/2020 15:18:37.7 Geocentric minimum 0.6 degrees
Global start/end: 01/21/2020 13:24:08.5   and   01/21/2020 17:13:09.1
Mid-occultation observing point (lat., long.) -61.219 161.844

Occultation of Jupiter -1.9 by moon 3% illuminated at phase= 339 degrees
01/22/2020 19:40:54.8 Geocentric minimum 0.4 degrees
Global start/end: 01/22/2020 17:30:51.4 and 01/22/2020 21:51:00.2
Mid-occultation observing point (lat., long.) -45.558 120.401

Occultation of Nashira 3.69 by moon 2% illuminated at phase= 16 degrees
01/26/2020 00:56:55.7 Geocentric minimum 1.1 degrees
Global start/end: 01/25/2020 23:58:28.2 and 01/26/2020 01:55:24.3
Mid-occultation observing point (lat., long.) -66.845 -140.894

Occultation of Deneb Algedi 2.85 by moon 2% illuminated at phase= 18 degrees
01/26/2020 04:23:05.5 Geocentric minimum 1.1 degrees
Global start/end: 01/26/2020 03:46:04.6 and 01/26/2020 05:00:06.7
Mid-occultation observing point (lat., long.) -66.897 167.309

Occultation of 71 tau Aqr 4.05 by moon 8% illuminated at phase= 32 degrees
01/27/2020 10:26:50.0 Geocentric minimum 1.1 degrees
Global start/end: 01/27/2020 09:54:39.9 and 01/27/2020 10:59:00.4
Mid-occultation observing point (lat., long.) 66.885 -105.12

Occultation of 91 psi^1 Aqr 4.24 by moon 11% illuminated at phase= 39 degrees
01/28/2020 01:44:13.4 Geocentric minimum 0.8 degrees
Global start/end: 01/28/2020 00:08:54.6 and 01/28/2020 03:19:34.1
Mid-occultation observing point (lat., long.) -66.154 146.563

Occultation of 93 psi^2 Aqr 4.41 by moon 11% illuminated at phase= 39 degrees
01/28/2020 02:35:48.9 Geocentric minimum 0.6 degrees
Global start/end: 01/28/2020 00:35:04.3 and 01/28/2020 04:36:36.3
Mid-occultation observing point (lat., long.) -44.946 97.445

Occultation of 95 psi^3 Aqr 4.99 by moon 11% illuminated at phase= 39 degrees
01/28/2020 02:46:32.2 Geocentric minimum 0.1 degrees
Global start/end: 01/28/2020 00:27:47.7 and 01/28/2020 05:05:18.9
Mid-occultation observing point (lat., long.) -14.125 78.046

Occultation of 30 YY Psc 4.37 by moon 18% illuminated at phase= 49 degrees
01/29/2020 01:28:02.5 Geocentric minimum 0.6 degrees
Global start/end: 01/28/2020 23:27:58.1 and 01/29/2020 03:28:08.8
Mid-occultation observing point (lat., long.) 31.447 88.579

Occultation of 33 BC Psc 4.61 by moon 18% illuminated at phase= 50 degrees
01/29/2020 03:16:47.3 Geocentric minimum 0.6 degrees
Global start/end: 01/29/2020 01:19:47.5 and 01/29/2020 05:13:48.8
Mid-occultation observing point (lat., long.) 34.87 60.112

Occultation of 20 Cet 4.78 by moon 27% illuminated at phase= 62 degrees
01/30/2020 05:09:34.7 Geocentric minimum 1.1 degrees
Global start/end: 01/30/2020 04:30:09.2 and 01/30/2020 05:49:00.2
Mid-occultation observing point (lat., long.) 66.882 -28.575

Occultation of 89 Psc 5.13 by moon 32% illuminated at phase= 69 degrees
01/30/2020 20:32:13.0 Geocentric minimum 0.8 degrees
Global start/end: 01/30/2020 18:54:57.8 and 01/30/2020 22:09:27.6
Mid-occultation observing point (lat., long.) -54.84 -124.659

Occultation of 106 nu Psc 4.45 by moon 37% illuminated at phase= 75 degrees
01/31/2020 08:59:49.1 Geocentric minimum 0.3 degrees
Global start/end: 01/31/2020 06:43:32.2 and 01/31/2020 11:16:05.3
Mid-occultation observing point (lat., long.) -9.48 21.611

Occultation of 65 xi^1 Cet 4.36 by moon 43% illuminated at phase= 82 degrees
02/01/2020 02:08:24.6 Geocentric minimum 0.4 degrees
Global start/end: 01/31/2020 23:57:21.2 and 02/01/2020 04:19:25.8
Mid-occultation observing point (lat., long.) -14.712 134.814

Occultation of 68v776 Tau 4.3 by moon 70% illuminated at phase= 113 degrees
02/03/2020 19:10:47.1 Geocentric minimum 1.1 degrees
Global start/end: 02/03/2020 18:12:40.2   and   02/03/2020 20:08:51.9
Mid-occultation observing point (lat., long.) 66.818 116.384
At HVO the miss angle is 1514.7 arc-sec at 02/03/2020 19:05:51.2

Occultation of Ain 3.53 by moon 70% illuminated at phase= 114 degrees
02/03/2020 21:04:56.2 Geocentric minimum 0.0 degrees
Global start/end: 02/03/2020 18:50:24.5   and   02/03/2020 23:19:26.2
Mid-occultation observing point (lat., long.) 21.336 -128.085
At HVO the miss angle is 153.5 arc-sec at 02/03/2020 22:02:18.6

Occultation of 102 iota Tau 4.62 by moon 76% illuminated at phase= 122 degrees
02/04/2020 12:41:16.2 Geocentric minimum 0.6 degrees
Global start/end: 02/04/2020 10:48:54.5   and   02/04/2020 14:33:31.3
Mid-occultation observing point (lat., long.) -20.968 13.924

Occultation of 123 zeta Tau 2.97 by moon 81% illuminated at phase= 129 degrees
02/05/2020 03:01:15.5 Geocentric minimum 1.0 degrees
Global start/end: 02/05/2020 01:51:54.6   and   02/05/2020 04:10:33.0
Mid-occultation observing point (lat., long.) 66.725 -2.571

Occultation of 1 Gem 4.16 by moon 85% illuminated at phase= 135 degrees
02/05/2020 14:18:18.8 Geocentric minimum 0.4 degrees
Global start/end: 02/05/2020 12:15:55.9   and   02/05/2020 16:20:35.4
Mid-occultation observing point (lat., long.) -3.135 -1.637

Occultation of Propus 3.31 by moon 87% illuminated at phase= 137 degrees
02/05/2020 18:34:26.6 Geocentric minimum 0.5 degrees
Global start/end: 02/05/2020 16:35:43.3   and   02/05/2020 20:33:03.3
Mid-occultation observing point (lat., long.) 54.218 -68.366

---For observations at HVO:
02/05/2020 17:06:00.1 Start Total 36.6 36.78 (az93) 0.1
02/05/2020 17:39:20.1 OCCULTATION MID-POINT 42.55 42.57 (az100) -6.2 ***
02/05/2020 18:14:18.3 End Total 48.67 48.53 (az107) -12.3 ***

Occultation of 13 mu Gem 2.87 by moon 88% illuminated at phase= 139 degrees
02/05/2020 21:51:09.3 Geocentric minimum 0.6 degrees
Global start/end: 02/05/2020 19:58:02.8   and   02/05/2020 23:44:09.2
Mid-occultation observing point (lat., long.) 61.474 -116.069

---For observations at HVO:
02/05/2020 22:00:26.4 Start Total 66.39 66.6 (az208) -51.0 ***
02/05/2020 22:11:47.4 OCCULTATION MID-POINT 65.35 65.58 (az214) -52.6 ***
02/05/2020 22:23:04.6 End Total 64.15 64.41 (az219) -54.1 ***

Occultation of 42 omega Gem 5.2 by moon 92% illuminated at phase= 147 degrees
02/06/2020 13:36:20.0 Geocentric minimum 0.9 degrees
Global start/end: 02/06/2020 12:12:27.6   and   02/06/2020 15:00:08.2
Mid-occultation observing point (lat., long.) -50.952 18.786

Occultation of Wasat 3.5 by moon 94% illuminated at phase= 151 degrees
02/06/2020 20:41:05.7 Geocentric minimum 1.2 degrees
Global start/end: 02/06/2020 19:51:34.6   and   02/06/2020 21:30:35.2
Mid-occultation observing point (lat., long.) 66.77 90.896
At HVO the miss angle is 1813.4 arc-sec at 02/06/2020 19:53:19.9

Occultation of 33 eta Cnc 5.33 by moon 99% illuminated at phase= 167 degrees
02/08/2020 01:04:29.9 Geocentric minimum 0.8 degrees
Global start/end: 02/07/2020 23:30:09.7   and   02/08/2020 02:38:46.5
Mid-occultation observing point (lat., long.) 75.143 -96.642
At HVO the miss angle is 200.0 arc-sec at 02/08/2020 01:43:31.0

Occultation of Asellus Borealis 4.66 by moon 99% illuminated at phase= 169 degrees
02/08/2020 04:46:22.6 Geocentric minimum 0.6 degrees
Global start/end: 02/08/2020 02:56:02.7   and   02/08/2020 06:36:38.6
Mid-occultation observing point (lat., long.) -15.419 169.786
At HVO the miss angle is 4027.6 arc-sec at 02/08/2020 05:30:13.2

Occultation of 30 eta Leo 3.48 by moon 100% illuminated at phase= 188 degrees
02/09/2020 13:49:17.7 Geocentric minimum 0.9 degrees
Global start/end: 02/09/2020 12:19:50.0   and   02/09/2020 15:18:44.4
Mid-occultation observing point (lat., long.) -42.497 39.49

Occultation of 46 Leo 5.43 by moon 99% illuminated at phase= 194 degrees
02/10/2020 00:15:46.2 Geocentric minimum 0.3 degrees
Global start/end: 02/09/2020 22:14:28.4   and   02/10/2020 02:17:04.0
Mid-occultation observing point (lat., long.) -0.263 -95.314
At HVO the miss angle is 1391.0 arc-sec at 02/09/2020 23:25:50.6

Occultation of 3 nu Vir 4.04 by moon 92% illuminated at phase= 212 degrees
02/11/2020 07:41:40.5 Geocentric minimum 0.4 degrees
Global start/end: 02/11/2020 05:44:12.7   and   02/11/2020 09:39:10.1
Mid-occultation observing point (lat., long.) 28.95 -174.524
At HVO the miss angle is 824.9 arc-sec at 02/11/2020 08:19:42.5

Occultation of 8 pi Vir 4.65 by moon 91% illuminated at phase= 215 degrees
02/11/2020 13:10:49.2 Geocentric minimum 1.1 degrees
Global start/end: 02/11/2020 12:04:37.5   and   02/11/2020 14:17:02.0
Mid-occultation observing point (lat., long.) -66.864 18.41

Occultation of 16 Vir 4.97 by moon 88% illuminated at phase= 221 degrees
02/11/2020 22:27:38.7 Geocentric minimum 0.1 degrees
Global start/end: 02/11/2020 20:23:07.7   and   02/12/2020 00:32:11.2
Mid-occultation observing point (lat., long.) 6.523 -36.902
At HVO the miss angle is 66.1 arc-sec at 02/11/2020 20:56:41.1

Occultation of 15 xi^2 Lib 5.48 by moon 59% illuminated at phase= 259 degrees
02/14/2020 19:33:31.0 Geocentric minimum 1.1 degrees
Global start/end: 02/14/2020 18:39:15.2   and   02/14/2020 20:27:48.2
Mid-occultation observing point (lat., long.) -66.703 -80.138

Occultation of 38 gamma Lib 3.91 by moon 51% illuminated at phase= 269 degrees
02/15/2020 12:56:12.1 Geocentric minimum 1.0 degrees
Global start/end: 02/15/2020 11:33:00.5   and   02/15/2020 14:19:26.8
Mid-occultation observing point (lat., long.) -72.802 50.129

Occultation of 46 theta Lib 4.13 by moon 48% illuminated at phase= 273 degrees
02/15/2020 21:19:48.7 Geocentric minimum 0.4 degrees
Global start/end: 02/15/2020 19:15:12.6   and   02/15/2020 23:24:28.4
Mid-occultation observing point (lat., long.) -38.197 20.489

Occultation of 49 Lib 5.47 by moon 46% illuminated at phase= 275 degrees
02/15/2020 23:52:31.5 Geocentric minimum 1.0 degrees
Global start/end: 02/15/2020 22:33:02.9   and   02/16/2020 01:12:03.0
Mid-occultation observing point (lat., long.) -66.584 -146.185

Occultation of 4 psi Oph 4.48 by moon 41% illuminated at phase= 280 degrees
02/16/2020 11:10:42.0 Geocentric minimum 1.0 degrees
Global start/end: 02/16/2020 09:51:06.7   and   02/16/2020 12:30:19.9
Mid-occultation observing point (lat., long.) 67.056 -135.69

Occultation of 7 chi Oph 4.22 by moon 41% illuminated at phase= 281 degrees
02/16/2020 11:42:34.7 Geocentric minimum 0.7 degrees
Global start/end: 02/16/2020 09:56:44.5   and   02/16/2020 13:28:28.7
Mid-occultation observing point (lat., long.) -64.991 155.629

Occultation of 40 xi Oph 4.39 by moon 31% illuminated at phase= 293 degrees
02/17/2020 11:11:50.1 Geocentric minimum 0.6 degrees
Global start/end: 02/17/2020 09:15:52.8   and   02/17/2020 13:07:50.9
Mid-occultation observing point (lat., long.) -59.02 -170.134

Occultation of Mars 1.2 by moon 24% illuminated at phase= 302 degrees
02/18/2020 06:24:20.4 Geocentric minimum 0.8 degrees
Global start/end: 02/18/2020 04:34:18.7   and   02/18/2020 08:14:25.8
Mid-occultation observing point (lat., long.) 29.427 -73.251

---For observations at HVO:
02/18/2020 04:45:21.3 Start Partial 8.07 8.25 (az135) -22.8 ***
02/18/2020 04:45:34.0 Start Total 8.1 8.28 (az135) -22.8 ***
02/18/2020 05:24:30.9 OCCULTATION MID-POINT 12.71 12.7 (az142) -15.8 ***
02/18/2020 06:05:44.7 End Total 16.77 16.61 (az151) -8.4 ***
02/18/2020 06:05:58.9 End Partial 16.79 16.63 (az151) -8.4 ***

Occultation of 58 Oph 4.86 by moon 27% illuminated at phase= 297 degrees
02/17/2020 20:50:32.8 Geocentric minimum 0.7 degrees
Global start/end: 02/17/2020 19:04:26.3   and   02/17/2020 22:36:42.4
Mid-occultation observing point (lat., long.) -71.547 44.657

Occultation of Jupiter -1.9 by moon 14% illuminated at phase= 317 degrees
02/19/2020 12:40:02.1 Geocentric minimum 0.9 degrees
Global start/end: 02/19/2020 11:14:02.8   and   02/19/2020 14:06:03.2
Mid-occultation observing point (lat., long.) -66.582 19.048

Occultation of 30 YY Psc 4.37 by moon 4% illuminated at phase= 22 degrees
02/25/2020 08:24:48.5 Geocentric minimum 0.7 degrees
Global start/end: 02/25/2020 06:35:27.8   and   02/25/2020 10:14:10.6
Mid-occultation observing point (lat., long.) 41.498 -49.502

Occultation of 33 BC Psc 4.61 by moon 4% illuminated at phase= 23 degrees
02/25/2020 10:13:23.8 Geocentric minimum 0.8 degrees
Global start/end: 02/25/2020 08:28:24.4   and   02/25/2020 11:58:24.5
Mid-occultation observing point (lat., long.) 45.795 -79.603

