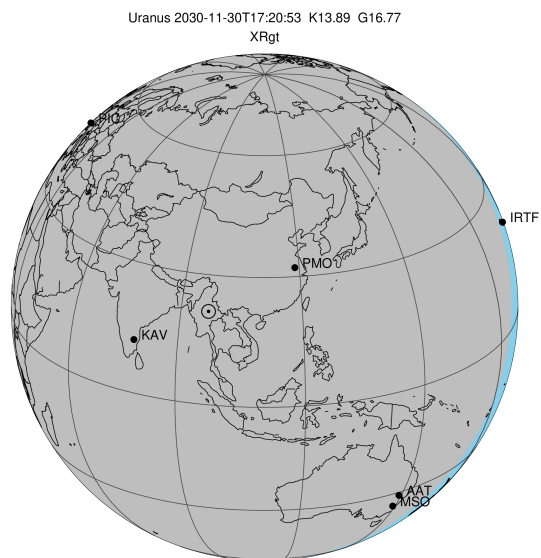


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-11-30T17:20:53.160
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3414853352303375744
 2Mass ID (if available) : 05202954+2312598

ICRS Star Coord at Epoch: 05h 20m 29.57530s +23:12:59.99435s

RUWE (>1.4 is poor) : 1.05
 K magnitude : 13.888
 G magnitude : 16.766
 RP magnitude : 15.893
 BP magnitude : 17.562
 DUPflag : 0
 Distance (au) : 18.195
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.71
 Sun-Target sep (deg) : 167.18
 Sun-Moon sep (deg) : 118.13
 B (ring opening deg) : 81.53
 PA of pole (deg) : 18.76

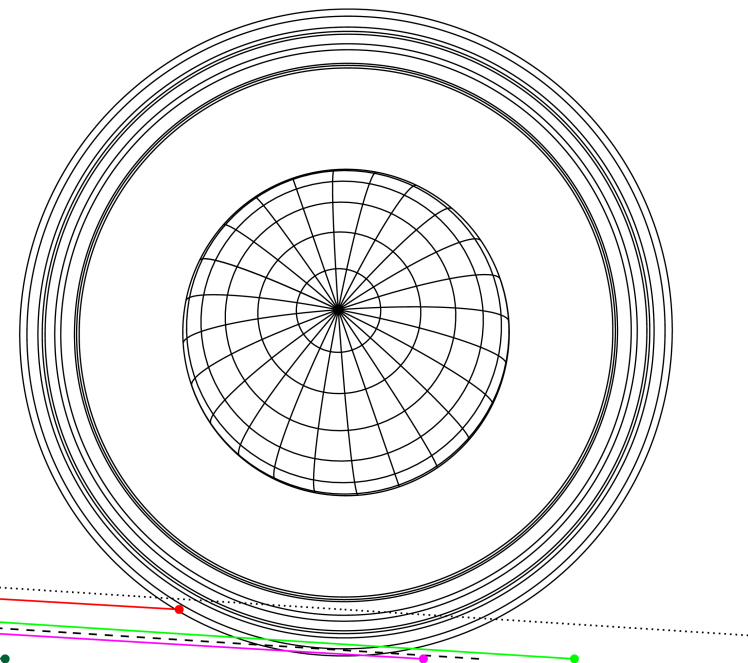
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2030-11-30T17:20:53.1600 ra: 05 20 29.5753 s: +23 12 59.994 C/A 3.759° PA 356.34 deg v_sky -22.71 km/s D 18.19 AU
 Credit: Styled after SORA/Lucky Star

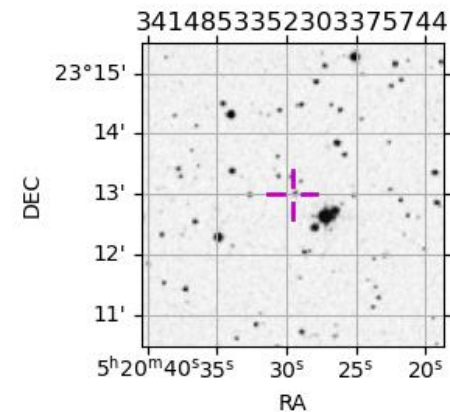
Uranus 2030-11-30T17:20:53 K13.89 G16.77 XRgt

