

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-01-18T19:13:15.390
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3425436323518592256
 2Mass ID (if available) : 06111703+2341213

ICRS Star Coord at Epoch: 06h 11m 17.04104s +23:41:21.39993s

RUWE (>1.4 is poor) : 0.96
 K magnitude : 14.907
 G magnitude : 16.983
 RP magnitude : 16.248
 BP magnitude : 17.545
 DUPflag : 0
 Distance (au) : 18.058
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.47
 Sun-Target sep (deg) : 154.29
 Sun-Moon sep (deg) : 172.11
 B (ring opening deg) : 73.10
 PA of pole (deg) : 62.57

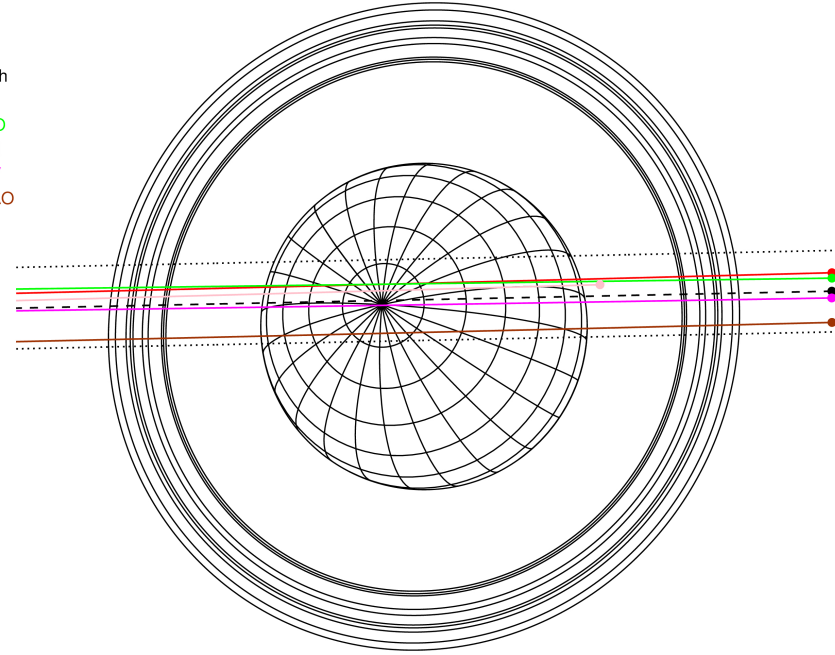
| # | a(km) | ring |
|----|---------|---------|
| 1 | 41837.2 | 6 |
| 2 | 42235.0 | 5 |
| 3 | 42571.2 | 4 |
| 4 | 44718.5 | alpha |
| 5 | 45661.1 | beta |
| 6 | 47176.1 | eta |
| 7 | 47626.3 | gamma |
| 8 | 48300.3 | delta |
| 9 | 50026.7 | lambda |
| 10 | 51149.4 | epsilon |



2034-01-18T19:13:15.3900 ra: 06 11 17.0410 s: +23 41 21.400 C/A 0.528 PA 181.18 deg v_sky -20.47 km/s D 18.06 AU
 Credit: Styled after SORA/Lucky Star

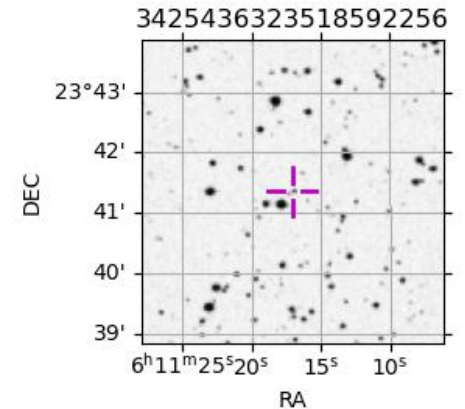
Uranus 2034-01-18T19:13:15 K14.91 G16.98 PgtRgt