Occultation of 89 Psc 5.13 by moon 12% illuminated at phase= 41 degrees
02/27/2020 03:28:26.7 Geocentric minimum 0.7 degrees
Global start/end: 02/27/2020 01:33:33.9   and   02/27/2020 05:23:19.8
Mid-occultation observing point (lat., long.) -38.522 87.259

Occultation of 106 nu Psc 4.45 by moon 16% illuminated at phase= 47 degrees
02/27/2020 15:58:06.9 Geocentric minimum 0.1 degrees
Global start/end: 02/27/2020 13:38:41.6   and   02/27/2020 18:17:33.6
Mid-occultation observing point (lat., long.) 1.681 -114.511
At HVO the miss angle is 798.5 arc-sec at 02/27/2020 17:10:00.5

Occultation of 65 xi^1 Cet 4.36 by moon 21% illuminated at phase= 55 degrees
02/28/2020 09:12:56.3 Geocentric minimum 0.2 degrees
Global start/end: 02/28/2020 06:55:22.3   and   02/28/2020 11:30:30.8
Mid-occultation observing point (lat., long.) -2.258 -3.221

Occultation of Ain 3.53 by moon 47% illuminated at phase= 86 degrees
03/02/2020 05:18:27.7 Geocentric minimum 0.3 degrees
Global start/end: 03/02/2020 03:05:14.2   and   03/02/2020 07:31:38.0
Mid-occultation observing point (lat., long.) 34.831 77.709

Occultation of 102 iota Tau 4.62 by moon 54% illuminated at phase= 94 degrees
03/02/2020 21:20:05.5 Geocentric minimum 0.4 degrees
Global start/end: 03/02/2020 19:14:06.4   and   03/02/2020 23:25:59.3
Mid-occultation observing point (lat., long.) -5.517 -145.564
At HVO the miss angle is 2034.0 arc-sec at 03/02/2020 22:28:58.5

Occultation of 1 Gem 4.16 by moon 65% illuminated at phase= 107 degrees
03/03/2020 23:42:20.1 Geocentric minimum 0.2 degrees
Global start/end: 03/03/2020 21:31:59.5   and   03/04/2020 01:52:36.2
Mid-occultation observing point (lat., long.) 9.223 -170.599
At HVO the miss angle is 1845.0 arc-sec at 03/04/2020 00:51:11.5

Occultation of Propus 3.31 by moon 67% illuminated at phase= 109 degrees
03/04/2020 04:06:18.6 Geocentric minimum 0.7 degrees
Global start/end: 03/04/2020 02:17:57.7   and   03/04/2020 05:54:33.0
Mid-occultation observing point (lat., long.) 69.634 117.681

Occultation of 13 mu Gem 2.87 by moon 68% illuminated at phase= 111 degrees
03/04/2020 07:28:50.7 Geocentric minimum 0.8 degrees
Global start/end: 03/04/2020 05:48:51.9   and   03/04/2020 09:08:43.4
Mid-occultation observing point (lat., long.) 78.889 64.864

Occultation of 42 omega Gem 5.2 by moon 75% illuminated at phase= 119 degrees
03/04/2020 23:40:26.7 Geocentric minimum 0.8 degrees
Global start/end: 03/04/2020 21:58:57.1   and   03/05/2020 01:21:50.0
Mid-occultation observing point (lat., long.) -29.128 -158.746
At HVO the miss angle is 3756.3 arc-sec at 03/05/2020 00:28:07.2

Occultation of 33 eta Cnc 5.33 by moon 88% illuminated at phase= 139 degrees
03/06/2020 11:56:39.4 Geocentric minimum 0.9 degrees
Global start/end: 03/06/2020 10:32:49.3   and   03/06/2020 13:20:25.1
Mid-occultation observing point (lat., long.) 79.805 149.637

Occultation of Asellus Borealis 4.66 by moon 89% illuminated at phase= 141 degrees
03/06/2020 15:41:25.5 Geocentric minimum 0.5 degrees
Global start/end: 03/06/2020 13:45:20.3   and   03/06/2020 17:37:24.9
Mid-occultation observing point (lat., long.) -8.683 -19.901
At HVO the miss angle is 2926.9 arc-sec at 03/06/2020 14:32:30.9

Occultation of 30 eta Leo 3.48 by moon 97% illuminated at phase= 160 degrees
03/08/2020 00:57:46.9 Geocentric minimum 0.9 degrees
Global start/end: 03/07/2020 23:25:48.1   and   03/08/2020 02:29:42.4
Mid-occultation observing point (lat., long.) -39.462 -153.296
At HVO the miss angle is 4324.3 arc-sec at 03/08/2020 00:54:48.6

Occultation of 46 Leo 5.43 by moon 99% illuminated at phase= 166 degrees
03/08/2020 11:21:53.4 Geocentric minimum 0.3 degrees
Global start/end: 03/08/2020 09:20:53.9   and   03/08/2020 13:22:50.8
Mid-occultation observing point (lat., long.) -0.121 71.082

Occultation of 3 nu Vir 4.04 by moon 100% illuminated at phase= 185 degrees
03/09/2020 18:20:34.2 Geocentric minimum 0.3 degrees
Global start/end: 03/09/2020 16:22:09.2   and   03/09/2020 20:18:59.0
Mid-occultation observing point (lat., long.) 24.545 -3.482

Occultation of 8 pi Vir 4.65 by moon 100% illuminated at phase= 188 degrees
03/09/2020 23:41:37.4 Geocentric minimum 1.2 degrees
Global start/end: 03/09/2020 22:49:12.4   and   03/10/2020 00:34:02.5
Mid-occultation observing point (lat., long.) -66.682 -166.483

Occultation of 16 Vir 4.97 by moon 99% illuminated at phase= 193 degrees
03/10/2020 08:44:21.8 Geocentric minimum 0.0 degrees
Global start/end: 03/10/2020 06:41:37.4   and   03/10/2020 10:47:06.7
Mid-occultation observing point (lat., long.) 0.836 139.461

Occultation of 38 gamma Lib 3.91 by moon 74% illuminated at phase= 241 degrees
03/13/2020 20:12:50.7 Geocentric minimum 1.2 degrees
Global start/end: 03/13/2020 19:31:16.2   and   03/13/2020 20:54:26.4
Mid-occultation observing point (lat., long.) -66.506 -117.752

Occultation of 46 theta Lib 4.13 by moon 71% illuminated at phase= 246 degrees
03/14/2020 04:20:18.1 Geocentric minimum 0.6 degrees
Global start/end: 03/14/2020 02:28:11.5   and   03/14/2020 06:12:30.7
Mid-occultation observing point (lat., long.) -53.098 -120.532
At HVO the miss angle is 4069.5 arc-sec at 03/14/2020 03:15:50.1

Occultation of 49 Lib 5.47 by moon 70% illuminated at phase= 247 degrees
03/14/2020 06:48:14.2 Geocentric minimum 1.2 degrees
Global start/end: 03/14/2020 06:21:03.5   and   03/14/2020 07:15:25.4
Mid-occultation observing point (lat., long.) -66.534 83.069
At HVO the miss angle is 6705.9 arc-sec at 03/14/2020 07:15:01.0

Occultation of 4 psi Oph 4.48 by moon 65% illuminated at phase= 253 degrees
03/14/2020 17:46:56.6 Geocentric minimum 0.7 degrees
Global start/end: 03/14/2020 16:01:49.7   and   03/14/2020 19:32:09.4
Mid-occultation observing point (lat., long.) 26.942 72.818

Occultation of 7 chi Oph 4.22 by moon 65% illuminated at phase= 253 degrees
03/14/2020 18:17:50.0 Geocentric minimum 1.0 degrees
Global start/end: 03/14/2020 16:57:28.1   and   03/14/2020 19:38:15.8
Mid-occultation observing point (lat., long.) -66.338 -90.101

Occultation of 40 xi Oph 4.39 by moon 54% illuminated at phase= 265 degrees
03/15/2020 17:14:26.0 Geocentric minimum 0.8 degrees
Global start/end: 03/15/2020 15:38:25.6   and   03/15/2020 18:50:31.4
Mid-occultation observing point (lat., long.) -78.845 39.977

Occultation of 58 Oph 4.86 by moon 50% illuminated at phase= 270 degrees
03/16/2020 02:43:06.9 Geocentric minimum 1.0 degrees
Global start/end: 03/16/2020 01:23:38.1   and   03/16/2020 04:02:39.2
Mid-occultation observing point (lat., long.) -66.349 142.48

Occultation of Mars 0.9 by moon 31% illuminated at phase= 293 degrees
03/18/2020 01:24:30.1 Geocentric minimum 0.7 degrees
Global start/end: 03/17/2020 23:32:16.9   and   03/18/2020 03:16:47.9
Mid-occultation observing point (lat., long.) -75.028 2.819

Occultation of Nashira 3.69 by moon 11% illuminated at phase= 321 degrees
03/20/2020 13:34:50.4 Geocentric minimum 1.1 degrees
Global start/end: 03/20/2020 13:13:54.8   and   03/20/2020 13:55:46.0
Mid-occultation observing point (lat., long.) -66.601 -24.872

Occultation of 71 tau Aqr 4.05 by moon 4% illuminated at phase= 337 degrees
03/21/2020 23:25:48.5 Geocentric minimum 1.1 degrees
Global start/end: 03/21/2020 23:20:56.1   and   03/21/2020 23:30:40.8
Mid-occultation observing point (lat., long.) 0.0 0.0

Occultation of 91 psi^1 Aqr 4.24 by moon 2% illuminated at phase= 344 degrees
03/22/2020 14:50:10.2 Geocentric minimum 0.8 degrees
Global start/end: 03/22/2020 13:05:46.1   and   03/22/2020 16:34:34.7
Mid-occultation observing point (lat., long.) -59.304 -122.047

Occultation of 93 psi^2 Aqr 4.41 by moon 2% illuminated at phase= 344 degrees
03/22/2020 15:41:43.8 Geocentric minimum 0.5 degrees
Global start/end: 03/22/2020 13:35:49.9   and   03/22/2020 17:47:38.1
Mid-occultation observing point (lat., long.) -39.227 -156.691

Occultation of 95 psi^3 Aqr 4.99 by moon 2% illuminated at phase= 344 degrees
03/22/2020 15:52:03.8 Geocentric minimum 0.0 degrees
Global start/end: 03/22/2020 13:32:57.8   and   03/22/2020 18:11:08.9
Mid-occultation observing point (lat., long.) -9.145 -174.084

Occultation of 89 Psc 5.13 by moon 1% illuminated at phase= 14 degrees
03/25/2020 09:37:23.1 Geocentric minimum 0.5 degrees
Global start/end: 03/25/2020 07:33:48.1   and   03/25/2020 11:40:58.2
Mid-occultation observing point (lat., long.) -29.183 -37.734
At HVO the miss angle is 3782.7 arc-sec at 03/25/2020 09:26:43.2

Occultation of 106 nu Psc 4.45 by moon 3% illuminated at phase= 20 degrees
03/25/2020 22:05:11.9 Geocentric minimum 0.1 degrees
Global start/end: 03/25/2020 19:46:20.9   and   03/26/2020 00:24:03.7
Mid-occultation observing point (lat., long.) 10.349 123.184

Occultation of 65 xi^1 Cet 4.36 by moon 6% illuminated at phase= 28 degrees
03/26/2020 15:18:22.5 Geocentric minimum 0.0 degrees
Global start/end: 03/26/2020 12:59:22.1   and   03/26/2020 17:37:24.2
Mid-occultation observing point (lat., long.) 8.252 -125.594
At HVO the miss angle is 393.8 arc-sec at 03/26/2020 16:35:13.8

Occultation of Ain 3.53 by moon 24% illuminated at phase= 59 degrees
03/29/2020 11:44:59.0 Geocentric minimum 0.5 degrees
Global start/end: 03/29/2020 09:41:35.0   and   03/29/2020 13:48:20.3
Mid-occultation observing point (lat., long.) 51.895 -53.37

Occultation of 102 iota Tau 4.62 by moon 30% illuminated at phase= 67 degrees
03/30/2020 04:02:25.3 Geocentric minimum 0.2 degrees
Global start/end: 03/30/2020 01:47:29.3   and   03/30/2020 06:17:20.2
Mid-occultation observing point (lat., long.) 11.498 84.07

Occultation of 1 Gem 4.16 by moon 41% illuminated at phase= 80 degrees
03/31/2020 07:01:08.4 Geocentric minimum 0.0 degrees
Global start/end: 03/31/2020 04:46:39.1   and   03/31/2020 09:15:37.6
Mid-occultation observing point (lat., long.) 25.685 51.451

Occultation of Propus 3.31 by moon 43% illuminated at phase= 82 degrees
03/31/2020 11:32:29.1 Geocentric minimum 1.0 degrees
Global start/end: 03/31/2020 10:13:16.6   and   03/31/2020 12:51:38.5
Mid-occultation observing point (lat., long.) 66.22 174.647

Occultation of 13 mu Gem 2.87 by moon 45% illuminated at phase= 84 degrees
03/31/2020 15:00:49.5 Geocentric minimum 1.1 degrees
Global start/end: 03/31/2020 13:58:45.1   and   03/31/2020 16:02:51.9
Mid-occultation observing point (lat., long.) 66.31 122.458

Occultation of 42 omega Gem 5.2 by moon 52% illuminated at phase= 92 degrees
04/01/2020 07:42:10.6 Geocentric minimum 0.5 degrees
Global start/end: 04/01/2020 05:41:57.6   and   04/01/2020 09:42:17.9
Mid-occultation observing point (lat., long.) -8.425 54.273

Occultation of 33 eta Cnc 5.33 by moon 69% illuminated at phase= 112 degrees
04/02/2020 21:13:14.6 Geocentric minimum 1.2 degrees
Global start/end: 04/02/2020 20:29:30.5   and   04/02/2020 21:56:57.4
Mid-occultation observing point (lat., long.) 66.336 27.222
At HVO the miss angle is 1519.6 arc-sec at 04/02/2020 21:55:53.4

Occultation of Asellus Borealis 4.66 by moon 70% illuminated at phase= 114 degrees
04/03/2020 01:05:15.9 Geocentric minimum 0.3 degrees
Global start/end: 04/02/2020 22:59:50.3   and   04/03/2020 03:10:36.8
Mid-occultation observing point (lat., long.) 4.577 174.452
At HVO the miss angle is 2846.5 arc-sec at 04/03/2020 01:52:33.3

Occultation of 30 eta Leo 3.48 by moon 84% illuminated at phase= 133 degrees
04/04/2020 11:23:23.3 Geocentric minimum 0.7 degrees
Global start/end: 04/04/2020 09:39:05.6   and   04/04/2020 13:07:35.7
Mid-occultation observing point (lat., long.) -26.944 28.622

Occultation of 46 Leo 5.43 by moon 88% illuminated at phase= 139 degrees
04/04/2020 22:03:05.3 Geocentric minimum 0.1 degrees
Global start/end: 04/04/2020 19:58:40.8   and   04/05/2020 00:07:27.2
Mid-occultation observing point (lat., long.) 6.736 -114.0
At HVO the miss angle is 1285.5 arc-sec at 04/04/2020 21:40:39.6

Occultation of 3 nu Vir 4.04 by moon 96% illuminated at phase= 157 degrees
04/06/2020 05:31:03.8 Geocentric minimum 0.4 degrees
Global start/end: 04/06/2020 03:33:20.1   and   04/06/2020 07:28:45.1
Mid-occultation observing point (lat., long.) 26.951 163.193

Occultation of 8 pi Vir 4.65 by moon 97% illuminated at phase= 160 degrees
04/06/2020 10:53:37.9 Geocentric minimum 1.1 degrees
Global start/end: 04/06/2020 09:56:09.8   and   04/06/2020 11:51:05.2
Mid-occultation observing point (lat., long.) -66.461 -1.681

Occultation of 16 Vir 4.97 by moon 99% illuminated at phase= 166 degrees
04/06/2020 19:58:19.1 Geocentric minimum 0.0 degrees
Global start/end: 04/06/2020 17:55:31.6   and   04/06/2020 22:01:05.9
Mid-occultation observing point (lat., long.) 0.983 -56.048
At HVO the miss angle is 448.2 arc-sec at 04/06/2020 18:31:09.5

