

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2046-04-06T03:26:00.270
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 614961977311435904
 2Mass ID (if available) : 09584124+1310264

Uranus 2046-04-06T03:26:00 K13.45 G14.55 PgtRgt

ICRS Star Coord at Epoch: 09h 58m 41.23282s +13:10:26.28794s

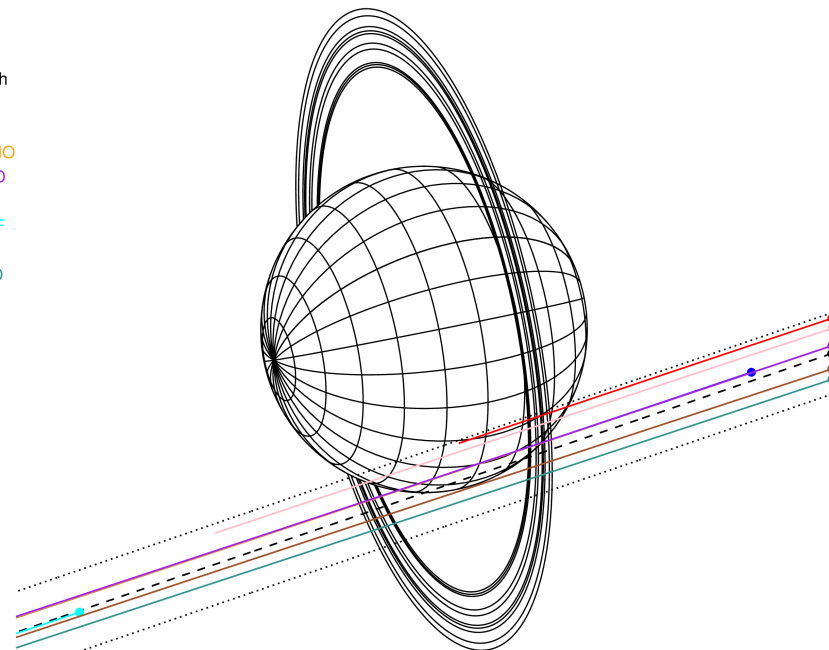
RUWE (>1.4 is poor) : 1.08
 K magnitude : 13.452
 G magnitude : 14.550
 RP magnitude : 14.157
 BP magnitude : 14.790
 DUPflag : 0
 Distance (au) : 17.657
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.95
 Sun-Target sep (deg) : 131.33
 Sun-Moon sep (deg) : 134.96
 B (ring opening deg) : 20.15
 PA of pole (deg) : 101.57

| # | 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 |



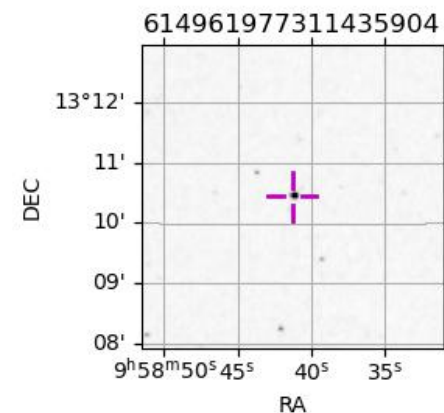
2046-04-06T03:26:00.2700 α: 09 58 41.2328 s; +13 10 26.288 C/A 1.893° PA 18.88 deg v_sky -12.96 km/s D 17.66 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO

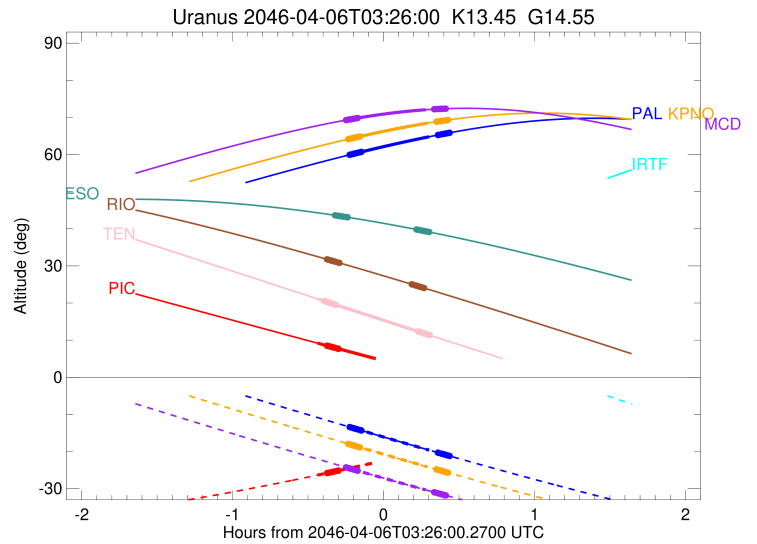
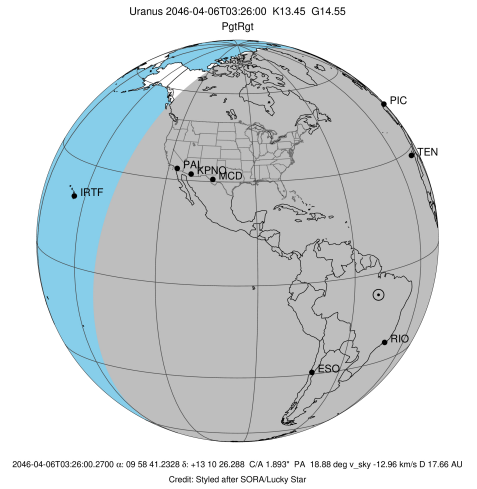


