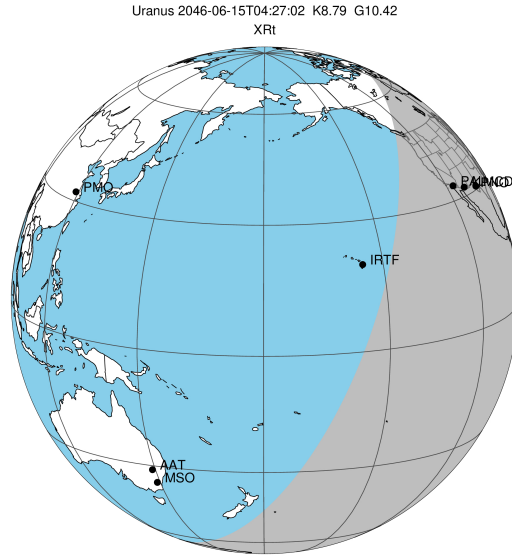


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2046-06-15T04:27:02.780  
 Event type : XRT  
 : No Uranus occs  
 : Ring occs: topocentric, not geocentric  
 Gaia source ID : 614895181980039936  
 2Mass ID (if available) : 10000873+1259531

Uranus 2046-06-15T04:27:02 K8.79 G10.42 XRT

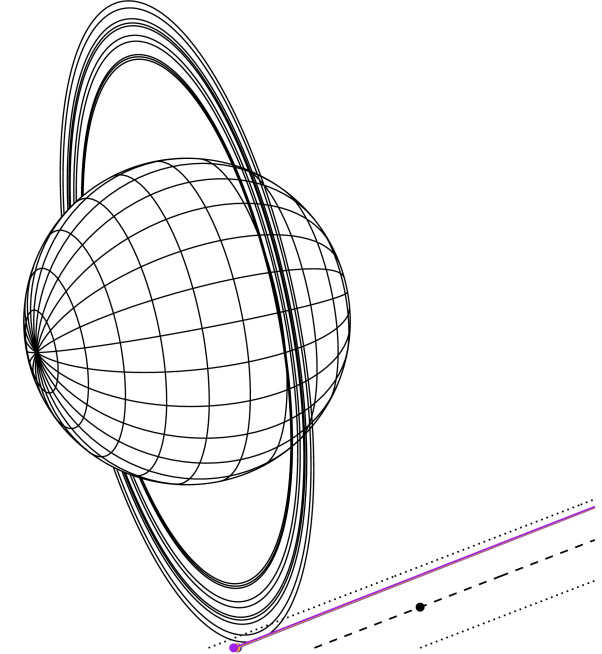
ICRS Star Coord at Epoch: 10h 00m 08.38765s +12:59:53.16981s

RUWE (>1.4 is poor) : 1.04  
 K magnitude : 8.787  
 G magnitude : 10.421  
 RP magnitude : 9.867  
 BP magnitude : 10.806  
 DUPflag : 0  
 Distance (au) : 18.752  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 19.82  
 Sun-Target sep (deg) : 63.95  
 Sun-Moon sep (deg) : 73.05  
 B (ring opening deg) : 19.76  
 PA of pole (deg) : 101.68



2046-06-15T04:27:02.7800 ra: 10 00 08.3877 s: +12 59 53.170 C/A 4.023° PA 21.06 deg v\_sky +19.82 km/s D 18.75 AU  
 Credit: Styled after SORA/Lucky Star