Occultation of 46 theta Lib 4.13 by moon 89% illuminated at phase= 219 degrees
04/10/2020 13:44:22.8 Geocentric minimum 0.8 degrees
Global start/end: 04/10/2020 12:08:23.7   and   04/10/2020 15:20:26.8
Mid-occultation observing point (lat., long.) -67.391 51.226

Occultation of 4 psi Oph 4.48 by moon 85% illuminated at phase= 226 degrees
04/11/2020 02:43:54.6 Geocentric minimum 0.5 degrees
Global start/end: 04/11/2020 00:46:53.2   and   04/11/2020 04:41:01.9
Mid-occultation observing point (lat., long.) 9.055 -92.848
At HVO the miss angle is 196.1 arc-sec at 04/11/2020 02:00:57.7

Occultation of 7 chi Oph 4.22 by moon 85% illuminated at phase= 226 degrees
04/11/2020 03:13:18.0 Geocentric minimum 1.2 degrees
Global start/end: 04/11/2020 02:36:27.5   and   04/11/2020 03:50:09.6
Mid-occultation observing point (lat., long.) -66.255 109.278

Occultation of 40 xi Oph 4.39 by moon 76% illuminated at phase= 238 degrees
04/12/2020 01:23:08.2 Geocentric minimum 1.1 degrees
Global start/end: 04/12/2020 00:21:32.8   and   04/12/2020 02:24:46.4
Mid-occultation observing point (lat., long.) -66.169 135.908

Occultation of 58 Oph 4.86 by moon 73% illuminated at phase= 243 degrees
04/12/2020 10:33:21.8 Geocentric minimum 1.2 degrees
Global start/end: 04/12/2020 10:29:49.9   and   04/12/2020 10:36:53.8
Mid-occultation observing point (lat., long.) 0.0 0.0

Occultation of 71 tau Aqr 4.05 by moon 18% illuminated at phase= 310 degrees
04/18/2020 05:21:41.1 Geocentric minimum 1.0 degrees
Global start/end: 04/18/2020 04:10:49.1   and   04/18/2020 06:32:33.6
Mid-occultation observing point (lat., long.) 66.379 -110.254

---For observations at HVO:
04/18/2020 04:17:41.0 Start Total 4.88 5.09 (az114) -8.7 ***
04/18/2020 04:45:15.8 OCCULTATION MID-POINT 9.25 9.39 (az119) -3.8 ***
04/18/2020 05:13:57.1 End Total 13.61 13.7 (az124) 1.3

Occultation of 91 psi^1 Aqr 4.24 by moon 14% illuminated at phase= 317 degrees
04/18/2020 20:48:55.6 Geocentric minimum 0.9 degrees
Global start/end: 04/18/2020 19:20:30.4   and   04/18/2020 22:17:21.2
Mid-occultation observing point (lat., long.) -68.65 172.343

Occultation of 93 psi^2 Aqr 4.41 by moon 13% illuminated at phase= 317 degrees
04/18/2020 21:40:30.1 Geocentric minimum 0.6 degrees
Global start/end: 04/18/2020 19:42:45.3   and   04/18/2020 23:38:15.2
Mid-occultation observing point (lat., long.) -48.142 94.213

Occultation of 95 psi^3 Aqr 4.99 by moon 13% illuminated at phase= 317 degrees
04/18/2020 21:50:38.8 Geocentric minimum 0.1 degrees
Global start/end: 04/18/2020 19:31:50.2   and   04/19/2020 00:09:26.3
Mid-occultation observing point (lat., long.) -16.783 72.59

Occultation of 30 YY Psc 4.37 by moon 8% illuminated at phase= 328 degrees
04/19/2020 20:36:51.9 Geocentric minimum 0.7 degrees
Global start/end: 04/19/2020 18:43:01.2   and   04/19/2020 22:30:42.2
Mid-occultation observing point (lat., long.) 37.377 76.337

Occultation of 33 BC Psc 4.61 by moon 7% illuminated at phase= 329 degrees
04/19/2020 22:25:44.8 Geocentric minimum 0.7 degrees
Global start/end: 04/19/2020 20:36:33.2   and   04/20/2020 00:14:55.8
Mid-occultation observing point (lat., long.) 41.975 46.372

Occultation of 89 Psc 5.13 by moon 1% illuminated at phase= 347 degrees
04/21/2020 15:40:29.6 Geocentric minimum 0.5 degrees
Global start/end: 04/21/2020 13:37:00.7   and   04/21/2020 17:43:57.1
Mid-occultation observing point (lat., long.) -29.125 -155.227

Occultation of Ain 3.53 by moon 8% illuminated at phase= 32 degrees
04/25/2020 17:21:34.7 Geocentric minimum 0.7 degrees
Global start/end: 04/25/2020 15:30:47.6   and   04/25/2020 19:12:19.7
Mid-occultation observing point (lat., long.) 64.942 -176.571
At HVO the miss angle is 234.8 arc-sec at 04/25/2020 18:50:30.5

Occultation of 102 iota Tau 4.62 by moon 12% illuminated at phase= 40 degrees
04/26/2020 09:38:26.8 Geocentric minimum 0.0 degrees
Global start/end: 04/26/2020 07:22:28.1   and   04/26/2020 11:54:26.7
Mid-occultation observing point (lat., long.) 23.454 -29.018
At HVO the miss angle is 1529.9 arc-sec at 04/26/2020 08:44:29.4

Occultation of 1 Gem 4.16 by moon 20% illuminated at phase= 53 degrees
04/27/2020 12:44:26.8 Geocentric minimum 0.3 degrees
Global start/end: 04/27/2020 10:32:47.7   and   04/27/2020 14:56:04.5
Mid-occultation observing point (lat., long.) 39.461 -62.651

Occultation of Mebsuta 3.06 by moon 26% illuminated at phase= 62 degrees
04/28/2020 05:55:48.0 Geocentric minimum 1.2 degrees
Global start/end: 04/28/2020 05:30:36.1   and   04/28/2020 06:20:59.6
Mid-occultation observing point (lat., long.) -66.22 51.977

Occultation of 42 omega Gem 5.2 by moon 29% illuminated at phase= 65 degrees
04/28/2020 13:44:01.2 Geocentric minimum 0.3 degrees
Global start/end: 04/28/2020 11:34:04.3   and   04/28/2020 15:53:56.0
Mid-occultation observing point (lat., long.) 7.102 -62.737
At HVO the miss angle is 1628.8 arc-sec at 04/28/2020 12:51:46.3

Occultation of 77 kappa Gem 3.57 by moon 37% illuminated at phase= 74 degrees
04/29/2020 07:15:53.7 Geocentric minimum 1.0 degrees
Global start/end: 04/29/2020 06:02:22.0   and   04/29/2020 08:29:23.1
Mid-occultation observing point (lat., long.) -66.413 30.83

Occultation of Asellus Borealis 4.66 by moon 48% illuminated at phase= 87 degrees
04/30/2020 08:05:54.2 Geocentric minimum 0.1 degrees
Global start/end: 04/30/2020 05:55:11.4   and   04/30/2020 10:16:36.3
Mid-occultation observing point (lat., long.) 18.265 44.954

Occultation of 30 eta Leo 3.48 by moon 64% illuminated at phase= 106 degrees
05/01/2020 19:32:48.0 Geocentric minimum 0.5 degrees
Global start/end: 05/01/2020 17:35:35.2   and   05/01/2020 21:29:56.1
Mid-occultation observing point (lat., long.) -13.198 -115.953
At HVO the miss angle is 2412.5 arc-sec at 05/01/2020 19:00:24.9

Occultation of 46 Leo 5.43 by moon 69% illuminated at phase= 112 degrees
05/02/2020 06:35:35.3 Geocentric minimum 0.1 degrees
Global start/end: 05/02/2020 04:28:13.2   and   05/02/2020 08:42:55.8
Mid-occultation observing point (lat., long.) 17.103 94.602

Occultation of 3 nu Vir 4.04 by moon 83% illuminated at phase= 131 degrees
05/03/2020 15:08:25.7 Geocentric minimum 0.5 degrees
Global start/end: 05/03/2020 13:13:58.7   and   05/03/2020 17:02:48.8
Mid-occultation observing point (lat., long.) 35.052 -3.273

Occultation of 8 pi Vir 4.65 by moon 85% illuminated at phase= 134 degrees
05/03/2020 20:40:23.9 Geocentric minimum 1.0 degrees
Global start/end: 05/03/2020 19:25:05.9   and   05/03/2020 21:55:39.8
Mid-occultation observing point (lat., long.) -66.291 -175.442
At HVO the miss angle is 4428.4 arc-sec at 05/03/2020 19:30:07.9

Occultation of 16 Vir 4.97 by moon 88% illuminated at phase= 139 degrees
05/04/2020 06:00:54.9 Geocentric minimum 0.1 degrees
Global start/end: 05/04/2020 03:56:26.2   and   05/04/2020 08:05:22.1
Mid-occultation observing point (lat., long.) 6.518 128.698

Occultation of 46 theta Lib 4.13 by moon 99% illuminated at phase= 192 degrees
05/08/2020 00:23:30.1 Geocentric minimum 0.9 degrees
Global start/end: 05/07/2020 22:56:43.3   and   05/08/2020 01:50:19.8
Mid-occultation observing point (lat., long.) -73.342 -163.204
At HVO the miss angle is 5101.7 arc-sec at 05/07/2020 23:06:45.6

Occultation of Acrab 2.56 by moon 98% illuminated at phase= 195 degrees
05/08/2020 06:06:29.5 Geocentric minimum 1.3 degrees
Global start/end: 05/08/2020 06:01:18.5   and   05/08/2020 06:11:40.5
Mid-occultation observing point (lat., long.) 0.0 0.0

Occultation of 8 beta^2 Sco 4.9 by moon 98% illuminated at phase= 195 degrees
05/08/2020 06:06:30.5 Geocentric minimum 1.3 degrees
Global start/end: 05/08/2020 05:55:32.9   and   05/08/2020 06:17:28.1
Mid-occultation observing point (lat., long.) 66.185 -140.775

Occultation of 4 psi Oph 4.48 by moon 97% illuminated at phase= 199 degrees
05/08/2020 13:10:40.1 Geocentric minimum 0.4 degrees
Global start/end: 05/08/2020 11:10:26.9   and   05/08/2020 15:10:57.1
Mid-occultation observing point (lat., long.) 1.269 81.708

Occultation of 40 xi Oph 4.39 by moon 93% illuminated at phase= 212 degrees
05/09/2020 11:19:29.5 Geocentric minimum 1.2 degrees
Global start/end: 05/09/2020 11:05:40.1   and   05/09/2020 11:33:19.0
Mid-occultation observing point (lat., long.) -66.113 -39.925

Occultation of 71 tau Aqr 4.05 by moon 38% illuminated at phase= 284 degrees
05/15/2020 12:05:51.4 Geocentric minimum 0.8 degrees
Global start/end: 05/15/2020 10:26:25.9   and   05/15/2020 13:45:19.0
Mid-occultation observing point (lat., long.) 45.087 155.92

Occultation of 91 psi^1 Aqr 4.24 by moon 33% illuminated at phase= 291 degrees
05/16/2020 03:28:16.7 Geocentric minimum 1.1 degrees
Global start/end: 05/16/2020 02:32:17.8   and   05/16/2020 04:24:16.1
Mid-occultation observing point (lat., long.) -66.128 71.432
At HVO the miss angle is 5927.7 arc-sec at 05/16/2020 02:43:39.2

Occultation of 93 psi^2 Aqr 4.41 by moon 32% illuminated at phase= 291 degrees
05/16/2020 04:19:35.2 Geocentric minimum 0.8 degrees
Global start/end: 05/16/2020 02:37:11.3   and   05/16/2020 06:02:00.4
Mid-occultation observing point (lat., long.) -60.954 -13.187
At HVO the miss angle is 4935.5 arc-sec at 05/16/2020 03:58:35.6

Occultation of 95 psi^3 Aqr 4.99 by moon 32% illuminated at phase= 291 degrees
05/16/2020 04:29:35.0 Geocentric minimum 0.3 degrees
Global start/end: 05/16/2020 02:14:24.6   and   05/16/2020 06:44:46.0
Mid-occultation observing point (lat., long.) -26.764 -49.365
At HVO the miss angle is 3143.5 arc-sec at 05/16/2020 04:09:58.7

Occultation of 30 YY Psc 4.37 by moon 24% illuminated at phase= 301 degrees
05/17/2020 03:12:30.0 Geocentric minimum 0.5 degrees
Global start/end: 05/17/2020 01:07:46.6   and   05/17/2020 05:17:13.2
Mid-occultation observing point (lat., long.) 26.418 -42.789

Occultation of 33 BC Psc 4.61 by moon 24% illuminated at phase= 302 degrees
05/17/2020 05:01:16.7 Geocentric minimum 0.6 degrees
Global start/end: 05/17/2020 03:00:02.0   and   05/17/2020 07:02:31.3
Mid-occultation observing point (lat., long.) 30.482 -71.471

Occultation of 89 Psc 5.13 by moon 11% illuminated at phase= 321 degrees
05/18/2020 22:16:43.2 Geocentric minimum 0.6 degrees
Global start/end: 05/18/2020 20:19:04.5   and   05/19/2020 00:14:19.8
Mid-occultation observing point (lat., long.) -35.41 82.974

Occultation of 106 nu Psc 4.45 by moon 8% illuminated at phase= 327 degrees
05/19/2020 10:41:48.6 Geocentric minimum 0.0 degrees
Global start/end: 05/19/2020 08:22:46.9   and   05/19/2020 13:00:48.5
Mid-occultation observing point (lat., long.) 7.606 -118.544
At HVO the miss angle is 391.1 arc-sec at 05/19/2020 11:53:35.4

Occultation of 65 xi^1 Cet 4.36 by moon 5% illuminated at phase= 334 degrees
05/20/2020 03:49:08.7 Geocentric minimum 0.0 degrees
Global start/end: 05/20/2020 01:30:37.7   and   05/20/2020 06:07:38.4
Mid-occultation observing point (lat., long.) 8.954 -7.308

Occultation of 102 iota Tau 4.62 by moon 1% illuminated at phase= 14 degrees
05/23/2020 15:33:49.7 Geocentric minimum 0.1 degrees
Global start/end: 05/23/2020 13:19:14.2   and   05/23/2020 17:48:25.0
Mid-occultation observing point (lat., long.) 27.697 -145.623
At HVO the miss angle is 30.2 arc-sec at 05/23/2020 16:45:26.1

Occultation of 1 Gem 4.16 by moon 5% illuminated at phase= 27 degrees
05/24/2020 18:23:05.5 Geocentric minimum 0.4 degrees
Global start/end: 05/24/2020 16:15:18.6   and   05/24/2020 20:30:50.7
Mid-occultation observing point (lat., long.) 45.851 -175.082

---For observations at HVO:
05/24/2020 19:20:11.4 Start Total 20.47 20.21 (az283) 0.1
05/24/2020 19:41:19.5 OCCULTATION MID-POINT 16.8 16.68 (az286) -3.3 ***
05/24/2020 20:01:51.0 End Total 13.3 13.3 (az289) -6.7 ***

Occultation of Mebsuta 3.06 by moon 9% illuminated at phase= 35 degrees
05/25/2020 11:26:23.9 Geocentric minimum 1.1 degrees
Global start/end: 05/25/2020 10:24:21.9   and   05/25/2020 12:28:24.7
Mid-occultation observing point (lat., long.) -66.219 -57.319
At HVO the miss angle is 4533.2 arc-sec at 05/25/2020 10:48:35.4

