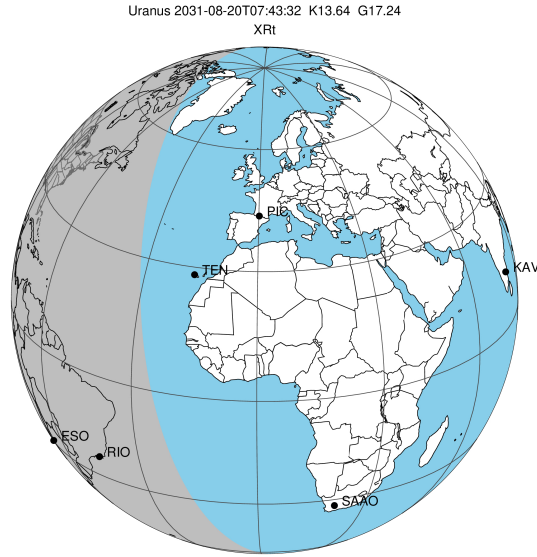


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-08-20T07:43:32.310
 Event type : XRT
 : No Uranus occs
 : Ring occs: topocentric, not geocentric
 Gaia source ID : 3428371164869628160
 2Mass ID (if available) : 05423635+2330088

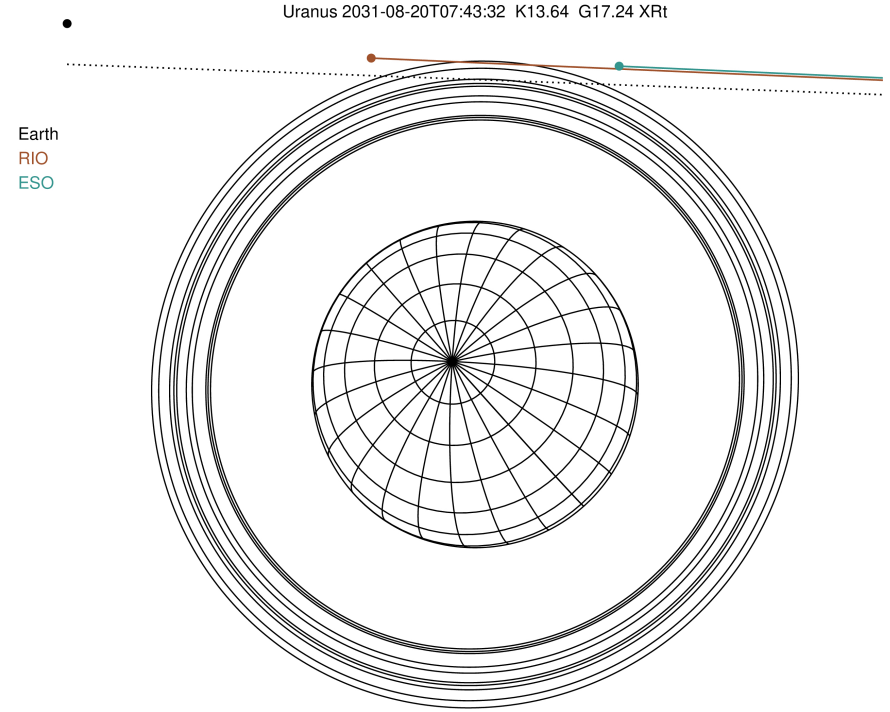
ICRS Star Coord at Epoch: 05h 42m 36.36675s +23:30:08.76896s

RUWE (>1.4 is poor) : 1.44
 K magnitude : 13.639
 G magnitude : 17.241
 RP magnitude : 16.156
 BP magnitude : 18.330
 DUPflag : 0
 Distance (au) : 19.584
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.94
 Sun-Target sep (deg) : 60.67
 Sun-Moon sep (deg) : 84.88
 B (ring opening deg) : 78.55
 PA of pole (deg) : 44.85

