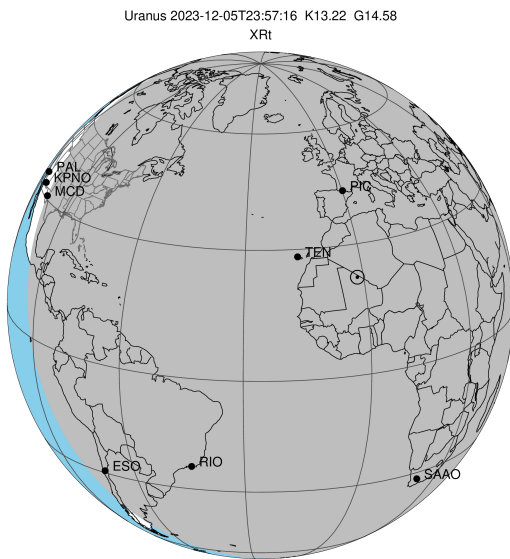


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2023-12-05T23:57:16.580
 Event type : XRT
 : No Uranus occs
 : Ring occs: topocentric, not geocentric
 Gaia source ID : 58619023621632640
 2Mass ID (if available) : 03095407+1723231

ICRS Star Coord at Epoch: 03h 09m 54.06829s +17:23:23.12847s

RUWE (>1.4 is poor) : 1.03
 K magnitude : 13.221
 G magnitude : 14.585
 RP magnitude : 14.117
 BP magnitude : 14.886
 DUPflag : 0
 Distance (au) : 18.709
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.98
 Sun-Target sep (deg) : 156.58
 Sun-Moon sep (deg) : 121.57
 B (ring opening deg) : 61.30
 PA of pole (deg) : -89.95

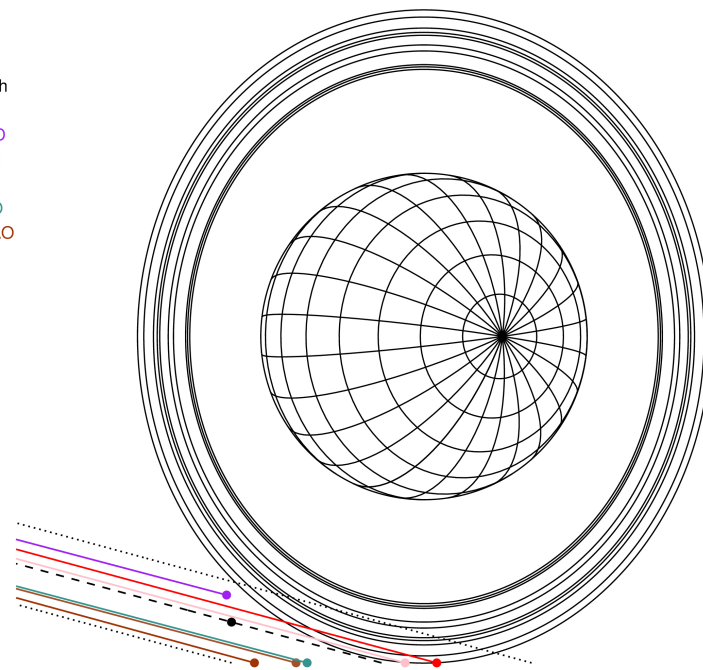
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2023-12-05T23:57:16.5800 ex: 03 09 54.0683 s: +17 23 23.128 C/A 3.761" PA 344.81 deg v_sky -20.98 km/s D 18.71 AU
 Credit: Styled after SORA/Lucky Star

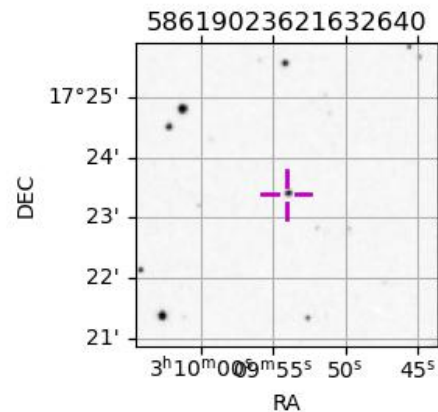
Uranus 2023-12-05T23:57:16 K13.22 G14.58 XRT