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

| Obs | Location | lat | Elon | Rings I | Planet | Rings E | Observed Events Interval | OEcode |
|------|-----------------------|-------|-------|---------|--------|---------|-----------------------------|--------|
| PIC | Pic du Midi | 42.9 | 0.1 | | + | | APR 06 02:59 - APR 06 02:59 | PinRnn |
| PAL | Palomar Mt (200") | 33.4 | 243.1 | +++++ | + + | +++++ | APR 06 03:12 - APR 06 03:52 | PieRie |
| PNO | Purple Mtn Obs. Nanki | 32.1 | 118.8 | | | | | PnnRnn |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | +++++ | + + | +++++ | APR 06 03:12 - APR 06 03:51 | PieRie |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | +++++ | + + | +++++ | APR 06 03:11 - APR 06 03:50 | PieRie |
| TEN | Teide Obs./Tenerife | 28.3 | 343.5 | | + + | +++++ | APR 06 03:00 - APR 06 03:44 | PieRne |
| IRTF | Mauna Kea/IRTF | 19.8 | 204.5 | | | | | PnnRnn |
| KAV | Kavalur Observatory | 12.6 | 78.8 | | | | | PnnRnn |
| RIO | Rio de Janeiro | -22.9 | 316.8 | +++++ | | +++++ | APR 06 03:03 - APR 06 03:42 | PnnRie |
| ESO | European Southern Obs | -29.3 | 289.3 | +++++ | | +++++ | APR 06 03:06 - APR 06 03:44 | PnnRie |
| AAT | Siding Spring (AAT) | -31.3 | 149.1 | | | | | PnnRnn |
| SAAO | So. Afr. Astro. Obs. | -32.4 | 20.8 | | | | | PnnRnn |
| MSO | Mt. Stromlo Observato | -35.3 | 149.0 | | | | | PnnRnn |

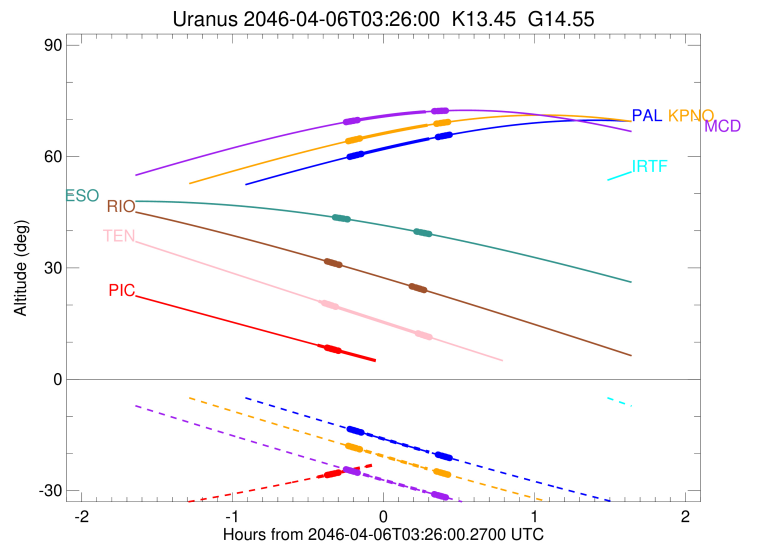
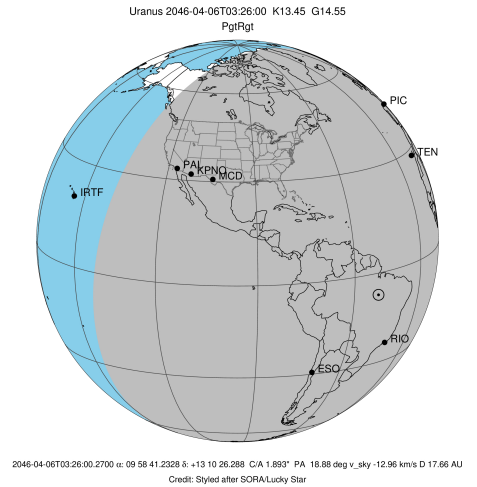


