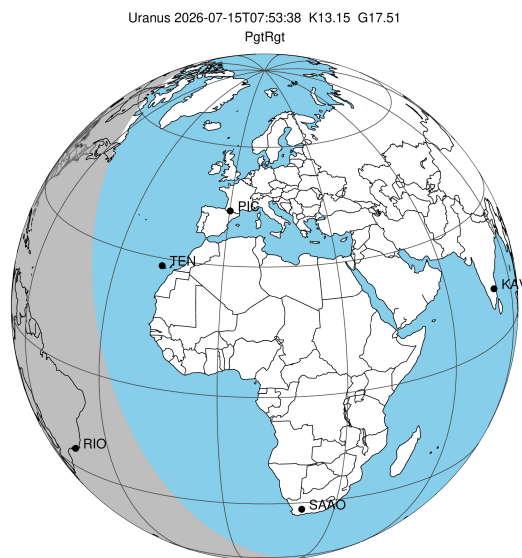


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2026-07-15T07:53:38.360
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 52027107816351488
 2Mass ID (if available) : 04081056+2047370

ICRS Star Coord at Epoch: 04h 08m 10.57494s +20:47:36.84727s

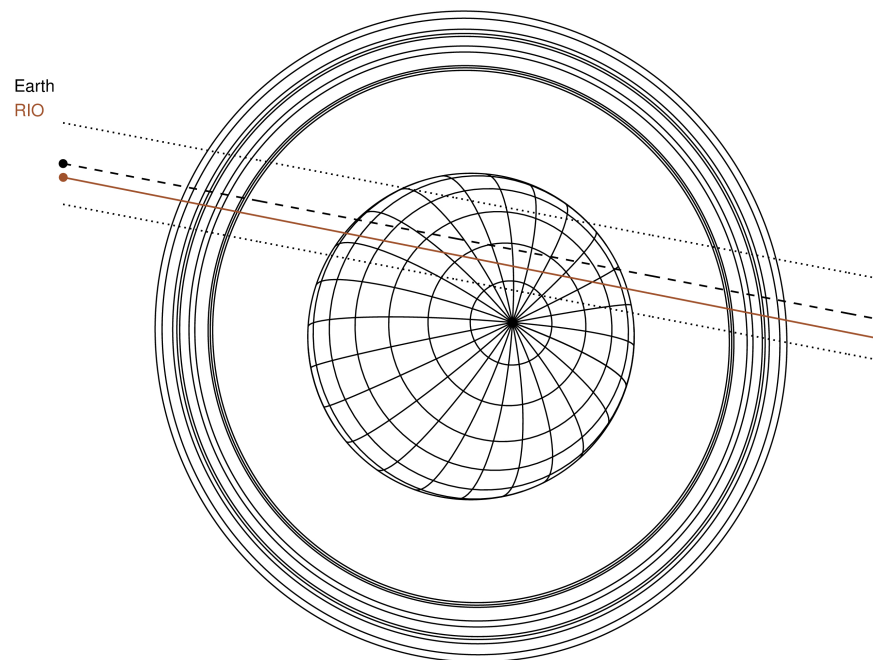
RUWE (>1.4 is poor) : 0.94
 K magnitude : 13.146
 G magnitude : 17.515
 RP magnitude : 16.168
 BP magnitude : 19.449
 DUPflag : 0
 Distance (au) : 20.114
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 26.08
 Sun-Target sep (deg) : 48.49
 Sun-Moon sep (deg) : 61.41
 B (ring opening deg) : 74.44
 PA of pole (deg) : -71.34

| # | 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 |



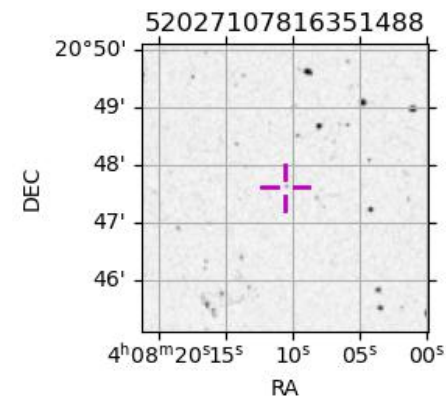
2026-07-15T07:53:38.3600 ex: 04 08 10.5749 s: +20 47 36.847 C/A 1.005° PA 169.19 deg v_sky +26.08 km/s D 20.11 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2026-07-15T07:53:38 K13.15 G17.51 PgtRgt