Earth
 PIC
 MCD
 TEN
 RIO
 ESO
 SAAO



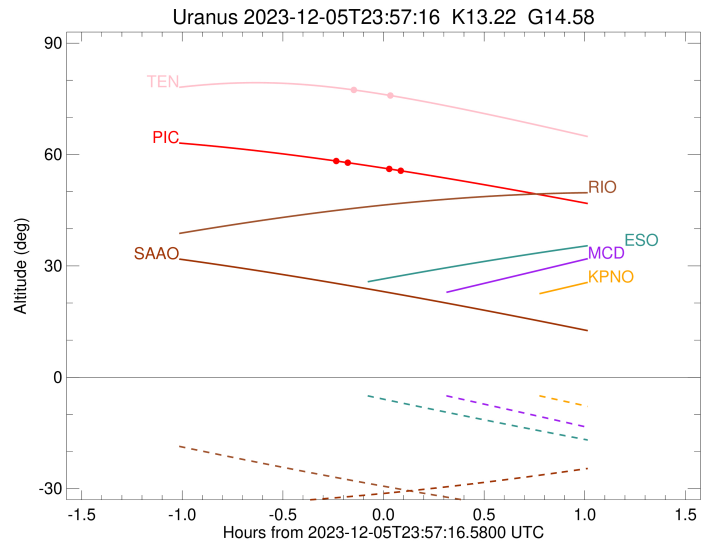
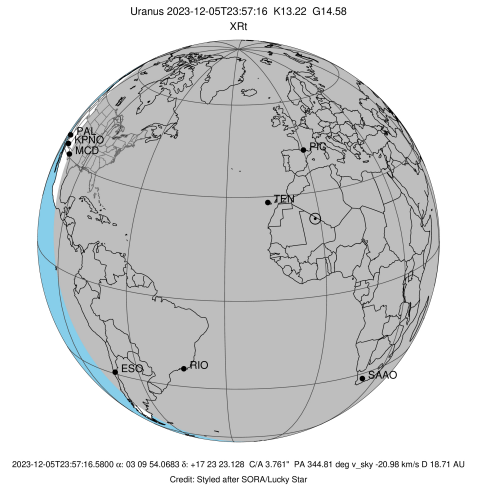
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	++		++	DEC 05 23:42 - DEC 06 00:03	PnnRie
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	+		+	DEC 05 23:46 - DEC 06 00:00	PnnRie
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					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            : 2023-12-05T23:55:03.970
Event type          : XRt
: No Uranus occs
: Ring occs: topocentric, not geocentric
Observer code       : PIC
Location            : Pic du Midi
Latitude (deg)      : 42.93656
E. Longitude (deg)  : 0.14231
Altitude (km)       : 2.890
Gaia source ID      : 58619023621632640
2Mass ID (if available) : 03095407+1723231
ICRS Star Coord at Epoch: 03h 09m 54.06829s +17:23:23.12847s
RUWE (>1.4 is poor) : 1.03
K magnitude          : 13.221
G magnitude          : 14.585
RP magnitude         : 14.117
BP magnitude         : 14.886
DUPflag             : 0
Distance (au)       : 18.709
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -20.98
Sun-Target sep (deg) : 156.58
Sun-Moon sep (deg)  : 122.43
B (ring opening deg) : 61.30
PA of pole (deg)    : -89.95
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.599
C/A sky separation (km) : 48834.8
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
  
```



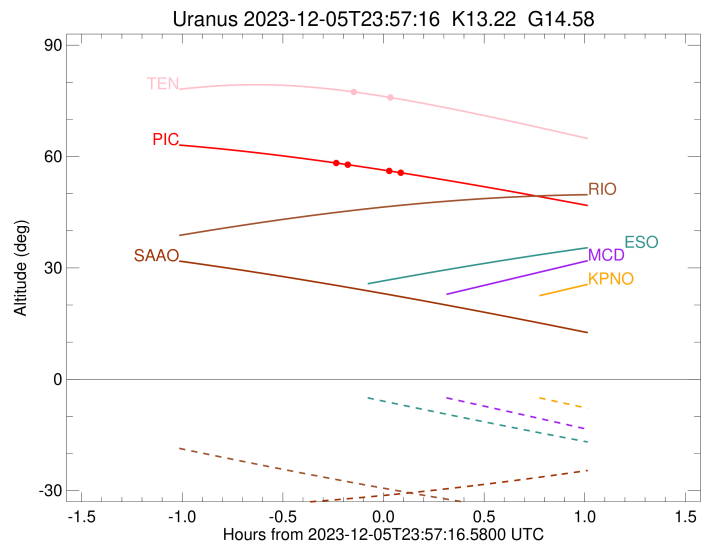
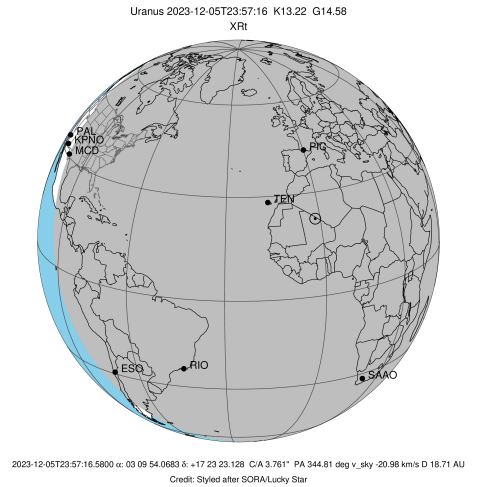
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2023-12-05T23:42:15.245		58.37	-69.62	51544.29	-7.17		
lambda	I	2023-12-05T23:46:40.908		57.80	-69.67	50026.71	-4.26		

No planet occultations

lambda	E	2023-12-05T23:58:55.904		56.13	-69.60	50026.71	4.26		
epsilon	E	2023-12-06T00:03:19.380		55.50	-69.50	51527.69	7.16		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2023-12-05T23:56:10.440
Event type           : XRt
: No Uranus occs
: Ring occs: topocentric, not geocentric
Observer code        : TEN
Location             : Teide Obs./Tenerife
Latitude (deg)       : 28.30050
E. Longitude (deg)   : 343.48909
Altitude (km)        : 2.395
Gaia source ID       : 58619023621632640
2Mass ID (if available) : 03095407+1723231
ICRS Star Coord at Epoch: 03h 09m 54.06829s +17:23:23.12847s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 13.221
G magnitude           : 14.585
RP magnitude          : 14.117
BP magnitude          : 14.886
DUPflag              : 0
Distance (au)         : 18.709
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -20.98
Sun-Target sep (deg) : 156.58
Sun-Moon sep (deg)   : 122.41
B (ring opening deg) : 61.30
PA of pole (deg)     : -89.95
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.695
C/A sky separation (km) : 50143.7
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
  
```



```

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  2023-12-05T23:46:54.436  77.59 -73.25  51552.59  -4.77
  
```

No planet occultations

```

epsilon   E  2023-12-06T00:00:49.229  75.67 -76.16  51541.82  4.77
  
```