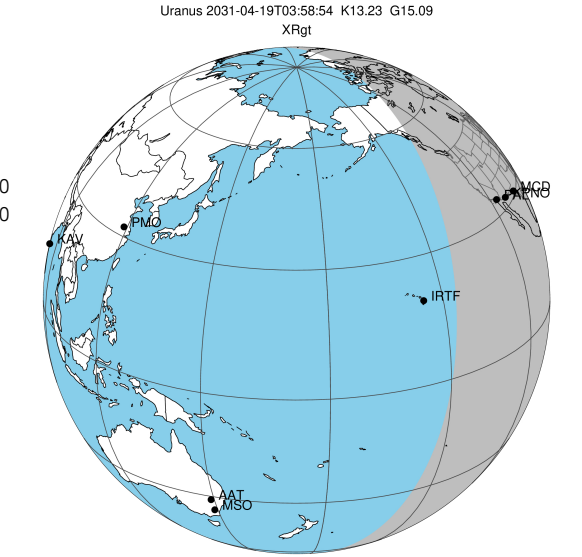


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-04-19T03:58:54.910
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3415554192182894592
 2Mass ID (if available) : 05143626+2307523

ICRS Star Coord at Epoch: 05h 14m 36.26270s +23:07:52.30658s

RUWE (>1.4 is poor) : 0.94
 K magnitude : 13.230
 G magnitude : 15.085
 RP magnitude : 14.453
 BP magnitude : 15.539
 DUPflag : 0
 Distance (au) : 19.746
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 25.04
 Sun-Target sep (deg) : 51.09
 Sun-Moon sep (deg) : 81.82
 B (ring opening deg) : 81.94
 PA of pole (deg) : 9.27

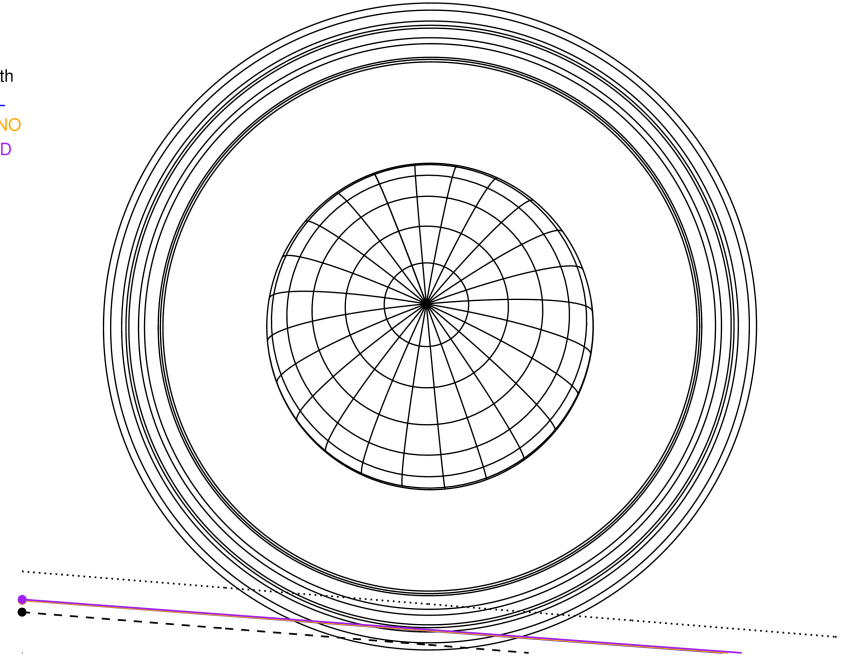
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2031-04-19T03:58:54.9100 ex: 05 14 36.2627 8: +23 07 52.307 C/A 3.466° PA 355.40 deg v_sky +25.04 km/s D 19.75 AU
 Credit: Styled after SORA/Lucky Star

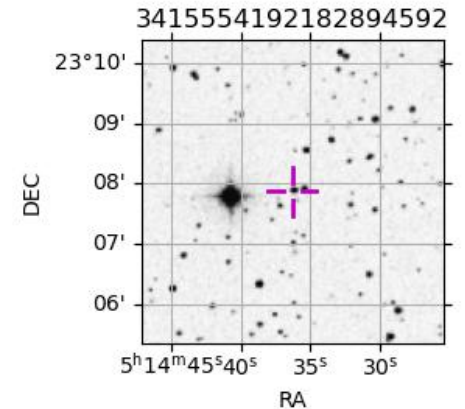
Uranus 2031-04-19T03:58:54 K13.23 G15.09 XRgt