Occultation of 42 omega Gem 5.2 by moon 11% illuminated at phase= 39 degrees
05/25/2020 19:11:46.0 Geocentric minimum 0.2 degrees
Global start/end: 05/25/2020 16:59:58.0   and   05/25/2020 21:23:33.7
Mid-occultation observing point (lat., long.) 14.722 -171.346
At HVO the miss angle is 1759.1 arc-sec at 05/25/2020 20:13:56.5

Occultation of 77 kappa Gem 3.57 by moon 17% illuminated at phase= 48 degrees
05/26/2020 12:40:46.4 Geocentric minimum 0.9 degrees
Global start/end: 05/26/2020 11:09:29.2   and   05/26/2020 14:12:01.5
Mid-occultation observing point (lat., long.) -42.8 -70.374
At HVO the miss angle is 3630.6 arc-sec at 05/26/2020 11:51:53.1

Occultation of Asellus Borealis 4.66 by moon 26% illuminated at phase= 61 degrees
05/27/2020 13:35:59.5 Geocentric minimum 0.1 degrees
Global start/end: 05/27/2020 11:25:10.1   and   05/27/2020 15:46:49.1
Mid-occultation observing point (lat., long.) 26.711 -62.607
At HVO the miss angle is 43.7 arc-sec at 05/27/2020 12:27:30.2

Occultation of 30 eta Leo 3.48 by moon 41% illuminated at phase= 80 degrees
05/29/2020 01:32:59.0 Geocentric minimum 0.4 degrees
Global start/end: 05/28/2020 23:29:08.1   and   05/29/2020 03:36:47.6
Mid-occultation observing point (lat., long.) -4.323 129.912

Occultation of 46 Leo 5.43 by moon 47% illuminated at phase= 86 degrees
05/29/2020 12:50:40.3 Geocentric minimum 0.2 degrees
Global start/end: 05/29/2020 10:43:16.0   and   05/29/2020 14:58:03.1
Mid-occultation observing point (lat., long.) 25.081 -22.864

Occultation of 3 nu Vir 4.04 by moon 62% illuminated at phase= 104 degrees
05/30/2020 22:19:13.9 Geocentric minimum 0.6 degrees
Global start/end: 05/30/2020 20:29:52.2   and   05/31/2020 00:08:32.6
Mid-occultation observing point (lat., long.) 43.304 -131.655

---For observations at HVO:
05/30/2020 22:21:37.5 Start Total 32.76 32.55 (az244) -20.9 ***
05/30/2020 22:46:55.7 OCCULTATION MID-POINT 28.58 28.41 (az249) -22.3 ***
05/30/2020 23:11:29.8 End Total 24.38 24.27 (az254) -23.3 ***

Occultation of 8 pi Vir 4.65 by moon 65% illuminated at phase= 107 degrees
05/31/2020 04:01:42.1 Geocentric minimum 0.9 degrees
Global start/end: 05/31/2020 02:32:45.4   and   05/31/2020 05:30:36.3
Mid-occultation observing point (lat., long.) -51.907 89.848

Occultation of 16 Vir 4.97 by moon 69% illuminated at phase= 113 degrees
05/31/2020 13:40:54.2 Geocentric minimum 0.2 degrees
Global start/end: 05/31/2020 11:35:18.1   and   05/31/2020 15:46:28.5
Mid-occultation observing point (lat., long.) 12.566 -10.484

Occultation of 46 theta Lib 4.13 by moon 98% illuminated at phase= 166 degrees
06/04/2020 10:25:17.6 Geocentric minimum 0.9 degrees
Global start/end: 06/04/2020 08:58:12.9   and   06/04/2020 11:52:23.5
Mid-occultation observing point (lat., long.) -73.346 18.359

Occultation of 8 beta^2 Sco 4.9 by moon 99% illuminated at phase= 169 degrees
06/04/2020 16:12:19.8 Geocentric minimum 1.3 degrees
Global start/end: 06/04/2020 16:05:58.4   and   06/04/2020 16:18:41.2
Mid-occultation observing point (lat., long.) 0.0 0.0

Occultation of 4 psi Oph 4.48 by moon 100% illuminated at phase= 173 degrees
06/04/2020 23:19:32.1 Geocentric minimum 0.4 degrees
Global start/end: 06/04/2020 21:18:42.4   and   06/05/2020 01:20:23.6
Mid-occultation observing point (lat., long.) 0.62 -97.636
At HVO the miss angle is 729.4 arc-sec at 06/04/2020 22:38:51.6

Occultation of 52 Sgr 4.59 by moon 91% illuminated at phase= 214 degrees
06/08/2020 03:48:53.1 Geocentric minimum 1.2 degrees
Global start/end: 06/08/2020 03:19:46.5   and   06/08/2020 04:18:00.3
Mid-occultation observing point (lat., long.) 66.086 -136.669

Occultation of 71 tau Aqr 4.05 by moon 61% illuminated at phase= 257 degrees
06/11/2020 19:56:48.1 Geocentric minimum 0.7 degrees
Global start/end: 06/11/2020 18:07:25.7   and   06/11/2020 21:46:14.3
Mid-occultation observing point (lat., long.) 34.353 18.192

Occultation of 91 psi^1 Aqr 4.24 by moon 55% illuminated at phase= 264 degrees
06/12/2020 11:08:18.0 Geocentric minimum 1.2 degrees
Global start/end: 06/12/2020 10:51:18.5   and   06/12/2020 11:25:17.6
Mid-occultation observing point (lat., long.) -66.108 -70.506

Occultation of 93 psi^2 Aqr 4.41 by moon 55% illuminated at phase= 265 degrees
06/12/2020 11:59:04.4 Geocentric minimum 0.9 degrees
Global start/end: 06/12/2020 10:28:20.1   and   06/12/2020 13:29:51.0
Mid-occultation observing point (lat., long.) -67.9 -123.789

Occultation of 95 psi^3 Aqr 4.99 by moon 55% illuminated at phase= 265 degrees
06/12/2020 12:08:57.0 Geocentric minimum 0.4 degrees
Global start/end: 06/12/2020 09:57:47.0   and   06/12/2020 14:20:09.8
Mid-occultation observing point (lat., long.) -32.479 171.95

Occultation of 30 YY Psc 4.37 by moon 46% illuminated at phase= 275 degrees
06/13/2020 10:41:18.2 Geocentric minimum 0.4 degrees
Global start/end: 06/13/2020 08:31:49.5   and   06/13/2020 12:50:48.3
Mid-occultation observing point (lat., long.) 20.352 -178.791

Occultation of 33 BC Psc 4.61 by moon 45% illuminated at phase= 276 degrees
06/13/2020 12:29:30.5 Geocentric minimum 0.5 degrees
Global start/end: 06/13/2020 10:22:48.7   and   06/13/2020 14:36:13.5
Mid-occultation observing point (lat., long.) 24.206 153.039

Occultation of 20 Cet 4.78 by moon 35% illuminated at phase= 288 degrees
06/14/2020 14:16:36.0 Geocentric minimum 1.1 degrees
Global start/end: 06/14/2020 13:56:54.4   and   06/14/2020 14:36:17.6
Mid-occultation observing point (lat., long.) 66.072 60.242

Occultation of 89 Psc 5.13 by moon 29% illuminated at phase= 295 degrees
06/15/2020 05:40:49.1 Geocentric minimum 0.7 degrees
Global start/end: 06/15/2020 03:48:29.7   and   06/15/2020 07:33:07.1
Mid-occultation observing point (lat., long.) -40.726 -50.889
At HVO the miss angle is 3954.7 arc-sec at 06/15/2020 06:15:59.7

Occultation of 106 nu Psc 4.45 by moon 25% illuminated at phase= 300 degrees
06/15/2020 18:06:43.8 Geocentric minimum 0.0 degrees
Global start/end: 06/15/2020 15:47:15.5   and   06/15/2020 20:26:10.6
Mid-occultation observing point (lat., long.) 3.973 104.885

Occultation of 65 xi^1 Cet 4.36 by moon 19% illuminated at phase= 308 degrees
06/16/2020 11:15:43.6 Geocentric minimum 0.1 degrees
Global start/end: 06/16/2020 08:56:55.9   and   06/16/2020 13:34:29.3
Mid-occultation observing point (lat., long.) 5.853 -144.588
At HVO the miss angle is 412.8 arc-sec at 06/16/2020 12:49:07.3

Occultation of Venus -4.4 by moon 4% illuminated at phase= 337 degrees
06/19/2020 01:32:00.8 Geocentric minimum 0.7 degrees
Global start/end: 06/18/2020 23:46:05.9   and   06/19/2020 03:17:53.5
Mid-occultation observing point (lat., long.) 65.864 -1.21

Occultation of Ain 3.53 by moon 3% illuminated at phase= 340 degrees
06/19/2020 06:46:03.0 Geocentric minimum 0.7 degrees
Global start/end: 06/19/2020 04:58:44.3   and   06/19/2020 08:33:17.8
Mid-occultation observing point (lat., long.) 67.164 -75.448

Eclipse of the Sun by moon 0% illuminated at phase= 360 degrees
06/20/2020 23:40:06.0 Geocentric minimum 0.1 degrees
Global start/end: 06/20/2020 20:46:00.5   and   06/21/2020 02:34:03.6
Mid-occultation observing point (lat., long.) 30.516 79.674

Occultation of 42 omega Gem 5.2 by moon 1% illuminated at phase= 13 degrees
06/22/2020 01:39:41.3 Geocentric minimum 0.1 degrees
Global start/end: 06/21/2020 23:28:56.8   and   06/22/2020 03:50:25.0
Mid-occultation observing point (lat., long.) 15.685 64.819

Occultation of 77 kappa Gem 3.57 by moon 4% illuminated at phase= 22 degrees
06/22/2020 18:51:21.3 Geocentric minimum 0.9 degrees
Global start/end: 06/22/2020 17:18:11.8   and   06/22/2020 20:24:28.7
Mid-occultation observing point (lat., long.) -39.127 170.693
At HVO the miss angle is 4635.0 arc-sec at 06/22/2020 19:38:31.6

Occultation of Asellus Borealis 4.66 by moon 9% illuminated at phase= 35 degrees
06/23/2020 19:23:21.1 Geocentric minimum 0.1 degrees
Global start/end: 06/23/2020 17:13:54.5   and   06/23/2020 21:32:48.0
Mid-occultation observing point (lat., long.) 28.145 -175.97
At HVO the miss angle is 1303.6 arc-sec at 06/23/2020 20:15:25.3

Occultation of 30 eta Leo 3.48 by moon 21% illuminated at phase= 54 degrees
06/25/2020 06:58:20.3 Geocentric minimum 0.3 degrees
Global start/end: 06/25/2020 04:54:09.3   and   06/25/2020 09:02:30.7
Mid-occultation observing point (lat., long.) -2.607 22.258

Occultation of 46 Leo 5.43 by moon 25% illuminated at phase= 60 degrees
06/25/2020 18:13:35.3 Geocentric minimum 0.2 degrees
Global start/end: 06/25/2020 16:06:57.0   and   06/25/2020 20:20:13.5
Mid-occultation observing point (lat., long.) 26.646 -129.761
At HVO the miss angle is 501.2 arc-sec at 06/25/2020 18:28:06.2

Occultation of 3 nu Vir 4.04 by moon 40% illuminated at phase= 78 degrees
06/27/2020 03:50:51.9 Geocentric minimum 0.7 degrees
Global start/end: 06/27/2020 02:02:46.1   and   06/27/2020 05:38:56.6
Mid-occultation observing point (lat., long.) 45.197 120.287

Occultation of 8 pi Vir 4.65 by moon 43% illuminated at phase= 81 degrees
06/27/2020 09:37:15.8 Geocentric minimum 0.9 degrees
Global start/end: 06/27/2020 08:05:52.1   and   06/27/2020 11:08:38.7
Mid-occultation observing point (lat., long.) -49.912 -18.421

Occultation of 16 Vir 4.97 by moon 47% illuminated at phase= 87 degrees
06/27/2020 19:24:50.6 Geocentric minimum 0.2 degrees
Global start/end: 06/27/2020 17:18:35.0   and   06/27/2020 21:31:05.7
Mid-occultation observing point (lat., long.) 13.878 -122.708
At HVO the miss angle is 857.5 arc-sec at 06/27/2020 19:13:51.8

Occultation of 46 theta Lib 4.13 by moon 88% illuminated at phase= 139 degrees
07/01/2020 18:29:36.2 Geocentric minimum 0.9 degrees
Global start/end: 07/01/2020 17:01:42.5   and   07/01/2020 19:57:30.5
Mid-occultation observing point (lat., long.) -73.516 -131.524

Occultation of 4 psi Oph 4.48 by moon 92% illuminated at phase= 147 degrees
07/02/2020 07:43:00.4 Geocentric minimum 0.4 degrees
Global start/end: 07/02/2020 05:40:59.5   and   07/02/2020 09:45:01.9
Mid-occultation observing point (lat., long.) 1.218 109.682

Occultation of 52 Sgr 4.59 by moon 100% illuminated at phase= 188 degrees
07/05/2020 13:05:50.9 Geocentric minimum 1.2 degrees
Global start/end: 07/05/2020 12:41:33.0   and   07/05/2020 13:30:09.0
Mid-occultation observing point (lat., long.) 66.085 57.099

Occultation of 71 tau Aqr 4.05 by moon 81% illuminated at phase= 231 degrees
07/09/2020 04:25:11.4 Geocentric minimum 0.7 degrees
Global start/end: 07/09/2020 02:38:41.7   and   07/09/2020 06:11:45.4
Mid-occultation observing point (lat., long.) 36.36 -137.028

Occultation of 91 psi^1 Aqr 4.24 by moon 76% illuminated at phase= 238 degrees
07/09/2020 19:26:14.9 Geocentric minimum 1.1 degrees
Global start/end: 07/09/2020 18:49:48.2   and   07/09/2020 20:02:42.0
Mid-occultation observing point (lat., long.) -66.088 138.039

Occultation of 93 psi^2 Aqr 4.41 by moon 76% illuminated at phase= 239 degrees
07/09/2020 20:16:27.7 Geocentric minimum 0.8 degrees
Global start/end: 07/09/2020 18:42:10.0   and   07/09/2020 21:50:48.5
Mid-occultation observing point (lat., long.) -65.714 69.594

Occultation of 95 psi^3 Aqr 4.99 by moon 76% illuminated at phase= 239 degrees
07/09/2020 20:26:12.7 Geocentric minimum 0.4 degrees
Global start/end: 07/09/2020 18:14:45.8   and   07/09/2020 22:37:43.5
Mid-occultation observing point (lat., long.) -30.63 19.654

Occultation of 30 YY Psc 4.37 by moon 68% illuminated at phase= 249 degrees
07/10/2020 18:46:05.9 Geocentric minimum 0.5 degrees
Global start/end: 07/10/2020 16:38:47.6   and   07/10/2020 20:53:27.3
Mid-occultation observing point (lat., long.) 22.414 32.012

Occultation of 33 BC Psc 4.61 by moon 67% illuminated at phase= 250 degrees
07/10/2020 20:33:30.7 Geocentric minimum 0.5 degrees
Global start/end: 07/10/2020 18:29:11.6   and   07/10/2020 22:37:52.7
Mid-occultation observing point (lat., long.) 26.356 3.916

Occultation of 89 Psc 5.13 by moon 51% illuminated at phase= 269 degrees
07/12/2020 13:36:38.1 Geocentric minimum 0.6 degrees
Global start/end: 07/12/2020 11:40:51.0   and   07/12/2020 15:32:25.3
Mid-occultation observing point (lat., long.) -37.597 160.77

Occultation of 106 nu Psc 4.45 by moon 46% illuminated at phase= 274 degrees
07/13/2020 02:03:43.0 Geocentric minimum 0.0 degrees
Global start/end: 07/12/2020 23:43:51.5   and   07/13/2020 04:23:34.3
Mid-occultation observing point (lat., long.) 6.262 -42.292
At HVO the miss angle is 1947.6 arc-sec at 07/13/2020 01:33:00.8