Earth
 PIC
 PMO
 TEN
 KAV
 SAAO

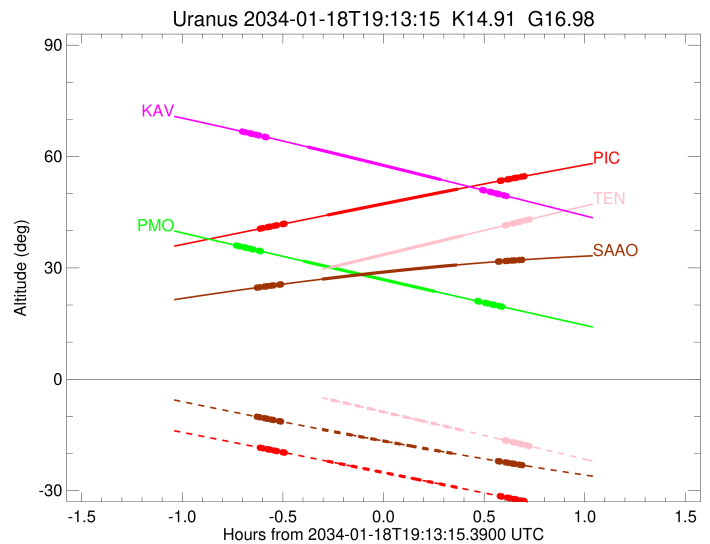
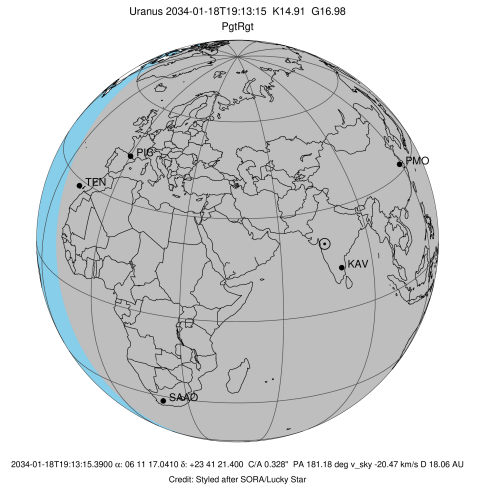


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

| Obs | Location | lat | Elon | Rings I | Planet | Rings E | Observed Events Interval | OEcode |
|------|-----------------------|-------|-------|---------|--------|---------|-----------------------------|--------|
| PIC | Pic du Midi | 42.9 | 0.1 | +++++ | + + | +++++ | JAN 18 18:36 - JAN 18 19:55 | PieRie |
| PAL | Palomar Mt (200") | 33.4 | 243.1 | | | | | PnnRnn |
| PMO | Purple Mtn Obs. Nanki | 32.1 | 118.8 | +++++ | + + | +++++ | JAN 18 18:29 - JAN 18 19:48 | PieRie |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | | | | | PnnRnn |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | | | | | PnnRnn |
| TEN | Teide Obs./Tenerife | 28.3 | 343.5 | | + + | +++++ | JAN 18 18:57 - JAN 18 19:56 | PieRne |
| IRTF | Mauna Kea/IRTF | 19.8 | 204.5 | | | | | PnnRnn |
| KAV | Kavalur Observatory | 12.6 | 78.8 | +++++ | + + | +++++ | JAN 18 18:31 - JAN 18 19:49 | PieRie |
| 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 | | | | | PnnRnn |
| SAAO | So. Afr. Astro. Obs. | -32.4 | 20.8 | +++++ | + + | +++++ | JAN 18 18:35 - JAN 18 19:54 | PieRie |
| MSO | Mt. Stromlo Observato | -35.3 | 149.0 | | | | | PnnRnn |

