

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-15T13:02:22.300
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3382554446620464256
 2Mass ID (if available) : 06320458+2334075

Uranus 2035-01-15T13:02:22 K14.29 G15.83 PgtRgt

ICRS Star Coord at Epoch: 06h 32m 04.58069s +23:34:07.44758s

RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.290
 G magnitude : 15.830
 RP magnitude : 15.302
 BP magnitude : 16.202
 DUPflag : 0
 Distance (au) : 17.945
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.02
 Sun-Target sep (deg) : 162.63
 Sun-Moon sep (deg) : 93.44
 B (ring opening deg) : 68.77
 PA of pole (deg) : 70.47

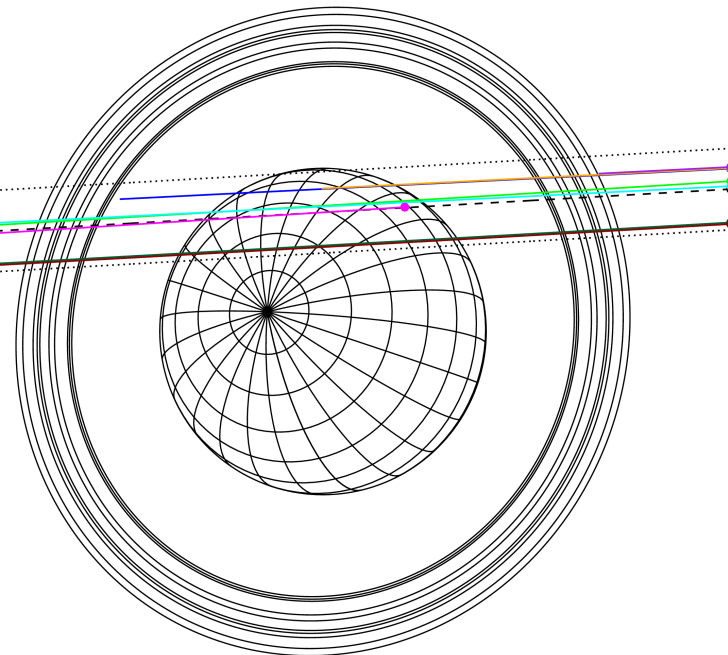
Uranus 2035-01-15T13:02:22 K14.29 G15.83
 PgtRgt



2035-01-15T13:02:22.3000 α: 06 32 04.5807 δ: +23 34 07.448 C/A 1.439° PA 183.26 deg v_sky -22.02 km/s D 17.95 AU

Credit: Styled after SORA/Lucky Star

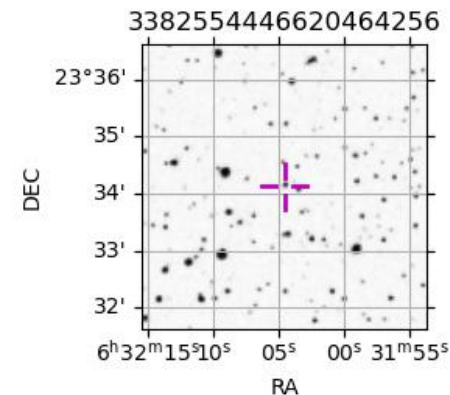
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 KAV
 AAT
 MSO



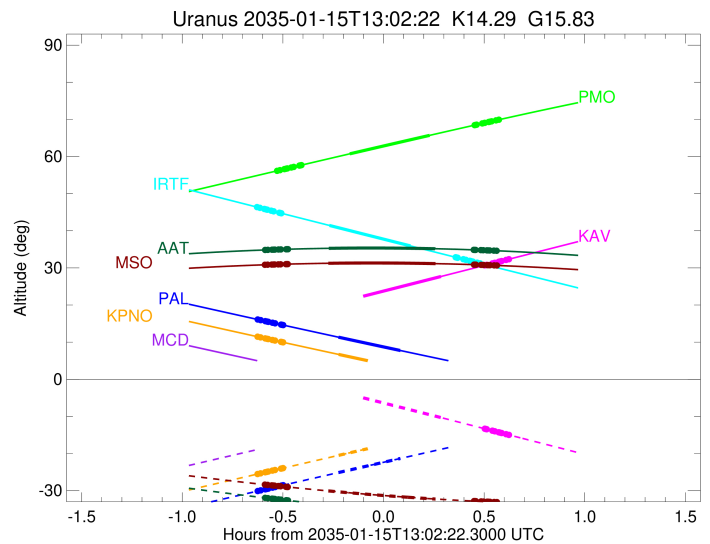
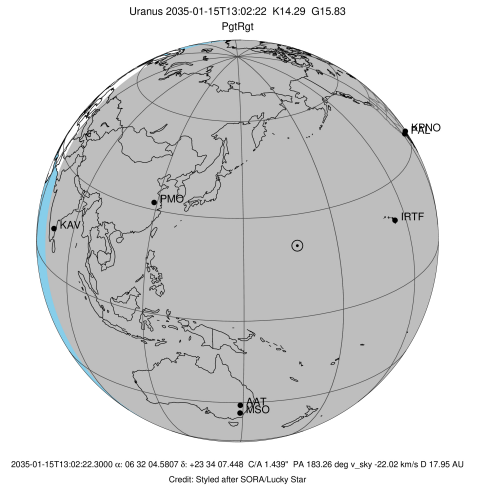
| # | a(km) | ring |
|----|---------|---------|
| 1 | 41837.2 | 6 |
| 2 | 42235.0 | 5 |
| 3 | 42571.2 | 4 |
| 4 | 44718.5 | alpha |
| 5 | 45661.1 | beta |
| 6 | 47176.1 | eta |
| 7 | 47626.3 | gamma |
| 8 | 48300.3 | delta |
| 9 | 50026.7 | lambda |
| 10 | 51149.4 | epsilon |

Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

| Obs | Location | lat | Elon | Rings I | Planet | Rings E | Observed Events Interval | OEncode |
|------|-----------------------|-------|-------|---------|--------|---------|-----------------------------|---------|
| PIC | Pic du Midi | 42.9 | 0.1 | | | | | PnnRnn |
| PAL | Palomar Mt (200") | 33.4 | 243.1 | +++++ | + + | | JAN 15 12:24 - JAN 15 13:07 | PieRin |
| PMO | Purple Mtn Obs. Nanki | 32.1 | 118.8 | +++++ | + + | +++++ | JAN 15 12:30 - JAN 15 13:36 | PieRie |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | +++++ | + | | JAN 15 12:24 - JAN 15 12:49 | PinRin |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | + | | | JAN 15 12:24 - JAN 15 12:24 | PnnRin |
| TEN | Teide Obs./Tenerife | 28.3 | 343.5 | | | | | PnnRnn |
| IRTF | Mauna Kea/IRTF | 19.8 | 204.5 | +++++ | + + | +++++ | JAN 15 12:24 - JAN 15 13:31 | PieRie |
| KAV | Kavalur Observatory | 12.6 | 78.8 | | + | +++++ | JAN 15 13:19 - JAN 15 13:39 | PneRne |
| RIO | Rio de Janeiro | -22.9 | 316.8 | | | | | PnnRnn |
| ESO | European Southern Obs | -29.3 | 289.3 | | | | | PnnRnn |
| AAT | Siding Spring (AAT) | -31.3 | 149.1 | +++++ | + + | +++++ | JAN 15 12:26 - JAN 15 13:35 | PieRie |
| SAAO | So. Afr. Astro. Obs. | -32.4 | 20.8 | | | | | PnnRnn |
| MSO | Mt. Stromlo Observato | -35.3 | 149.0 | +++++ | + + | +++++ | JAN 15 12:26 - JAN 15 13:36 | PieRie |

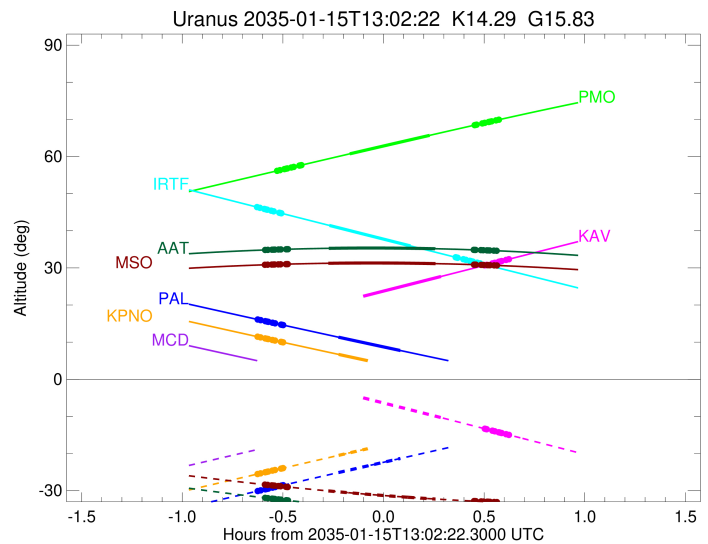
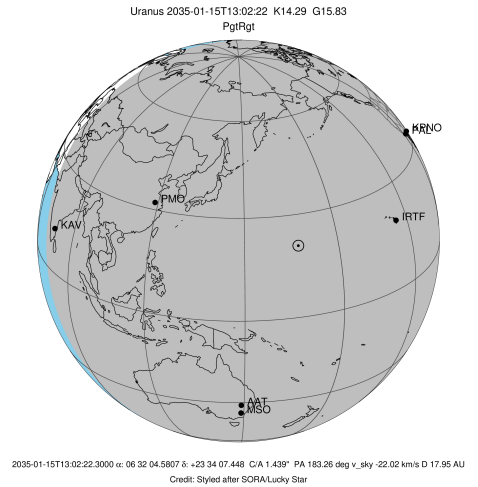


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-15T12:58:23.260
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3382554446620464256
 2Mass ID (if available) : 06320458+2334075
 ICRS Star Coord at Epoch: 06h 32m 04.58069s +23:34:07.44758s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.290
 G magnitude : 15.830
 RP magnitude : 15.302
 BP magnitude : 16.202
 DUPflag : 0
 Distance (au) : 17.945
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.02
 Sun-Target sep (deg) : 162.63
 Sun-Moon sep (deg) : 93.54
 B (ring opening deg) : 68.77
 PA of pole (deg) : 70.47
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.713
 C/A sky separation (km) : 22288.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itrff93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