Occultation of 65 xi^1 Cet 4.36 by moon 40% illuminated at phase= 282 degrees
07/13/2020 19:16:36.8 Geocentric minimum 0.0 degrees
Global start/end: 07/13/2020 16:57:06.4   and   07/13/2020 21:36:06.4
Mid-occultation observing point (lat., long.) 8.164 67.296

Occultation of Ain 3.53 by moon 15% illuminated at phase= 314 degrees
07/16/2020 15:09:53.5 Geocentric minimum 0.7 degrees
Global start/end: 07/16/2020 13:24:40.3   and   07/16/2020 16:55:01.9
Mid-occultation observing point (lat., long.) 69.416 127.181

Occultation of 102 iota Tau 4.62 by moon 11% illuminated at phase= 322 degrees
07/17/2020 07:10:15.5 Geocentric minimum 0.1 degrees
Global start/end: 07/17/2020 04:56:10.2   and   07/17/2020 09:24:17.9
Mid-occultation observing point (lat., long.) 28.572 -73.79
At HVO the miss angle is 427.4 arc-sec at 07/17/2020 06:38:30.3

Occultation of 1 Gem 4.16 by moon 5% illuminated at phase= 335 degrees
07/18/2020 09:35:52.9 Geocentric minimum 0.4 degrees
Global start/end: 07/18/2020 07:29:41.7   and   07/18/2020 11:41:59.3
Mid-occultation observing point (lat., long.) 46.572 -97.225

Occultation of Mebsuta 3.06 by moon 2% illuminated at phase= 343 degrees
07/19/2020 02:15:39.6 Geocentric minimum 1.0 degrees
Global start/end: 07/19/2020 01:09:34.6   and   07/19/2020 03:21:42.4
Mid-occultation observing point (lat., long.) -66.234 26.503

Occultation of 30 eta Leo 3.48 by moon 6% illuminated at phase= 28 degrees
07/22/2020 13:37:44.4 Geocentric minimum 0.4 degrees
Global start/end: 07/22/2020 11:36:50.4   and   07/22/2020 15:38:37.7
Mid-occultation observing point (lat., long.) -5.867 -105.516
At HVO the miss angle is 1856.5 arc-sec at 07/22/2020 12:57:30.4

Occultation of 46 Leo 5.43 by moon 9% illuminated at phase= 34 degrees
07/23/2020 00:37:55.9 Geocentric minimum 0.2 degrees
Global start/end: 07/22/2020 22:31:49.7   and   07/23/2020 02:44:02.5
Mid-occultation observing point (lat., long.) 22.92 105.715

Occultation of 3 nu Vir 4.04 by moon 19% illuminated at phase= 52 degrees
07/24/2020 09:36:11.2 Geocentric minimum 0.6 degrees
Global start/end: 07/24/2020 07:43:56.4   and   07/24/2020 11:28:26.5
Mid-occultation observing point (lat., long.) 39.526 2.389

Occultation of 8 pi Vir 4.65 by moon 22% illuminated at phase= 55 degrees
07/24/2020 15:17:16.0 Geocentric minimum 1.0 degrees
Global start/end: 07/24/2020 13:55:22.1   and   07/24/2020 16:39:10.1
Mid-occultation observing point (lat., long.) -59.826 -147.258
At HVO the miss angle is 4190.7 arc-sec at 07/24/2020 14:05:43.1

Occultation of 16 Vir 4.97 by moon 26% illuminated at phase= 61 degrees
07/25/2020 00:57:27.7 Geocentric minimum 0.1 degrees
Global start/end: 07/24/2020 22:50:54.1   and   07/25/2020 03:04:02.2
Mid-occultation observing point (lat., long.) 9.008 125.06

Occultation of 46 theta Lib 4.13 by moon 70% illuminated at phase= 113 degrees
07/29/2020 00:32:53.4 Geocentric minimum 1.0 degrees
Global start/end: 07/28/2020 23:14:59.2   and   07/29/2020 01:50:48.5
Mid-occultation observing point (lat., long.) -65.84 41.801

Occultation of Acrab 2.56 by moon 72% illuminated at phase= 117 degrees
07/29/2020 06:35:42.5 Geocentric minimum 1.2 degrees
Global start/end: 07/29/2020 06:01:03.0   and   07/29/2020 07:10:22.3
Mid-occultation observing point (lat., long.) 66.1 131.202

Occultation of 8 beta^2 Sco 4.9 by moon 72% illuminated at phase= 117 degrees
07/29/2020 06:35:43.6 Geocentric minimum 1.2 degrees
Global start/end: 07/29/2020 05:59:41.1   and   07/29/2020 07:11:46.2
Mid-occultation observing point (lat., long.) 66.103 131.204

Occultation of 4 psi Oph 4.48 by moon 76% illuminated at phase= 121 degrees
07/29/2020 14:02:29.2 Geocentric minimum 0.3 degrees
Global start/end: 07/29/2020 11:56:55.9   and   07/29/2020 16:08:03.1
Mid-occultation observing point (lat., long.) -3.171 -13.106

Occultation of 9 omega Oph 4.45 by moon 77% illuminated at phase= 123 degrees
07/29/2020 17:47:58.5 Geocentric minimum 1.2 degrees
Global start/end: 07/29/2020 17:32:22.7   and   07/29/2020 18:03:34.3
Mid-occultation observing point (lat., long.) 66.072 -37.397

Occultation of 52 Sgr 4.59 by moon 98% illuminated at phase= 162 degrees
08/01/2020 20:58:01.1 Geocentric minimum 1.2 degrees
Global start/end: 08/01/2020 20:36:25.4   and   08/01/2020 21:19:36.9
Mid-occultation observing point (lat., long.) 66.058 -88.123

Occultation of 71 tau Aqr 4.05 by moon 95% illuminated at phase= 205 degrees
08/05/2020 12:37:22.4 Geocentric minimum 0.8 degrees
Global start/end: 08/05/2020 11:00:56.8   and   08/05/2020 14:13:51.3
Mid-occultation observing point (lat., long.) 46.192 66.085

Occultation of 91 psi^1 Aqr 4.24 by moon 92% illuminated at phase= 212 degrees
08/06/2020 03:34:21.7 Geocentric minimum 1.0 degrees
Global start/end: 08/06/2020 02:27:34.1   and   08/06/2020 04:41:10.8
Mid-occultation observing point (lat., long.) -65.995 -11.042

Occultation of 93 psi^2 Aqr 4.41 by moon 92% illuminated at phase= 213 degrees
08/06/2020 04:24:14.4 Geocentric minimum 0.7 degrees
Global start/end: 08/06/2020 02:38:35.7   and   08/06/2020 06:09:56.7
Mid-occultation observing point (lat., long.) -56.995 -102.74

Occultation of 95 psi^3 Aqr 4.99 by moon 92% illuminated at phase= 213 degrees
08/06/2020 04:33:50.0 Geocentric minimum 0.2 degrees
Global start/end: 08/06/2020 02:19:40.4   and   08/06/2020 06:48:02.9
Mid-occultation observing point (lat., long.) -24.163 -132.483
At HVO the miss angle is 1490.5 arc-sec at 08/06/2020 06:16:54.4

Occultation of 30 YY Psc 4.37 by moon 87% illuminated at phase= 223 degrees
08/07/2020 02:46:03.2 Geocentric minimum 0.6 degrees
Global start/end: 08/07/2020 00:46:59.4   and   08/07/2020 04:45:10.5
Mid-occultation observing point (lat., long.) 31.071 -119.787

---For observations at HVO:
08/07/2020 02:49:57.2 Start Total 40.01 39.87 (az180) -18.2 ***
08/07/2020 03:32:07.0 OCCULTATION MID-POINT 39.14 39.14 (az193) -12.6 ***
08/07/2020 04:13:32.1 End Total 36.63 36.83 (az206) -6.5 ***

Occultation of 33 BC Psc 4.61 by moon 86% illuminated at phase= 224 degrees
08/07/2020 04:32:53.2 Geocentric minimum 0.6 degrees
Global start/end: 08/07/2020 02:37:55.6   and   08/07/2020 06:27:54.0
Mid-occultation observing point (lat., long.) 35.538 -148.561

Occultation of Mars -1.3 by moon 72% illuminated at phase= 244 degrees
08/09/2020 01:38:32.4 Geocentric minimum 0.7 degrees
Global start/end: 08/08/2020 23:43:06.9   and   08/09/2020 03:33:58.7
Mid-occultation observing point (lat., long.) -40.296 -42.392
At HVO the miss angle is 4090.2 arc-sec at 08/09/2020 02:00:18.3

Occultation of 89 Psc 5.13 by moon 73% illuminated at phase= 243 degrees
08/08/2020 21:28:16.0 Geocentric minimum 0.5 degrees
Global start/end: 08/08/2020 19:22:14.7   and   08/08/2020 23:34:18.9
Mid-occultation observing point (lat., long.) -26.759 8.987

Occultation of 106 nu Psc 4.45 by moon 69% illuminated at phase= 248 degrees
08/09/2020 09:55:53.2 Geocentric minimum 0.2 degrees
Global start/end: 08/09/2020 07:37:26.0   and   08/09/2020 12:14:21.5
Mid-occultation observing point (lat., long.) 15.302 168.688

Occultation of 65 xi^1 Cet 4.36 by moon 62% illuminated at phase= 256 degrees
08/10/2020 03:12:31.8 Geocentric minimum 0.1 degrees
Global start/end: 08/10/2020 00:53:44.8   and   08/10/2020 05:31:19.1
Mid-occultation observing point (lat., long.) 17.472 -82.609
At HVO the miss angle is 727.2 arc-sec at 08/10/2020 03:19:19.5

Occultation of Ain 3.53 by moon 35% illuminated at phase= 288 degrees
08/12/2020 23:49:32.5 Geocentric minimum 0.9 degrees
Global start/end: 08/12/2020 22:20:06.6   and   08/13/2020 01:18:54.9
Mid-occultation observing point (lat., long.) 76.309 -104.696

Occultation of 102 iota Tau 4.62 by moon 29% illuminated at phase= 295 degrees
08/13/2020 16:03:06.1 Geocentric minimum 0.2 degrees
Global start/end: 08/13/2020 13:50:07.4   and   08/13/2020 18:16:00.6
Mid-occultation observing point (lat., long.) 36.774 124.05

Occultation of 1 Gem 4.16 by moon 19% illuminated at phase= 308 degrees
08/14/2020 18:47:51.9 Geocentric minimum 0.5 degrees
Global start/end: 08/14/2020 16:45:18.6   and   08/14/2020 20:50:19.1
Mid-occultation observing point (lat., long.) 53.902 96.565

Occultation of Mebsuta 3.06 by moon 14% illuminated at phase= 317 degrees
08/15/2020 11:35:28.3 Geocentric minimum 1.0 degrees
Global start/end: 08/15/2020 10:15:06.3   and   08/15/2020 12:55:46.4
Mid-occultation observing point (lat., long.) -66.236 -140.742
At HVO the miss angle is 4056.4 arc-sec at 08/15/2020 12:13:03.9

Occultation of 42 omega Gem 5.2 by moon 11% illuminated at phase= 321 degrees
08/15/2020 19:10:47.8 Geocentric minimum 0.1 degrees
Global start/end: 08/15/2020 16:59:35.4   and   08/15/2020 21:21:57.7
Mid-occultation observing point (lat., long.) 20.091 108.17

Occultation of 77 kappa Gem 3.57 by moon 7% illuminated at phase= 330 degrees
08/16/2020 12:09:11.3 Geocentric minimum 0.8 degrees
Global start/end: 08/16/2020 10:32:16.6 and 08/16/2020 13:46:00.9
Mid-occultation observing point (lat., long.) -33.667 -142.183
At HVO the miss angle is 3641.3 arc-sec at 08/16/2020 12:33:09.1

Occultation of Asellus Borealis 4.66 by moon 2% illuminated at phase= 342 degrees
08/17/2020 12:06:34.7 Geocentric minimum 0.1 degrees
Global start/end: 08/17/2020 09:58:54.8 and 08/17/2020 14:14:12.8
Mid-occultation observing point (lat., long.) 26.903 -120.949
At HVO the miss angle is 300.9 arc-sec at 08/17/2020 12:20:44.3

Occultation of 3 nu Vir 4.04 by moon 5% illuminated at phase= 26 degrees
08/20/2020 17:14:10.5 Geocentric minimum 0.5 degrees
Global start/end: 08/20/2020 15:17:56.4 and 08/20/2020 19:10:24.7
Mid-occultation observing point (lat., long.) 31.935 -144.051
At HVO the miss angle is 377.3 arc-sec at 08/20/2020 17:41:41.1

Occultation of 8 pi Vir 4.65 by moon 6% illuminated at phase= 29 degrees
08/20/2020 22:45:10.8 Geocentric minimum 1.1 degrees
Global start/end: 08/20/2020 21:40:06.6 and 08/20/2020 23:50:15.1
Mid-occultation observing point (lat., long.) -65.995 45.672

Occultation of 16 Vir 4.97 by moon 9% illuminated at phase= 35 degrees
08/21/2020 08:09:02.2 Geocentric minimum 0.0 degrees
Global start/end: 08/21/2020 06:04:01.3 and 08/21/2020 10:14:04.0
Mid-occultation observing point (lat., long.) 1.538 -13.062

Occultation of 98 kappa Vir 4.18 by moon 28% illuminated at phase= 64 degrees
08/23/2020 11:16:29.9 Geocentric minimum 1.1 degrees
Global start/end: 08/23/2020 10:11:29.3 and 08/23/2020 12:21:31.9
Mid-occultation observing point (lat., long.) 66.025 36.16

Occultation of 46 theta Lib 4.13 by moon 48% illuminated at phase= 87 degrees
08/25/2020 05:55:20.1 Geocentric minimum 1.2 degrees
Global start/end: 08/25/2020 05:15:24.4 and 08/25/2020 06:35:16.4
Mid-occultation observing point (lat., long.) -65.842 -65.662

Occultation of Acrab 2.56 by moon 51% illuminated at phase= 91 degrees
08/25/2020 11:57:00.0 Geocentric minimum 1.0 degrees
Global start/end: 08/25/2020 10:40:38.5 and 08/25/2020 13:13:23.7
Mid-occultation observing point (lat., long.) 66.136 23.944

Occultation of 8 beta^2 Sco 4.9 by moon 51% illuminated at phase= 91 degrees
08/25/2020 11:57:01.1 Geocentric minimum 1.0 degrees
Global start/end: 08/25/2020 10:40:07.7 and 08/25/2020 13:13:56.6
Mid-occultation observing point (lat., long.) 66.139 23.946

Occultation of 4 psi Oph 4.48 by moon 54% illuminated at phase= 95 degrees
08/25/2020 19:23:38.0 Geocentric minimum 0.1 degrees
Global start/end: 08/25/2020 17:14:40.5 and 08/25/2020 21:32:36.4
Mid-occultation observing point (lat., long.) -14.377 -122.905
At HVO the miss angle is 1916.9 arc-sec at 08/25/2020 19:23:44.5

Occultation of 9 omega Oph 4.45 by moon 56% illuminated at phase= 97 degrees
08/25/2020 23:09:19.0 Geocentric minimum 1.0 degrees
Global start/end: 08/25/2020 21:59:06.3 and 08/26/2020 00:19:33.5
Mid-occultation observing point (lat., long.) 66.11 -144.718

Occultation of 52 Sgr 4.59 by moon 86% illuminated at phase= 136 degrees
08/29/2020 03:09:34.2 Geocentric minimum 1.1 degrees
Global start/end: 08/29/2020 02:13:09.4 and 08/29/2020 04:05:59.9
Mid-occultation observing point (lat., long.) 66.018 151.727

Occultation of 71 tau Aqr 4.05 by moon 100% illuminated at phase= 179 degrees
09/01/2020 19:50:23.2 Geocentric minimum 0.9 degrees
Global start/end: 09/01/2020 18:20:41.0   and   09/01/2020 21:20:07.4
Mid-occultation observing point (lat., long.) 54.274 -77.606