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2046-04-06T03:22:15.320
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 614961977311435904
 2Mass ID (if available) : 09584124+1310264
 ICRS Star Coord at Epoch: 09h 58m 41.23282s +13:10:26.28794s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 13.452
 G magnitude : 14.550
 RP magnitude : 14.157
 BP magnitude : 14.790
 DUPflag : 0
 Distance (au) : 17.657
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.95
 Sun-Target sep (deg) : 131.33
 Sun-Moon sep (deg) : 134.78
 B (ring opening deg) : 20.15
 PA of pole (deg) : 101.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.455
 C/A sky separation (km) : 18630.9
 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 | 2046-04-06T03:03:38.941 | b | 8.49 | -25.80 | 51067.02 | -34.80 | | |
| lambda | I | 2046-04-06T03:04:08.975 | b | 8.39 | -25.72 | 50026.71 | -34.58 | | |
| delta | I | 2046-04-06T03:04:59.050 | b | 8.24 | -25.60 | 48300.35 | -34.37 | | |
| gamma | I | 2046-04-06T03:05:18.731 | b | 8.18 | -25.55 | 47624.79 | -34.28 | | |
| eta | I | 2046-04-06T03:05:31.831 | b | 8.14 | -25.52 | 47176.12 | -34.22 | | |
| beta | I | 2046-04-06T03:06:17.041 | b | 8.01 | -25.41 | 45641.30 | -34.01 | | |
| alpha | I | 2046-04-06T03:06:44.037 | b | 7.93 | -25.35 | 44699.11 | -33.84 | | |
| 4 | I | 2046-04-06T03:07:47.616 | b | 7.73 | -25.19 | 42616.44 | -33.49 | | |
| 5 | I | 2046-04-06T03:07:57.784 | b | 7.70 | -25.17 | 42218.64 | -33.40 | | |
| 6 | I | 2046-04-06T03:08:10.266 | b | 7.67 | -25.14 | 41855.29 | -33.42 | | |
| Uranus | I | 2046-04-06T02:59:46.310 | | 9.19 | -26.35 | 25518.42 | | -46.09 | -47.40 |
| Uranus | E | 2046-04-06T03:44:50.121 | | 1.11x | -19.50 | 25535.07 | | 33.57 | 34.80 |
| 6 | E | 2046-04-06T03:41:34.499 | b | 1.68x | -20.02 | 41857.22 | 33.26 | | |
| 5 | E | 2046-04-06T03:41:45.356 | b | 1.65x | -19.99 | 42182.22 | 33.25 | | |
| 4 | E | 2046-04-06T03:41:58.429 | b | 1.61x | -19.96 | 42540.90 | 33.34 | | |
| alpha | E | 2046-04-06T03:43:04.974 | b | 1.42x | -19.78 | 44752.27 | 33.67 | | |
| beta | E | 2046-04-06T03:43:31.195 | b | 1.34x | -19.71 | 45676.61 | 33.84 | | |
| eta | E | 2046-04-06T03:44:15.662 | b | 1.21x | -19.59 | 47176.12 | 34.04 | | |
| gamma | E | 2046-04-06T03:44:29.012 | b | 1.17x | -19.56 | 47630.98 | 34.10 | | |
| delta | E | 2046-04-06T03:44:48.616 | b | 1.11x | -19.50 | 48300.35 | 34.19 | | |
| lambda | E | 2046-04-06T03:45:38.963 | b | 0.97x | -19.37 | 50026.71 | 34.39 | | |
| epsilon | E | 2046-04-06T03:46:21.057 | b | 0.84x | -19.26 | 51477.52 | 34.60 | | |

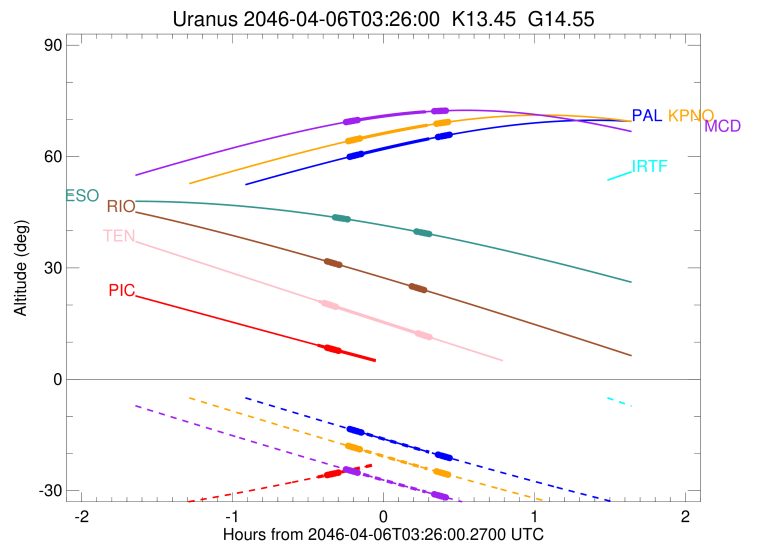
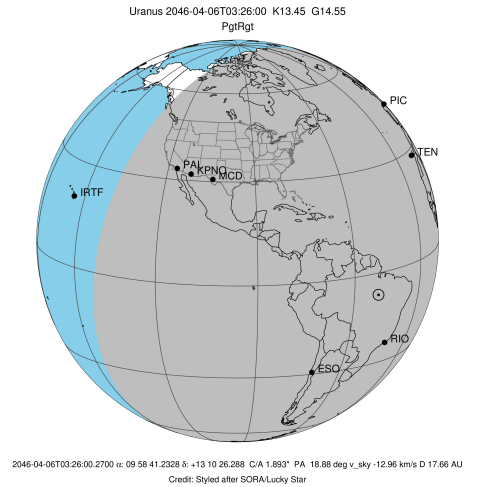
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2046-04-06T03:29:23.800
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 614961977311435904
 2Mass ID (if available) : 09584124+1310264
 ICRS Star Coord at Epoch: 09h 58m 41.23282s +13:10:26.28794s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 13.452
 G magnitude : 14.550
 RP magnitude : 14.157
 BP magnitude : 14.790
 DUPflag : 0
 Distance (au) : 17.657
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.95
 Sun-Target sep (deg) : 131.33
 Sun-Moon sep (deg) : 135.79
 B (ring opening deg) : 20.15
 PA of pole (deg) : 101.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.770
 C/A sky separation (km) : 22667.4
 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 | 2046-04-06T03:12:35.911 | | 59.94 | -13.42 | 51101.96 | -34.47 | | |
| lambda | I | 2046-04-06T03:13:07.308 | | 60.03 | -13.52 | 50026.71 | -34.15 | | |
| delta | I | 2046-04-06T03:13:58.093 | | 60.17 | -13.69 | 48300.35 | -33.83 | | |
| gamma | I | 2046-04-06T03:14:18.090 | | 60.22 | -13.76 | 47625.28 | -33.69 | | |
| eta | I | 2046-04-06T03:14:31.442 | | 60.26 | -13.80 | 47176.12 | -33.59 | | |
| beta | I | 2046-04-06T03:15:17.543 | b | 60.39 | -13.96 | 45641.71 | -33.25 | | |
| alpha | I | 2046-04-06T03:15:45.244 | b | 60.47 | -14.05 | 44702.08 | -33.00 | | |
| 4 | I | 2046-04-06T03:16:50.748 | b | 60.65 | -14.27 | 42615.79 | -32.43 | | |
| 5 | I | 2046-04-06T03:17:01.148 | b | 60.68 | -14.30 | 42210.01 | -32.28 | | |
| 6 | I | 2046-04-06T03:17:13.545 | b | 60.71 | -14.34 | 41859.50 | -32.27 | | |
| Uranus | I | 2046-04-06T03:14:39.413 | | 60.28 | -13.83 | 25537.02 | | -32.00 | -33.20 |
| Uranus | E | 2046-04-06T03:44:10.197 | | 64.80 | -19.64 | 25550.48 | | 19.27 | 20.11 |
| 6 | E | 2046-04-06T03:47:35.576 | | 65.25 | -20.30 | 41861.24 | 32.28 | | |
| 5 | E | 2046-04-06T03:47:46.241 | | 65.28 | -20.33 | 42175.94 | 32.29 | | |
| 4 | E | 2046-04-06T03:48:00.234 | | 65.31 | -20.38 | 42544.71 | 32.44 | | |
| alpha | E | 2046-04-06T03:49:08.042 | | 65.46 | -20.60 | 44752.43 | 33.01 | | |
| beta | E | 2046-04-06T03:49:34.774 | | 65.51 | -20.68 | 45675.28 | 33.27 | | |
| eta | E | 2046-04-06T03:50:19.928 | | 65.61 | -20.83 | 47176.12 | 33.61 | | |
| gamma | E | 2046-04-06T03:50:33.448 | | 65.64 | -20.87 | 47631.19 | 33.71 | | |
| delta | E | 2046-04-06T03:50:53.260 | | 65.68 | -20.93 | 48300.35 | 33.84 | | |
| lambda | E | 2046-04-06T03:51:44.019 | | 65.79 | -21.09 | 50026.71 | 34.17 | | |
| epsilon | E | 2046-04-06T03:52:26.876 | | 65.88 | -21.23 | 51496.72 | 34.49 | | |