#	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

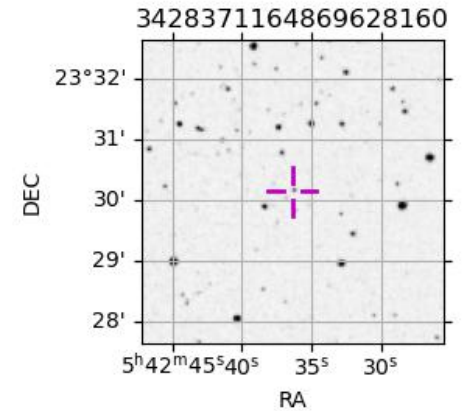


2031-08-20T07:43:32.3100 ex: 05 42 36.3667 8: +23 30 08.769 C/A 3.814" PA 177.87 deg v_sky +20.94 km/s D 19.58 AU
 Credit: Styled after SORA/Lucky Star



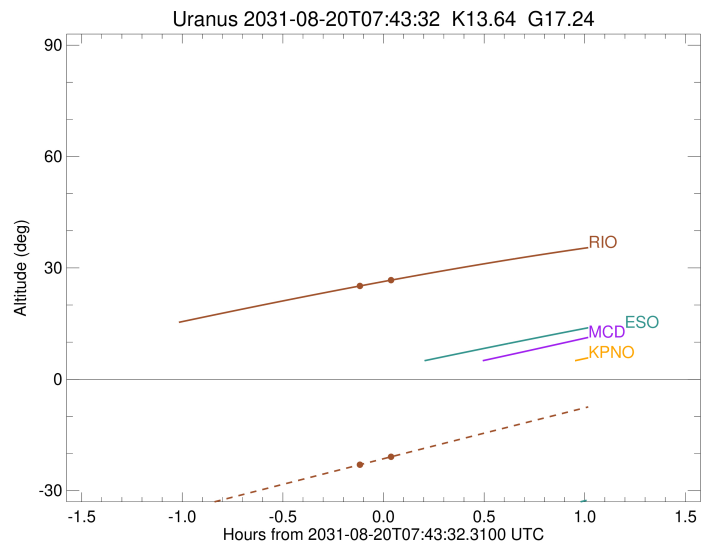
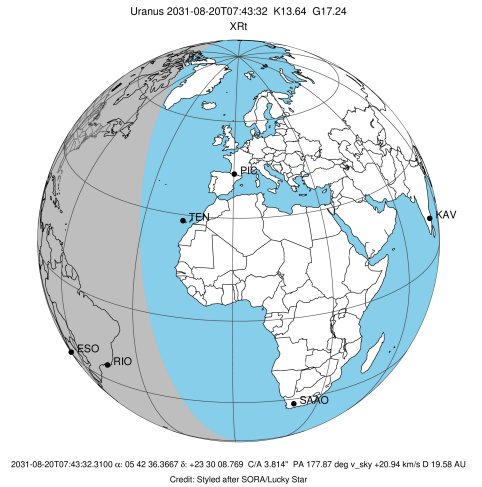
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+			AUG 20 07:35 - AUG 20 07:46	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					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2031-08-20T07:40:20.250
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       : 3428371164869628160
2Mass ID (if available) : 05423635+2330088
ICRS Star Coord at Epoch: 05h 42m 36.36675s +23:30:08.76896s
RUWE (>1.4 is poor) : 1.44
K magnitude          : 13.639
G magnitude           : 17.241
RP magnitude         : 16.156
BP magnitude         : 18.330
DUPflag             : 0
Distance (au)        : 19.584
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 20.94
Sun-Target sep (deg) : 60.67
Sun-Moon sep (deg)   : 85.34
B (ring opening deg) : 78.55
PA of pole (deg)     : 44.85
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.545
C/A sky separation (km) : 50355.8
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.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  2031-08-20T07:35:08.501  24.90 -23.33  51388.16  -2.93
  
```

No planet occultations

```

epsilon   E  2031-08-20T07:46:35.204  26.83 -20.70  51286.88  2.93
  
```