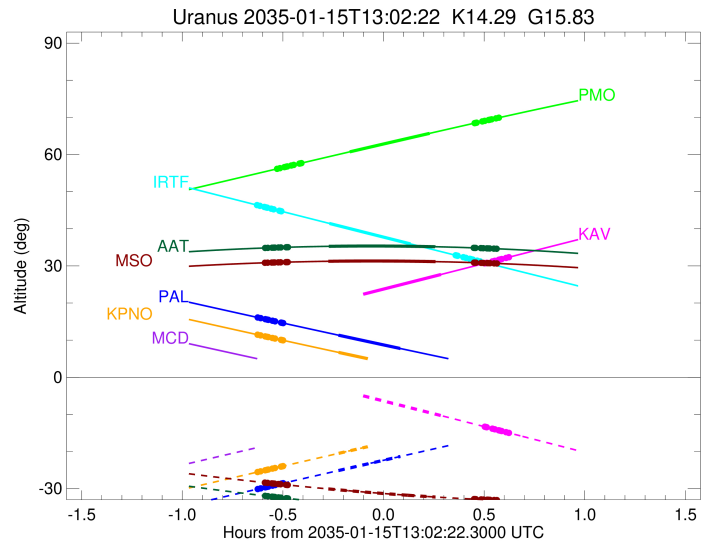
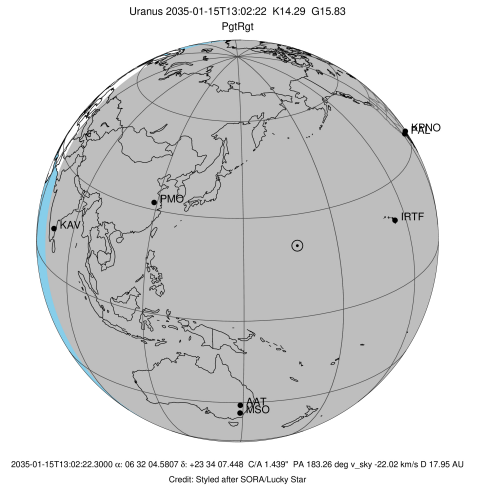
| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| epsilon | I | 2035-01-15T12:24:34.810 | | 16.16 | -30.18 | 51524.58 | -21.10 | | |
| lambda | I | 2035-01-15T12:25:46.172 | | 15.92 | -29.93 | 50026.71 | -20.91 | | |
| delta | I | 2035-01-15T12:27:09.110 | | 15.65 | -29.64 | 48300.35 | -20.71 | | |
| gamma | I | 2035-01-15T12:27:41.903 | | 15.54 | -29.53 | 47622.41 | -20.63 | | |
| eta | I | 2035-01-15T12:28:03.565 | | 15.47 | -29.45 | 47176.12 | -20.57 | | |
| beta | I | 2035-01-15T12:29:17.629 | | 15.22 | -29.20 | 45660.86 | -20.37 | | |
| alpha | I | 2035-01-15T12:30:05.186 | | 15.06 | -29.03 | 44693.52 | -20.21 | | |
| 4 | I | 2035-01-15T12:31:51.441 | | 14.71 | -28.66 | 42565.82 | -19.87 | | |
| 5 | I | 2035-01-15T12:32:08.835 | | 14.65 | -28.60 | 42210.69 | -19.77 | | |
| 6 | I | 2035-01-15T12:32:27.189 | | 14.59 | -28.54 | 41848.37 | -19.73 | | |
| Uranus | I | 2035-01-15T12:48:55.160 | | 11.34 | -25.14 | 25551.48 | | -2.49 | -2.61 |
| Uranus | E | 2035-01-15T13:07:23.496 | | 7.75 | -21.34 | 25253.20 | | 16.21 | 16.93 |
| 6 | E | 2035-01-15T13:22:48.282 | | 4.80x | -18.19 | 41869.75 | 19.65 | | |
| 5 | E | 2035-01-15T13:23:03.614 | | 4.75x | -18.14 | 42176.29 | 19.68 | | |
| 4 | E | 2035-01-15T13:23:25.690 | | 4.68x | -18.07 | 42614.02 | 19.79 | | |
| alpha | E | 2035-01-15T13:25:10.598 | | 4.35x | -17.71 | 44710.83 | 20.12 | | |
| beta | E | 2035-01-15T13:25:58.254 | | 4.20x | -17.55 | 45678.53 | 20.27 | | |
| eta | E | 2035-01-15T13:27:11.777 | | 3.96x | -17.30 | 47176.12 | 20.47 | | |
| gamma | E | 2035-01-15T13:27:33.691 | | 3.89x | -17.23 | 47625.36 | 20.53 | | |
| delta | E | 2035-01-15T13:28:06.507 | | 3.79x | -17.12 | 48300.35 | 20.61 | | |
| lambda | E | 2035-01-15T13:29:29.878 | | 3.53x | -16.84 | 50026.71 | 20.80 | | |
| epsilon | E | 2035-01-15T13:30:18.337 | | 3.38x | -16.67 | 51037.19 | 20.98 | | |

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-15T13:04:25.910
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 3382554446620464256
 2Mass ID (if available) : 06320458+2334075
 ICRS Star Coord at Epoch: 06h 32m 04.58069s +23:34:07.44758s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.290
 G magnitude : 15.830
 RP magnitude : 15.302
 BP magnitude : 16.202
 DUPflag : 0
 Distance (au) : 17.945
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.02
 Sun-Target sep (deg) : 162.63
 Sun-Moon sep (deg) : 94.32
 B (ring opening deg) : 68.77
 PA of pole (deg) : 70.47
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.510
 C/A sky separation (km) : 19658.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itrff93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



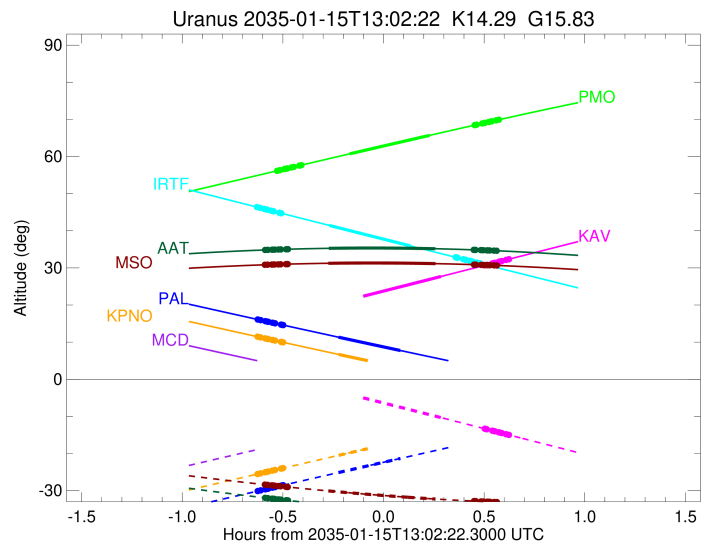
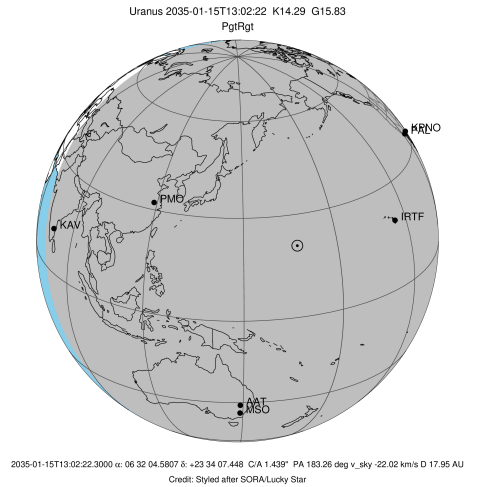
| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| epsilon | I | 2035-01-15T12:30:22.773 | | 56.09 | -39.36 | 51516.85 | -21.92 | | |
| lambda | I | 2035-01-15T12:31:31.015 | | 56.33 | -39.60 | 50026.71 | -21.78 | | |
| delta | I | 2035-01-15T12:32:50.553 | | 56.61 | -39.88 | 48300.35 | -21.63 | | |
| gamma | I | 2035-01-15T12:33:21.932 | | 56.73 | -39.99 | 47622.60 | -21.57 | | |
| eta | I | 2035-01-15T12:33:42.655 | | 56.80 | -40.06 | 47176.12 | -21.52 | | |
| beta | I | 2035-01-15T12:34:53.407 | | 57.05 | -40.31 | 45659.73 | -21.37 | | |
| alpha | I | 2035-01-15T12:35:38.558 | | 57.21 | -40.47 | 44694.89 | -21.25 | | |
| 4 | I | 2035-01-15T12:37:19.570 | | 57.56 | -40.83 | 42563.03 | -21.00 | | |
| 5 | I | 2035-01-15T12:37:35.627 | | 57.62 | -40.89 | 42215.58 | -20.91 | | |
| 6 | I | 2035-01-15T12:37:53.321 | | 57.68 | -40.95 | 41845.72 | -20.89 | | |
| Uranus | I | 2035-01-15T12:52:18.748 | | 60.73 | -44.01 | 25516.01 | | -5.96 | -6.24 |
| Uranus | E | 2035-01-15T13:16:07.817 | | 65.70 | -49.06 | 25163.36 | | 18.56 | 19.38 |
| 6 | E | 2035-01-15T13:29:34.049 | | 68.46 | -51.90 | 41867.41 | 20.92 | | |
| 5 | E | 2035-01-15T13:29:48.792 | | 68.51 | -51.95 | 42180.89 | 20.95 | | |
| 4 | E | 2035-01-15T13:30:09.196 | | 68.58 | -52.02 | 42612.68 | 21.03 | | |
| alpha | E | 2035-01-15T13:31:48.329 | | 68.92 | -52.37 | 44713.34 | 21.29 | | |
| beta | E | 2035-01-15T13:32:33.255 | | 69.07 | -52.53 | 45677.74 | 21.41 | | |
| eta | E | 2035-01-15T13:33:43.010 | | 69.30 | -52.77 | 47176.12 | 21.56 | | |
| gamma | E | 2035-01-15T13:34:03.839 | | 69.37 | -52.84 | 47625.73 | 21.61 | | |
| delta | E | 2035-01-15T13:34:35.014 | | 69.48 | -52.95 | 48300.35 | 21.67 | | |
| lambda | E | 2035-01-15T13:35:54.395 | | 69.75 | -53.23 | 50026.71 | 21.82 | | |
| epsilon | E | 2035-01-15T13:36:39.470 | | 69.90 | -53.39 | 51012.11 | 21.97 | | |

