

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-05-02T13:29:58.290  
 Event type : XRgt  
 : No Uranus occs  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 3425425332699763712  
 2Mass ID (if available) : 06120095+2340484

ICRS Star Coord at Epoch: 06h 12m 00.96039s +23:40:48.47804s

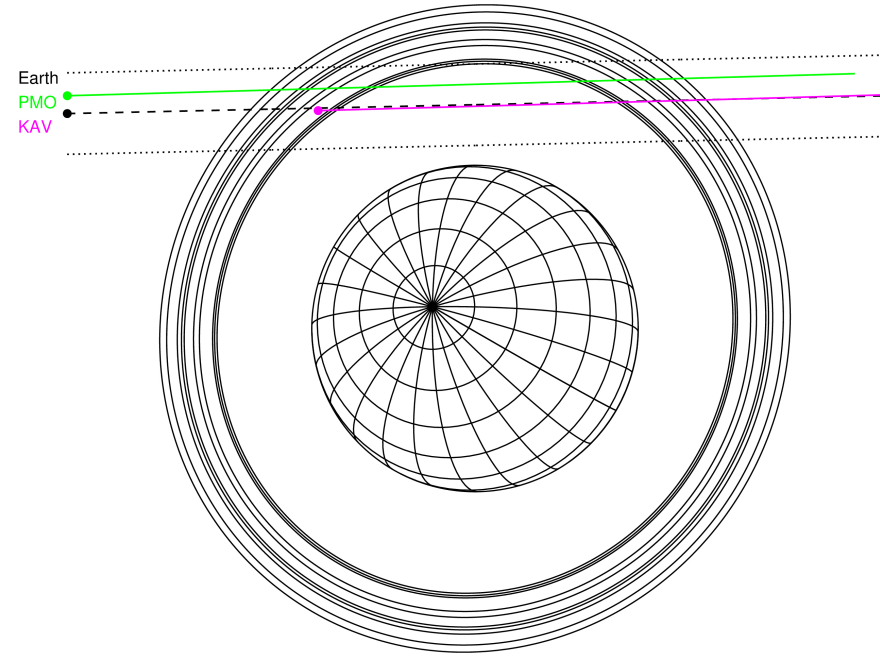
RUWE (>1.4 is poor) : 1.06  
 K magnitude : 14.082  
 G magnitude : 16.004  
 RP magnitude : 15.352  
 BP magnitude : 16.466  
 DUPflag : 0  
 Distance (au) : 19.549  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 25.12  
 Sun-Target sep (deg) : 51.00  
 Sun-Moon sep (deg) : 118.65  
 B (ring opening deg) : 72.95  
 PA of pole (deg) : 62.92

| #  | 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 |



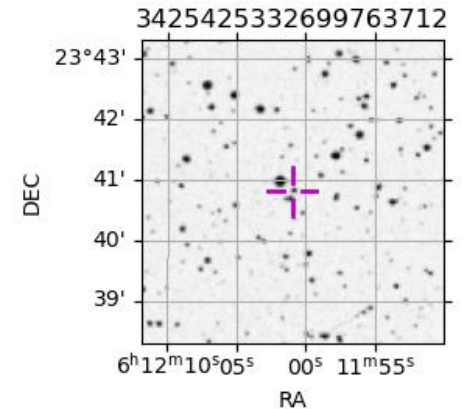
2034-05-02T13:29:58.2900 ex: 06 12 00.9604 s: +23 40 48.478 C/A 2.478° PA 181.25 deg v\_sky +25.12 km/s D 19.55 AU  
 Credit: Styled after SORA/Lucky Star