Earth
 PAL
 KPNO
 MCD



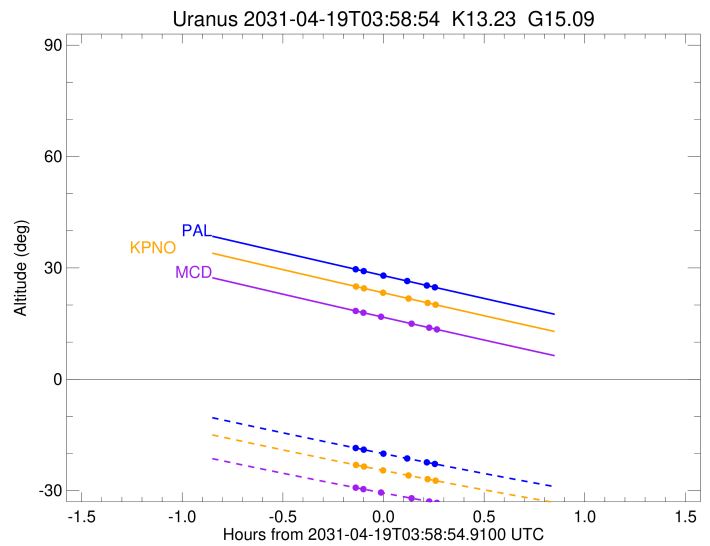
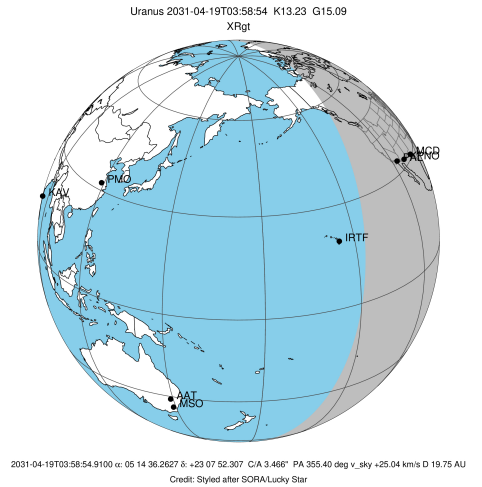
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++		+++	APR 19 03:50 - APR 19 04:14	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++		+++	APR 19 03:50 - APR 19 04:14	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++		+++	APR 19 03:50 - APR 19 04:15	PnnRie
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					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            : 2031-04-19T04:02:34.730
Event type          : XRgt
: No Uranus occs
: Ring occs: geocentric, topocentric
Observer code       : PAL
Location            : Palomar Mt (200")
Latitude (deg)      : 33.35622
E. Longitude (deg) : 243.13601
Altitude (km)       : 1.706
Gaia source ID      : 3415554192182894592
2Mass ID (if available) : 05143626+2307523
ICRS Star Coord at Epoch: 05h 14m 36.26270s +23:07:52.30658s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 13.230
G magnitude          : 15.085
RP magnitude         : 14.453
BP magnitude         : 15.539
DUPflag             : 0
Distance (au)        : 19.746
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 25.04
Sun-Target sep (deg) : 51.09
Sun-Moon sep (deg)  : 82.36
B (ring opening deg) : 81.94
PA of pole (deg)    : 9.27
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.321
C/A sky separation (km) : 47560.5
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl.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
  
```

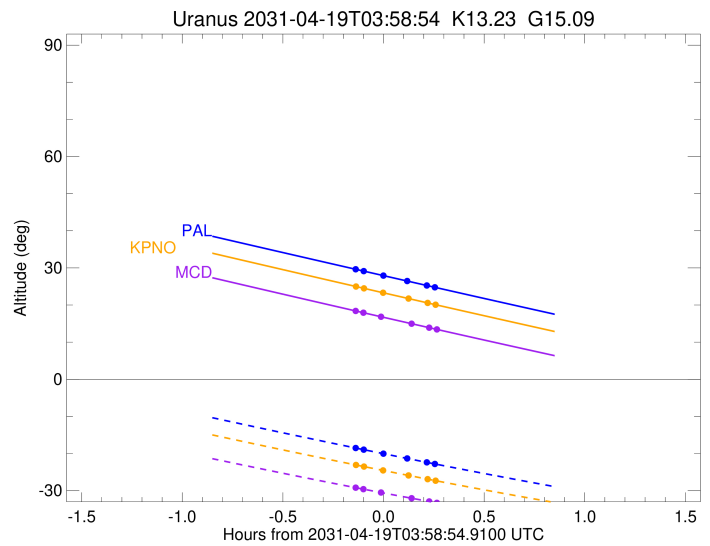
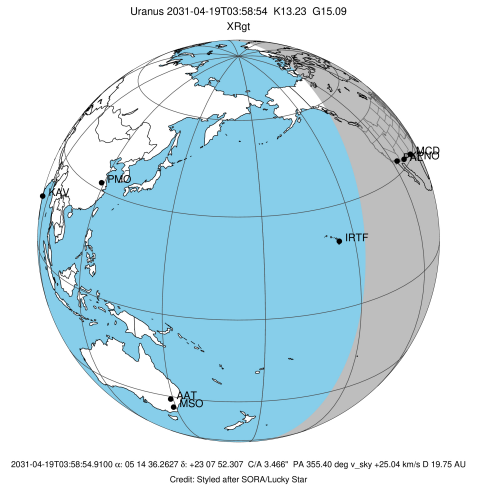


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-04-19T03:50:42.312		29.61	-18.53	51122.83	-8.72		
lambda	I	2031-04-19T03:53:03.497		29.13	-18.97	50026.71	-6.97		
delta	I	2031-04-19T03:58:59.046		27.90	-20.06	48300.35	-2.66		

No planet occultations

delta	E	2031-04-19T04:05:52.929		26.48	-21.31	48300.35	2.66		
lambda	E	2031-04-19T04:11:48.131		25.27	-22.38	50026.71	6.99		
epsilon	E	2031-04-19T04:14:40.323		24.68	-22.89	51395.12	8.74		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-04-19T04:02:44.100
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 3415554192182894592
 2Mass ID (if available) : 05143626+2307523