---For observations at HVO:
09/01/2020 18:37:38.5 Start Total -1.7 -1.56 (az107) -1.9
09/01/2020 19:09:55.6 OCCULTATION MID-POINT 3.42 3.45 (az112) -8.2 ***
09/01/2020 19:43:49.7 End Total 8.81 8.76 (az118) -13.8 ***

Occultation of 91 psi^1 Aqr 4.24 by moon 100% illuminated at phase= 186 degrees
09/02/2020 10:51:16.4 Geocentric minimum 0.9 degrees
Global start/end: 09/02/2020 09:30:29.5   and   09/02/2020 12:12:04.9
Mid-occultation observing point (lat., long.) -65.813 -147.399

Occultation of 93 psi^2 Aqr 4.41 by moon 100% illuminated at phase= 186 degrees
09/02/2020 11:41:09.0 Geocentric minimum 0.7 degrees
Global start/end: 09/02/2020 09:48:31.2   and   09/02/2020 13:33:49.3
Mid-occultation observing point (lat., long.) -50.893 112.965

Occultation of 95 psi^3 Aqr 4.99 by moon 100% illuminated at phase= 186 degrees
09/02/2020 11:50:33.3 Geocentric minimum 0.2 degrees
Global start/end: 09/02/2020 09:34:43.5   and   09/02/2020 14:06:24.7
Mid-occultation observing point (lat., long.) -19.415 89.251

Occultation of 30 YY Psc 4.37 by moon 98% illuminated at phase= 197 degrees
09/03/2020 10:03:27.0 Geocentric minimum 0.7 degrees
Global start/end: 09/03/2020 08:14:17.8   and   09/03/2020 11:52:38.7
Mid-occultation observing point (lat., long.) 40.443 97.224

Occultation of 33 BC Psc 4.61 by moon 98% illuminated at phase= 198 degrees
09/03/2020 11:50:12.6 Geocentric minimum 0.8 degrees
Global start/end: 09/03/2020 10:06:45.9   and   09/03/2020 13:33:41.6
Mid-occultation observing point (lat., long.) 45.988 66.309

Occultation of 89 Psc 5.13 by moon 90% illuminated at phase= 216 degrees
09/05/2020 04:42:56.1 Geocentric minimum 0.3 degrees
Global start/end: 09/05/2020 02:29:01.5   and   09/05/2020 06:56:52.7
Mid-occultation observing point (lat., long.) -15.194 -132.486
At HVO the miss angle is 1410.4 arc-sec at 09/05/2020 06:21:06.6

Occultation of Mars -1.9 by moon 86% illuminated at phase= 224 degrees
09/05/2020 21:44:47.8 Geocentric minimum 0.0 degrees
Global start/end: 09/05/2020 19:24:48.3   and   09/06/2020 00:04:48.1
Mid-occultation observing point (lat., long.) 8.281 -29.992
At HVO the miss angle is 1948.8 arc-sec at 09/05/2020 21:07:20.2

Occultation of 106 nu Psc 4.45 by moon 87% illuminated at phase= 222 degrees
09/05/2020 17:10:04.0 Geocentric minimum 0.4 degrees
Global start/end: 09/05/2020 14:57:27.7   and   09/05/2020 19:22:42.1
Mid-occultation observing point (lat., long.) 27.05 27.252

Occultation of 65 xi^1 Cet 4.36 by moon 82% illuminated at phase= 230 degrees
09/06/2020 10:28:07.7 Geocentric minimum 0.4 degrees
Global start/end: 09/06/2020 08:15:11.6   and   09/06/2020 12:41:04.8
Mid-occultation observing point (lat., long.) 30.316 135.156

Occultation of Ain 3.53 by moon 58% illuminated at phase= 261 degrees
09/09/2020 07:45:05.6 Geocentric minimum 1.1 degrees
Global start/end: 09/09/2020 07:12:34.9   and   09/09/2020 08:17:36.0
Mid-occultation observing point (lat., long.) 65.79 71.739

Occultation of 102 iota Tau 4.62 by moon 51% illuminated at phase= 269 degrees
09/10/2020 00:16:50.9 Geocentric minimum 0.5 degrees
Global start/end: 09/09/2020 22:11:38.2   and   09/10/2020 02:21:59.3
Mid-occultation observing point (lat., long.) 52.726 -31.913

---For observations at HVO:
09/09/2020 23:10:34.4 Start Total 10.18 10.0 (az70) -40.4 ***
09/09/2020 23:17:02.6 OCCULTATION MID-POINT 11.27 11.06 (az71) -40.6 ***
09/09/2020 23:23:34.3 End Total 12.37 12.13 (az72) -40.8 ***

Occultation of 1 Gem 4.16 by moon 40% illuminated at phase= 282 degrees
09/11/2020 03:36:17.9 Geocentric minimum 0.7 degrees
Global start/end: 09/11/2020 01:47:00.3   and   09/11/2020 05:25:29.9
Mid-occultation observing point (lat., long.) 71.891 -69.317

---For observations at HVO:
09/11/2020 02:08:35.5 Start Total 32.47 32.73 (az88) -32.4 ***
09/11/2020 02:30:15.2 OCCULTATION MID-POINT 36.36 36.52 (az92) -29.7 ***
09/11/2020 02:52:38.9 End Total 40.38 40.43 (az96) -26.6 ***

Occultation of Mebsuta 3.06 by moon 33% illuminated at phase= 290 degrees
09/11/2020 20:46:16.6 Geocentric minimum 0.8 degrees
Global start/end: 09/11/2020 19:02:12.4   and   09/11/2020 22:30:14.8
Mid-occultation observing point (lat., long.) -28.304 53.544

Occultation of 42 omega Gem 5.2 by moon 30% illuminated at phase= 294 degrees
09/12/2020 04:31:51.2 Geocentric minimum 0.1 degrees
Global start/end: 09/12/2020 02:19:27.6   and   09/12/2020 06:44:11.6
Mid-occultation observing point (lat., long.) 32.042 -58.735
At HVO the miss angle is 219.4 arc-sec at 09/12/2020 03:30:11.3

Occultation of 77 kappa Gem 3.57 by moon 23% illuminated at phase= 303 degrees
09/12/2020 21:50:48.5 Geocentric minimum 0.6 degrees
Global start/end: 09/12/2020 19:59:17.0   and   09/12/2020 23:42:13.2
Mid-occultation observing point (lat., long.) -17.985 47.023

Occultation of Asellus Borealis 4.66 by moon 14% illuminated at phase= 316 degrees
09/13/2020 22:11:25.1 Geocentric minimum 0.2 degrees
Global start/end: 09/13/2020 20:04:25.9   and   09/14/2020 00:18:19.8
Mid-occultation observing point (lat., long.) 34.5 62.801

Occultation of 30 eta Leo 3.48 by moon 5% illuminated at phase= 335 degrees
09/15/2020 08:39:12.4 Geocentric minimum 0.4 degrees
Global start/end: 09/15/2020 06:39:07.2   and   09/15/2020 10:39:13.1
Mid-occultation observing point (lat., long.) -5.13 -84.805
At HVO the miss angle is 1630.3 arc-sec at 09/15/2020 07:36:51.6

Occultation of 46 Leo 5.43 by moon 3% illuminated at phase= 341 degrees
09/15/2020 19:23:05.8 Geocentric minimum 0.1 degrees
Global start/end: 09/15/2020 17:18:20.7   and   09/15/2020 21:27:48.9
Mid-occultation observing point (lat., long.) 20.689 129.593

Occultation of 98 kappa Vir 4.18 by moon 10% illuminated at phase= 37 degrees
09/19/2020 19:17:01.9 Geocentric minimum 0.9 degrees
Global start/end: 09/19/2020 17:47:33.8   and   09/19/2020 20:46:32.6
Mid-occultation observing point (lat., long.) 46.239 -150.817

---For observations at HVO:
09/19/2020 19:28:00.5 Start Total 0.56 0.44 (az256) -17.3 ***
09/19/2020 19:56:01.4 OCCULTATION MID-POINT -4.81 -4.84 (az260) -21.9
09/19/2020 20:23:03.9 End Total -9.74 -9.65 (az265) -26.2

Occultation of Acrab 2.56 by moon 28% illuminated at phase= 64 degrees
09/21/2020 18:27:33.9 Geocentric minimum 0.8 degrees
Global start/end: 09/21/2020 16:45:44.4   and   09/21/2020 20:09:28.2
Mid-occultation observing point (lat., long.) 28.351 -128.197

---For observations at HVO:
09/21/2020 18:26:12.5 Start Total 17.26 17.06 (az217) -7.2 ***
09/21/2020 18:54:56.3 OCCULTATION MID-POINT 13.93 13.77 (az223) -12.2 ***
09/21/2020 19:22:47.1 End Total 10.33 10.25 (az229) -17.1 ***

Occultation of 8 beta^2 Sco 4.9 by moon 28% illuminated at phase= 64 degrees
09/21/2020 18:27:34.9 Geocentric minimum 0.8 degrees
Global start/end: 09/21/2020 16:45:28.3   and   09/21/2020 20:09:46.3
Mid-occultation observing point (lat., long.) 28.028 -128.309

---For observations at HVO:
09/21/2020 18:26:38.6 Start Total 17.22 17.01 (az218) -7.2 ***
09/21/2020 18:54:58.2 OCCULTATION MID-POINT 13.93 13.77 (az223) -12.2 ***
09/21/2020 19:22:26.1 End Total 10.38 10.3 (az229) -17.0 ***

Occultation of 4 psi Oph 4.48 by moon 31% illuminated at phase= 68 degrees
09/22/2020 01:42:47.2 Geocentric minimum 0.1 degrees
Global start/end: 09/21/2020 23:35:54.4   and   09/22/2020 03:49:42.7
Mid-occultation observing point (lat., long.) -28.676 111.545

Occultation of 9 omega Oph 4.45 by moon 33% illuminated at phase= 70 degrees
09/22/2020 05:23:10.5 Geocentric minimum 0.8 degrees
Global start/end: 09/22/2020 03:43:41.4   and   09/22/2020 07:02:44.3
Mid-occultation observing point (lat., long.) 30.633 73.039

Occultation of 44 Oph 4.16 by moon 43% illuminated at phase= 82 degrees
09/23/2020 03:24:16.9 Geocentric minimum 1.1 degrees
Global start/end: 09/23/2020 02:19:35.4   and   09/23/2020 04:29:00.7
Mid-occultation observing point (lat., long.) 65.861 123.343

Occultation of Kaus Borealis 2.82 by moon 54% illuminated at phase= 95 degrees
09/24/2020 04:14:26.0 Geocentric minimum 1.0 degrees
Global start/end: 09/24/2020 03:03:06.6   and   09/24/2020 05:25:47.8
Mid-occultation observing point (lat., long.) 65.881 109.69

Occultation of 52 Sgr 4.59 by moon 67% illuminated at phase= 109 degrees
09/25/2020 08:35:26.1 Geocentric minimum 0.9 degrees
Global start/end: 09/25/2020 07:03:30.5   and   09/25/2020 10:07:24.9
Mid-occultation observing point (lat., long.) 42.645 49.281

Occultation of 71 tau Aqr 4.05 by moon 94% illuminated at phase= 152 degrees
09/29/2020 01:58:52.4 Geocentric minimum 0.8 degrees
Global start/end: 09/29/2020 00:21:01.7   and   09/29/2020 03:36:44.7
Mid-occultation observing point (lat., long.) 45.21 172.114

Occultation of 30 YY Psc 4.37 by moon 99% illuminated at phase= 170 degrees
09/30/2020 16:27:32.9 Geocentric minimum 0.7 degrees
Global start/end: 09/30/2020 14:39:54.3   and   09/30/2020 18:15:12.8
Mid-occultation observing point (lat., long.) 41.934 -27.214

Occultation of 91 psi^1 Aqr 4.24 by moon 97% illuminated at phase= 159 degrees
09/29/2020 17:07:58.8 Geocentric minimum 1.0 degrees
Global start/end: 09/29/2020 15:52:58.5   and   09/29/2020 18:23:00.0
Mid-occultation observing point (lat., long.) -65.598 91.303

Occultation of 93 psi^2 Aqr 4.41 by moon 97% illuminated at phase= 160 degrees
09/29/2020 17:58:05.0 Geocentric minimum 0.7 degrees
Global start/end: 09/29/2020 16:07:48.0   and   09/29/2020 19:48:23.4
Mid-occultation observing point (lat., long.) -53.251 -4.821

Occultation of 95 psi^3 Aqr 4.99 by moon 97% illuminated at phase= 160 degrees
09/29/2020 18:07:18.6 Geocentric minimum 0.2 degrees
Global start/end: 09/29/2020 15:51:30.1   and   09/29/2020 20:23:07.4
Mid-occultation observing point (lat., long.) -21.225 -30.91

Occultation of 33 BC Psc 4.61 by moon 99% illuminated at phase= 171 degrees
09/30/2020 18:14:44.2 Geocentric minimum 0.8 degrees
Global start/end: 09/30/2020 16:33:30.3   and   09/30/2020 19:55:59.2
Mid-occultation observing point (lat., long.) 48.055 -59.281

---For observations at HVO:
09/30/2020 17:04:46.4 Start Total -6.47 -6.43 (az92) 4.7
09/30/2020 17:34:11.5 OCCULTATION MID-POINT -0.55 -0.6 (az97) -0.2
09/30/2020 18:04:53.2 End Total 4.5 4.37 (az102) -6.3 ***

Occultation of 89 Psc 5.13 by moon 99% illuminated at phase= 190 degrees
10/02/2020 11:12:16.5 Geocentric minimum 0.2 degrees
Global start/end: 10/02/2020 08:55:39.3   and   10/02/2020 13:28:54.7
Mid-occultation observing point (lat., long.) -8.966 100.459

Occultation of Mars -2.5 by moon 99% illuminated at phase= 194 degrees
10/02/2020 21:00:08.1 Geocentric minimum 0.7 degrees
Global start/end: 10/02/2020 19:09:26.9   and   10/02/2020 22:50:49.9
Mid-occultation observing point (lat., long.) -37.164 -26.543
At HVO the miss angle is 4244.3 arc-sec at 10/02/2020 20:46:28.4

Occultation of 106 nu Psc 4.45 by moon 98% illuminated at phase= 195 degrees
10/02/2020 23:38:41.2 Geocentric minimum 0.5 degrees
Global start/end: 10/02/2020 21:32:28.6   and   10/03/2020 01:44:54.8
Mid-occultation observing point (lat., long.) 35.089 -101.862

---For observations at HVO:
10/02/2020 23:12:51.2 Start Total 46.42 46.28 (az145) -49.5 ***
10/02/2020 23:51:24.2 OCCULTATION MID-POINT 49.68 49.6 (az159) -50.0 ***
10/03/2020 00:30:41.6 End Total 51.35 51.39 (az174) -48.7 ***

Occultation of 65 xi^1 Cet 4.36 by moon 96% illuminated at phase= 203 degrees
10/03/2020 16:55:50.6 Geocentric minimum 0.5 degrees
Global start/end: 10/03/2020 14:51:03.1   and   10/03/2020 19:00:38.9
Mid-occultation observing point (lat., long.) 40.381 4.698

Occultation of 102 iota Tau 4.62 by moon 73% illuminated at phase= 242 degrees
10/07/2020 07:10:15.3 Geocentric minimum 0.7 degrees
Global start/end: 10/07/2020 05:23:21.4   and   10/07/2020 08:57:06.8
Mid-occultation observing point (lat., long.) 73.081 176.596
At HVO the miss angle is 359.2 arc-sec at 10/07/2020 08:39:09.0

Occultation of 1 Gem 4.16 by moon 63% illuminated at phase= 255 degrees
10/08/2020 10:59:43.3 Geocentric minimum 1.0 degrees
Global start/end: 10/08/2020 09:41:24.6   and   10/08/2020 12:17:59.6
Mid-occultation observing point (lat., long.) 65.335 -5.821