Uranus 2034-05-02T13:29:58 K14.08 G16.00 XRgt

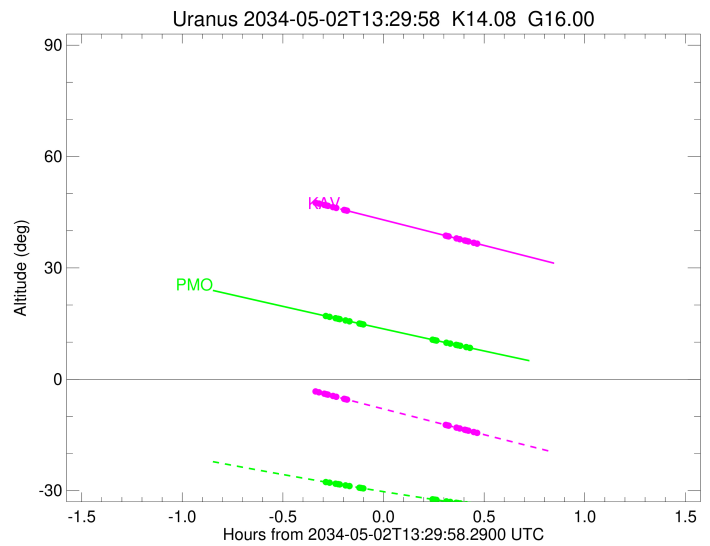
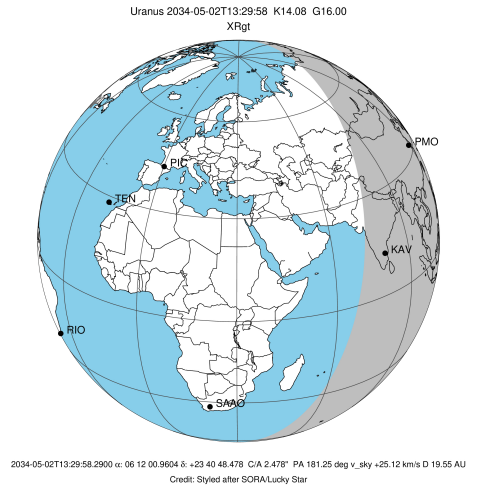


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

| 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 | +++++   |        | +++++   | MAY 02 13:12 - MAY 02 13:56 | PnnRie |
| 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  |         | +++    | +++++   | MAY 02 13:18 - MAY 02 13:58 | PnnRie |
| 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  |         |        |         |                             | PnnRnn |
| MSO  | Mt. Stromlo Observato | -35.3 | 149.0 |         |        |         |                             | PnnRnn |



target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-05-02T13:33:20.870  
 Event type : XRgt  
 : No Uranus occs  
 : 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 : 3425425332699763712  
 2Mass ID (if available) : 06120095+2340484  
 ICRS Star Coord at Epoch: 06h 12m 00.96039s +23:40:48.47804s  
 RUWE (>1.4 is poor) : 1.06  
 K magnitude : 14.082  
 G magnitude : 16.004  
 RP magnitude : 15.352  
 BP magnitude : 16.466  
 DUPflag : 0  
 Distance (au) : 19.549  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 25.12  
 Sun-Target sep (deg) : 51.00  
 Sun-Moon sep (deg) : 119.21  
 B (ring opening deg) : 72.95  
 PA of pole (deg) : 62.92  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 2.696  
 C/A sky separation (km) : 38226.7  
 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



