

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-12-03T07:01:35.550
 Event type : XRT
 : No Uranus occs
 : Ring occs: topocentric, not geocentric
 Gaia source ID : 3412513247961444480
 2Mass ID (if available) : 05003016+2245542

ICRS Star Coord at Epoch: 05h 00m 30.16458s +22:45:54.21980s

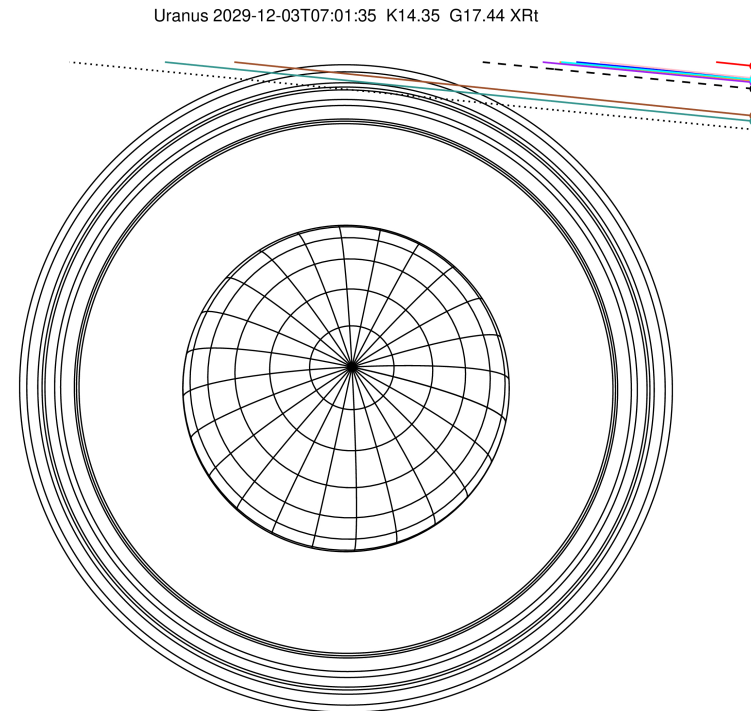
RUWE (>1.4 is poor) : 3.65
 K magnitude : 14.347
 G magnitude : 17.440
 RP magnitude : 16.415
 BP magnitude : 18.102
 DUPflag : 0
 Distance (au) : 18.244
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.34
 Sun-Target sep (deg) : 174.67
 Sun-Moon sep (deg) : 141.90
 B (ring opening deg) : 82.13
 PA of pole (deg) : -15.60

#	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



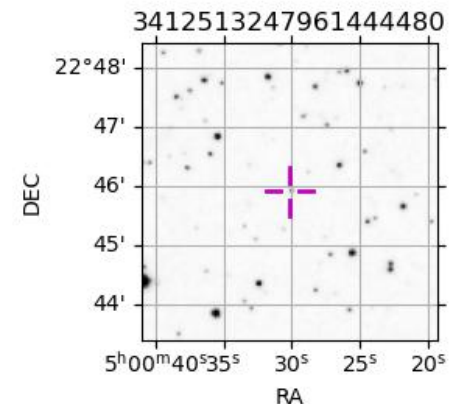
2029-12-03T07:01:35.5500 ra: 05 00 30.1646 ra: +22 45 54.220 C/A 4.009° PA 174.37 deg v_sky -23.34 km/s D 18.24 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO



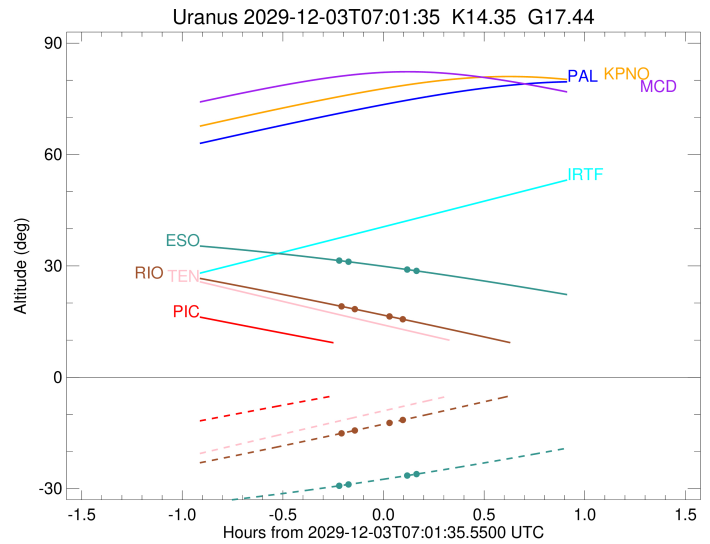
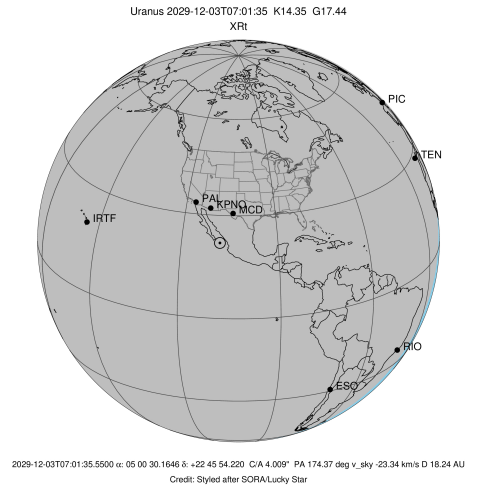
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	++		++	DEC 03 06:48 - DEC 03 07:07	PnnRie
ESO	European Southern Obs	-29.3	289.3	++		++	DEC 03 06:47 - DEC 03 07:11	PnnRie
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