PIC
 PMO
 KAV
 AAT
 MSO

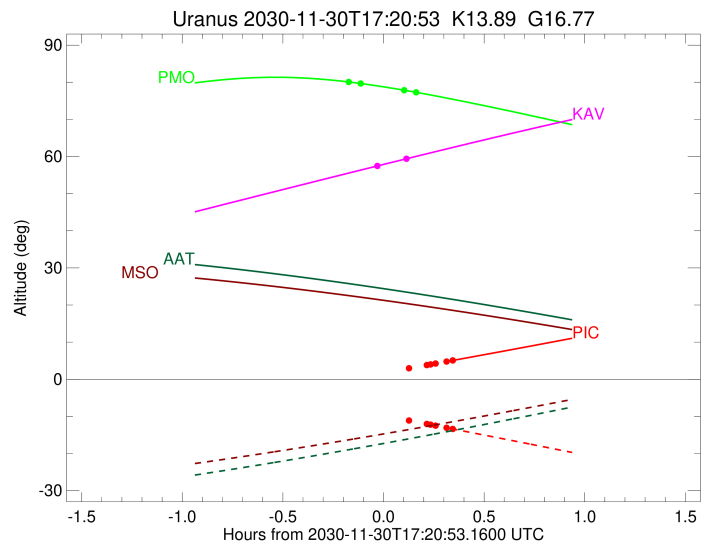
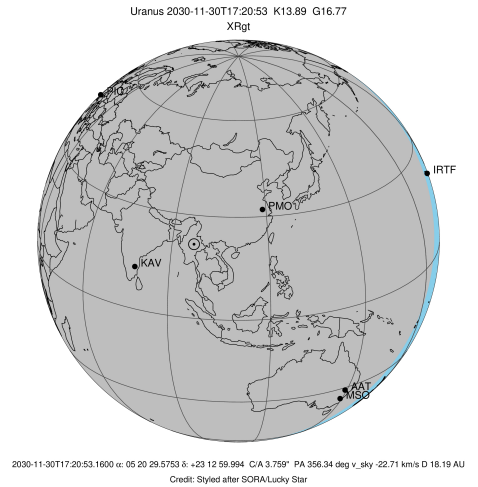


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1				+ NOV 30 17:41 - NOV 30 17:41	PnnRne
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	++			++ NOV 30 17:11 - NOV 30 17:30	PnnRie
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	+			+ NOV 30 17:20 - NOV 30 17:26	PnnRie
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 : 2030-11-30T17:23:43.820
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3414853352303375744
 2Mass ID (if available) : 05202954+2312598
 ICRS Star Coord at Epoch: 05h 20m 29.57530s +23:12:59.99435s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 13.888
 G magnitude : 16.766
 RP magnitude : 15.893
 BP magnitude : 17.562
 DUPflag : 0
 Distance (au) : 18.195
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.71
 Sun-Target sep (deg) : 167.18
 Sun-Moon sep (deg) : 118.49
 B (ring opening deg) : 81.53
 PA of pole (deg) : 18.76
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.397
 C/A sky separation (km) : 44826.0
 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



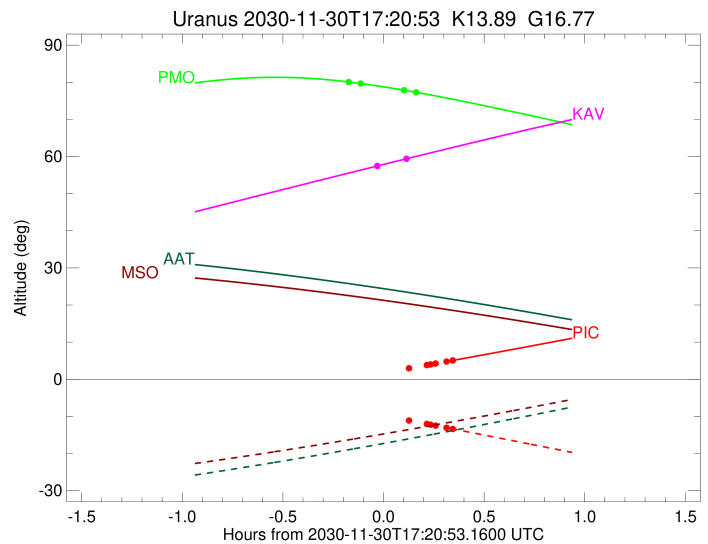
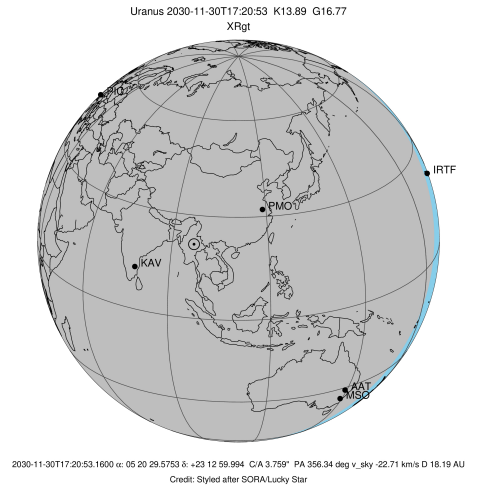
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-11-30T17:06:57.856	-0.43x	-7.43	50818.81	-10.37			
lambda	I	2030-11-30T17:08:17.426	-0.23x	-7.65	50026.71	-9.63			
delta	I	2030-11-30T17:11:34.179	0.28x	-8.21	48300.35	-7.89			
gamma	I	2030-11-30T17:13:05.172	0.52x	-8.47	47621.40	-7.03			
eta	I	2030-11-30T17:14:11.620	0.69x	-8.66	47176.12	-6.37			
beta	I	2030-11-30T17:19:27.741	1.52x	-9.56	45679.82	-3.04			

