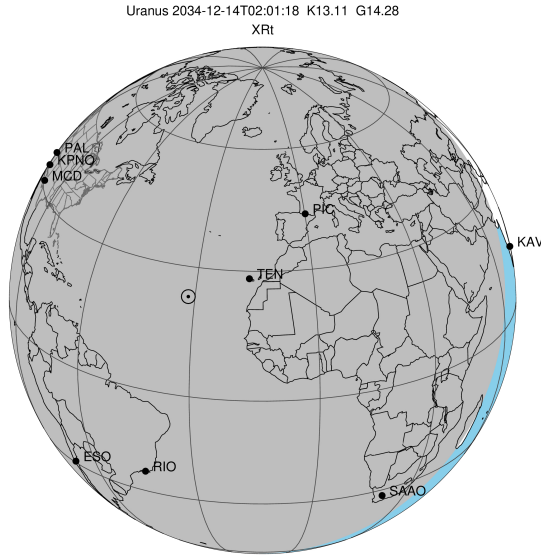


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-14T02:01:18.490  
 Event type : XRT  
 : No Uranus occs  
 : Ring occs: topocentric, not geocentric  
 Gaia source ID : 3382409238070072576  
 2Mass ID (if available) : 06380360+2328524

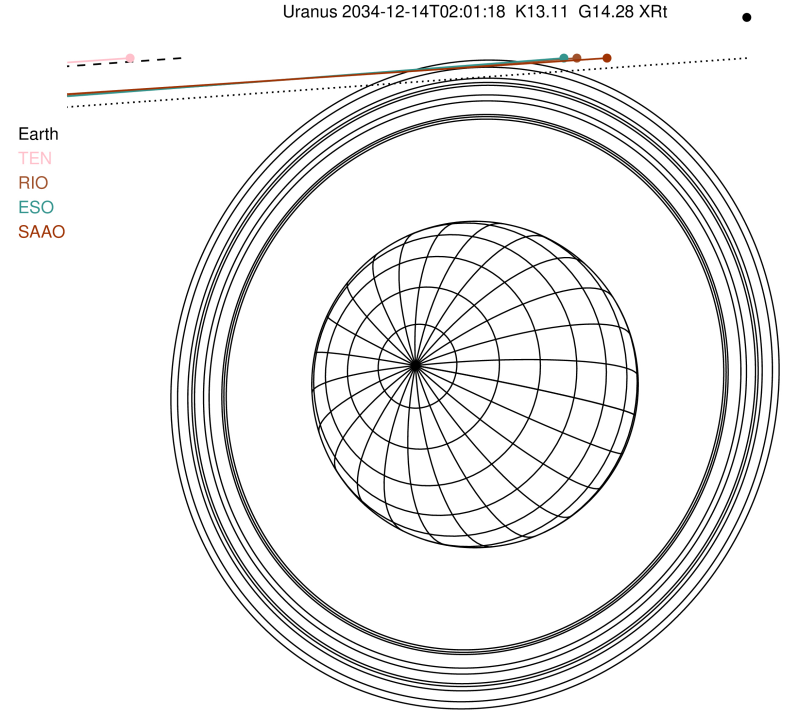
ICRS Star Coord at Epoch: 06h 38m 03.60706s +23:28:52.20175s

RUWE (>1.4 is poor) : 1.05  
 K magnitude : 13.114  
 G magnitude : 14.276  
 RP magnitude : 13.856  
 BP magnitude : 14.538  
 DUPflag : 0  
 Distance (au) : 17.949  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.07  
 Sun-Target sep (deg) : 162.93  
 Sun-Moon sep (deg) : 160.90  
 B (ring opening deg) : 67.50  
 PA of pole (deg) : 72.37

#	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

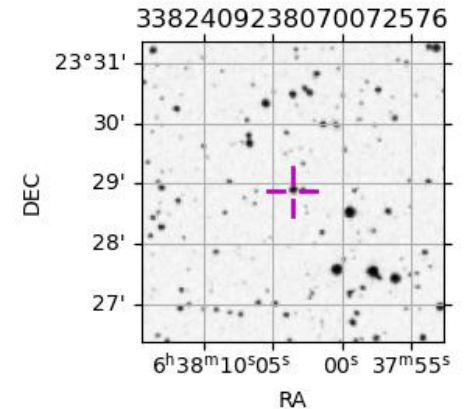


2034-12-14T02:01:18.4900 ra: 06 38 03.6071 s: +23 28 52.202 C/A 4.179° PA 184.12 deg v\_sky -22.07 km/s D 17.95 AU  
 Credit: Styled after SORA/Lucky Star