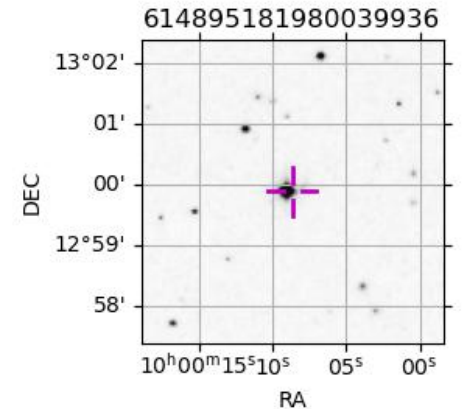
Earth  
 PAL  
 KPNO  
 MCD



#	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

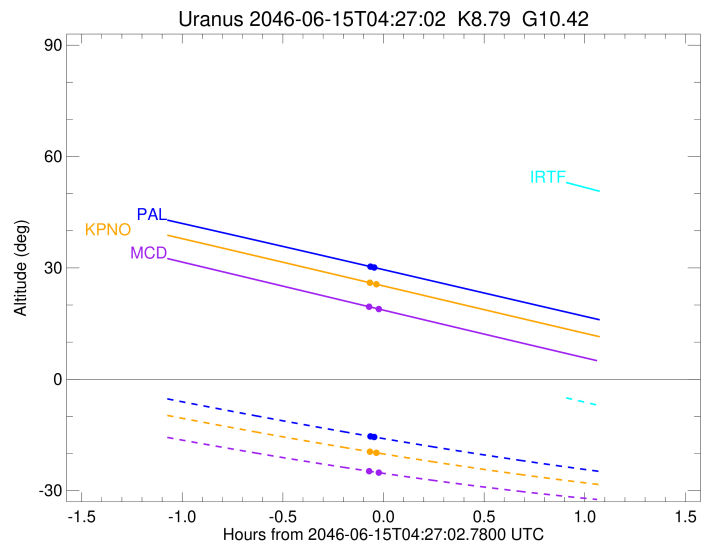
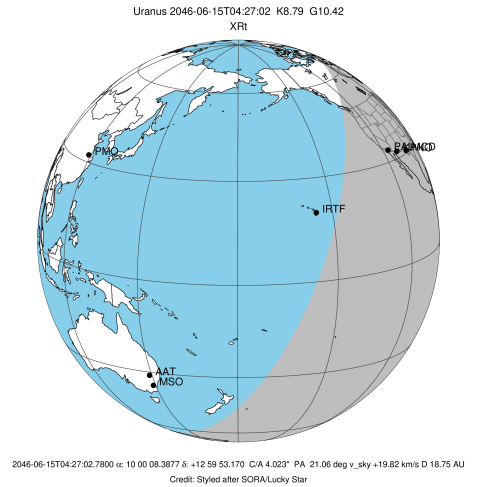
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+		+	JUN 15 04:22 - JUN 15 04:25	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+		+	JUN 15 04:22 - JUN 15 04:25	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+		+	JUN 15 04:22 - JUN 15 04:26	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            : 2046-06-15T04:30:12.570
Event type          : XRt
                    : No Uranus occs
                    : Ring occs: topocentric, not geocentric
Observer code       : PAL
Location            : Palomar Mt (200")
Latitude (deg)      : 33.35622
E. Longitude (deg)  : 243.13601
Altitude (km)       : 1.706
Gaia source ID      : 614895181980039936
2Mass ID (if available) : 10000873+1259531
ICRS Star Coord at Epoch: 10h 00m 08.38765s +12:59:53.16981s
RUWE (>1.4 is poor) : 1.04
K magnitude         : 8.787
G magnitude         : 10.421
RP magnitude        : 9.867
BP magnitude        : 10.806
DUPflag            : 0
Distance (au)       : 18.752
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : 19.82
Sun-Target sep (deg) : 63.95
Sun-Moon sep (deg)  : 73.38
B (ring opening deg) : 19.76
PA of pole (deg)    : 101.68
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.710
C/A sky separation (km) : 50457.5
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_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
```

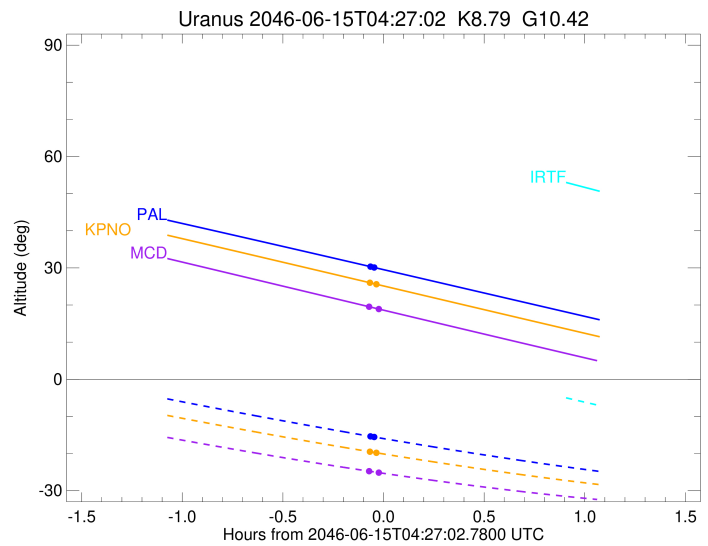
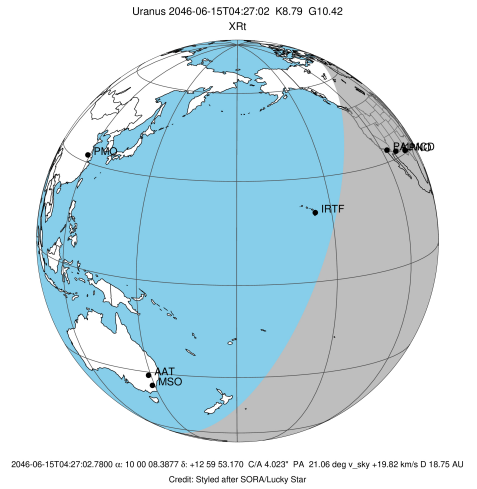


Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2046-06-15T04:22:25.304	30.50	-15.26	51322.09	-5.58		

No planet occultations

epsilon	E	2046-06-15T04:25:13.425	29.91	-15.70	51444.99	6.14		
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target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2046-06-15T04:30:25.250  
 Event type : XRt  
 : No Uranus occs  
 : Ring occs: topocentric, not geocentric  
 Observer code : KPNO  
 Location : Kitt Peak Natl Obs  
 Latitude (deg) : 31.96333  
 E. Longitude (deg) : 248.40000  