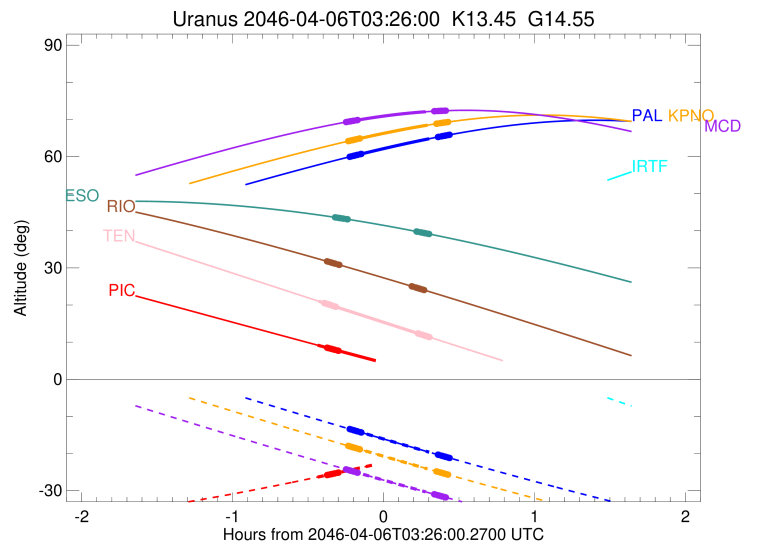
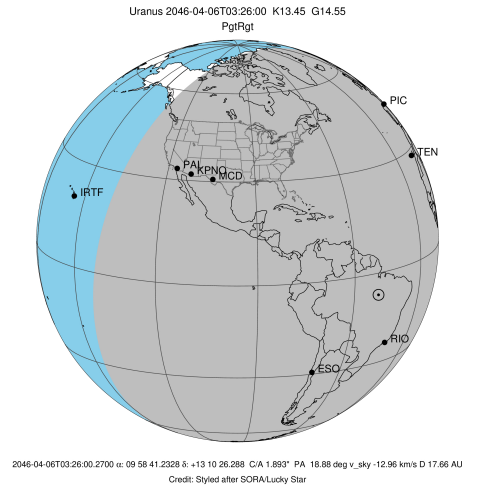
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2046-04-06T03:28:49.370
Event type           : PgtRgt
: 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       : 614961977311435904
2Mass ID (if available) : 09584124+1310264
ICRS Star Coord at Epoch: 09h 58m 41.23282s +13:10:26.28794s
RUWE (>1.4 is poor) : 1.08
K magnitude           : 13.452
G magnitude           : 14.550
RP magnitude          : 14.157
BP magnitude          : 14.790
DUPflag              : 0
Distance (au)        : 17.657
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -12.95
Sun-Target sep (deg) : 131.33
Sun-Moon sep (deg)   : 135.76
B (ring opening deg) : 20.15
PA of pole (deg)     : 101.57
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.772
C/A sky separation (km) : 22694.1
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl1.spk
ural11.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.ural11.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.bsp
earthstns_itrff93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```