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-15T12:58:22.330
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 3382554446620464256
 2Mass ID (if available) : 06320458+2334075
 ICRS Star Coord at Epoch: 06h 32m 04.58069s +23:34:07.44758s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.290
 G magnitude : 15.830
 RP magnitude : 15.302
 BP magnitude : 16.202
 DUPflag : 0
 Distance (au) : 17.945
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.02
 Sun-Target sep (deg) : 162.63
 Sun-Moon sep (deg) : 93.46
 B (ring opening deg) : 68.77
 PA of pole (deg) : 70.47
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.719
 C/A sky separation (km) : 22370.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itrff93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|--------|---------|----------|--------|---------|--------------|
| epsilon | I | 2035-01-15T12:24:32.024 | | 11.52 | -25.59 | 51524.86 | -21.04 | | |
| lambda | I | 2035-01-15T12:25:43.581 | | 11.28 | -25.34 | 50026.71 | -20.86 | | |
| delta | I | 2035-01-15T12:27:06.738 | | 11.01 | -25.05 | 48300.35 | -20.66 | | |
| gamma | I | 2035-01-15T12:27:39.620 | | 10.90 | -24.94 | 47622.40 | -20.57 | | |
| eta | I | 2035-01-15T12:28:01.340 | | 10.83 | -24.86 | 47176.12 | -20.52 | | |
| beta | I | 2035-01-15T12:29:15.609 | | 10.58 | -24.60 | 45660.90 | -20.31 | | |
| alpha | I | 2035-01-15T12:30:03.307 | | 10.42 | -24.44 | 44693.47 | -20.15 | | |
| 4 | I | 2035-01-15T12:31:49.874 | | 10.07 | -24.07 | 42565.93 | -19.81 | | |
| 5 | I | 2035-01-15T12:32:07.337 | | 10.01 | -24.00 | 42210.51 | -19.70 | | |
| 6 | I | 2035-01-15T12:32:25.736 | | 9.95 | -23.94 | 41848.46 | -19.67 | | |
| Uranus | I | 2035-01-15T12:48:59.907 | | 6.69 | -20.49 | 25552.28 | | -2.35 | -2.46 |
| Uranus | E | 2035-01-15T13:07:16.725 | | 3.15x | -16.72 | 25256.49 | | 16.12 | 16.84 |
| 6 | E | 2035-01-15T13:22:47.372 | | 0.21x | -13.55 | 41869.81 | 19.58 | | |
| 5 | E | 2035-01-15T13:23:02.743 | | 0.16x | -13.50 | 42176.17 | 19.62 | | |
| 4 | E | 2035-01-15T13:23:24.899 | | 0.09x | -13.42 | 42614.05 | 19.73 | | |
| alpha | E | 2035-01-15T13:25:10.118 | | -0.24x | -13.06 | 44710.76 | 20.06 | | |
| beta | E | 2035-01-15T13:25:57.918 | | -0.39x | -12.90 | 45678.55 | 20.22 | | |
| eta | E | 2035-01-15T13:27:11.648 | | -0.62x | -12.65 | 47176.12 | 20.42 | | |
| gamma | E | 2035-01-15T13:27:33.622 | | -0.69x | -12.58 | 47625.35 | 20.47 | | |
| delta | E | 2035-01-15T13:28:06.527 | | -0.79x | -12.47 | 48300.35 | 20.55 | | |
| lambda | E | 2035-01-15T13:29:30.122 | | -1.05x | -12.18 | 50026.71 | 20.75 | | |
| epsilon | E | 2035-01-15T13:30:18.738 | | -1.20x | -12.02 | 51037.85 | 20.93 | | |

