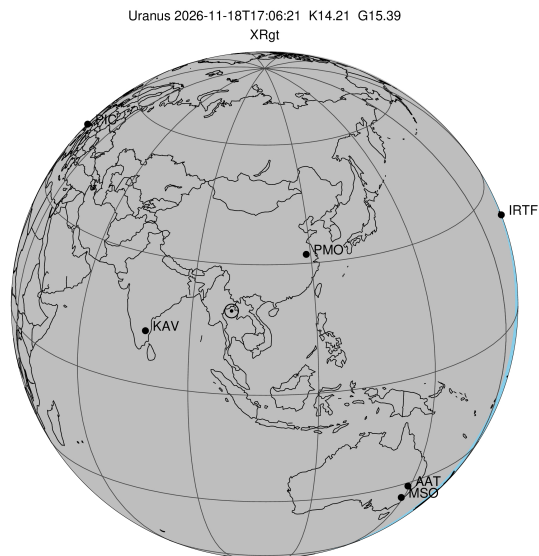


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2026-11-18T17:06:21.580  
 Event type : XRgt  
 : No Uranus occs  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 52121734537849216  
 2Mass ID (if available) : 04062631+2043163

ICRS Star Coord at Epoch: 04h 06m 26.31259s +20:43:16.21222s

RUWE (>1.4 is poor) : 3.23  
 K magnitude : 14.212  
 G magnitude : 15.386  
 RP magnitude : 14.951  
 BP magnitude : 15.613  
 DUPflag : 0  
 Distance (au) : 18.452  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.19  
 Sun-Target sep (deg) : 172.40  
 Sun-Moon sep (deg) : 83.73  
 B (ring opening deg) : 74.08  
 PA of pole (deg) : -72.19

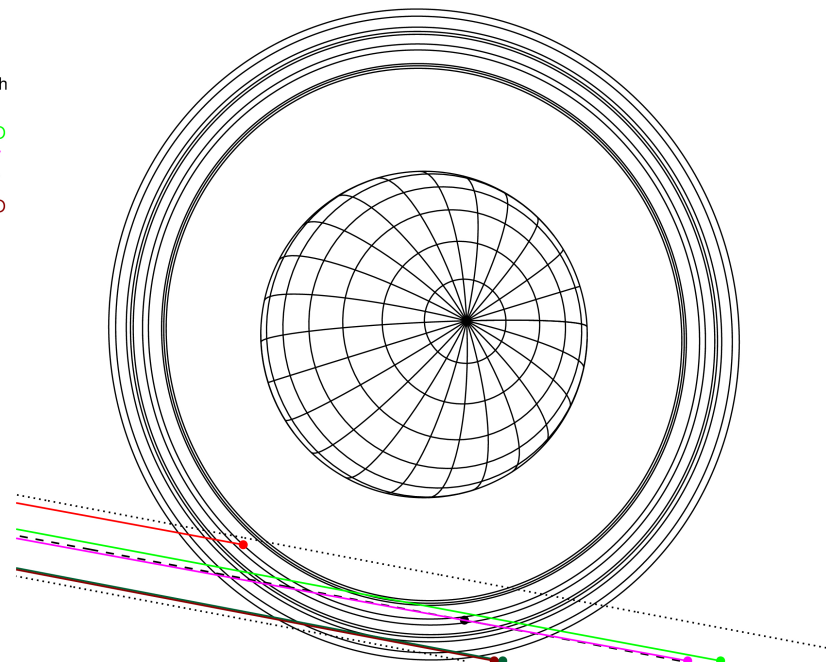
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2026-11-18T17:06:21.5800 ra: 04 06 26.3126 s: +20 43 16.212 C/A 3.193° PA 349.30 deg v\_sky -23.19 km/s D 18.45 AU  
 Credit: Styled after SORA/Lucky Star

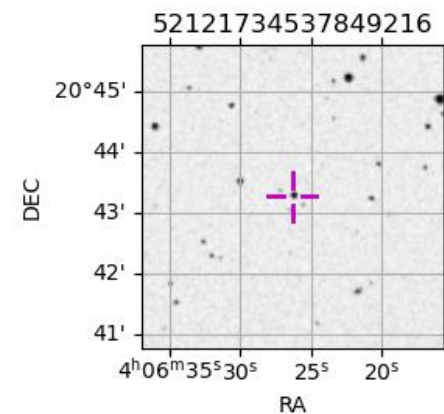
Earth  
 PIC  
 PMO  
 KAV  
 AAT  
 MSO