No planet occultations

beta	E	2030-11-30T17:28:29.527	2.96x	-11.12	45677.17	3.04			
eta	E	2030-11-30T17:33:46.252	3.81x	-12.03	47176.12	6.38			
gamma	E	2030-11-30T17:34:52.924	3.99x	-12.23	47623.59	7.04			
delta	E	2030-11-30T17:36:23.469	4.23x	-12.49	48300.35	7.90			
lambda	E	2030-11-30T17:39:39.868	4.77x	-13.06	50026.71	9.65			
epsilon	E	2030-11-30T17:41:31.052	5.07	-13.38	51150.14	10.39			

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2030-11-30T17:20:17.550
Event type           : XRgt
: No Uranus occs
: Ring occs: geocentric, topocentric
Observer code        : PMO
Location             : Purple Mtn Obs. Nanking
Latitude (deg)       : 32.06667
E. Longitude (deg)   : 118.82089
Altitude (km)        : 0.364
Gaia source ID       : 3414853352303375744
2Mass ID (if available) : 05202954+2312598
ICRS Star Coord at Epoch: 05h 20m 29.57530s +23:12:59.99435s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 13.888
G magnitude           : 16.766
RP magnitude          : 15.893
BP magnitude          : 17.562
DUPflag              : 0
Distance (au)         : 18.195
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -22.71
Sun-Target sep (deg) : 167.18
Sun-Moon sep (deg)   : 118.91
B (ring opening deg) : 81.53
PA of pole (deg)     : 18.76
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.695
C/A sky separation (km) : 48752.8
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_itr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
```



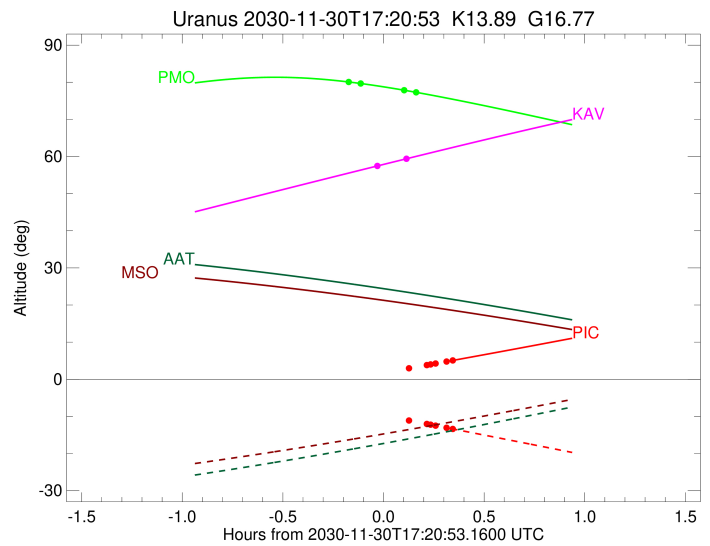
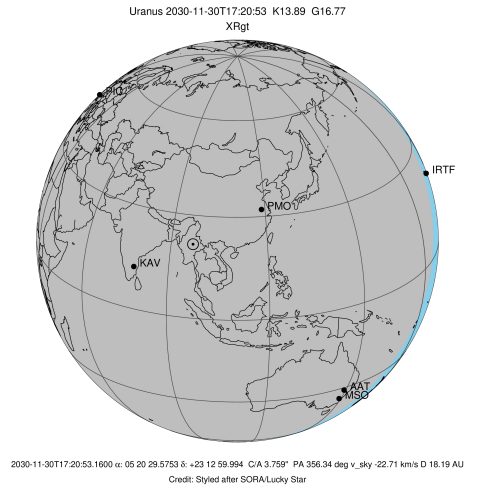
```

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  2030-11-30T17:11:17.934  80.00 -69.92  50878.23 -5.98
lambda    I  2030-11-30T17:14:08.476  79.67 -69.38  50026.71 -4.12

No planet occultations

lambda    E  2030-11-30T17:26:59.559  77.87 -66.86  50026.71  4.12
epsilon   E  2030-11-30T17:30:21.344  77.34 -66.18  51065.61  5.98
  
```

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-11-30T17:23:06.570
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 3414853352303375744
 2Mass ID (if available) : 05202954+2312598
 ICRS Star Coord at Epoch: 05h 20m 29.57530s +23:12:59.99435s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 13.888
 G magnitude : 16.766
 RP magnitude : 15.893
 BP magnitude : 17.562
 DUPflag : 0
 Distance (au) : 18.195
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.71
 Sun-Target sep (deg) : 167.18
 Sun-Moon sep (deg) : 119.09
 B (ring opening deg) : 81.53
 PA of pole (deg) : 18.76
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.813
 C/A sky separation (km) : 50318.5
 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_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	2030-11-30T17:20:46.759	57.85	-70.37	50937.87	-1.81		

No planet occultations

epsilon	E	2030-11-30T17:26:31.166	59.13	-71.57	50993.18	1.80		
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