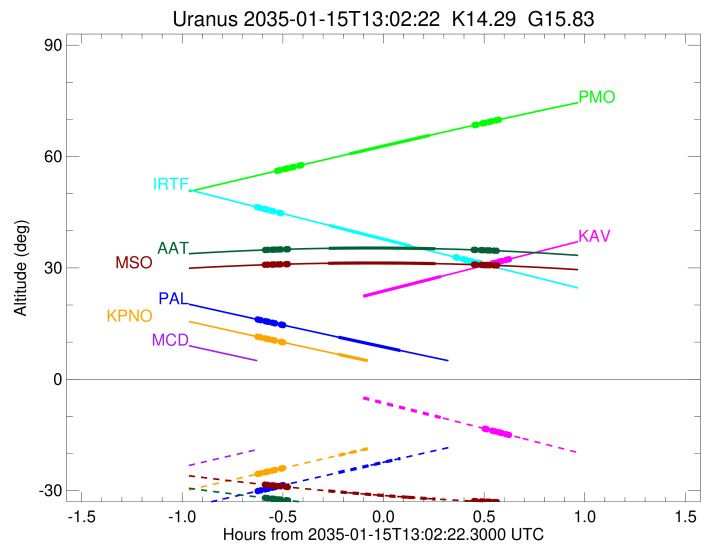
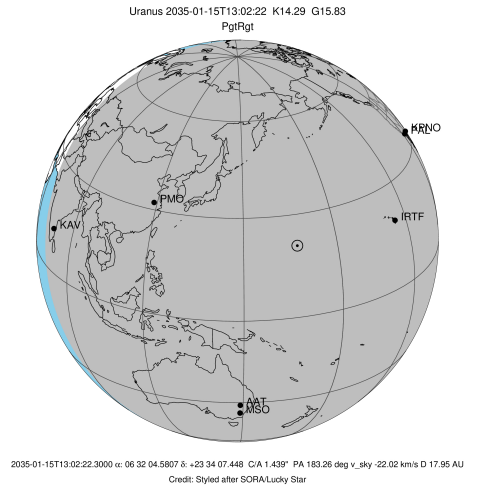
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-15T12:58:27.150
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 3382554446620464256
 2Mass ID (if available) : 06320458+2334075
 ICRS Star Coord at Epoch: 06h 32m 04.58069s +23:34:07.44758s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.290
 G magnitude : 15.830
 RP magnitude : 15.302
 BP magnitude : 16.202
 DUPflag : 0
 Distance (au) : 17.945
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.02
 Sun-Target sep (deg) : 162.63
 Sun-Moon sep (deg) : 93.36
 B (ring opening deg) : 68.77
 PA of pole (deg) : 70.47
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.732
 C/A sky separation (km) : 22540.3
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|--------|---------|----------|--------|---------|--------------|
| epsilon | I | 2035-01-15T12:24:35.065 | | 5.03 | -18.97 | 51525.46 | -20.95 | | |
| lambda | I | 2035-01-15T12:25:46.962 | | 4.79x | -18.72 | 50026.71 | -20.77 | | |
| delta | I | 2035-01-15T12:27:10.493 | | 4.52x | -18.43 | 48300.35 | -20.56 | | |
| gamma | I | 2035-01-15T12:27:43.528 | | 4.41x | -18.31 | 47622.38 | -20.48 | | |
| eta | I | 2035-01-15T12:28:05.350 | | 4.34x | -18.24 | 47176.12 | -20.42 | | |
| beta | I | 2035-01-15T12:29:19.974 | | 4.10x | -17.98 | 45660.99 | -20.21 | | |
| alpha | I | 2035-01-15T12:30:07.922 | | 3.94x | -17.81 | 44693.37 | -20.05 | | |
| 4 | I | 2035-01-15T12:31:55.034 | | 3.59x | -17.44 | 42566.15 | -19.70 | | |
| 5 | I | 2035-01-15T12:32:12.626 | | 3.53x | -17.38 | 42210.13 | -19.59 | | |
| 6 | I | 2035-01-15T12:32:31.099 | | 3.47x | -17.31 | 41848.67 | -19.56 | | |
| Uranus | I | 2035-01-15T12:49:17.480 | | 0.23x | -13.83 | 25553.82 | | -2.06 | -2.16 |
| Uranus | E | 2035-01-15T13:07:08.455 | | -3.16x | -10.17 | 25263.43 | | 15.92 | 16.64 |
| 6 | E | 2035-01-15T13:22:50.577 | | -6.07x | -6.98 | 41869.94 | 19.48 | | |
| 5 | E | 2035-01-15T13:23:06.013 | | -6.11x | -6.93 | 42175.92 | 19.51 | | |
| 4 | E | 2035-01-15T13:23:28.310 | | -6.18x | -6.85 | 42614.12 | 19.62 | | |
| alpha | E | 2035-01-15T13:25:14.066 | | -6.50x | -6.50 | 44710.62 | 19.96 | | |
| beta | E | 2035-01-15T13:26:02.111 | | -6.65x | -6.34 | 45678.59 | 20.12 | | |
| eta | E | 2035-01-15T13:27:16.190 | | -6.88x | -6.09 | 47176.12 | 20.32 | | |
| gamma | E | 2035-01-15T13:27:38.265 | | -6.94x | -6.01 | 47625.33 | 20.38 | | |
| delta | E | 2035-01-15T13:28:11.322 | | -7.04x | -5.90 | 48300.35 | 20.46 | | |
| lambda | E | 2035-01-15T13:29:35.287 | | -7.30x | -5.62 | 50026.71 | 20.66 | | |
| epsilon | E | 2035-01-15T13:30:24.177 | | -7.45x | -5.46 | 51039.20 | 20.84 | | |