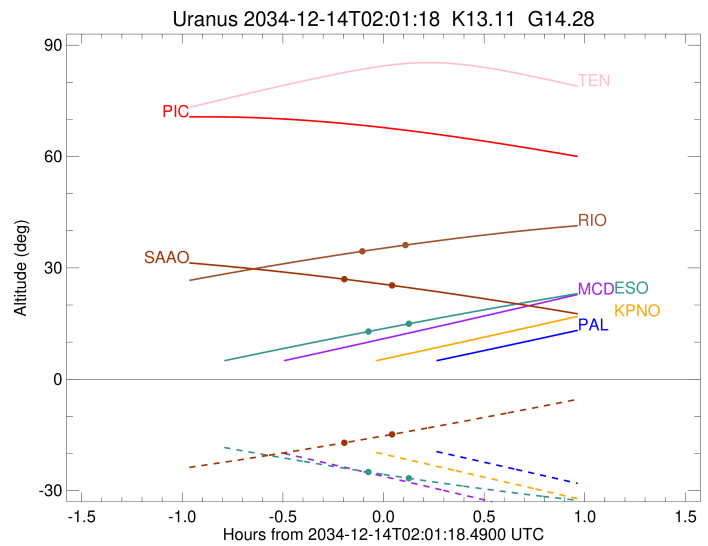
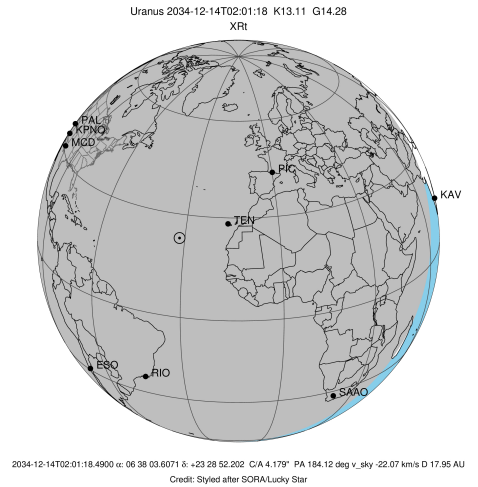


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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					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	+			DEC 14 01:54 - DEC 14 02:07	PnnRie
ESO	European Southern Obs	-29.3	289.3	+			DEC 14 01:56 - DEC 14 02:08	PnnRie
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+			DEC 14 01:49 - DEC 14 02:03	PnnRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



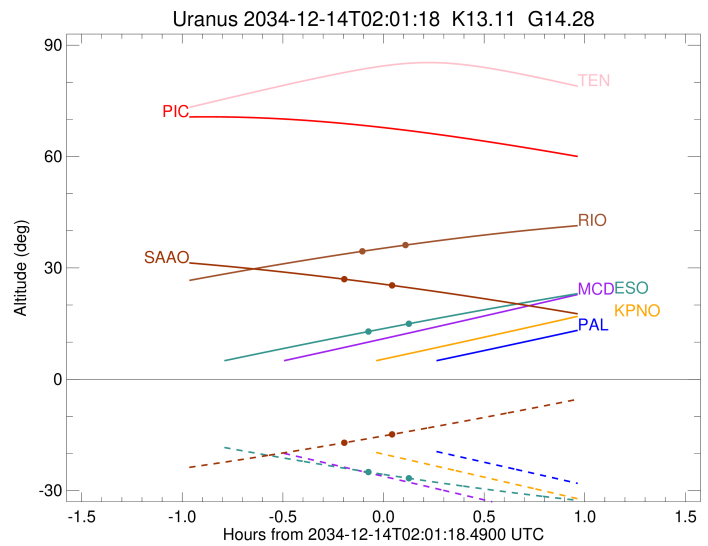
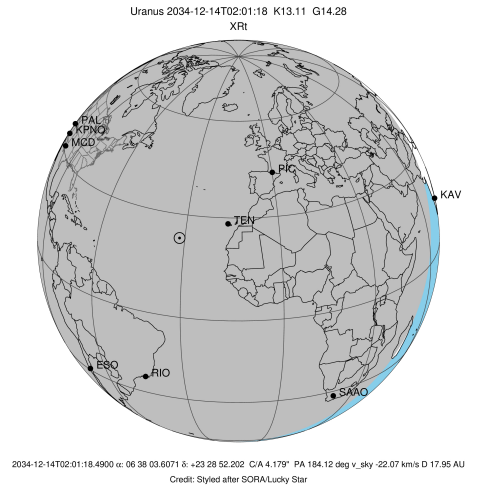
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-14T02:03:20.590  
 Event type : XRt  
 : No Uranus occs  
 : Ring occs: topocentric, not geocentric  
 Observer code : RIO  
 Location : Rio de Janeiro  
 Latitude (deg) : -22.89506  
 E. Longitude (deg) : 316.77708  
 Altitude (km) : 0.033  
 Gaia source ID : 3382409238070072576  
 2Mass ID (if available) : 06380360+2328524  
 ICRS Star Coord at Epoch: 06h 38m 03.60706s +23:28:52.20175s  
 RUWE (>1.4 is poor) : 1.05  
 K magnitude : 13.114  
 G magnitude : 14.276  
 RP magnitude : 13.856  
 BP magnitude : 14.538  
 DUPflag : 0  
 Distance (au) : 17.949  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.07  
 Sun-Target sep (deg) : 162.93  
 Sun-Moon sep (deg) : 161.27  
 B (ring opening deg) : 67.50  
 PA of pole (deg) : 72.37  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.824  
 C/A sky separation (km) : 49785.0  
 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	2034-12-14T01:54:41.673		34.43	-42.30	51245.33	-4.38		
No planet occultations									
epsilon	E	2034-12-14T02:07:36.386		36.11	-43.04	51097.76	4.39		