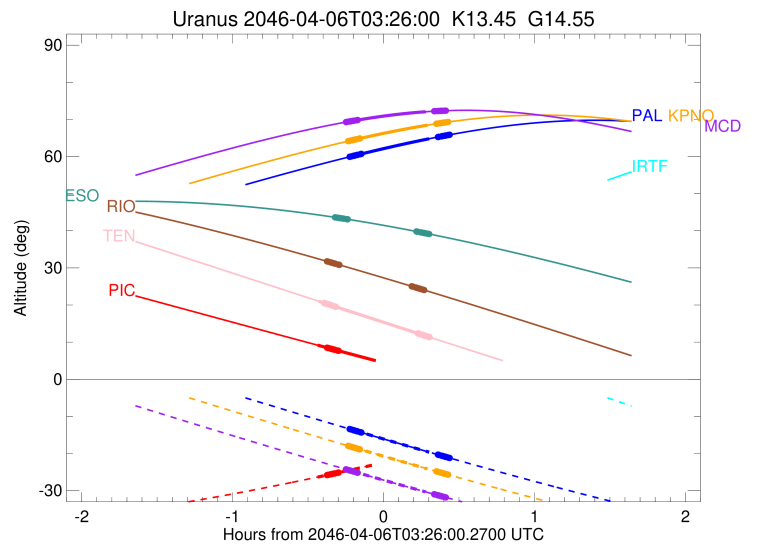
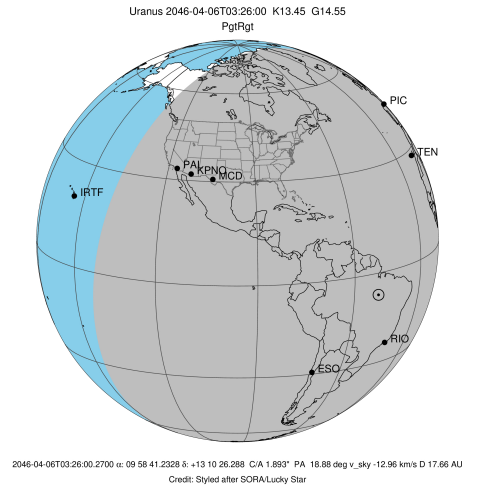
| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| epsilon | I | 2046-04-06T03:12:01.868 | | 64.16 | -17.96 | 51102.30 | -34.51 | | |
| lambda | I | 2046-04-06T03:12:33.243 | | 64.24 | -18.06 | 50026.71 | -34.19 | | |
| delta | I | 2046-04-06T03:13:23.979 | | 64.37 | -18.23 | 48300.35 | -33.86 | | |
| gamma | I | 2046-04-06T03:13:43.957 | | 64.42 | -18.30 | 47625.28 | -33.72 | | |
| eta | I | 2046-04-06T03:13:57.296 | | 64.46 | -18.34 | 47176.12 | -33.62 | | |
| beta | I | 2046-04-06T03:14:43.354 | b | 64.58 | -18.49 | 45641.72 | -33.28 | | |
| alpha | I | 2046-04-06T03:15:11.032 | b | 64.65 | -18.59 | 44702.11 | -33.03 | | |
| 4 | I | 2046-04-06T03:16:16.481 | b | 64.81 | -18.80 | 42615.78 | -32.45 | | |
| 5 | I | 2046-04-06T03:16:26.873 | b | 64.84 | -18.84 | 42209.93 | -32.30 | | |
| 6 | I | 2046-04-06T03:16:39.255 | b | 64.87 | -18.88 | 41859.54 | -32.29 | | |
| Uranus | I | 2046-04-06T03:14:09.807 | | 64.49 | -18.38 | 25537.23 | | -31.83 | -33.03 |
| Uranus | E | 2046-04-06T03:43:31.061 | | 68.46 | -24.13 | 25550.54 | | 19.19 | 20.03 |
| 6 | E | 2046-04-06T03:46:58.496 | | 68.83 | -24.80 | 41861.26 | 32.29 | | |
| 5 | E | 2046-04-06T03:47:09.154 | | 68.85 | -24.83 | 42175.92 | 32.31 | | |
| 4 | E | 2046-04-06T03:47:23.141 | | 68.87 | -24.88 | 42544.72 | 32.45 | | |
| alpha | E | 2046-04-06T03:48:30.915 | | 68.99 | -25.09 | 44752.43 | 33.03 | | |
| beta | E | 2046-04-06T03:48:57.632 | | 69.03 | -25.18 | 45675.27 | 33.28 | | |
| eta | E | 2046-04-06T03:49:42.762 | | 69.11 | -25.32 | 47176.12 | 33.63 | | |
| gamma | E | 2046-04-06T03:49:56.275 | | 69.13 | -25.36 | 47631.19 | 33.73 | | |
| delta | E | 2046-04-06T03:50:16.075 | | 69.16 | -25.43 | 48300.35 | 33.86 | | |
| lambda | E | 2046-04-06T03:51:06.805 | | 69.25 | -25.59 | 50026.71 | 34.19 | | |
| epsilon | E | 2046-04-06T03:51:49.638 | | 69.32 | -25.72 | 51496.77 | 34.52 | | |

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2046-04-06T03:27:58.090
 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 : 614961977311435904
 2Mass ID (if available) : 09584124+1310264
 ICRS Star Coord at Epoch: 09h 58m 41.23282s +13:10:26.28794s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 13.452
 G magnitude : 14.550
 RP magnitude : 14.157
 BP magnitude : 14.790
 DUPflag : 0
 Distance (au) : 17.657
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.95
 Sun-Target sep (deg) : 131.33
 Sun-Moon sep (deg) : 135.71
 B (ring opening deg) : 20.15
 PA of pole (deg) : 101.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.767
 C/A sky separation (km) : 22632.8
 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