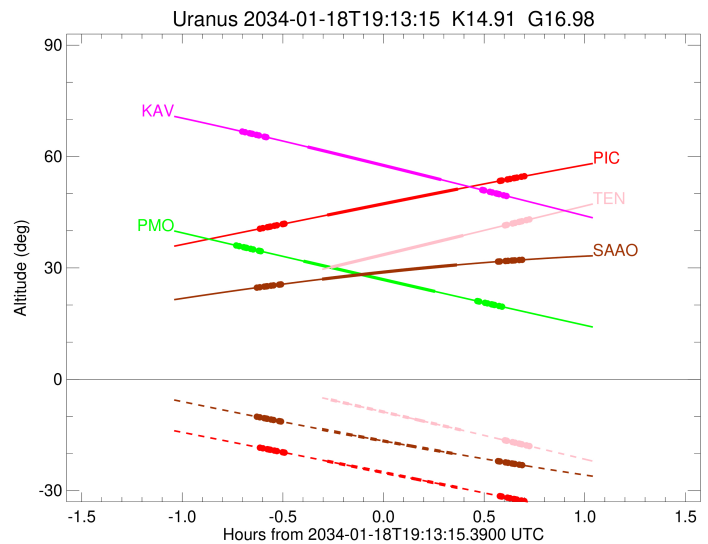
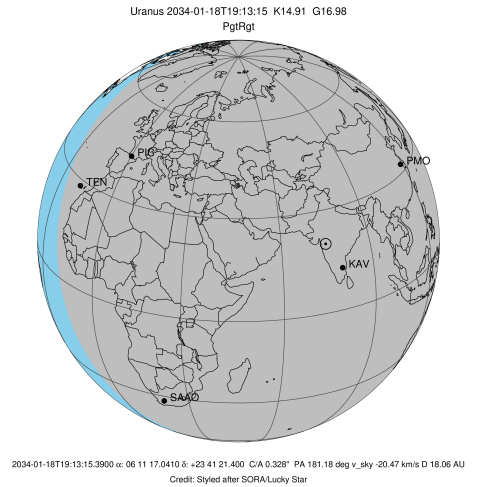


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-01-18T19:16:04.140
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3425436323518592256
 2Mass ID (if available) : 06111703+2341213
 ICRS Star Coord at Epoch: 06h 11m 17.04104s +23:41:21.39993s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 14.907
 G magnitude : 16.983
 RP magnitude : 16.248
 BP magnitude : 17.545
 DUPflag : 0
 Distance (au) : 18.058
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.47
 Sun-Target sep (deg) : 154.29
 Sun-Moon sep (deg) : 172.83
 B (ring opening deg) : 73.10
 PA of pole (deg) : 62.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.517
 C/A sky separation (km) : 6770.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl1.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