Occultation of Mebsuta 3.06 by moon 56% illuminated at phase= 264 degrees
10/09/2020 04:34:28.0 Geocentric minimum 0.5 degrees
Global start/end: 10/09/2020 02:31:10.0   and   10/09/2020 06:37:41.5
Mid-occultation observing point (lat., long.) -7.016 -90.633
At HVO the miss angle is 2031.3 arc-sec at 10/09/2020 04:18:32.7

Occultation of 42 omega Gem 5.2 by moon 52% illuminated at phase= 268 degrees
10/09/2020 12:32:43.6 Geocentric minimum 0.4 degrees
Global start/end: 10/09/2020 10:24:52.9   and   10/09/2020 14:40:29.8
Mid-occultation observing point (lat., long.) 48.67 154.871

Occultation of 77 kappa Gem 3.57 by moon 45% illuminated at phase= 276 degrees
10/10/2020 06:21:38.9 Geocentric minimum 0.4 degrees
Global start/end: 10/10/2020 04:15:35.7   and   10/10/2020 08:27:36.9
Mid-occultation observing point (lat., long.) -0.496 -106.043
At HVO the miss angle is 1663.6 arc-sec at 10/10/2020 06:11:42.3

Occultation of Asellus Borealis 4.66 by moon 34% illuminated at phase= 289 degrees
10/11/2020 07:27:17.2 Geocentric minimum 0.4 degrees
Global start/end: 10/11/2020 05:24:57.4   and   10/11/2020 09:29:30.7
Mid-occultation observing point (lat., long.) 48.395 -98.232

Occultation of 30 eta Leo 3.48 by moon 19% illuminated at phase= 308 degrees
10/12/2020 18:52:59.5 Geocentric minimum 0.2 degrees
Global start/end: 10/12/2020 16:47:09.4   and   10/12/2020 20:58:45.3
Mid-occultation observing point (lat., long.) 4.313 97.651

Occultation of 46 Leo 5.43 by moon 15% illuminated at phase= 314 degrees
10/13/2020 05:51:38.4 Geocentric minimum 0.3 degrees
Global start/end: 10/13/2020 03:47:34.6   and   10/13/2020 07:55:37.7
Mid-occultation observing point (lat., long.) 28.548 -51.113

---For observations at HVO:
10/13/2020 03:59:20.9 Start Total 20.97 21.18 (az91) -23.5 ***
10/13/2020 04:29:09.0 OCCULTATION MID-POINT 26.31 26.28 (az96) -18.2 ***
10/13/2020 05:00:09.1 End Total 31.82 31.55 (az102) -12.7 ***

Occultation of 3 nu Vir 4.04 by moon 6% illuminated at phase= 332 degrees
10/14/2020 14:01:16.7 Geocentric minimum 0.5 degrees
Global start/end: 10/14/2020 12:06:01.2   and   10/14/2020 15:56:28.3
Mid-occultation observing point (lat., long.) 32.403 -149.29
At HVO the miss angle is 431.4 arc-sec at 10/14/2020 14:31:16.4

Occultation of 8 pi Vir 4.65 by moon 5% illuminated at phase= 336 degrees
10/14/2020 19:26:20.2 Geocentric minimum 1.1 degrees
Global start/end: 10/14/2020 18:22:28.9   and   10/14/2020 20:30:09.8
Mid-occultation observing point (lat., long.) -65.587 41.05

Occultation of 16 Vir 4.97 by moon 3% illuminated at phase= 341 degrees
10/15/2020 04:39:20.2 Geocentric minimum 0.1 degrees
Global start/end: 10/15/2020 02:36:07.7   and   10/15/2020 06:42:31.4
Mid-occultation observing point (lat., long.) -1.6 -16.131

Occultation of Acrab 2.56 by moon 10% illuminated at phase= 37 degrees
10/19/2020 03:25:18.7 Geocentric minimum 0.6 degrees
Global start/end: 10/19/2020 01:33:07.0   and   10/19/2020 05:17:35.1
Mid-occultation observing point (lat., long.) 13.03 65.885

Occultation of 8 beta^2 Sco 4.9 by moon 10% illuminated at phase= 37 degrees
10/19/2020 03:25:19.6 Geocentric minimum 0.6 degrees
Global start/end: 10/19/2020 01:32:57.1   and   10/19/2020 05:17:46.8
Mid-occultation observing point (lat., long.) 12.782 65.813

Occultation of 4 psi Oph 4.48 by moon 12% illuminated at phase= 41 degrees
10/19/2020 10:25:17.5 Geocentric minimum 0.4 degrees
Global start/end: 10/19/2020 08:24:48.8   and   10/19/2020 12:25:50.7
Mid-occultation observing point (lat., long.) -40.169 -50.145

Occultation of 9 omega Oph 4.45 by moon 13% illuminated at phase= 43 degrees
10/19/2020 13:58:18.5 Geocentric minimum 0.6 degrees
Global start/end: 10/19/2020 12:06:26.4   and   10/19/2020 15:50:15.9
Mid-occultation observing point (lat., long.) 13.128 -87.116

Occultation of 44 Oph 4.16 by moon 21% illuminated at phase= 55 degrees
10/20/2020 11:14:16.6 Geocentric minimum 0.8 degrees
Global start/end: 10/20/2020 09:39:29.3   and   10/20/2020 12:49:09.2
Mid-occultation observing point (lat., long.) 33.811 -32.885

Occultation of Kaus Borealis 2.82 by moon 31% illuminated at phase= 68 degrees
10/21/2020 11:18:07.0 Geocentric minimum 0.8 degrees
Global start/end: 10/21/2020 09:37:24.4   and   10/21/2020 12:58:55.5
Mid-occultation observing point (lat., long.) 28.077 -26.093

Occultation of 52 Sgr 4.59 by moon 43% illuminated at phase= 82 degrees
10/22/2020 14:57:33.1 Geocentric minimum 0.6 degrees
Global start/end: 10/22/2020 13:04:11.6   and   10/22/2020 16:51:00.6
Mid-occultation observing point (lat., long.) 16.079 -70.217

Occultation of 71 tau Aqr 4.05 by moon 79% illuminated at phase= 125 degrees
10/26/2020 07:44:29.3 Geocentric minimum 0.7 degrees
Global start/end: 10/26/2020 05:50:29.6   and   10/26/2020 09:38:31.3
Mid-occultation observing point (lat., long.) 29.327 68.683

Occultation of 91 psi^1 Aqr 4.24 by moon 84% illuminated at phase= 132 degrees
10/26/2020 22:57:58.1 Geocentric minimum 1.1 degrees
Global start/end: 10/26/2020 22:17:56.5   and   10/26/2020 23:38:00.0
Mid-occultation observing point (lat., long.) -65.437 -23.224

Occultation of 93 psi^2 Aqr 4.41 by moon 84% illuminated at phase= 133 degrees
10/26/2020 23:48:12.3 Geocentric minimum 0.8 degrees
Global start/end: 10/26/2020 22:11:41.3   and   10/27/2020 01:24:44.7
Mid-occultation observing point (lat., long.) -63.939 -95.301

Occultation of 95 psi^3 Aqr 4.99 by moon 84% illuminated at phase= 133 degrees
10/26/2020 23:57:17.5 Geocentric minimum 0.3 degrees
Global start/end: 10/26/2020 21:44:41.2   and   10/27/2020 02:09:54.5
Mid-occultation observing point (lat., long.) -29.356 -141.043
At HVO the miss angle is 1605.6 arc-sec at 10/27/2020 01:44:45.7

Occultation of 30 YY Psc 4.37 by moon 90% illuminated at phase= 143 degrees
10/27/2020 22:23:54.9 Geocentric minimum 0.6 degrees
Global start/end: 10/27/2020 20:27:18.3   and   10/28/2020 00:20:32.2
Mid-occultation observing point (lat., long.) 33.839 -137.227

---For observations at HVO:
10/27/2020 22:58:23.2 Start Total 36.03 35.95 (az208) -58.1 ***
10/27/2020 23:31:06.3 OCCULTATION MID-POINT 32.85 32.92 (az217) -59.2 ***
10/28/2020 00:02:53.9 End Total 29.07 29.31 (az225) -58.7 ***

Occultation of 33 BC Psc 4.61 by moon 90% illuminated at phase= 144 degrees
10/28/2020 00:11:36.6 Geocentric minimum 0.7 degrees
Global start/end: 10/27/2020 22:20:26.8   and   10/28/2020 02:02:47.1
Mid-occultation observing point (lat., long.) 39.308 -167.346
At HVO the miss angle is 328.0 arc-sec at 10/28/2020 01:43:43.2

Occultation of 89 Psc 5.13 by moon 98% illuminated at phase= 163 degrees
10/29/2020 17:18:19.8 Geocentric minimum 0.2 degrees
Global start/end: 10/29/2020 15:02:03.3   and   10/29/2020 19:34:35.8
Mid-occultation observing point (lat., long.) -10.185 -17.292

Occultation of 106 nu Psc 4.45 by moon 99% illuminated at phase= 168 degrees
10/30/2020 05:45:07.2 Geocentric minimum 0.5 degrees
Global start/end: 10/30/2020 03:39:02.5   and   10/30/2020 07:51:11.5
Mid-occultation observing point (lat., long.) 35.183 139.446

Occultation of 65 xi^1 Cet 4.36 by moon 100% illuminated at phase= 176 degrees
10/30/2020 23:01:31.0 Geocentric minimum 0.5 degrees
Global start/end: 10/30/2020 20:59:00.6   and   10/31/2020 01:04:00.9
Mid-occultation observing point (lat., long.) 42.56 -115.489

---For observations at HVO:
10/30/2020 22:42:06.4 Start Total 53.5 53.48 (az161) -58.0 ***
10/30/2020 23:23:04.9 OCCULTATION MID-POINT 54.84 54.89 (az178) -60.0 ***
10/31/2020 00:04:27.4 End Total 53.92 54.14 (az196) -59.6 ***

Occultation of 102 iota Tau 4.62 by moon 91% illuminated at phase= 215 degrees
11/03/2020 13:02:44.3 Geocentric minimum 0.9 degrees
Global start/end: 11/03/2020 11:35:29.7   and   11/03/2020 14:29:57.8
Mid-occultation observing point (lat., long.) 73.581 -48.228

Occultation of 1 Gem 4.16 by moon 83% illuminated at phase= 228 degrees
11/04/2020 16:58:51.9 Geocentric minimum 1.2 degrees
Global start/end: 11/04/2020 16:35:03.0   and   11/04/2020 17:22:40.6
Mid-occultation observing point (lat., long.) 65.325 -122.223

Occultation of Mebsuta 3.06 by moon 78% illuminated at phase= 236 degrees
11/05/2020 10:44:37.7 Geocentric minimum 0.3 degrees
Global start/end: 11/05/2020 08:32:44.3   and   11/05/2020 12:56:29.7
Mid-occultation observing point (lat., long.) 6.426 149.885

Occultation of 42 omega Gem 5.2 by moon 75% illuminated at phase= 240 degrees
11/05/2020 18:49:42.7 Geocentric minimum 0.6 degrees
Global start/end: 11/05/2020 16:51:45.3   and   11/05/2020 20:47:37.0
Mid-occultation observing point (lat., long.) 63.664 34.977

Occultation of 77 kappa Gem 3.57 by moon 68% illuminated at phase= 249 degrees
11/06/2020 12:58:38.9 Geocentric minimum 0.2 degrees
Global start/end: 11/06/2020 10:45:30.4   and   11/06/2020 15:11:46.1
Mid-occultation observing point (lat., long.) 12.628 129.051

Occultation of Asellus Borealis 4.66 by moon 57% illuminated at phase= 262 degrees
11/07/2020 14:43:12.7 Geocentric minimum 0.7 degrees
Global start/end: 11/07/2020 12:50:58.5   and   11/07/2020 16:35:22.1
Mid-occultation observing point (lat., long.) 63.246 135.764

Occultation of 30 eta Leo 3.48 by moon 41% illuminated at phase= 281 degrees
11/09/2020 03:20:05.2 Geocentric minimum 0.0 degrees
Global start/end: 11/09/2020 01:09:51.5   and   11/09/2020 05:30:17.8
Mid-occultation observing point (lat., long.) 14.699 -52.678
At HVO the miss angle is 406.5 arc-sec at 11/09/2020 01:56:11.8

Occultation of 46 Leo 5.43 by moon 36% illuminated at phase= 287 degrees
11/09/2020 14:42:57.0 Geocentric minimum 0.4 degrees
Global start/end: 11/09/2020 12:41:54.3   and   11/09/2020 16:43:54.4
Mid-occultation observing point (lat., long.) 38.878 154.66

Occultation of 3 nu Vir 4.04 by moon 21% illuminated at phase= 305 degrees
11/11/2020 00:00:47.5 Geocentric minimum 0.6 degrees
Global start/end: 11/10/2020 22:10:05.9   and   11/11/2020 01:51:23.8
Mid-occultation observing point (lat., long.) 40.689 39.884

Occultation of 8 pi Vir 4.65 by moon 19% illuminated at phase= 308 degrees
11/11/2020 05:35:46.4 Geocentric minimum 1.0 degrees
Global start/end: 11/11/2020 04:15:38.4   and   11/11/2020 06:55:51.0
Mid-occultation observing point (lat., long.) -61.054 -115.708

Occultation of 16 Vir 4.97 by moon 16% illuminated at phase= 314 degrees
11/11/2020 15:05:23.7 Geocentric minimum 0.0 degrees
Global start/end: 11/11/2020 12:59:58.6   and   11/11/2020 17:10:47.4
Mid-occultation observing point (lat., long.) 3.967 162.831

Occultation of 98 kappa Vir 4.18 by moon 2% illuminated at phase= 343 degrees
11/13/2020 16:56:29.8 Geocentric minimum 0.8 degrees
Global start/end: 11/13/2020 15:20:03.3   and   11/13/2020 18:32:55.1
Mid-occultation observing point (lat., long.) 37.55 -176.192

Occultation of 4 psi Oph 4.48 by moon 1% illuminated at phase= 14 degrees
11/15/2020 21:14:43.7 Geocentric minimum 0.4 degrees
Global start/end: 11/15/2020 19:18:09.9   and   11/15/2020 23:11:20.4
Mid-occultation observing point (lat., long.) -44.85 118.273

Occultation of 9 omega Oph 4.45 by moon 2% illuminated at phase= 16 degrees
11/16/2020 00:43:24.5 Geocentric minimum 0.5 degrees
Global start/end: 11/15/2020 22:48:44.1 and 11/16/2020 02:38:08.3
Mid-occultation observing point (lat., long.) 6.887 83.224

Occultation of 44 Oph 4.16 by moon 6% illuminated at phase= 27 degrees
11/16/2020 21:26:40.4 Geocentric minimum 0.7 degrees
Global start/end: 11/16/2020 19:43:24.4 and 11/16/2020 23:10:01.2
Mid-occultation observing point (lat., long.) 21.746 145.045

Occultation of Kaus Borealis 2.82 by moon 12% illuminated at phase= 40 degrees
11/17/2020 20:45:53.1 Geocentric minimum 0.6 degrees
Global start/end: 11/17/2020 18:56:06.7 and 11/17/2020 22:35:45.6
Mid-occultation observing point (lat., long.) 14.847 164.551

Occultation of 52 Sgr 4.59 by moon 21% illuminated at phase= 55 degrees
11/18/2020 23:31:05.7 Geocentric minimum 0.5 degrees
Global start/end: 11/18/2020 21:30:44.2 and 11/19/2020 01:31:33.7
Mid-occultation observing point (lat., long.) 3.755 135.493

Occultation of 71 tau Aqr 4.05 by moon 57% illuminated at phase= 98 degrees
11/22/2020 14:17:40.8 Geocentric minimum 0.5 degrees
Global start/end: 11/22/2020 12:13:39.2 and 11/22/2020 16:21:46.4
Mid-occultation observing point (lat., long.) 17.722 -51.246