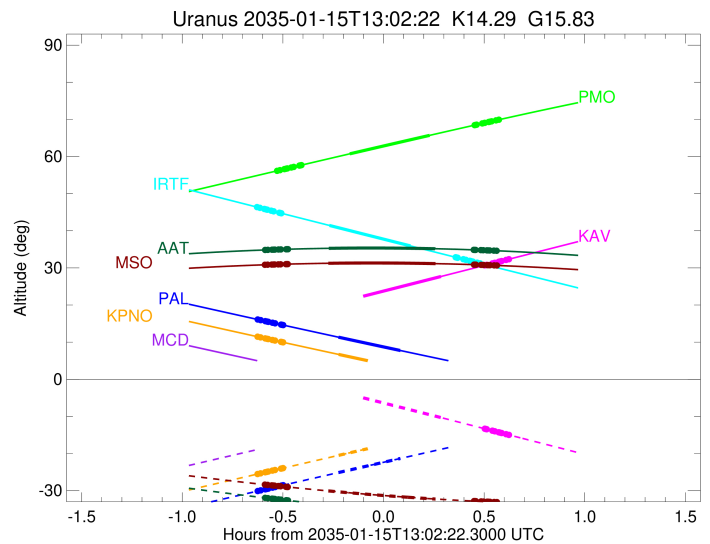
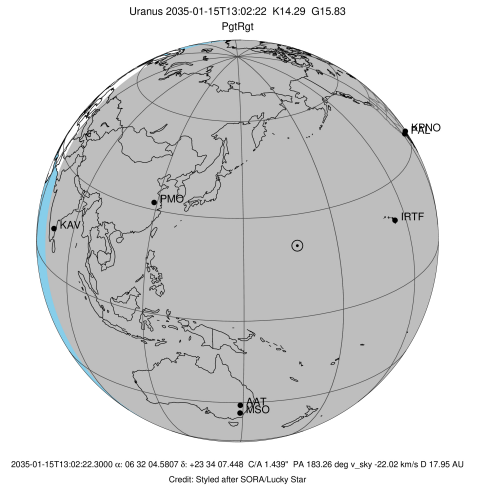

```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch              : 2035-01-15T12:58:33.440
Event type             : PgtRgt
: Uranus occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code         : IRTF
Location               : Mauna Kea/IRTF
Latitude (deg)        : 19.82622
E. Longitude (deg)    : 204.52800
Altitude (km)         : 4.168
Gaia source ID        : 3382554446620464256
2Mass ID (if available) : 06320458+2334075
ICRS Star Coord at Epoch: 06h 32m 04.58069s +23:34:07.44758s
RUWE (>1.4 is poor)  : 1.00
K magnitude            : 14.290
G magnitude           : 15.830
RP magnitude          : 15.302
BP magnitude          : 16.202
DUPflag               : 0
Distance (au)         : 17.945
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s)  : -22.02
Sun-Target sep (deg)  : 162.63
Sun-Moon sep (deg)    : 93.98
B (ring opening deg)  : 68.77
PA of pole (deg)      : 70.47
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.501
C/A sky separation (km) : 19535.6
NAIF SPICE kernels    : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.bsp
earthstns_itr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```



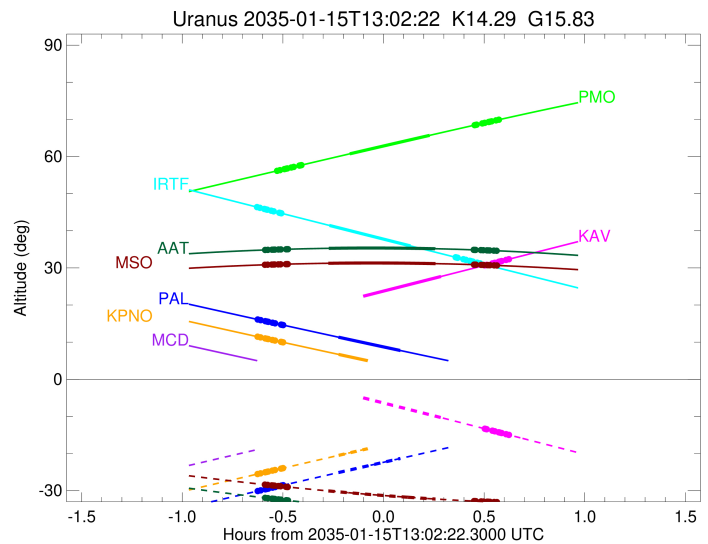
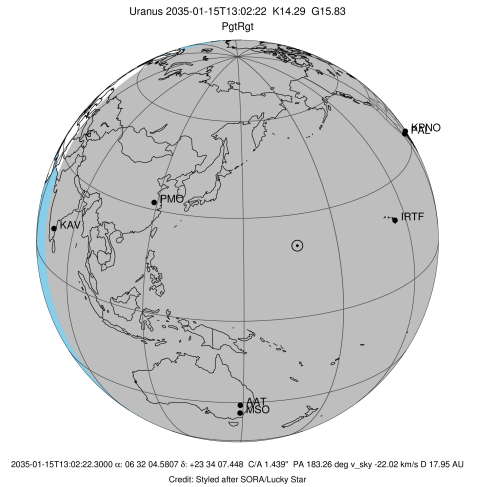
| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| epsilon | I | 2035-01-15T12:24:23.690 | | 46.44 | -63.47 | 51514.74 | -21.93 | | |
| lambda | I | 2035-01-15T12:25:31.811 | | 46.18 | -63.21 | 50026.71 | -21.78 | | |
| delta | I | 2035-01-15T12:26:51.325 | | 45.88 | -62.90 | 48300.35 | -21.64 | | |
| gamma | I | 2035-01-15T12:27:22.693 | | 45.76 | -62.78 | 47622.65 | -21.57 | | |
| eta | I | 2035-01-15T12:27:43.413 | | 45.68 | -62.70 | 47176.12 | -21.53 | | |
| beta | I | 2035-01-15T12:28:54.157 | | 45.41 | -62.42 | 45659.48 | -21.38 | | |
| alpha | I | 2035-01-15T12:29:39.266 | | 45.23 | -62.25 | 44695.20 | -21.26 | | |
| 4 | I | 2035-01-15T12:31:20.291 | | 44.85 | -61.85 | 42562.47 | -21.00 | | |
| 5 | I | 2035-01-15T12:31:36.264 | | 44.79 | -61.79 | 42216.56 | -20.92 | | |
| 6 | I | 2035-01-15T12:31:54.022 | | 44.72 | -61.72 | 41845.19 | -20.90 | | |
| Uranus | I | 2035-01-15T12:46:16.864 | | 41.43 | -58.37 | 25511.03 | | -6.30 | -6.60 |
| Uranus | E | 2035-01-15T13:10:26.227 | | 35.92 | -52.76 | 25164.07 | | 18.55 | 19.36 |
| 6 | E | 2035-01-15T13:23:54.606 | | 32.86 | -49.63 | 41867.56 | 20.81 | | |
| 5 | E | 2035-01-15T13:24:09.405 | | 32.80 | -49.57 | 42180.58 | 20.83 | | |
| 4 | E | 2035-01-15T13:24:29.944 | | 32.72 | -49.49 | 42612.78 | 20.92 | | |
| alpha | E | 2035-01-15T13:26:09.625 | | 32.35 | -49.11 | 44713.16 | 21.16 | | |
| beta | E | 2035-01-15T13:26:54.831 | | 32.18 | -48.93 | 45677.80 | 21.28 | | |
| eta | E | 2035-01-15T13:28:05.012 | | 31.91 | -48.66 | 47176.12 | 21.43 | | |
| gamma | E | 2035-01-15T13:28:25.971 | | 31.83 | -48.58 | 47625.70 | 21.47 | | |
| delta | E | 2035-01-15T13:28:57.347 | | 31.71 | -48.46 | 48300.35 | 21.53 | | |
| lambda | E | 2035-01-15T13:30:17.249 | | 31.41 | -48.15 | 50026.71 | 21.68 | | |
| epsilon | E | 2035-01-15T13:31:02.733 | | 31.24 | -47.98 | 51014.37 | 21.82 | | |

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-15T13:06:51.280
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 3382554446620464256
 2Mass ID (if available) : 06320458+2334075
 ICRS Star Coord at Epoch: 06h 32m 04.58069s +23:34:07.44758s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.290
 G magnitude : 15.830
 RP magnitude : 15.302
 BP magnitude : 16.202
 DUPflag : 0
 Distance (au) : 17.945
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.02
 Sun-Target sep (deg) : 162.63
 Sun-Moon sep (deg) : 93.89