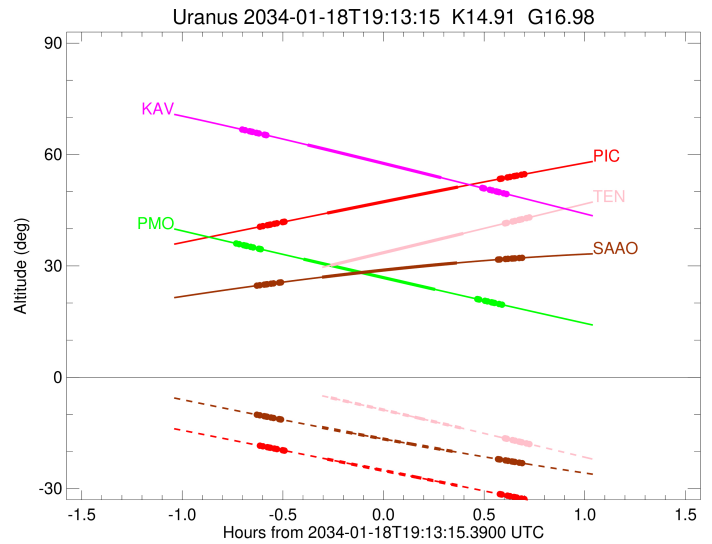
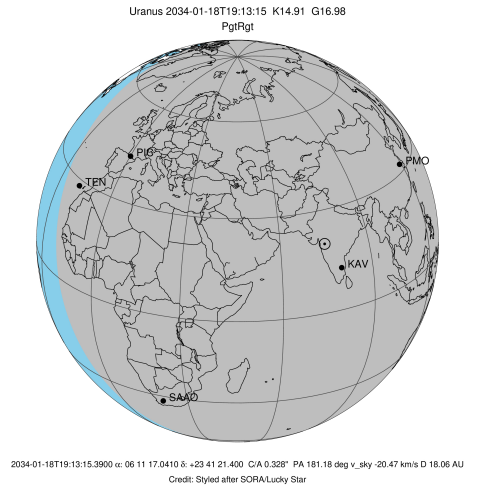
| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| epsilon | I | 2034-01-18T18:36:26.671 | | 40.56 | -18.44 | 51121.98 | -21.17 | | |
| lambda | I | 2034-01-18T18:37:18.365 | | 40.72 | -18.59 | 50026.71 | -21.18 | | |
| delta | I | 2034-01-18T18:38:39.886 | | 40.97 | -18.84 | 48300.35 | -21.17 | | |
| gamma | I | 2034-01-18T18:39:11.517 | | 41.06 | -18.93 | 47630.82 | -21.16 | | |
| eta | I | 2034-01-18T18:39:33.003 | | 41.13 | -19.00 | 47176.12 | -21.16 | | |
| beta | I | 2034-01-18T18:40:44.758 | | 41.35 | -19.21 | 45658.89 | -21.15 | | |
| alpha | I | 2034-01-18T18:41:30.678 | | 41.49 | -19.35 | 44684.88 | -21.13 | | |
| 4 | I | 2034-01-18T18:43:11.486 | | 41.80 | -19.66 | 42562.54 | -21.11 | | |
| 5 | I | 2034-01-18T18:43:23.556 | | 41.84 | -19.69 | 42305.66 | -21.11 | | |
| 6 | I | 2034-01-18T18:43:47.658 | | 41.91 | -19.76 | 41794.77 | -21.10 | | |
| Uranus | I | 2034-01-18T18:56:27.479 | | 44.22 | -22.06 | 25281.34 | | -11.99 | -12.54 |
| Uranus | E | 2034-01-18T19:35:28.215 | | 51.25 | -29.19 | 25050.11 | | 16.45 | 17.18 |
| 6 | E | 2034-01-18T19:47:58.146 | | 53.44 | -31.48 | 41877.87 | 21.16 | | |
| 5 | E | 2034-01-18T19:48:12.295 | | 53.48 | -31.52 | 42180.31 | 21.17 | | |
| 4 | E | 2034-01-18T19:48:30.127 | | 53.53 | -31.58 | 42565.18 | 21.17 | | |
| alpha | E | 2034-01-18T19:50:13.758 | | 53.83 | -31.90 | 44751.86 | 21.20 | | |
| beta | E | 2034-01-18T19:50:56.881 | | 53.96 | -32.03 | 45669.24 | 21.21 | | |
| eta | E | 2034-01-18T19:52:07.914 | | 54.16 | -32.25 | 47176.12 | 21.23 | | |
| gamma | E | 2034-01-18T19:52:28.875 | | 54.22 | -32.31 | 47621.12 | 21.23 | | |
| delta | E | 2034-01-18T19:53:00.860 | | 54.31 | -32.41 | 48300.35 | 21.24 | | |
| lambda | E | 2034-01-18T19:54:22.110 | | 54.55 | -32.66 | 50026.71 | 21.26 | | |
| epsilon | E | 2034-01-18T19:55:10.774 | | 54.69 | -32.80 | 51061.32 | 21.24 | | |

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-01-18T19:09:05.910
 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 : 3425436323518592256
 2Mass ID (if available) : 06111703+2341213
 ICRS Star Coord at Epoch: 06h 11m 17.04104s +23:41:21.39993s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 14.907
 G magnitude : 16.983
 RP magnitude : 16.248
 BP magnitude : 17.545
 DUPflag : 0
 Distance (au) : 18.058
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.47
 Sun-Target sep (deg) : 154.29
 Sun-Moon sep (deg) : 171.84
 B (ring opening deg) : 73.10
 PA of pole (deg) : 62.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.512
 C/A sky separation (km) : 6701.7
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