Uranus 2026-11-18T17:06:21 K14.21 G15.39 XRgt

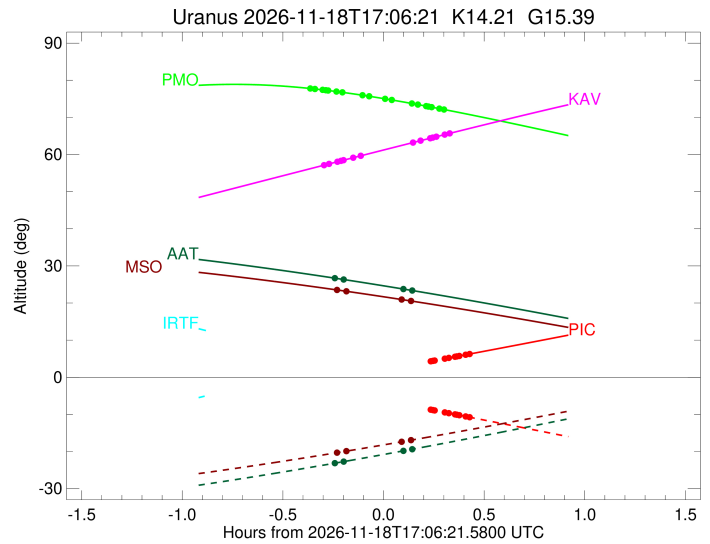
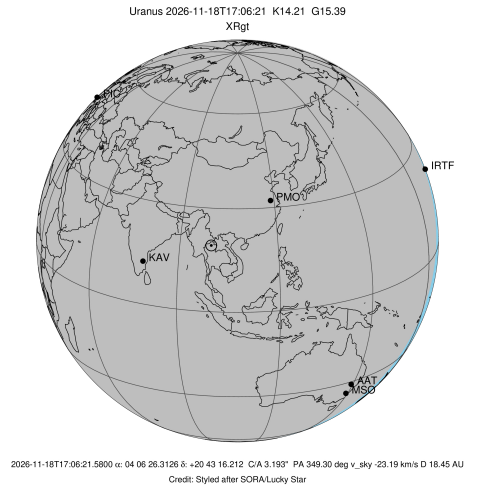


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1			+++++++	NOV 18 17:24 - NOV 18 17:32	PnnRne
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++++		+++++++	NOV 18 16:44 - NOV 18 17:24	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 18 16:48 - NOV 18 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	++		++	NOV 18 16:51 - NOV 18 17:15	PnnRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	++		++	NOV 18 16:51 - NOV 18 17:15	PnnRie



target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2026-11-18T17:08:48.890  
 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 : 52121734537849216  
 2Mass ID (if available) : 04062631+2043163  
 ICRS Star Coord at Epoch: 04h 06m 26.31259s +20:43:16.21222s  
 RUWE (>1.4 is poor) : 3.23  
 K magnitude : 14.212  
 G magnitude : 15.386  
 RP magnitude : 14.951  
 BP magnitude : 15.613  
 DUPflag : 0  
 Distance (au) : 18.452  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.19  
 Sun-Target sep (deg) : 172.40  
 Sun-Moon sep (deg) : 83.70  
 B (ring opening deg) : 74.08  
 PA of pole (deg) : -72.19  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 2.803  
 C/A sky separation (km) : 37516.2  
 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\_itr93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk