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target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2029-12-03T06:58:06.180
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      : 3412513247961444480
2Mass ID (if available) : 05003016+2245542
ICRS Star Coord at Epoch: 05h 00m 30.16458s +22:45:54.21980s
RUWE (>1.4 is poor) : 3.65
K magnitude         : 14.347
G magnitude         : 17.440
RP magnitude        : 16.415
BP magnitude        : 18.102
DUPflag            : 0
Distance (au)       : 18.244
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -23.34
Sun-Target sep (deg) : 174.67
Sun-Moon sep (deg)  : 142.71
B (ring opening deg) : 82.13
PA of pole (deg)    : -15.60
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.706
C/A sky separation (km) : 49035.2
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_itr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
```

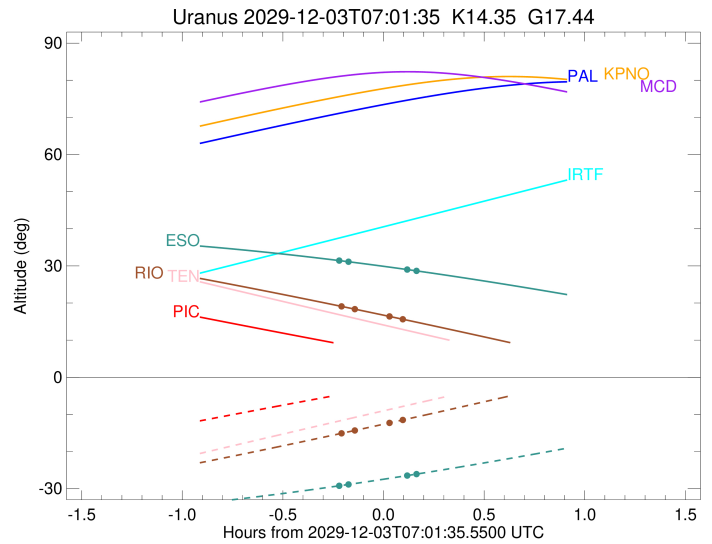
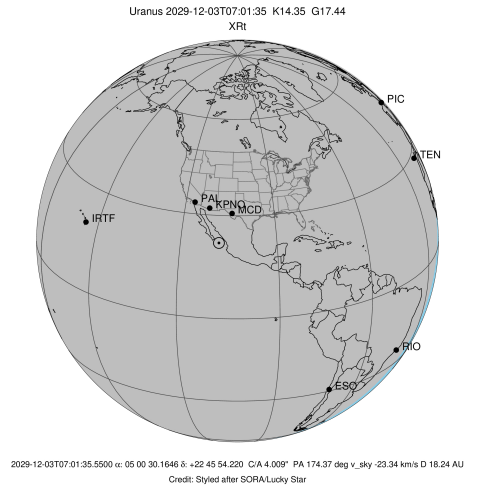


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2029-12-03T06:48:29.744		19.20	-15.22	51378.70	-6.17		
lambda	I	2029-12-03T06:53:06.507		18.34	-14.32	50026.71	-3.41		

No planet occultations

lambda	E	2029-12-03T07:03:19.082		16.40	-12.31	50026.71	3.41		
epsilon	E	2029-12-03T07:07:23.549		15.62	-11.50	51178.43	6.17		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-12-03T06:59:48.050
 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 : 3412513247961444480
 2Mass ID (if available) : 05003016+2245542
 ICRS Star Coord at Epoch: 05h 00m 30.16458s +22:45:54.21980s
 RUWE (>1.4 is poor) : 3.65
 K magnitude : 14.347
 G magnitude : 17.440
 RP magnitude : 16.415
 BP magnitude : 18.102
 DUPflag : 0
 Distance (au) : 18.244
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.34
 Sun-Target sep (deg) : 174.67
 Sun-Moon sep (deg) : 142.57
 B (ring opening deg) : 82.13
 PA of pole (deg) : -15.60
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.628
 C/A sky separation (km) : 48010.1
 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_itr93_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	2029-12-03T06:47:52.937		31.49	-29.30	51400.14	-7.76		
lambda	I	2029-12-03T06:51:11.970		31.12	-28.87	50026.71	-5.88		

No planet occultations

lambda	E	2029-12-03T07:08:37.307		29.02	-26.49	50026.71	5.87		
epsilon	E	2029-12-03T07:11:24.061		28.66	-26.09	51149.39	7.75		