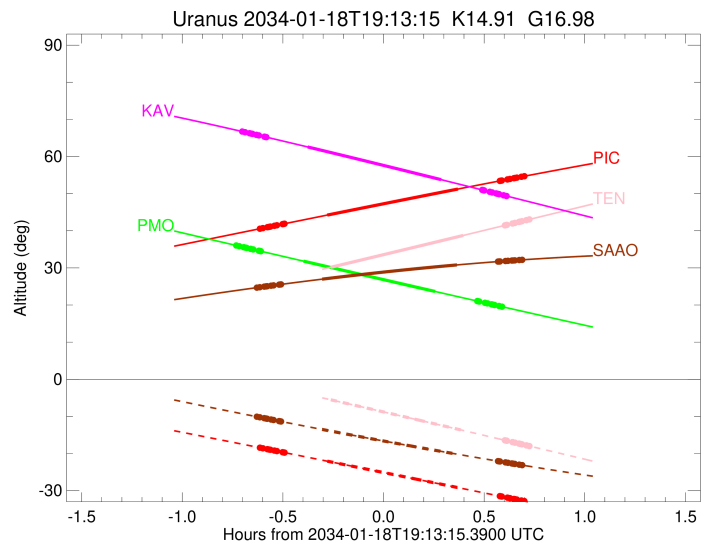
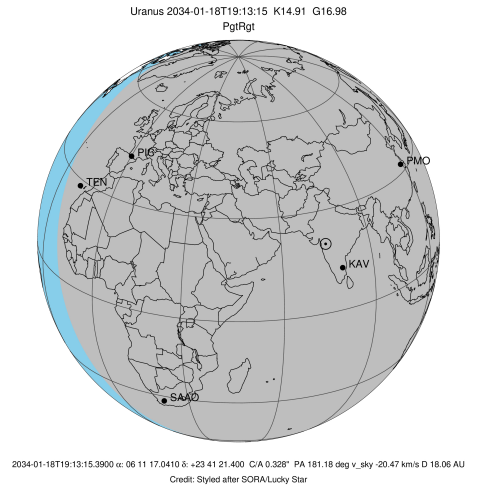
| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| epsilon | I | 2034-01-18T18:29:22.135 | | 36.04 | -57.93 | 51127.29 | -21.18 | | |
| lambda | I | 2034-01-18T18:30:14.065 | | 35.86 | -57.75 | 50026.71 | -21.19 | | |
| delta | I | 2034-01-18T18:31:35.573 | | 35.57 | -57.47 | 48300.35 | -21.17 | | |
| gamma | I | 2034-01-18T18:32:07.200 | | 35.46 | -57.36 | 47630.86 | -21.16 | | |
| eta | I | 2034-01-18T18:32:28.689 | | 35.38 | -57.29 | 47176.12 | -21.16 | | |
| beta | I | 2034-01-18T18:33:40.463 | | 35.13 | -57.04 | 45658.63 | -21.14 | | |
| alpha | I | 2034-01-18T18:34:26.383 | | 34.97 | -56.88 | 44684.83 | -21.13 | | |
| 4 | I | 2034-01-18T18:36:07.202 | | 34.62 | -56.53 | 42563.13 | -21.10 | | |
| 5 | I | 2034-01-18T18:36:19.320 | | 34.57 | -56.49 | 42305.14 | -21.10 | | |
| 6 | I | 2034-01-18T18:36:43.409 | | 34.49 | -56.40 | 41794.75 | -21.09 | | |
| Uranus | I | 2034-01-18T18:49:23.712 | | 31.82 | -53.76 | 25273.46 | | -12.16 | -12.72 |
| Uranus | E | 2034-01-18T19:28:38.766 | | 23.65 | -45.47 | 25048.08 | | 16.48 | 17.22 |
| 6 | E | 2034-01-18T19:41:14.603 | | 21.06 | -42.80 | 41877.75 | 20.97 | | |
| 5 | E | 2034-01-18T19:41:28.910 | | 21.01 | -42.75 | 42180.86 | 20.98 | | |
| 4 | E | 2034-01-18T19:41:46.850 | | 20.95 | -42.68 | 42564.76 | 20.98 | | |
| alpha | E | 2034-01-18T19:43:31.454 | | 20.59 | -42.31 | 44751.80 | 21.00 | | |
| beta | E | 2034-01-18T19:44:14.996 | | 20.44 | -42.16 | 45669.41 | 21.01 | | |
| eta | E | 2034-01-18T19:45:26.696 | | 20.20 | -41.90 | 47176.12 | 21.03 | | |
| gamma | E | 2034-01-18T19:45:47.859 | | 20.13 | -41.83 | 47621.11 | 21.03 | | |
| delta | E | 2034-01-18T19:46:20.154 | | 20.02 | -41.72 | 48300.35 | 21.03 | | |
| lambda | E | 2034-01-18T19:47:42.203 | | 19.74 | -41.42 | 50026.71 | 21.05 | | |
| epsilon | E | 2034-01-18T19:48:31.170 | | 19.57 | -41.25 | 51057.45 | 21.03 | | |

