

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-11-22T01:23:21.110
 Event type : XRT
 : No Uranus occs
 : Ring occs: topocentric, not geocentric
 Gaia source ID : 3404367589083826304
 2Mass ID (if available) : 05414222+2331154

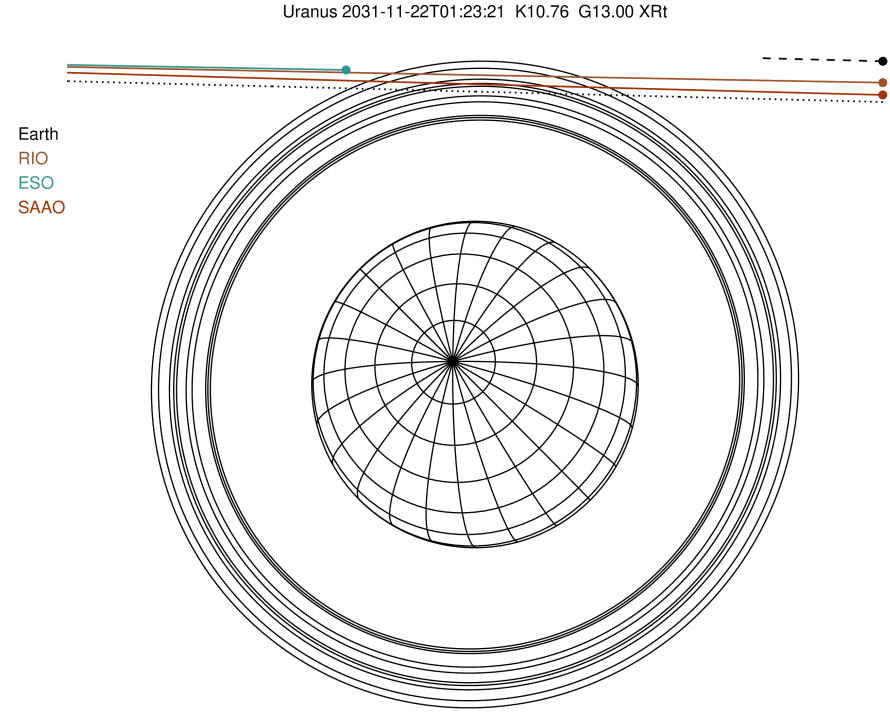
ICRS Star Coord at Epoch: 05h 41m 42.23520s +23:31:15.45524s

RUWE (>1.4 is poor) : 7.30
 K magnitude : 10.763
 G magnitude : 12.996
 RP magnitude : 11.885
 BP magnitude : 12.904
 DUPflag : 0
 Distance (au) : 18.204
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.26
 Sun-Target sep (deg) : 153.28
 Sun-Moon sep (deg) : 110.86
 B (ring opening deg) : 78.68
 PA of pole (deg) : 43.96

#	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

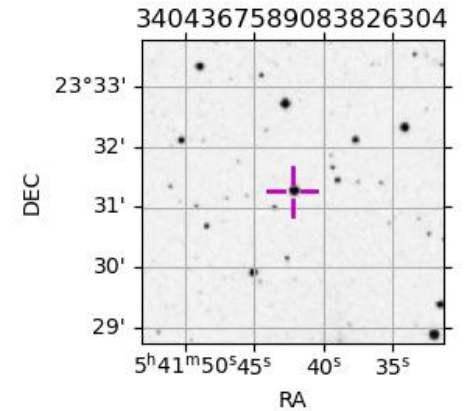


2031-11-22T01:23:21.1100 α: 05 41 42.2352 δ: +23 31 15.455 C/A 3.963° PA 178.54 deg v_sky -20.26 km/s D 18.20 AU
 Credit: Styled after SORA/Lucky Star



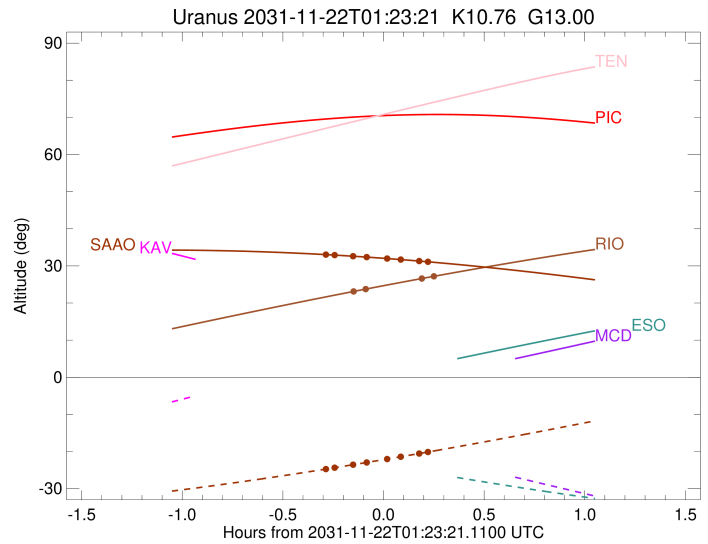
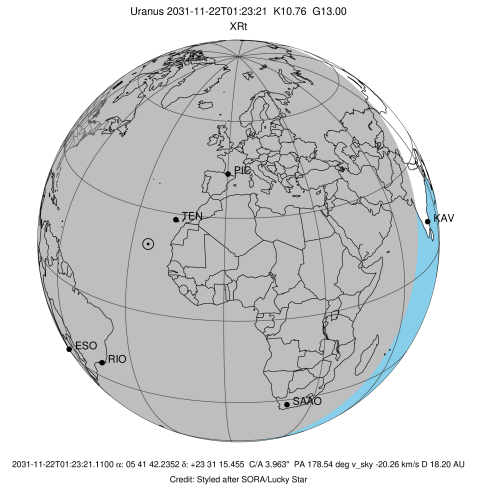
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	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	++		++	NOV 22 01:15 - NOV 22 01:37	PnnRie
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	++++		++++	NOV 22 01:07 - NOV 22 01:35	PnnRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