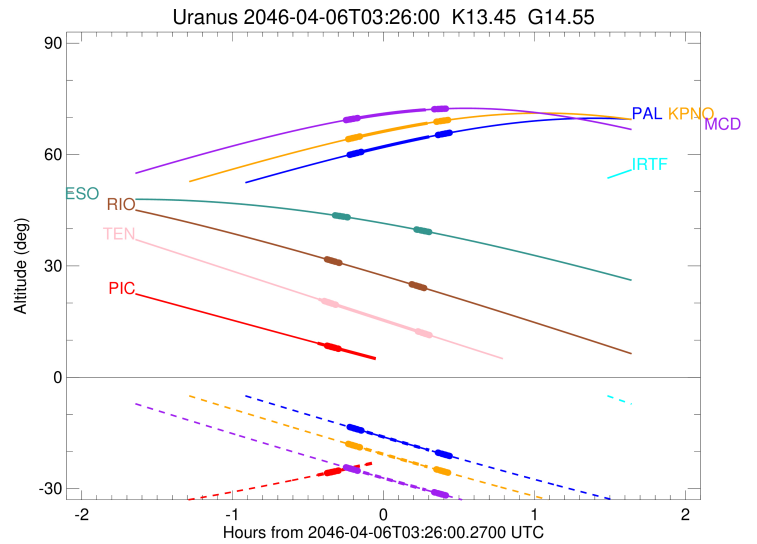
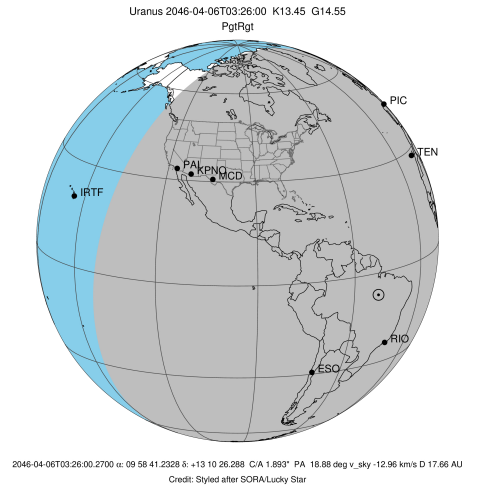
| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| epsilon | I | 2046-04-06T03:11:08.682 | | 69.28 | -24.27 | 51101.89 | -34.58 | | |
| lambda | I | 2046-04-06T03:11:39.984 | | 69.35 | -24.38 | 50026.71 | -34.26 | | |
| delta | I | 2046-04-06T03:12:30.618 | | 69.45 | -24.54 | 48300.35 | -33.93 | | |
| gamma | I | 2046-04-06T03:12:50.555 | | 69.49 | -24.61 | 47625.28 | -33.79 | | |
| eta | I | 2046-04-06T03:13:03.867 | | 69.52 | -24.65 | 47176.12 | -33.69 | | |
| beta | I | 2046-04-06T03:13:49.829 | b | 69.61 | -24.80 | 45641.71 | -33.35 | | |
| alpha | I | 2046-04-06T03:14:17.445 | b | 69.66 | -24.89 | 44702.06 | -33.10 | | |
| 4 | I | 2046-04-06T03:15:22.747 | b | 69.79 | -25.10 | 42615.79 | -32.53 | | |
| 5 | I | 2046-04-06T03:15:33.115 | b | 69.81 | -25.14 | 42210.04 | -32.38 | | |
| 6 | I | 2046-04-06T03:15:45.476 | b | 69.83 | -25.18 | 41859.48 | -32.37 | | |
| Uranus | I | 2046-04-06T03:13:10.615 | | 69.53 | -24.67 | 25536.97 | | -32.04 | -33.24 |
| Uranus | E | 2046-04-06T03:42:47.853 | | 72.07 | -30.35 | 25550.25 | | 19.53 | 20.38 |
| 6 | E | 2046-04-06T03:46:05.183 | | 72.21 | -30.96 | 41861.18 | 32.35 | | |
| 5 | E | 2046-04-06T03:46:15.831 | | 72.21 | -30.99 | 42176.04 | 32.37 | | |
| 4 | E | 2046-04-06T03:46:29.784 | | 72.22 | -31.04 | 42544.64 | 32.51 | | |
| alpha | E | 2046-04-06T03:47:37.446 | | 72.26 | -31.24 | 44752.43 | 33.08 | | |
| beta | E | 2046-04-06T03:48:04.120 | | 72.28 | -31.33 | 45675.30 | 33.34 | | |
| eta | E | 2046-04-06T03:48:49.179 | | 72.30 | -31.47 | 47176.12 | 33.68 | | |
| gamma | E | 2046-04-06T03:49:02.672 | | 72.31 | -31.51 | 47631.19 | 33.78 | | |
| delta | E | 2046-04-06T03:49:22.444 | | 72.32 | -31.57 | 48300.35 | 33.91 | | |
| lambda | E | 2046-04-06T03:50:13.102 | | 72.34 | -31.72 | 50026.71 | 34.24 | | |
| epsilon | E | 2046-04-06T03:50:55.868 | | 72.36 | -31.85 | 51496.40 | 34.56 | | |