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-01-18T19:17:22.290
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 3425436323518592256
 2Mass ID (if available) : 06111703+2341213
 ICRS Star Coord at Epoch: 06h 11m 17.04104s +23:41:21.39993s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 14.907
 G magnitude : 16.983
 RP magnitude : 16.248
 BP magnitude : 17.545
 DUPflag : 0
 Distance (au) : 18.058
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.47
 Sun-Target sep (deg) : 154.29
 Sun-Moon sep (deg) : 172.88
 B (ring opening deg) : 73.10
 PA of pole (deg) : 62.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.441
 C/A sky separation (km) : 5779.4
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



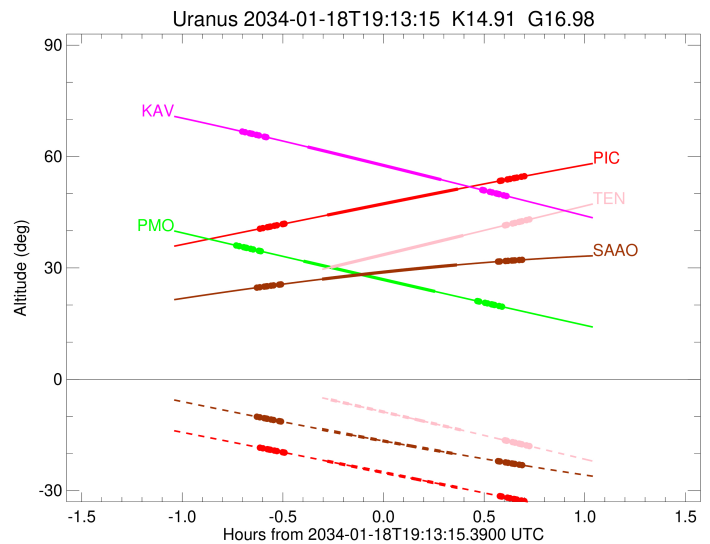
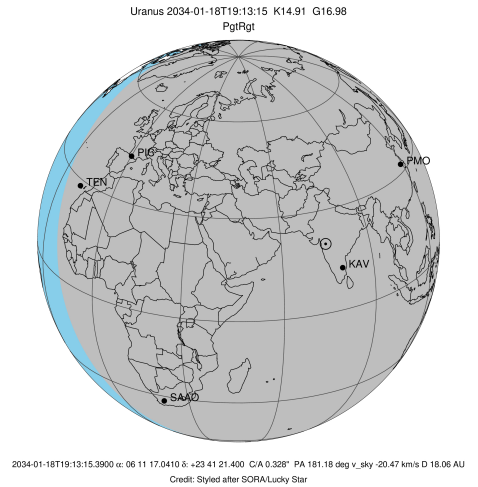
| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| epsilon | I | 2034-01-18T18:37:33.761 | | 25.87 | -1.43x | 51129.07 | -21.16 | | |
| lambda | I | 2034-01-18T18:38:25.828 | | 26.05 | -1.60x | 50026.71 | -21.17 | | |
| delta | I | 2034-01-18T18:39:47.394 | | 26.35 | -1.88x | 48300.35 | -21.16 | | |
| gamma | I | 2034-01-18T18:40:19.035 | | 26.46 | -1.99x | 47630.88 | -21.16 | | |
| eta | I | 2034-01-18T18:40:40.531 | | 26.54 | -2.06x | 47176.12 | -21.15 | | |
| beta | I | 2034-01-18T18:41:52.316 | | 26.79 | -2.31x | 45658.50 | -21.15 | | |
| alpha | I | 2034-01-18T18:42:38.220 | | 26.96 | -2.46x | 44684.80 | -21.14 | | |
| 4 | I | 2034-01-18T18:44:18.957 | | 27.32 | -2.81x | 42563.50 | -21.12 | | |
| 5 | I | 2034-01-18T18:44:31.091 | | 27.36 | -2.85x | 42304.81 | -21.12 | | |
| 6 | I | 2034-01-18T18:44:55.137 | | 27.45 | -2.93x | 41794.75 | -21.11 | | |
| Uranus | I | 2034-01-18T18:57:31.452 | | 30.16 | -5.52 | 25261.08 | | -12.43 | -13.00 |
| Uranus | E | 2034-01-18T19:37:01.572 | | 38.74 | -13.80 | 25061.00 | | 16.26 | 16.99 |
| 6 | E | 2034-01-18T19:49:28.762 | | 41.47 | -16.44 | 41878.18 | 21.21 | | |
| 5 | E | 2034-01-18T19:49:42.794 | | 41.52 | -16.49 | 42178.79 | 21.22 | | |
| 4 | E | 2034-01-18T19:50:00.736 | | 41.58 | -16.56 | 42566.36 | 21.22 | | |
| alpha | E | 2034-01-18T19:51:44.108 | | 41.96 | -16.92 | 44752.00 | 21.24 | | |
| beta | E | 2034-01-18T19:52:27.125 | | 42.12 | -17.08 | 45668.79 | 21.25 | | |
| eta | E | 2034-01-18T19:53:38.063 | | 42.38 | -17.33 | 47176.12 | 21.26 | | |
| gamma | E | 2034-01-18T19:53:58.994 | | 42.45 | -17.40 | 47621.15 | 21.26 | | |
| delta | E | 2034-01-18T19:54:30.930 | | 42.57 | -17.52 | 48300.35 | 21.27 | | |
| lambda | E | 2034-01-18T19:55:52.069 | | 42.87 | -17.81 | 50026.71 | 21.28 | | |
| epsilon | E | 2034-01-18T19:56:41.084 | | 43.05 | -17.98 | 51070.07 | 21.27 | | |