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target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2031-11-22T01:27:10.880
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      : 3404367589083826304
2Mass ID (if available) : 05414222+2331154
ICRS Star Coord at Epoch: 05h 41m 42.23520s +23:31:15.45524s
RUWE (>1.4 is poor) : 7.30
K magnitude          : 10.763
G magnitude          : 12.996
RP magnitude         : 11.885
BP magnitude         : 12.904
DUPflag             : 0
Distance (au)       : 18.204
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -20.26
Sun-Target sep (deg) : 153.28
Sun-Moon sep (deg)  : 111.47
B (ring opening deg) : 78.68
PA of pole (deg)    : 43.96
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.670
C/A sky separation (km) : 48455.0
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
  
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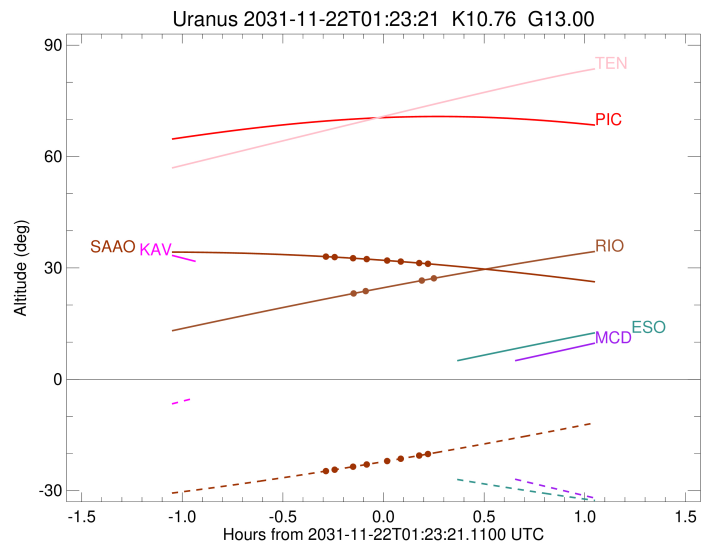
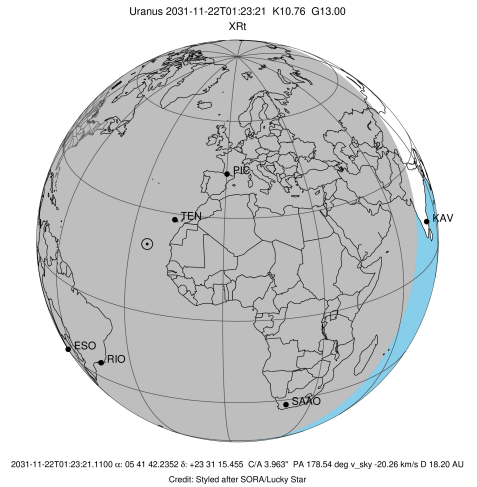
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-11-22T01:15:34.350		23.32	-42.63	50777.82	-5.46		
lambda	I	2031-11-22T01:18:07.381		23.76	-42.89	50026.71	-4.29		

No planet occultations

lambda	E	2031-11-22T01:34:42.118		26.59	-44.43	50026.71	4.29		
epsilon	E	2031-11-22T01:37:09.213		26.99	-44.63	50746.37	5.47		

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target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2031-11-22T01:22:08.160
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      : 3404367589083826304
2Mass ID (if available) : 05414222+2331154
ICRS Star Coord at Epoch: 05h 41m 42.23520s +23:31:15.45524s
RUWE (>1.4 is poor) : 7.30
K magnitude          : 10.763
G magnitude          : 12.996
RP magnitude         : 11.885
BP magnitude         : 12.904
DUPflag             : 0
Distance (au)       : 18.204
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -20.26
Sun-Target sep (deg) : 153.28
Sun-Moon sep (deg)  : 111.24
B (ring opening deg) : 78.68
PA of pole (deg)    : 43.96
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.562
C/A sky separation (km) : 47021.9
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.bsp
earthstns_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
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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	2031-11-22T01:07:00.434		33.00	-24.62	50796.03	-7.32		
lambda	I	2031-11-22T01:08:50.635		32.91	-24.35	50026.71	-6.55		
delta	I	2031-11-22T01:14:22.655		32.60	-23.54	48300.35	-3.80		
gamma	I	2031-11-22T01:18:31.834		32.36	-22.92	47629.71	-1.57		

No planet occultations

gamma	E	2031-11-22T01:24:15.300		31.99	-22.06	47629.06	1.57		
delta	E	2031-11-22T01:28:24.928		31.71	-21.42	48300.35	3.80		
lambda	E	2031-11-22T01:33:57.043		31.31	-20.56	50026.71	6.55		
epsilon	E	2031-11-22T01:35:41.290		31.18	-20.28	50751.79	7.32		