 Altitude (km) : 2.120  
 Gaia source ID : 614895181980039936  
 2Mass ID (if available) : 10000873+1259531  
 ICRS Star Coord at Epoch: 10h 00m 08.38765s +12:59:53.16981s  
 RUWE (>1.4 is poor) : 1.04  
 K magnitude : 8.787  
 G magnitude : 10.421  
 RP magnitude : 9.867  
 BP magnitude : 10.806  
 DUPflag : 0  
 Distance (au) : 18.752  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 19.82  
 Sun-Target sep (deg) : 63.95  
 Sun-Moon sep (deg) : 73.30  
 B (ring opening deg) : 19.76  
 PA of pole (deg) : 101.68  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.705  
 C/A sky separation (km) : 50388.2  
 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

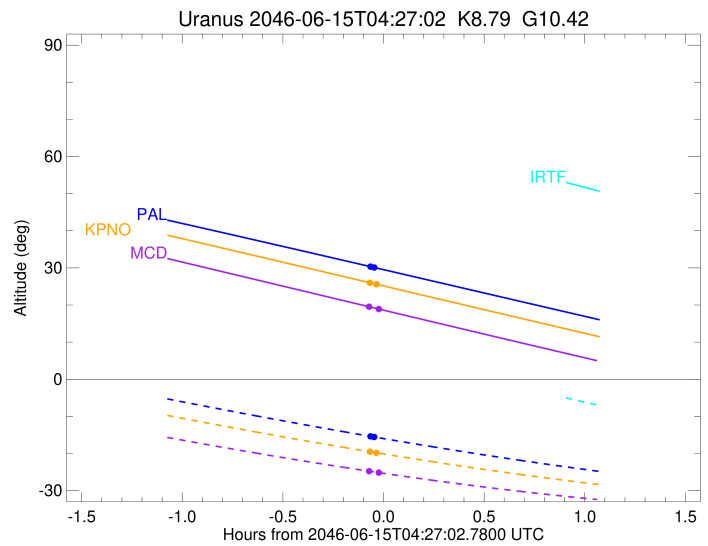
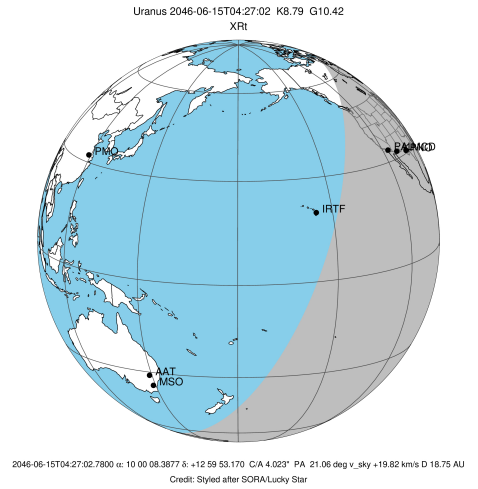


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2046-06-15T04:22:27.642		26.12	-19.44	51304.11	-6.23		

No planet occultations

epsilon	E	2046-06-15T04:25:39.729		25.44	-19.92	51389.23	6.32		
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target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2046-06-15T04:30:36.340  
 Event type : XRt  
 : No Uranus occs  
 : Ring occs: topocentric, not geocentric  
 Observer code : MCD  
 Location : McDonald Obs. 2.7m  
 Latitude (deg) : 30.67158  
 E. Longitude (deg) : 255.97844  
 Altitude (km) : 2.075  
 Gaia source ID : 614895181980039936  
 2Mass ID (if available) : 10000873+1259531  
 ICRS Star Coord at Epoch: 10h 00m 08.38765s +12:59:53.16981s  
 RUWE (>1.4 is poor) : 1.04  
 K magnitude : 8.787  
 G magnitude : 10.421  
 RP magnitude : 9.867  
 BP magnitude : 10.806  
 DUPflag : 0  
 Distance (au) : 18.752  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 19.82  
 Sun-Target sep (deg) : 63.95  
 Sun-Moon sep (deg) : 73.19  
 B (ring opening deg) : 19.76  
 PA of pole (deg) : 101.68  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.695  
 C/A sky separation (km) : 50257.9  
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2046-06-15T04:22:22.676		19.62	-24.71	51293.99	-7.52		

No planet occultations

epsilon	E	2046-06-15T04:26:13.872		18.79	-25.23	51388.60	7.54		
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