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-01-18T19:10:35.030
 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 : 3425436323518592256
 2Mass ID (if available) : 06111703+2341213
 ICRS Star Coord at Epoch: 06h 11m 17.04104s +23:41:21.39993s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 14.907
 G magnitude : 16.983
 RP magnitude : 16.248
 BP magnitude : 17.545
 DUPflag : 0
 Distance (au) : 18.058
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.47
 Sun-Target sep (deg) : 154.29
 Sun-Moon sep (deg) : 171.79
 B (ring opening deg) : 73.10
 PA of pole (deg) : 62.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.260
 C/A sky separation (km) : 3409.4
 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 | 2034-01-18T18:31:08.257 | | 66.73 | -80.22 | 51152.71 | -21.56 | | |
| lambda | I | 2034-01-18T18:32:00.448 | | 66.55 | -80.34 | 50026.71 | -21.57 | | |
| delta | I | 2034-01-18T18:33:20.482 | | 66.27 | -80.52 | 48300.35 | -21.57 | | |
| gamma | I | 2034-01-18T18:33:51.517 | | 66.16 | -80.59 | 47631.03 | -21.57 | | |
| eta | I | 2034-01-18T18:34:12.612 | | 66.09 | -80.64 | 47176.12 | -21.56 | | |
| beta | I | 2034-01-18T18:35:23.084 | | 65.84 | -80.78 | 45657.23 | -21.56 | | |
| alpha | I | 2034-01-18T18:36:08.052 | | 65.69 | -80.87 | 44684.64 | -21.55 | | |
| 4 | I | 2034-01-18T18:37:46.696 | | 65.34 | -81.06 | 42566.54 | -21.55 | | |
| 5 | I | 2034-01-18T18:37:58.814 | | 65.30 | -81.09 | 42301.95 | -21.55 | | |
| 6 | I | 2034-01-18T18:38:22.238 | | 65.21 | -81.13 | 41794.82 | -21.54 | | |
| Uranus | I | 2034-01-18T18:50:38.243 | | 62.58 | -82.02 | 25205.48 | | -13.58 | -14.20 |
| Uranus | E | 2034-01-18T19:30:27.455 | | 53.77 | -78.42 | 25087.00 | | 15.80 | 16.51 |
| 6 | E | 2034-01-18T19:42:43.558 | | 51.00 | -76.13 | 41878.67 | 21.46 | | |
| 5 | E | 2034-01-18T19:42:57.287 | | 50.94 | -76.09 | 42176.24 | 21.47 | | |
| 4 | E | 2034-01-18T19:43:15.268 | | 50.88 | -76.03 | 42568.40 | 21.47 | | |
| alpha | E | 2034-01-18T19:44:57.390 | | 50.49 | -75.69 | 44752.20 | 21.47 | | |
| beta | E | 2034-01-18T19:45:39.900 | | 50.33 | -75.55 | 45668.01 | 21.47 | | |
| eta | E | 2034-01-18T19:46:50.151 | | 50.06 | -75.31 | 47176.12 | 21.48 | | |
| gamma | E | 2034-01-18T19:47:10.877 | | 49.99 | -75.24 | 47621.21 | 21.48 | | |
| delta | E | 2034-01-18T19:47:42.499 | | 49.87 | -75.14 | 48300.35 | 21.48 | | |
| lambda | E | 2034-01-18T19:49:02.878 | | 49.56 | -74.86 | 50026.71 | 21.48 | | |
| epsilon | E | 2034-01-18T19:49:52.112 | | 49.38 | -74.70 | 51084.24 | 21.47 | | |