Occultation of 93 psi^2 Aqr 4.41 by moon 63% illuminated at phase= 105 degrees
11/23/2020 06:13:41.8 Geocentric minimum 1.0 degrees
Global start/end: 11/23/2020 04:57:05.6 and 11/23/2020 07:30:19.8
Mid-occultation observing point (lat., long.) -65.258 -158.519

Occultation of 95 psi^3 Aqr 4.99 by moon 63% illuminated at phase= 105 degrees
11/23/2020 06:22:39.4 Geocentric minimum 0.5 degrees
Global start/end: 11/23/2020 04:16:13.8 and 11/23/2020 08:29:07.8
Mid-occultation observing point (lat., long.) -37.915 101.078

Occultation of 30 YY Psc 4.37 by moon 72% illuminated at phase= 116 degrees
11/24/2020 04:44:11.3 Geocentric minimum 0.5 degrees
Global start/end: 11/24/2020 02:38:59.3 and 11/24/2020 06:49:24.8
Mid-occultation observing point (lat., long.) 24.925 106.171

Occultation of 33 BC Psc 4.61 by moon 72% illuminated at phase= 116 degrees
11/24/2020 06:31:43.3 Geocentric minimum 0.6 degrees
Global start/end: 11/24/2020 04:30:42.1 and 11/24/2020 08:32:46.0
Mid-occultation observing point (lat., long.) 29.859 77.248

Occultation of 89 Psc 5.13 by moon 85% illuminated at phase= 135 degrees
11/25/2020 23:40:57.2 Geocentric minimum 0.3 degrees
Global start/end: 11/25/2020 21:26:39.0 and 11/26/2020 01:55:14.3
Mid-occultation observing point (lat., long.) -15.04 -137.457
At HVO the miss angle is 1346.5 arc-sec at 11/26/2020 01:21:35.9

Occultation of 106 nu Psc 4.45 by moon 89% illuminated at phase= 141 degrees
11/26/2020 12:08:55.4 Geocentric minimum 0.4 degrees
Global start/end: 11/26/2020 09:58:55.1 and 11/26/2020 14:18:54.3
Mid-occultation observing point (lat., long.) 30.745 19.448

Occultation of 65 xi^1 Cet 4.36 by moon 93% illuminated at phase= 149 degrees
11/27/2020 05:26:24.3 Geocentric minimum 0.5 degrees
Global start/end: 11/27/2020 03:20:36.0 and 11/27/2020 07:32:10.9
Mid-occultation observing point (lat., long.) 39.161 123.962

Occultation of 102 iota Tau 4.62 by moon 100% illuminated at phase= 188 degrees
11/30/2020 19:03:30.6 Geocentric minimum 0.9 degrees
Global start/end: 11/30/2020 17:41:46.1   and   11/30/2020 20:25:13.7
Mid-occultation observing point (lat., long.) 65.073 -179.129

---For observations at HVO:
11/30/2020 17:44:28.7 Start Total 9.56 9.8 (az69) -15.5 ***
11/30/2020 17:58:08.6 OCCULTATION MID-POINT 11.85 12.04 (az71) -17.8 ***
11/30/2020 18:12:03.4 End Total 14.23 14.35 (az73) -20.3 ***

Occultation of Mebsuta 3.06 by moon 94% illuminated at phase= 209 degrees
12/02/2020 16:23:09.0 Geocentric minimum 0.2 degrees
Global start/end: 12/02/2020 14:10:14.2   and   12/02/2020 18:36:03.2
Mid-occultation observing point (lat., long.) 10.802 38.393

Occultation of 42 omega Gem 5.2 by moon 92% illuminated at phase= 213 degrees
12/03/2020 00:25:32.2 Geocentric minimum 0.7 degrees
Global start/end: 12/02/2020 22:33:16.4   and   12/03/2020 02:17:46.0
Mid-occultation observing point (lat., long.) 69.655 -74.991
At HVO the miss angle is 169.3 arc-sec at 12/02/2020 23:33:25.0

Occultation of 77 kappa Gem 3.57 by moon 87% illuminated at phase= 222 degrees
12/03/2020 18:31:47.6 Geocentric minimum 0.1 degrees
Global start/end: 12/03/2020 16:17:51.3   and   12/03/2020 20:45:44.4
Mid-occultation observing point (lat., long.) 17.554 19.417

Occultation of Asellus Borealis 4.66 by moon 79% illuminated at phase= 234 degrees
12/04/2020 20:22:09.0 Geocentric minimum 0.7 degrees
Global start/end: 12/04/2020 18:36:49.1   and   12/04/2020 22:07:26.3
Mid-occultation observing point (lat., long.) 70.405 34.305

Occultation of 77 xi Cnc 5.16 by moon 75% illuminated at phase= 240 degrees
12/05/2020 07:01:29.2 Geocentric minimum 1.2 degrees
Global start/end: 12/05/2020 06:25:16.8   and   12/05/2020 07:37:41.1
Mid-occultation observing point (lat., long.) -65.33 177.319
At HVO the miss angle is 5348.8 arc-sec at 12/05/2020 07:11:05.9

Occultation of 30 eta Leo 3.48 by moon 65% illuminated at phase= 253 degrees
12/06/2020 09:32:22.0 Geocentric minimum 0.1 degrees
Global start/end: 12/06/2020 07:20:51.0   and   12/06/2020 11:43:53.2
Mid-occultation observing point (lat., long.) 19.702 -170.843
At HVO the miss angle is 1716.9 arc-sec at 12/06/2020 10:12:14.4

Occultation of 46 Leo 5.43 by moon 59% illuminated at phase= 259 degrees
12/06/2020 21:11:55.1 Geocentric minimum 0.5 degrees
Global start/end: 12/06/2020 19:13:30.4   and   12/06/2020 23:10:16.4
Mid-occultation observing point (lat., long.) 44.548 34.398

Occultation of 3 nu Vir 4.04 by moon 44% illuminated at phase= 277 degrees
12/08/2020 07:33:08.2 Geocentric minimum 0.7 degrees
Global start/end: 12/08/2020 05:45:49.7   and   12/08/2020 09:20:22.7
Mid-occultation observing point (lat., long.) 46.326 -94.906

---For observations at HVO:
12/08/2020 06:49:27.3 Start Total 52.05 52.24 (az189) -5.0 ***
12/08/2020 07:25:50.1 OCCULTATION MID-POINT 50.31 50.38 (az202) 1.1
12/08/2020 08:01:32.9 End Total 47.21 47.24 (az215) 5.9

Occultation of 8 pi Vir 4.65 by moon 41% illuminated at phase= 281 degrees
12/08/2020 13:20:11.6 Geocentric minimum 0.9 degrees
Global start/end: 12/08/2020 11:51:51.6   and   12/08/2020 14:48:28.4
Mid-occultation observing point (lat., long.) -53.029 118.321

Occultation of 16 Vir 4.97 by moon 36% illuminated at phase= 286 degrees
12/08/2020 23:11:18.0 Geocentric minimum 0.1 degrees
Global start/end: 12/08/2020 21:03:38.4   and   12/09/2020 01:18:56.0
Mid-occultation observing point (lat., long.) 7.648 16.115

Occultation of 98 kappa Vir 4.18 by moon 15% illuminated at phase= 315 degrees
12/11/2020 02:52:02.4 Geocentric minimum 0.8 degrees
Global start/end: 12/11/2020 01:17:59.8   and   12/11/2020 04:26:02.7
Mid-occultation observing point (lat., long.) 41.781 11.169

Occultation of Venus -3.9 by moon 5% illuminated at phase= 335 degrees
12/12/2020 14:06:17.3 Geocentric minimum 0.8 degrees
Global start/end: 12/12/2020 12:16:08.7   and   12/12/2020 15:56:25.2
Mid-occultation observing point (lat., long.) 27.87 -148.56

---For observations at HVO:
12/12/2020 14:24:23.5 Start Partial 4.18 3.95 (az240) 13.8
12/12/2020 14:24:53.0 Start Total 4.11 3.87 (az240) 13.7
12/12/2020 14:52:04.1 OCCULTATION MID-POINT 0.14 0.02 (az245) 10.6
12/12/2020 15:18:11.9 End Total -4.69 -4.72 (az249) 7.4
12/12/2020 15:18:39.2 End Partial -4.78 -4.81 (az249) 7.3

Occultation of Acrab 2.56 by moon 3% illuminated at phase= 342 degrees
12/13/2020 01:20:30.2 Geocentric minimum 0.5 degrees
Global start/end: 12/12/2020 23:25:52.1   and   12/13/2020 03:15:08.4
Mid-occultation observing point (lat., long.) 8.692 41.921

Occultation of 8 beta^2 Sco 4.9 by moon 3% illuminated at phase= 342 degrees
12/13/2020 01:20:31.0 Geocentric minimum 0.5 degrees
Global start/end: 12/12/2020 23:25:43.7   and   12/13/2020 03:15:18.4
Mid-occultation observing point (lat., long.) 8.455 41.853

Occultation of 9 omega^1 Sco 3.93 by moon 2% illuminated at phase= 342 degrees
12/13/2020 02:13:27.0 Geocentric minimum 1.2 degrees
Global start/end: 12/13/2020 01:40:40.4   and   12/13/2020 02:46:13.5
Mid-occultation observing point (lat., long.) 65.306 61.626

Occultation of 4 psi Oph 4.48 by moon 2% illuminated at phase= 346 degrees
12/13/2020 08:16:12.1 Geocentric minimum 0.4 degrees
Global start/end: 12/13/2020 06:19:09.4   and   12/13/2020 10:13:15.4
Mid-occultation observing point (lat., long.) -44.821 -74.164
At HVO the miss angle is 2760.1 arc-sec at 12/13/2020 06:43:09.2

Eclipse of the Sun by moon 0% illuminated at phase= 360 degrees
12/14/2020 09:13:27.3 Geocentric minimum 0.3 degrees
Global start/end: 12/14/2020 06:33:53.9   and   12/14/2020 11:53:07.0
Mid-occultation observing point (lat., long.) -40.338 -67.964

Occultation of 52 Sgr 4.59 by moon 5% illuminated at phase= 27 degrees
12/16/2020 09:53:07.7 Geocentric minimum 0.4 degrees
Global start/end: 12/16/2020 07:53:04.7   and   12/16/2020 11:53:16.0
Mid-occultation observing point (lat., long.) 1.577 -46.862

Occultation of 71 tau Aqr 4.05 by moon 33% illuminated at phase= 70 degrees
12/19/2020 22:26:23.0 Geocentric minimum 0.5 degrees
Global start/end: 12/19/2020 20:21:59.0   and   12/20/2020 00:30:52.7
Mid-occultation observing point (lat., long.) 15.403 160.575

Occultation of 93 psi^2 Aqr 4.41 by moon 39% illuminated at phase= 78 degrees
12/20/2020 14:03:33.9 Geocentric minimum 1.0 degrees
Global start/end: 12/20/2020 12:50:45.0   and   12/20/2020 15:16:25.2
Mid-occultation observing point (lat., long.) -65.246 57.095
At HVO the miss angle is 5744.8 arc-sec at 12/20/2020 13:51:02.0

Occultation of 95 psi^3 Aqr 4.99 by moon 39% illuminated at phase= 78 degrees
12/20/2020 14:12:21.4 Geocentric minimum 0.5 degrees
Global start/end: 12/20/2020 12:08:13.0   and   12/20/2020 16:16:34.9
Mid-occultation observing point (lat., long.) -39.308 -42.284
At HVO the miss angle is 3947.1 arc-sec at 12/20/2020 13:59:56.3

Occultation of 30 YY Psc 4.37 by moon 48% illuminated at phase= 88 degrees
12/21/2020 12:13:57.0 Geocentric minimum 0.5 degrees
Global start/end: 12/21/2020 10:07:57.5   and   12/21/2020 14:20:00.0
Mid-occultation observing point (lat., long.) 23.217 -32.279

Occultation of 33 BC Psc 4.61 by moon 49% illuminated at phase= 89 degrees
12/21/2020 14:00:13.6 Geocentric minimum 0.5 degrees
Global start/end: 12/21/2020 11:58:06.5   and   12/21/2020 16:02:24.2
Mid-occultation observing point (lat., long.) 28.056 -60.737
At HVO the miss angle is 172.2 arc-sec at 12/21/2020 13:27:57.7

Occultation of 89 Psc 5.13 by moon 65% illuminated at phase= 107 degrees
12/23/2020 06:53:47.2 Geocentric minimum 0.3 degrees
Global start/end: 12/23/2020 04:39:44.2   and   12/23/2020 09:07:50.4
Mid-occultation observing point (lat., long.) -15.783 87.796

Occultation of 106 nu Psc 4.45 by moon 70% illuminated at phase= 113 degrees
12/23/2020 19:21:00.2 Geocentric minimum 0.4 degrees
Global start/end: 12/23/2020 17:10:06.6   and   12/23/2020 21:31:53.3
Mid-occultation observing point (lat., long.) 29.978 -115.024

---For observations at HVO:
12/23/2020 19:21:04.4 Start Total 51.49 51.31 (az179) -31.6 ***
12/23/2020 20:02:41.5 OCCULTATION MID-POINT 50.54 50.5 (az195) -39.1 ***
12/23/2020 20:43:58.4 End Total 47.62 47.78 (az210) -46.4 ***

Occultation of 65 xi^1 Cet 4.36 by moon 76% illuminated at phase= 121 degrees
12/24/2020 12:39:21.6 Geocentric minimum 0.5 degrees
Global start/end: 12/24/2020 10:32:35.6   and   12/24/2020 14:46:06.2
Mid-occultation observing point (lat., long.) 38.548 -10.755

Occultation of 102 iota Tau 4.62 by moon 97% illuminated at phase= 160 degrees
12/28/2020 02:12:53.2 Geocentric minimum 0.9 degrees
Global start/end: 12/28/2020 00:49:44.5   and   12/28/2020 03:35:59.6
Mid-occultation observing point (lat., long.) 65.077 46.571

Occultation of Mebsuta 3.06 by moon 100% illuminated at phase= 181 degrees
12/29/2020 23:03:38.8 Geocentric minimum 0.2 degrees
Global start/end: 12/29/2020 20:52:09.2   and   12/30/2020 01:15:06.3
Mid-occultation observing point (lat., long.) 9.891 -88.615
At HVO the miss angle is 1137.9 arc-sec at 12/29/2020 22:42:47.6

Occultation of 42 omega Gem 5.2 by moon 100% illuminated at phase= 185 degrees
12/30/2020 06:59:05.2 Geocentric minimum 0.6 degrees
Global start/end: 12/30/2020 05:06:12.9   and   12/30/2020 08:51:54.6
Mid-occultation observing point (lat., long.) 67.79 159.465

Occultation of 77 kappa Gem 3.57 by moon 99% illuminated at phase= 194 degrees
12/31/2020 00:48:28.7 Geocentric minimum 0.1 degrees
Global start/end: 12/30/2020 22:36:07.5   and   12/31/2020 03:00:49.3
Mid-occultation observing point (lat., long.) 16.166 -101.767
At HVO the miss angle is 685.6 arc-sec at 12/31/2020 00:36:10.3

Occultation of Asellus Borealis 4.66 by moon 95% illuminated at phase= 207 degrees
01/01/2021 02:14:56.4 Geocentric minimum 0.7 degrees
Global start/end: 01/01/2021 00:27:42.4   and   01/01/2021 04:02:08.3
Mid-occultation observing point (lat., long.) 67.547 -85.593
At HVO the miss angle is 280.3 arc-sec at 01/01/2021 02:19:38.0

Occultation of 77 xi Cnc 5.16 by moon 92% illuminated at phase= 212 degrees
01/01/2021 12:45:20.9 Geocentric minimum 1.2 degrees
Global start/end: 01/01/2021 12:24:51.7   and   01/01/2021 13:05:50.0
Mid-occultation observing point (lat., long.) -65.308 64.401

*** = The Moon is above the horizon, and the Sun is not a factor.
Program LOSP3 version 171111b + gglib version 180919a - delta-T data of 10/11/2018