

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2038-12-13T11:05:06.850  
 Event type : XRgt  
 : No Uranus occs  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 673891024558949632  
 2Mass ID (if available) : 07590264+2110269

ICRS Star Coord at Epoch: 07h 59m 02.63561s +21:10:26.94591s

RUWE (>1.4 is poor) : 1.48  
 K magnitude : 14.938  
 G magnitude : 16.437  
 RP magnitude : 15.917  
 BP magnitude : 16.738  
 DUPflag : 0  
 Distance (au) : 17.850  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -17.38  
 Sun-Target sep (deg) : 143.41  
 Sun-Moon sep (deg) : 17.32  
 B (ring opening deg) : 49.34  
 PA of pole (deg) : 88.85

# a(km) ring

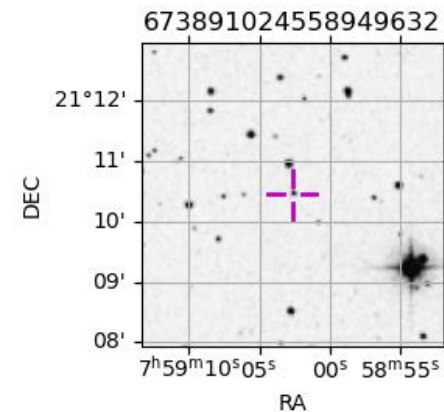
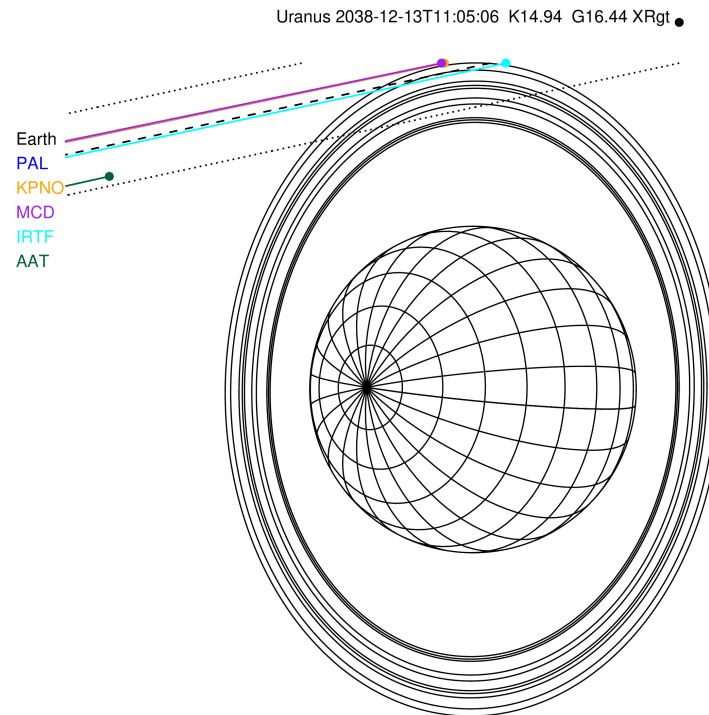
- 1 41837.2 6
- 2 42235.0 5
- 3 42571.2 4
- 4 44718.5 alpha
- 5 45661.1 beta
- 6 47176.1 eta
- 7 47626.3 gamma
- 8 48300.3 delta
- 9 50026.7 lambda
- 10 51149.4 epsilon

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	++		++	DEC 13 10:54 - DEC 13 11:12	PnnRie
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

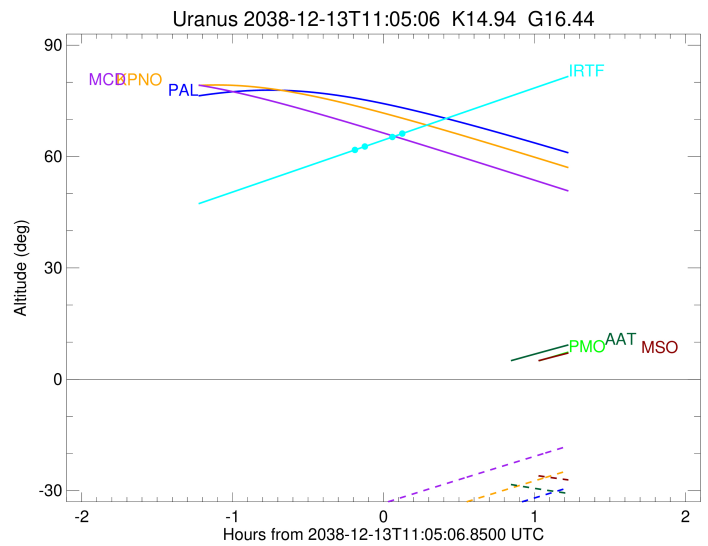
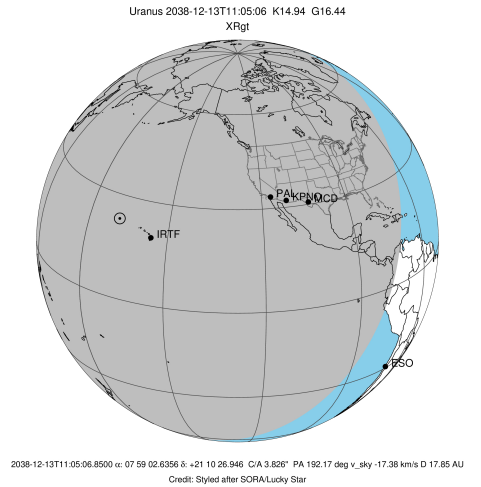


2038-12-13T11:05:06.8500 ra: 07 59 02.6356 s: +21 10 26.946 C/A 3.826° PA 192.17 deg v\_sky -17.38 km/s D 17.85 AU  
 Credit: Styled after SORA/Lucky Star



```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2038-12-13T11:07:36.820
Event type           : XRgt
: No Uranus occs
: Ring occs: geocentric, topocentric
Observer code        : IRTF
Location             : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)   : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 673891024558949632
2Mass ID (if available) : 07590264+2110269
ICRS Star Coord at Epoch: 07h 59m 02.63561s +21:10:26.94591s
RUWE (>1.4 is poor) : 1.48
K magnitude           : 14.938
G magnitude           : 16.437
RP magnitude          : 15.917
BP magnitude          : 16.738
DUPflag              : 0
Distance (au)         : 17.850
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -17.38
Sun-Target sep (deg) : 143.41
Sun-Moon sep (deg)   : 17.19
B (ring opening deg) : 49.34
PA of pole (deg)     : 88.85
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.776
C/A sky separation (km) : 48887.8
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall11.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall11.bsp
ural161.bsp
vgr2.ural161.bsp
peph.ural160.bsp
earthstns_itr93_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	2038-12-13T10:54:21.302		61.92	-80.43	50954.42	-5.73		
lambda	I	2038-12-13T10:57:45.852		62.72	-79.69	50026.71	-3.48		

No planet occultations

lambda	E	2038-12-13T11:08:34.115		65.24	-77.29	50026.71	3.48		
epsilon	E	2038-12-13T11:12:32.299		66.17	-76.40	51148.57	5.73		