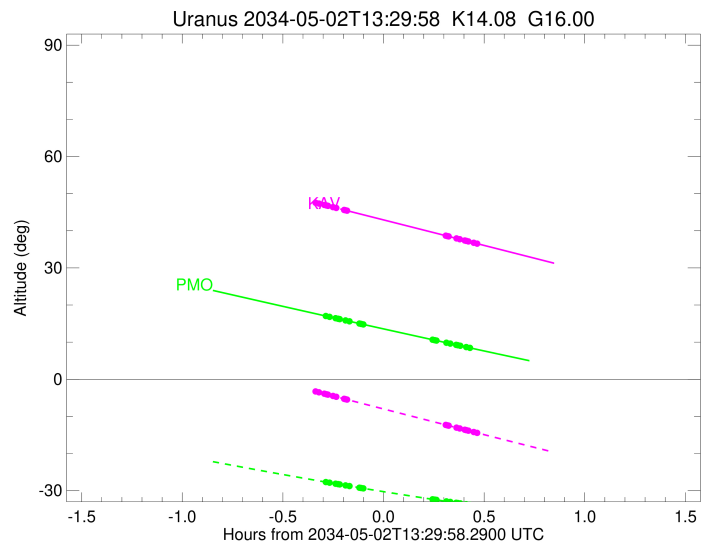
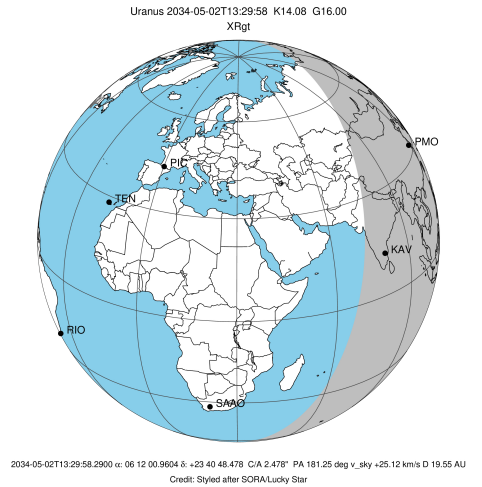
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

| Ring    | I/E | UTC                     | b? | alt   | alt-sun | radius   | r-dot  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| epsilon | I   | 2034-05-02T13:12:41.684 |    | 17.05 | -27.68  | 51248.62 | -17.22 |         |              |
| lambda  | I   | 2034-05-02T13:13:54.462 |    | 16.81 | -27.86  | 50026.71 | -16.50 |         |              |
| delta   | I   | 2034-05-02T13:15:41.972 |    | 16.45 | -28.14  | 48300.35 | -15.59 |         |              |
| gamma   | I   | 2034-05-02T13:16:25.461 |    | 16.30 | -28.25  | 47630.71 | -15.20 |         |              |
| eta     | I   | 2034-05-02T13:16:55.653 |    | 16.20 | -28.33  | 47176.12 | -14.91 |         |              |
| beta    | I   | 2034-05-02T13:18:42.323 |    | 15.84 | -28.60  | 45641.61 | -13.84 |         |              |
| alpha   | I   | 2034-05-02T13:19:50.221 |    | 15.61 | -28.77  | 44728.97 | -13.12 |         |              |
| 4       | I   | 2034-05-02T13:22:47.106 |    | 15.02 | -29.21  | 42591.90 | -10.93 |         |              |
| 5       | I   | 2034-05-02T13:23:27.301 |    | 14.88 | -29.31  | 42160.18 | -10.43 |         |              |
| 6       | I   | 2034-05-02T13:23:54.733 |    | 14.79 | -29.38  | 41879.73 | -10.04 |         |              |

No planet occultations

|         |   |                         |  |       |        |          |       |  |  |
|---------|---|-------------------------|--|-------|--------|----------|-------|--|--|
| 6       | E | 2034-05-02T13:44:37.086 |  | 10.65 | -32.34 | 41866.33 | 10.05 |  |  |
| 5       | E | 2034-05-02T13:45:10.148 |  | 10.54 | -32.41 | 42205.54 | 10.45 |  |  |
| 4       | E | 2034-05-02T13:45:42.725 |  | 10.44 | -32.49 | 42553.78 | 10.95 |  |  |
| alpha   | E | 2034-05-02T13:48:44.888 |  | 9.83  | -32.89 | 44751.77 | 13.15 |  |  |
| beta    | E | 2034-05-02T13:49:51.843 |  | 9.61  | -33.04 | 45656.94 | 13.88 |  |  |
| eta     | E | 2034-05-02T13:51:37.124 |  | 9.27  | -33.27 | 47176.12 | 14.96 |  |  |
| gamma   | E | 2034-05-02T13:52:06.851 |  | 9.17  | -33.34 | 47624.90 | 15.24 |  |  |
| delta   | E | 2034-05-02T13:52:50.594 |  | 9.03  | -33.43 | 48300.35 | 15.64 |  |  |
| lambda  | E | 2034-05-02T13:54:37.772 |  | 8.68  | -33.67 | 50026.71 | 16.56 |  |  |
| epsilon | E | 2034-05-02T13:56:07.956 |  | 8.38  | -33.86 | 51552.04 | 17.28 |  |  |