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2046-04-06T03:20:39.290
 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 : 614961977311435904
 2Mass ID (if available) : 09584124+1310264
 ICRS Star Coord at Epoch: 09h 58m 41.23282s +13:10:26.28794s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 13.452
 G magnitude : 14.550
 RP magnitude : 14.157
 BP magnitude : 14.790
 DUPflag : 0
 Distance (au) : 17.657
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.95
 Sun-Target sep (deg) : 131.33
 Sun-Moon sep (deg) : 134.75
 B (ring opening deg) : 20.15
 PA of pole (deg) : 101.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.555
 C/A sky separation (km) : 19907.6
 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_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 | 2046-04-06T03:02:31.630 | b | 20.52 | -45.77 | 51078.26 | -34.73 | | |
| lambda | I | 2046-04-06T03:03:02.064 | b | 20.41 | -45.69 | 50026.71 | -34.48 | | |
| delta | I | 2046-04-06T03:03:52.303 | b | 20.23 | -45.56 | 48300.35 | -34.24 | | |
| gamma | I | 2046-04-06T03:04:12.058 | b | 20.15 | -45.51 | 47624.94 | -34.14 | | |
| eta | I | 2046-04-06T03:04:25.220 | b | 20.10 | -45.48 | 47176.12 | -34.06 | | |
| beta | I | 2046-04-06T03:05:10.648 | b | 19.94 | -45.37 | 45641.41 | -33.81 | | |
| alpha | I | 2046-04-06T03:05:37.825 | b | 19.84 | -45.30 | 44700.03 | -33.62 | | |
| 4 | I | 2046-04-06T03:06:41.903 | b | 19.60 | -45.13 | 42616.29 | -33.21 | | |
| 5 | I | 2046-04-06T03:06:52.117 | b | 19.56 | -45.11 | 42215.87 | -33.10 | | |
| 6 | I | 2046-04-06T03:07:04.553 | b | 19.52 | -45.08 | 41856.65 | -33.11 | | |
| Uranus | I | 2046-04-06T03:00:13.640 | | 21.03 | -46.11 | 25523.89 | | -42.07 | -43.38 |
| Uranus | E | 2046-04-06T03:41:10.625 | | 12.03 | -39.44 | 25539.68 | | 29.79 | 30.94 |
| 6 | E | 2046-04-06T03:39:36.659 | b | 12.37 | -39.71 | 41858.46 | 32.94 | | |
| 5 | E | 2046-04-06T03:39:47.468 | b | 12.33 | -39.68 | 42180.26 | 32.93 | | |
| 4 | E | 2046-04-06T03:40:00.835 | b | 12.28 | -39.64 | 42542.00 | 33.04 | | |
| alpha | E | 2046-04-06T03:41:07.825 | b | 12.04 | -39.44 | 44752.35 | 33.43 | | |
| beta | E | 2046-04-06T03:41:34.226 | | 11.94 | -39.37 | 45676.23 | 33.62 | | |
| eta | E | 2046-04-06T03:42:18.959 | | 11.78 | -39.23 | 47176.12 | 33.86 | | |
| gamma | E | 2046-04-06T03:42:32.378 | | 11.73 | -39.20 | 47631.05 | 33.93 | | |
| delta | E | 2046-04-06T03:42:52.073 | | 11.66 | -39.14 | 48300.35 | 34.03 | | |
| lambda | E | 2046-04-06T03:43:42.624 | | 11.48 | -38.99 | 50026.71 | 34.27 | | |
| epsilon | E | 2046-04-06T03:44:25.026 | | 11.32 | -38.86 | 51483.53 | 34.51 | | |

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2046-04-06T03:19:29.610
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 614961977311435904
 2Mass ID (if available) : 09584124+1310264
 ICRS Star Coord at Epoch: 09h 58m 41.23282s +13:10:26.28794s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 13.452
 G magnitude : 14.550
 RP magnitude : 14.157
 BP magnitude : 14.790
 DUPflag : 0
 Distance (au) : 17.657
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.95
 Sun-Target sep (deg) : 131.33
 Sun-Moon sep (deg) : 134.69
 B (ring opening deg) : 20.15
 PA of pole (deg) : 101.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.014
 C/A sky separation (km) : 25791.2
 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

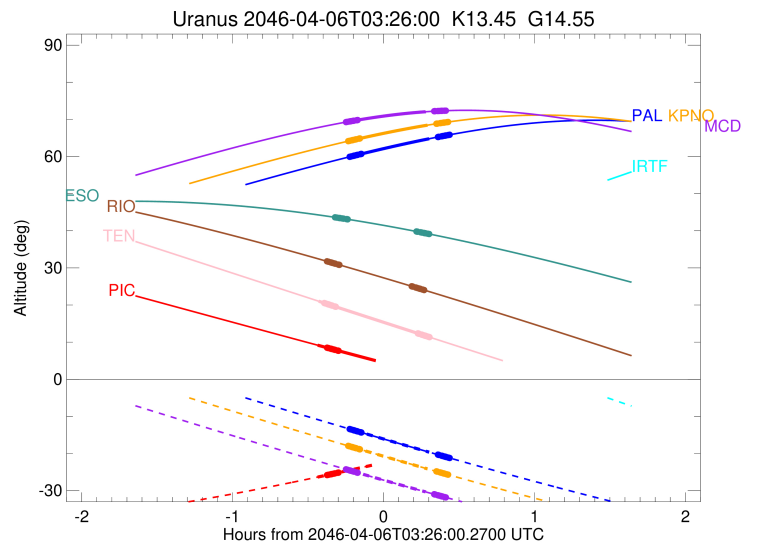
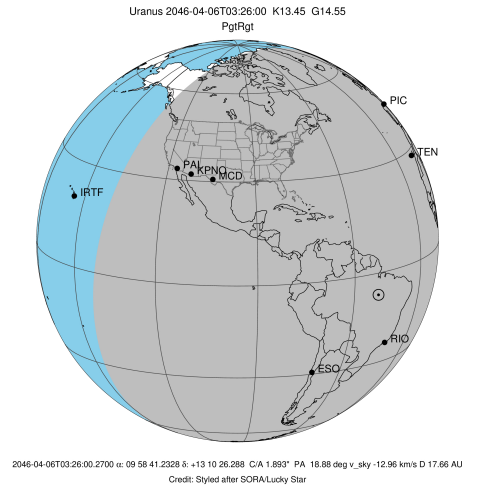


| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| epsilon | I | 2046-04-06T03:03:34.225 | | 31.77 | -73.61 | 51130.73 | -33.02 | | |
| lambda | I | 2046-04-06T03:04:07.942 | | 31.66 | -73.59 | 50026.71 | -32.61 | | |
| delta | I | 2046-04-06T03:05:01.232 | | 31.48 | -73.56 | 48300.35 | -32.17 | | |
| gamma | I | 2046-04-06T03:05:22.265 | | 31.42 | -73.55 | 47625.69 | -31.98 | | |
| eta | I | 2046-04-06T03:05:36.350 | | 31.37 | -73.54 | 47176.12 | -31.85 | | |
| beta | I | 2046-04-06T03:06:25.038 | | 31.21 | -73.51 | 45642.20 | -31.38 | | |
| alpha | I | 2046-04-06T03:06:54.487 | | 31.12 | -73.49 | 44704.66 | -31.05 | | |
| 4 | I | 2046-04-06T03:08:04.451 | | 30.89 | -73.44 | 42614.85 | -30.25 | | |
| 5 | I | 2046-04-06T03:08:15.576 | | 30.85 | -73.43 | 42203.07 | -30.05 | | |
| 6 | I | 2046-04-06T03:08:28.419 | | 30.81 | -73.42 | 41862.79 | -30.00 | | |

No planet occultations

| | | | | | | | | | |
|---------|---|-------------------------|--|-------|--------|----------|-------|--|--|
| 6 | E | 2046-04-06T03:37:09.579 | | 25.06 | -70.86 | 41864.32 | 29.88 | | |
| 5 | E | 2046-04-06T03:37:20.657 | | 25.02 | -70.84 | 42171.32 | 29.93 | | |
| 4 | E | 2046-04-06T03:37:36.115 | | 24.97 | -70.80 | 42548.05 | 30.13 | | |
| alpha | E | 2046-04-06T03:38:48.543 | | 24.72 | -70.65 | 44752.30 | 30.91 | | |
| beta | E | 2046-04-06T03:39:17.091 | | 24.63 | -70.58 | 45674.10 | 31.24 | | |
| eta | E | 2046-04-06T03:40:05.081 | | 24.46 | -70.48 | 47176.12 | 31.70 | | |
| gamma | E | 2046-04-06T03:40:19.410 | | 24.41 | -70.45 | 47631.33 | 31.83 | | |
| delta | E | 2046-04-06T03:40:40.368 | | 24.34 | -70.40 | 48300.35 | 32.01 | | |
| lambda | E | 2046-04-06T03:41:33.924 | | 24.16 | -70.28 | 50026.71 | 32.45 | | |
| epsilon | E | 2046-04-06T03:42:19.406 | | 24.00 | -70.18 | 51510.18 | 32.85 | | |

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2046-04-06T03:21:54.630
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 614961977311435904
 2Mass ID (if available) : 09584124+1310264
 ICRS Star Coord at Epoch: 09h 58m 41.23282s +13:10:26.28794s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 13.452
 G magnitude : 14.550
 RP magnitude : 14.157
 BP magnitude : 14.790
 DUPflag : 0
 Distance (au) : 17.657
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.95
 Sun-Target sep (deg) : 131.33
 Sun-Moon sep (deg) : 134.98
 B (ring opening deg) : 20.15
 PA of pole (deg) : 101.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.141
 C/A sky separation (km) : 27416.5
 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_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 | 2046-04-06T03:06:45.071 | | 43.62 | -57.58 | 51145.84 | -32.52 | | |
| lambda | I | 2046-04-06T03:07:19.823 | | 43.56 | -57.67 | 50026.71 | -32.05 | | |
| delta | I | 2046-04-06T03:08:14.117 | | 43.47 | -57.83 | 48300.35 | -31.53 | | |
| gamma | I | 2046-04-06T03:08:35.578 | | 43.43 | -57.89 | 47625.91 | -31.32 | | |
| eta | I | 2046-04-06T03:08:49.976 | | 43.40 | -57.93 | 47176.12 | -31.16 | | |
| beta | I | 2046-04-06T03:09:39.787 | | 43.32 | -58.07 | 45642.51 | -30.61 | | |
| alpha | I | 2046-04-06T03:10:10.036 | | 43.26 | -58.15 | 44706.08 | -30.22 | | |
| 4 | I | 2046-04-06T03:11:22.127 | | 43.14 | -58.35 | 42614.18 | -29.27 | | |
| 5 | I | 2046-04-06T03:11:33.641 | | 43.12 | -58.38 | 42199.42 | -29.04 | | |
| 6 | I | 2046-04-06T03:11:46.663 | | 43.09 | -58.42 | 41864.48 | -28.97 | | |

No planet occultations

| | | | | | | | | | |
|---------|---|-------------------------|--|-------|--------|----------|-------|--|--|
| 6 | E | 2046-04-06T03:39:03.297 | | 39.82 | -62.52 | 41865.95 | 28.90 | | |
| 5 | E | 2046-04-06T03:39:14.505 | | 39.79 | -62.55 | 42168.96 | 28.98 | | |
| 4 | E | 2046-04-06T03:39:30.633 | | 39.76 | -62.58 | 42550.01 | 29.21 | | |
| alpha | E | 2046-04-06T03:40:44.955 | | 39.59 | -62.75 | 44752.13 | 30.15 | | |
| beta | E | 2046-04-06T03:41:14.228 | | 39.53 | -62.81 | 45673.40 | 30.53 | | |
| eta | E | 2046-04-06T03:42:03.266 | | 39.42 | -62.92 | 47176.12 | 31.08 | | |
| gamma | E | 2046-04-06T03:42:17.880 | | 39.38 | -62.95 | 47631.39 | 31.23 | | |
| delta | E | 2046-04-06T03:42:39.227 | | 39.34 | -63.00 | 48300.35 | 31.44 | | |
| lambda | E | 2046-04-06T03:43:33.681 | | 39.21 | -63.11 | 50026.71 | 31.95 | | |
| epsilon | E | 2046-04-06T03:44:20.027 | | 39.11 | -63.21 | 51516.87 | 32.42 | | |