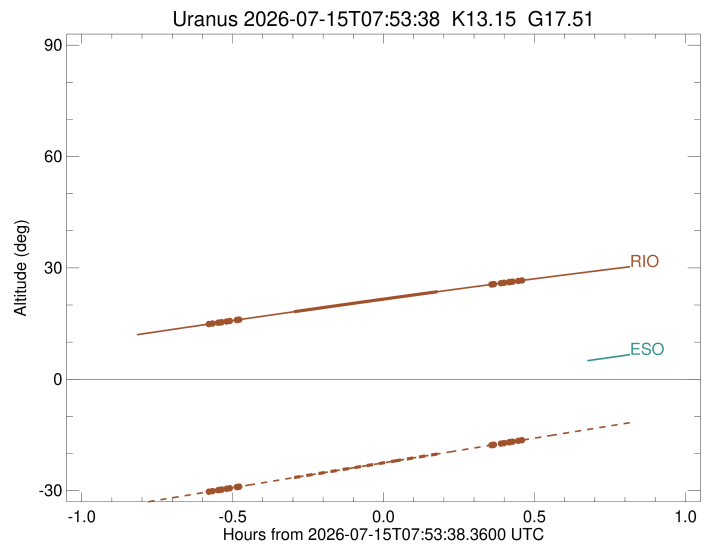
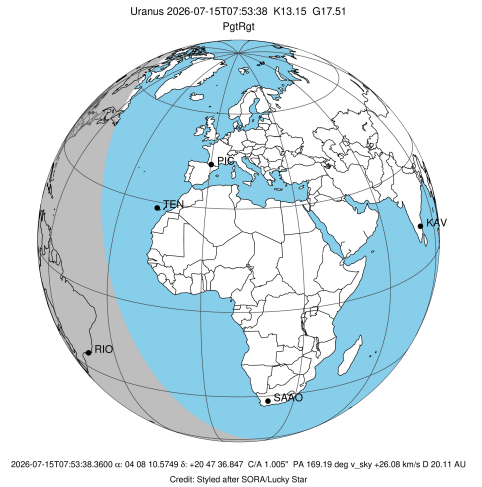


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

| Obs | Location | lat | Elon | Rings I | Planet | Rings E | Observed Events Interval | OEcode |
|------|-----------------------|-------|-------|---------|--------|---------|-----------------------------|--------|
| PIC | Pic du Midi | 42.9 | 0.1 | | | | | PnnRnn |
| PAL | Palomar Mt (200") | 33.4 | 243.1 | | | | | PnnRnn |
| PMO | Purple Mtn Obs. Nanki | 32.1 | 118.8 | | | | | PnnRnn |
| 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 | | | | | PnnRnn |
| 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 | +++++ | + + | +++++ | JUL 15 07:18 - JUL 15 08:21 | PieRie |
| 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 | | | | | PnnRnn |
| MSO | Mt. Stromlo Observato | -35.3 | 149.0 | | | | | PnnRnn |



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2026-07-15T07:50:15.240
 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 : 52027107816351488
 2Mass ID (if available) : 04081056+2047370
 ICRS Star Coord at Epoch: 04h 08m 10.57494s +20:47:36.84727s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 13.146
 G magnitude : 17.515
 RP magnitude : 16.168
 BP magnitude : 19.449
 DUPflag : 0
 Distance (au) : 20.114
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 26.08
 Sun-Target sep (deg) : 48.49
 Sun-Moon sep (deg) : 62.14
 B (ring opening deg) : 74.44
 PA of pole (deg) : -71.34
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.827
 C/A sky separation (km) : 12063.3
 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_itrf93_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 | 2026-07-15T07:18:43.105 | 14.83 | -30.33 | 51487.99 | -25.93 | | |
| lambda | I | 2026-07-15T07:19:39.564 | 15.02 | -30.12 | 50026.71 | -25.86 | | |
| delta | I | 2026-07-15T07:20:46.406 | 15.24 | -29.87 | 48300.35 | -25.80 | | |
| gamma | I | 2026-07-15T07:21:12.408 | 15.32 | -29.77 | 47629.94 | -25.77 | | |
| eta | I | 2026-07-15T07:21:30.024 | 15.38 | -29.71 | 47176.12 | -25.75 | | |
| beta | I | 2026-07-15T07:22:29.420 | 15.58 | -29.49 | 45648.84 | -25.68 | | |
| alpha | I | 2026-07-15T07:23:06.691 | 15.70 | -29.35 | 44692.30 | -25.64 | | |
| 4 | I | 2026-07-15T07:24:31.352 | 15.98 | -29.03 | 42526.09 | -25.53 | | |
| 5 | I | 2026-07-15T07:24:43.682 | 16.02 | -28.98 | 42216.92 | -25.50 | | |
| 6 | I | 2026-07-15T07:24:56.855 | 16.06 | -28.93 | 41879.59 | -25.50 | | |
| Uranus | I | 2026-07-15T07:35:51.293 | 18.19 | -26.48 | 25404.49 | | -8.13 | -8.51 |
| Uranus | E | 2026-07-15T08:04:22.938 | 23.59 | -20.12 | 25015.78 | | 15.56 | 16.26 |
| 6 | E | 2026-07-15T08:15:03.843 | 25.53 | -17.75 | 41800.02 | 25.40 | | |
| 5 | E | 2026-07-15T08:15:19.402 | 25.58 | -17.70 | 42206.81 | 25.41 | | |
| 4 | E | 2026-07-15T08:15:35.411 | 25.63 | -17.64 | 42606.94 | 25.44 | | |
| alpha | E | 2026-07-15T08:16:58.875 | 25.88 | -17.33 | 44729.59 | 25.54 | | |
| beta | E | 2026-07-15T08:17:35.319 | 25.99 | -17.20 | 45663.54 | 25.58 | | |
| eta | E | 2026-07-15T08:18:34.399 | 26.16 | -16.98 | 47176.12 | 25.65 | | |
| gamma | E | 2026-07-15T08:18:51.746 | 26.21 | -16.91 | 47621.18 | 25.66 | | |
| delta | E | 2026-07-15T08:19:18.197 | 26.29 | -16.82 | 48300.35 | 25.69 | | |
| lambda | E | 2026-07-15T08:20:25.322 | 26.49 | -16.57 | 50026.71 | 25.75 | | |
| epsilon | E | 2026-07-15T08:21:01.091 | 26.60 | -16.44 | 50948.16 | 25.82 | | |