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-05-02T13:32:57.830  
 Event type : XRgt  
 : No Uranus occs  
 : 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 : 3425425332699763712  
 2Mass ID (if available) : 06120095+2340484  
 ICRS Star Coord at Epoch: 06h 12m 00.96039s +23:40:48.47804s  
 RUWE (>1.4 is poor) : 1.06  
 K magnitude : 14.082  
 G magnitude : 16.004  
 RP magnitude : 15.352  
 BP magnitude : 16.466  
 DUPflag : 0  
 Distance (au) : 19.549  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 25.12  
 Sun-Target sep (deg) : 51.00  
 Sun-Moon sep (deg) : 119.51  
 B (ring opening deg) : 72.95  
 PA of pole (deg) : 62.92  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 2.453  
 C/A sky separation (km) : 34784.2  
 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\_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   | 2034-05-02T13:09:40.656 |    | 47.57 | -3.27x  | 51210.14 | -18.81 |         |              |
| lambda  | I   | 2034-05-02T13:10:44.715 |    | 47.32 | -3.52x  | 50026.71 | -18.27 |         |              |
| delta   | I   | 2034-05-02T13:12:20.905 |    | 46.96 | -3.89x  | 48300.35 | -17.61 |         |              |
| gamma   | I   | 2034-05-02T13:12:59.214 |    | 46.81 | -4.04x  | 47631.02 | -17.33 |         |              |
| eta     | I   | 2034-05-02T13:13:25.616 |    | 46.71 | -4.15x  | 47176.12 | -17.13 |         |              |
| beta    | I   | 2034-05-02T13:14:57.181 |    | 46.36 | -4.50x  | 45641.17 | -16.38 |         |              |
| alpha   | I   | 2034-05-02T13:15:54.173 |    | 46.15 | -4.72x  | 44724.45 | -15.90 |         |              |
| 4       | I   | 2034-05-02T13:18:13.585 |    | 45.62 | -5.27   | 42598.25 | -14.49 |         |              |
| 5       | I   | 2034-05-02T13:18:44.043 |    | 45.50 | -5.38   | 42156.35 | -14.18 |         |              |
| 6       | I   | 2034-05-02T13:19:03.726 |    | 45.43 | -5.46   | 41879.24 | -13.96 |         |              |

No planet occultations

|         |   |                         |  |       |        |          |       |  |  |
|---------|---|-------------------------|--|-------|--------|----------|-------|--|--|
| 6       | E | 2034-05-02T13:48:32.587 |  | 38.68 | -12.29 | 41860.36 | 13.99 |  |  |
| 5       | E | 2034-05-02T13:48:57.969 |  | 38.58 | -12.39 | 42218.80 | 14.22 |  |  |
| 4       | E | 2034-05-02T13:49:20.702 |  | 38.50 | -12.48 | 42547.11 | 14.53 |  |  |
| alpha   | E | 2034-05-02T13:51:45.446 |  | 37.94 | -13.04 | 44752.37 | 15.94 |  |  |
| beta    | E | 2034-05-02T13:52:41.514 |  | 37.73 | -13.25 | 45659.53 | 16.43 |  |  |
| eta     | E | 2034-05-02T13:54:11.700 |  | 37.38 | -13.60 | 47176.12 | 17.18 |  |  |
| gamma   | E | 2034-05-02T13:54:37.639 |  | 37.28 | -13.70 | 47624.32 | 17.38 |  |  |
| delta   | E | 2034-05-02T13:55:16.217 |  | 37.14 | -13.84 | 48300.35 | 17.67 |  |  |
| lambda  | E | 2034-05-02T13:56:52.101 |  | 36.77 | -14.21 | 50026.71 | 18.33 |  |  |
| epsilon | E | 2034-05-02T13:58:13.772 |  | 36.46 | -14.52 | 51545.12 | 18.88 |  |  |