 B (ring opening deg) : 68.77
 PA of pole (deg) : 70.47
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.430
 C/A sky separation (km) : 18615.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



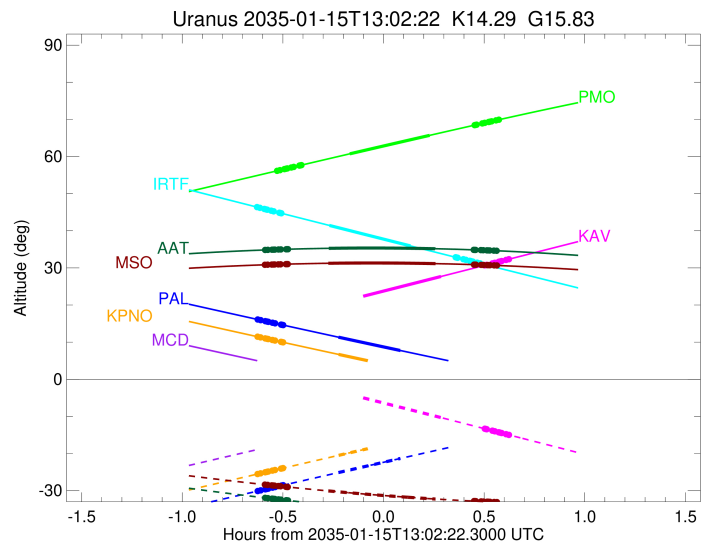
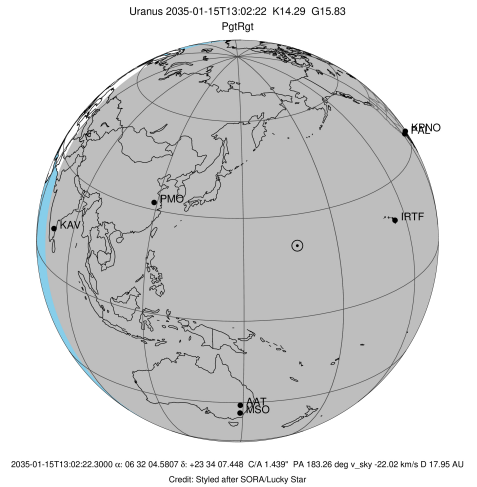
| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| epsilon | I | 2035-01-15T12:32:14.172 | | 16.86 | 0.48x | 51513.70 | -21.91 | | |
| lambda | I | 2035-01-15T12:33:22.289 | | 17.12 | 0.22x | 50026.71 | -21.78 | | |
| delta | I | 2035-01-15T12:34:41.786 | | 17.42 | -0.08x | 48300.35 | -21.65 | | |
| gamma | I | 2035-01-15T12:35:13.126 | | 17.54 | -0.20x | 47622.68 | -21.59 | | |
| eta | I | 2035-01-15T12:35:33.823 | | 17.62 | -0.27x | 47176.12 | -21.56 | | |
| beta | I | 2035-01-15T12:36:44.449 | | 17.88 | -0.54x | 45659.31 | -21.43 | | |
| alpha | I | 2035-01-15T12:37:29.420 | | 18.06 | -0.71x | 44695.43 | -21.32 | | |
| 4 | I | 2035-01-15T12:39:10.098 | | 18.44 | -1.09x | 42561.98 | -21.10 | | |
| 5 | I | 2035-01-15T12:39:25.928 | | 18.50 | -1.15x | 42217.43 | -21.02 | | |
| 6 | I | 2035-01-15T12:39:43.658 | | 18.57 | -1.22x | 41844.71 | -21.01 | | |
| Uranus | I | 2035-01-15T12:53:46.036 | | 21.78 | -4.42x | 25498.49 | | -7.08 | -7.41 |
| Uranus | E | 2035-01-15T13:19:31.691 | | 27.69 | -10.32 | 25136.48 | | 19.22 | 20.06 |
| 6 | E | 2035-01-15T13:32:35.541 | | 30.69 | -13.33 | 41866.42 | 21.09 | | |
| 5 | E | 2035-01-15T13:32:50.311 | | 30.75 | -13.39 | 42182.84 | 21.11 | | |
| 4 | E | 2035-01-15T13:33:10.412 | | 30.83 | -13.47 | 42612.08 | 21.19 | | |
| alpha | E | 2035-01-15T13:34:48.976 | | 31.20 | -13.84 | 44714.37 | 21.41 | | |
| beta | E | 2035-01-15T13:35:33.586 | | 31.38 | -14.02 | 45677.39 | 21.52 | | |
| eta | E | 2035-01-15T13:36:43.021 | | 31.64 | -14.28 | 47176.12 | 21.66 | | |
| gamma | E | 2035-01-15T13:37:03.767 | | 31.72 | -14.36 | 47625.88 | 21.70 | | |
| delta | E | 2035-01-15T13:37:34.808 | | 31.84 | -14.48 | 48300.35 | 21.76 | | |
| lambda | E | 2035-01-15T13:38:53.910 | | 32.14 | -14.79 | 50026.71 | 21.89 | | |
| epsilon | E | 2035-01-15T13:39:38.392 | | 32.31 | -14.96 | 51002.00 | 22.02 | | |

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-15T13:02:03.590
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 3382554446620464256
 2Mass ID (if available) : 06320458+2334075
 ICRS Star Coord at Epoch: 06h 32m 04.58069s +23:34:07.44758s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.290
 G magnitude : 15.830
 RP magnitude : 15.302
 BP magnitude : 16.202
 DUPflag : 0
 Distance (au) : 17.945
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.02
 Sun-Target sep (deg) : 162.63
 Sun-Moon sep (deg) : 93.99
 B (ring opening deg) : 68.77
 PA of pole (deg) : 70.47
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.033
 C/A sky separation (km) : 13441.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itrff93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| epsilon | I | 2035-01-15T12:26:50.299 | | 34.82 | -31.92 | 51490.69 | -22.99 | | |
| lambda | I | 2035-01-15T12:27:54.109 | | 34.86 | -32.03 | 50026.71 | -22.92 | | |
| delta | I | 2035-01-15T12:29:09.550 | | 34.90 | -32.16 | 48300.35 | -22.85 | | |
| gamma | I | 2035-01-15T12:29:39.203 | | 34.91 | -32.21 | 47623.20 | -22.82 | | |
| eta | I | 2035-01-15T12:29:58.802 | | 34.92 | -32.24 | 47176.12 | -22.80 | | |
| beta | I | 2035-01-15T12:31:05.583 | | 34.96 | -32.36 | 45656.72 | -22.74 | | |
| alpha | I | 2035-01-15T12:31:47.615 | | 34.98 | -32.43 | 44698.93 | -22.68 | | |
| 4 | I | 2035-01-15T12:33:22.417 | | 35.02 | -32.59 | 42555.86 | -22.57 | | |
| 5 | I | 2035-01-15T12:33:36.405 | | 35.03 | -32.61 | 42228.68 | -22.52 | | |