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-01-18T19:15:02.600
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : SAAO
 Location : So. Afr. Astro. Obs. (Sutherland)
 Latitude (deg) : -32.37953
 E. Longitude (deg) : 20.81070
 Altitude (km) : 1.768
 Gaia source ID : 3425436323518592256
 2Mass ID (if available) : 06111703+2341213
 ICRS Star Coord at Epoch: 06h 11m 17.04104s +23:41:21.39993s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 14.907
 G magnitude : 16.983
 RP magnitude : 16.248
 BP magnitude : 17.545
 DUPflag : 0
 Distance (au) : 18.058
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.47
 Sun-Target sep (deg) : 154.29
 Sun-Moon sep (deg) : 171.88
 B (ring opening deg) : 73.10
 PA of pole (deg) : 62.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.070
 C/A sky separation (km) : 920.6
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| epsilon | I | 2034-01-18T18:35:28.778 | | 24.68 | -10.08 | 51184.34 | -21.52 | | |
| lambda | I | 2034-01-18T18:36:22.590 | | 24.79 | -10.24 | 50026.71 | -21.51 | | |
| delta | I | 2034-01-18T18:37:42.837 | | 24.96 | -10.48 | 48300.35 | -21.51 | | |
| gamma | I | 2034-01-18T18:38:13.941 | | 25.02 | -10.58 | 47631.21 | -21.51 | | |
| eta | I | 2034-01-18T18:38:35.094 | | 25.06 | -10.64 | 47176.12 | -21.51 | | |
| beta | I | 2034-01-18T18:39:45.799 | | 25.21 | -10.85 | 45655.51 | -21.51 | | |
| alpha | I | 2034-01-18T18:40:30.780 | | 25.30 | -10.98 | 44684.65 | -21.51 | | |
| 4 | I | 2034-01-18T18:42:09.417 | | 25.49 | -11.27 | 42570.85 | -21.52 | | |
| 5 | I | 2034-01-18T18:42:21.892 | | 25.52 | -11.31 | 42297.40 | -21.51 | | |
| 6 | I | 2034-01-18T18:42:45.105 | | 25.56 | -11.38 | 41795.25 | -21.51 | | |
| Uranus | I | 2034-01-18T18:54:56.416 | | 26.97 | -13.51 | 25128.54 | | -15.06 | -15.74 |
| Uranus | E | 2034-01-18T19:35:09.669 | | 30.80 | -20.17 | 25160.79 | | 14.45 | 15.11 |
| 6 | E | 2034-01-18T19:47:25.426 | | 31.71 | -22.06 | 41879.47 | 21.55 | | |
| 5 | E | 2034-01-18T19:47:38.809 | | 31.72 | -22.09 | 42170.56 | 21.55 | | |
| 4 | E | 2034-01-18T19:47:57.298 | | 31.74 | -22.14 | 42573.39 | 21.56 | | |
| alpha | E | 2034-01-18T19:49:38.763 | | 31.85 | -22.40 | 44752.43 | 21.55 | | |
| beta | E | 2034-01-18T19:50:20.997 | | 31.90 | -22.50 | 45666.03 | 21.56 | | |
| eta | E | 2034-01-18T19:51:31.074 | | 31.98 | -22.68 | 47176.12 | 21.56 | | |
| gamma | E | 2034-01-18T19:51:51.729 | | 32.00 | -22.73 | 47621.40 | 21.56 | | |
| delta | E | 2034-01-18T19:52:23.223 | | 32.03 | -22.80 | 48300.35 | 21.56 | | |
| lambda | E | 2034-01-18T19:53:43.299 | | 32.12 | -23.00 | 50026.71 | 21.56 | | |
| epsilon | E | 2034-01-18T19:54:34.091 | | 32.17 | -23.13 | 51121.78 | 21.56 | | |