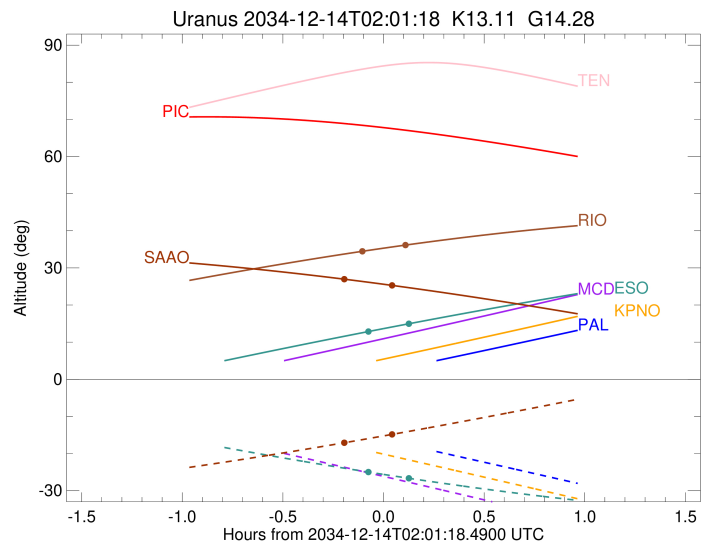
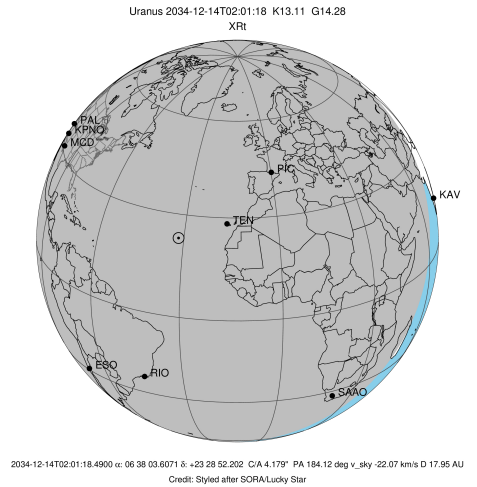
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-14T02:04:47.030  
 Event type : XRt  
 : No Uranus occs  
 : Ring occs: topocentric, not geocentric  
 Observer code : ESO  
 Location : European Southern Obs. (3.6m)  
 Latitude (deg) : -29.26097  
 E. Longitude (deg) : 289.26831  
 Altitude (km) : 2.400  
 Gaia source ID : 3382409238070072576  
 2Mass ID (if available) : 06380360+2328524  
 ICRS Star Coord at Epoch: 06h 38m 03.60706s +23:28:52.20175s  
 RUWE (>1.4 is poor) : 1.05  
 K magnitude : 13.114  
 G magnitude : 14.276  
 RP magnitude : 13.856  
 BP magnitude : 14.538  
 DUPflag : 0  
 Distance (au) : 17.949  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.07  
 Sun-Target sep (deg) : 162.93  
 Sun-Moon sep (deg) : 161.41  
 B (ring opening deg) : 67.50  
 PA of pole (deg) : 72.37  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.832  
 C/A sky separation (km) : 49888.8  
 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\_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	2034-12-14T01:56:30.079	12.80	-24.95	51239.35	-4.06		
No planet occultations								
epsilon	E	2034-12-14T02:08:37.109	14.91	-26.64	51101.77	4.06		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-14T01:58:37.020  
 Event type : XRt  
 : No Uranus occs  
 : Ring occs: topocentric, not geocentric  
 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 : 3382409238070072576  
 2Mass ID (if available) : 06380360+2328524  
 ICRS Star Coord at Epoch: 06h 38m 03.60706s +23:28:52.20175s  
 RUWE (>1.4 is poor) : 1.05  
 K magnitude : 13.114  
 G magnitude : 14.276  
 RP magnitude : 13.856  
 BP magnitude : 14.538  
 DUPflag : 0  
 Distance (au) : 17.949  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.07  
 Sun-Target sep (deg) : 162.93  
 Sun-Moon sep (deg) : 160.45  
 B (ring opening deg) : 67.50  
 PA of pole (deg) : 72.37  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.811  
 C/A sky separation (km) : 49614.5  
 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



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	2034-12-14T01:49:17.971		27.00	-17.15	51255.84	-4.84		
No planet occultations									
epsilon	E	2034-12-14T02:03:37.009		25.32	-14.89	51092.59	4.84		