 ICRS Star Coord at Epoch: 05h 14m 36.26270s +23:07:52.30658s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 13.230
 G magnitude : 15.085
 RP magnitude : 14.453
 BP magnitude : 15.539
 DUPflag : 0
 Distance (au) : 19.746
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 25.04
 Sun-Target sep (deg) : 51.09
 Sun-Moon sep (deg) : 82.30
 B (ring opening deg) : 81.94
 PA of pole (deg) : 9.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.318
 C/A sky separation (km) : 47517.1
 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

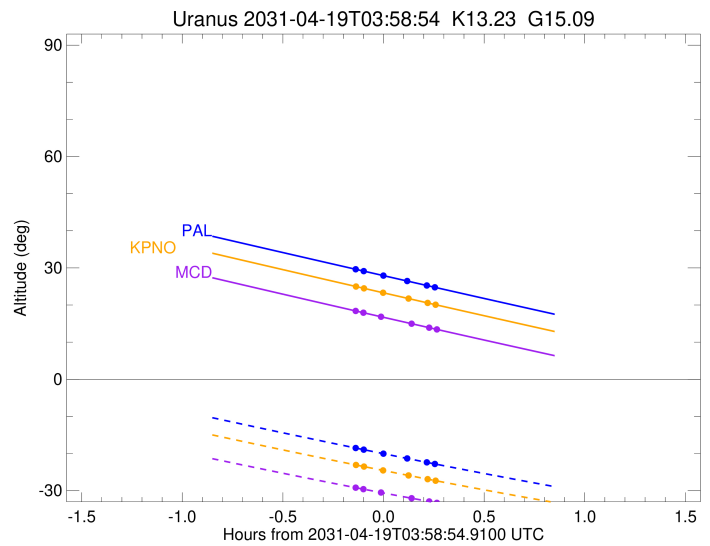
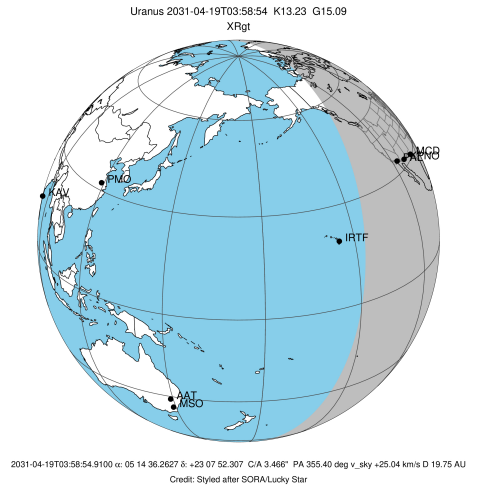


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-04-19T03:50:47.951		24.97	-23.10	51121.98	-8.79		
lambda	I	2031-04-19T03:53:07.662		24.48	-23.53	50026.71	-7.06		
delta	I	2031-04-19T03:58:52.989		23.29	-24.57	48300.35	-2.87		

No planet occultations

delta	E	2031-04-19T04:06:17.764		21.76	-25.89	48300.35	2.87		
lambda	E	2031-04-19T04:12:02.731		20.58	-26.90	50026.71	7.07		
epsilon	E	2031-04-19T04:14:53.394		19.99	-27.40	51396.01	8.81		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-04-19T04:02:52.760
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 3415554192182894592
 2Mass ID (if available) : 05143626+2307523
 ICRS Star Coord at Epoch: 05h 14m 36.26270s +23:07:52.30658s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 13.230
 G magnitude : 15.085
 RP magnitude : 14.453
 BP magnitude : 15.539
 DUPflag : 0
 Distance (au) : 19.746
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 25.04
 Sun-Target sep (deg) : 51.09
 Sun-Moon sep (deg) : 82.20
 B (ring opening deg) : 81.94
 PA of pole (deg) : 9.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.307
 C/A sky separation (km) : 47368.0
 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	2031-04-19T03:50:42.347		18.39	-29.22	51118.80	-9.00		
lambda	I	2031-04-19T03:52:57.562		17.92	-29.61	50026.71	-7.32		
delta	I	2031-04-19T03:58:15.220		16.83	-30.52	48300.35	-3.48		

No planet occultations

delta	E	2031-04-19T04:07:12.946		14.99	-32.04	48300.35	3.48		
lambda	E	2031-04-19T04:12:30.235		13.90	-32.91	50026.71	7.33		
epsilon	E	2031-04-19T04:15:16.324		13.34	-33.36	51398.77	9.02		