| 6 | I | 2035-01-15T12:33:53.690 | | 35.03 | -32.64 | 41838.66 | -22.52 | | |
| Uranus | I | 2035-01-15T12:46:03.152 | | 35.27 | -33.79 | 25385.89 | | -12.08 | -12.63 |
| Uranus | E | 2035-01-15T13:17:47.217 | | 35.16 | -36.15 | 25064.70 | | 20.91 | 21.81 |
| 6 | E | 2035-01-15T13:29:17.805 | | 34.86 | -36.77 | 41862.24 | 22.51 | | |
| 5 | E | 2035-01-15T13:29:32.217 | | 34.85 | -36.78 | 42190.94 | 22.51 | | |
| 4 | E | 2035-01-15T13:29:50.502 | | 34.84 | -36.79 | 42609.30 | 22.56 | | |
| alpha | E | 2035-01-15T13:31:23.685 | | 34.79 | -36.86 | 44718.35 | 22.67 | | |
| beta | E | 2035-01-15T13:32:05.643 | | 34.77 | -36.89 | 45675.93 | 22.73 | | |
| eta | E | 2035-01-15T13:33:11.590 | | 34.73 | -36.94 | 47176.12 | 22.79 | | |
| gamma | E | 2035-01-15T13:33:31.340 | | 34.72 | -36.96 | 47626.46 | 22.81 | | |
| delta | E | 2035-01-15T13:34:00.864 | | 34.70 | -36.98 | 48300.35 | 22.84 | | |
| lambda | E | 2035-01-15T13:35:16.339 | | 34.65 | -37.03 | 50026.71 | 22.91 | | |
| epsilon | E | 2035-01-15T13:35:57.274 | | 34.63 | -37.06 | 50965.06 | 22.98 | | |

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-15T13:02:03.370
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MSO
 Location : Mt. Stromlo Observatory
 Latitude (deg) : -35.32000
 E. Longitude (deg) : 149.00833
 Altitude (km) : 0.770
 Gaia source ID : 3382554446620464256
 2Mass ID (if available) : 06320458+2334075
 ICRS Star Coord at Epoch: 06h 32m 04.58069s +23:34:07.44758s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.290
 G magnitude : 15.830
 RP magnitude : 15.302
 BP magnitude : 16.202
 DUPflag : 0
 Distance (au) : 17.945
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.02
 Sun-Target sep (deg) : 162.63
 Sun-Moon sep (deg) : 93.94
 B (ring opening deg) : 68.77
 PA of pole (deg) : 70.47
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.014
 C/A sky separation (km) : 13196.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| epsilon | I | 2035-01-15T12:26:46.119 | | 30.83 | -28.36 | 51489.60 | -23.01 | | |
| lambda | I | 2035-01-15T12:27:49.845 | | 30.86 | -28.46 | 50026.71 | -22.93 | | |
| delta | I | 2035-01-15T12:29:05.234 | | 30.90 | -28.58 | 48300.35 | -22.87 | | |
| gamma | I | 2035-01-15T12:29:34.864 | | 30.91 | -28.63 | 47623.22 | -22.84 | | |
| eta | I | 2035-01-15T12:29:54.448 | | 30.92 | -28.66 | 47176.12 | -22.82 | | |
| beta | I | 2035-01-15T12:31:01.175 | | 30.95 | -28.76 | 45656.61 | -22.76 | | |
| alpha | I | 2035-01-15T12:31:43.152 | | 30.97 | -28.83 | 44699.09 | -22.70 | | |
| 4 | I | 2035-01-15T12:33:17.865 | | 31.01 | -28.98 | 42555.60 | -22.60 | | |
| 5 | I | 2035-01-15T12:33:31.802 | | 31.02 | -29.00 | 42229.18 | -22.55 | | |
| 6 | I | 2035-01-15T12:33:49.097 | | 31.02 | -29.02 | 41838.40 | -22.55 | | |
| Uranus | I | 2035-01-15T12:45:55.698 | | 31.24 | -30.08 | 25380.46 | | -12.27 | -12.83 |
| Uranus | E | 2035-01-15T13:17:54.530 | | 31.15 | -32.26 | 25062.86 | | 20.95 | 21.85 |
| 6 | E | 2035-01-15T13:29:22.948 | | 30.88 | -32.82 | 41862.02 | 22.54 | | |
| 5 | E | 2035-01-15T13:29:37.371 | | 30.87 | -32.83 | 42191.36 | 22.54 | | |
| 4 | E | 2035-01-15T13:29:55.603 | | 30.86 | -32.85 | 42609.15 | 22.59 | | |
| alpha | E | 2035-01-15T13:31:28.697 | | 30.81 | -32.91 | 44718.55 | 22.69 | | |
| beta | E | 2035-01-15T13:32:10.602 | | 30.79 | -32.94 | 45675.85 | 22.75 | | |
| eta | E | 2035-01-15T13:33:16.495 | | 30.76 | -32.98 | 47176.12 | 22.81 | | |
| gamma | E | 2035-01-15T13:33:36.230 | | 30.75 | -33.00 | 47626.49 | 22.83 | | |
| delta | E | 2035-01-15T13:34:05.730 | | 30.73 | -33.02 | 48300.35 | 22.86 | | |
| lambda | E | 2035-01-15T13:35:21.153 | | 30.69 | -33.06 | 50026.71 | 22.92 | | |
| epsilon | E | 2035-01-15T13:36:01.983 | | 30.66 | -33.09 | 50963.22 | 23.00 | | |