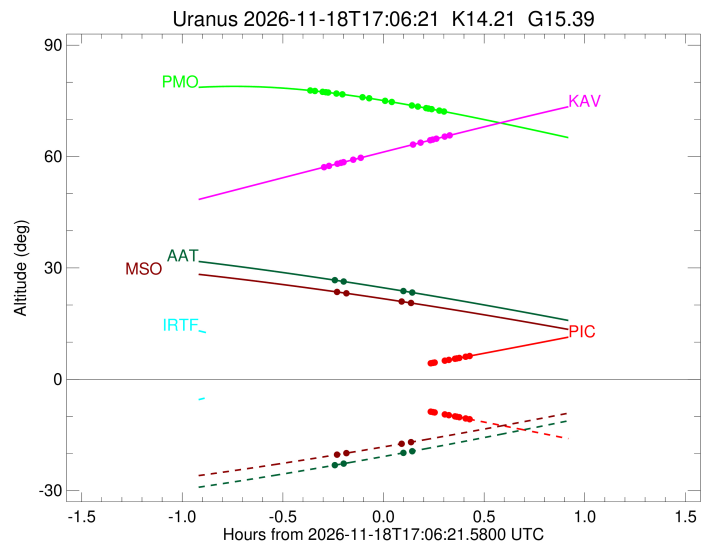
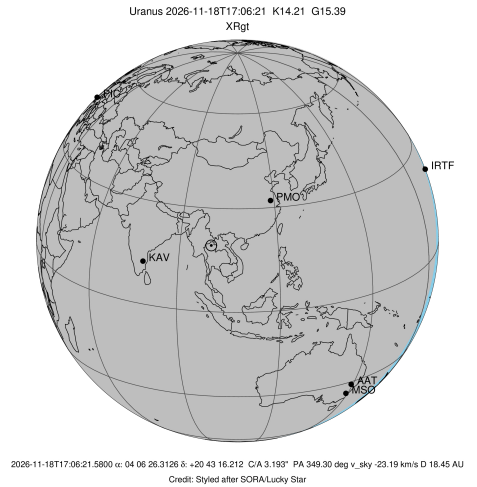


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-11-18T16:43:25.074	-1.73x	-2.40x	51551.12	-16.14			
lambda	I	2026-11-18T16:45:01.354	-1.48x	-2.67x	50026.71	-15.53			
delta	I	2026-11-18T16:46:55.295	-1.18x	-2.99x	48300.35	-14.76			
gamma	I	2026-11-18T16:47:41.709	-1.05x	-3.12x	47623.25	-14.42			
eta	I	2026-11-18T16:48:12.978	-0.97x	-3.20x	47176.12	-14.18			
beta	I	2026-11-18T16:50:03.877	-0.67x	-3.51x	45652.37	-13.29			
alpha	I	2026-11-18T16:51:15.527	-0.48x	-3.72x	44723.22	-12.67			
4	I	2026-11-18T16:54:13.976	-0.00x	-4.22x	42616.04	-10.91			
5	I	2026-11-18T16:54:44.975	0.08x	-4.31x	42282.74	-10.62			
6	I	2026-11-18T16:55:31.107	0.20x	-4.44x	41805.22	-10.11			

No planet occultations

6	E	2026-11-18T17:20:26.061	4.30x	-8.73	41838.34	10.12			
5	E	2026-11-18T17:21:10.483	4.43x	-8.86	42315.25	10.64			
4	E	2026-11-18T17:21:36.566	4.50x	-8.93	42591.50	10.93			
alpha	E	2026-11-18T17:24:39.459	5.01	-9.47	44750.85	12.70			
beta	E	2026-11-18T17:25:50.507	5.21	-9.67	45674.63	13.32			
eta	E	2026-11-18T17:27:39.488	5.52	-9.99	47176.12	14.21			
gamma	E	2026-11-18T17:28:10.544	5.61	-10.08	47621.26	14.45			
delta	E	2026-11-18T17:28:56.980	5.74	-10.22	48300.35	14.79			
lambda	E	2026-11-18T17:30:50.619	6.06	-10.55	50026.71	15.58			
epsilon	E	2026-11-18T17:32:07.170	6.28	-10.78	51237.64	16.19			

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2026-11-18T17:05:24.710  
 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 : 52121734537849216  
 2Mass ID (if available) : 04062631+2043163  
 ICRS Star Coord at Epoch: 04h 06m 26.31259s +20:43:16.21222s  
 RUWE (>1.4 is poor) : 3.23  
 K magnitude : 14.212  
 G magnitude : 15.386  
 RP magnitude : 14.951  
 BP magnitude : 15.613  
 DUPflag : 0  
 Distance (au) : 18.452  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.19  
 Sun-Target sep (deg) : 172.40  
 Sun-Moon sep (deg) : 84.65  
 B (ring opening deg) : 74.08  
 PA of pole (deg) : -72.19  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.118  
 C/A sky separation (km) : 41733.0  
 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\_itrf93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk

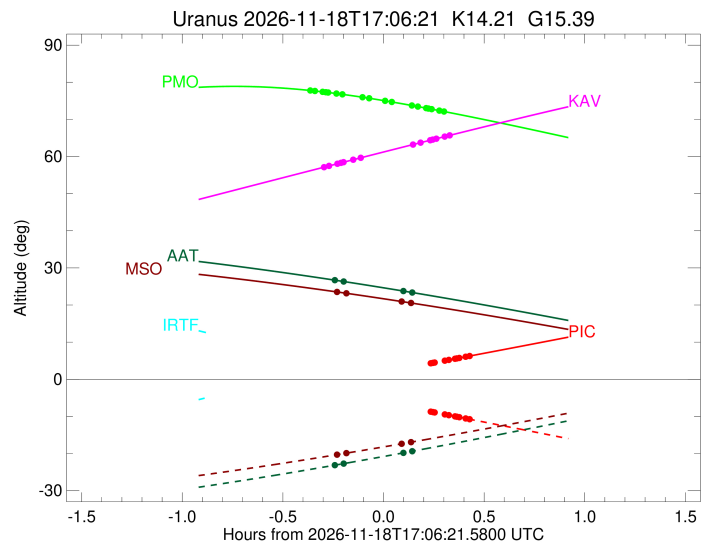
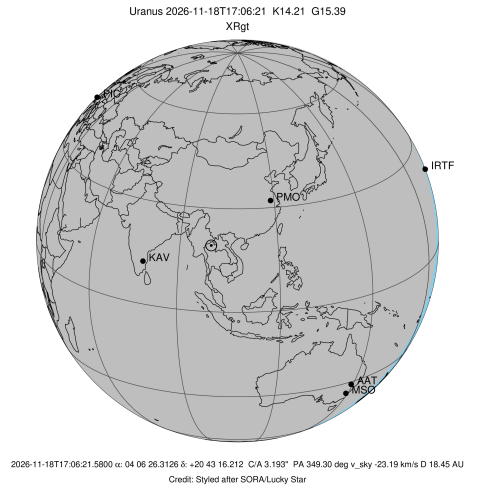


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-11-18T16:44:03.766		77.83	-72.53	51555.28	-14.02		
lambda	I	2026-11-18T16:45:56.368		77.66	-72.23	50026.71	-13.12		
delta	I	2026-11-18T16:48:14.255		77.42	-71.86	48300.35	-11.90		
gamma	I	2026-11-18T16:49:12.552		77.32	-71.71	47622.56	-11.35		
eta	I	2026-11-18T16:49:52.585		77.25	-71.60	47176.12	-10.95		
beta	I	2026-11-18T16:52:21.845		76.96	-71.19	45656.10	-9.40		
alpha	I	2026-11-18T16:54:07.025		76.75	-70.89	44730.43	-8.21		
4	I	2026-11-18T17:00:00.235		75.99	-69.88	42611.46	-3.69		
5	I	2026-11-18T17:01:43.136		75.75	-69.58	42302.85	-2.32		

No planet occultations

5	E	2026-11-18T17:07:14.760		74.94	-68.59	42309.78	2.32		
4	E	2026-11-18T17:08:52.952		74.69	-68.29	42603.30	3.69		
alpha	E	2026-11-18T17:14:50.928		73.75	-67.19	44747.92	8.21		
beta	E	2026-11-18T17:16:35.697		73.46	-66.86	45671.50	9.40		
eta	E	2026-11-18T17:19:03.359		73.05	-66.39	47176.12	10.95		
gamma	E	2026-11-18T17:19:43.269		72.93	-66.27	47621.04	11.34		
delta	E	2026-11-18T17:20:41.716		72.77	-66.08	48300.35	11.90		
lambda	E	2026-11-18T17:22:59.646		72.37	-65.64	50026.71	13.11		
epsilon	E	2026-11-18T17:24:33.125		72.10	-65.34	51288.16	14.02		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2026-11-18T17:08:20.380  
 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 : 52121734537849216  
 2Mass ID (if available) : 04062631+2043163  
 ICRS Star Coord at Epoch: 04h 06m 26.31259s +20:43:16.21222s  
 RUWE (>1.4 is poor) : 3.23  
 K magnitude : 14.212  
 G magnitude : 15.386  
 RP magnitude : 14.951  
 BP magnitude : 15.613  
 DUPflag : 0  
 Distance (au) : 18.452  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.19  
 Sun-Target sep (deg) : 172.40  
 Sun-Moon sep (deg) : 84.50  
 B (ring opening deg) : 74.08  
 PA of pole (deg) : -72.19  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.205  
 C/A sky separation (km) : 42889.4  
 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



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

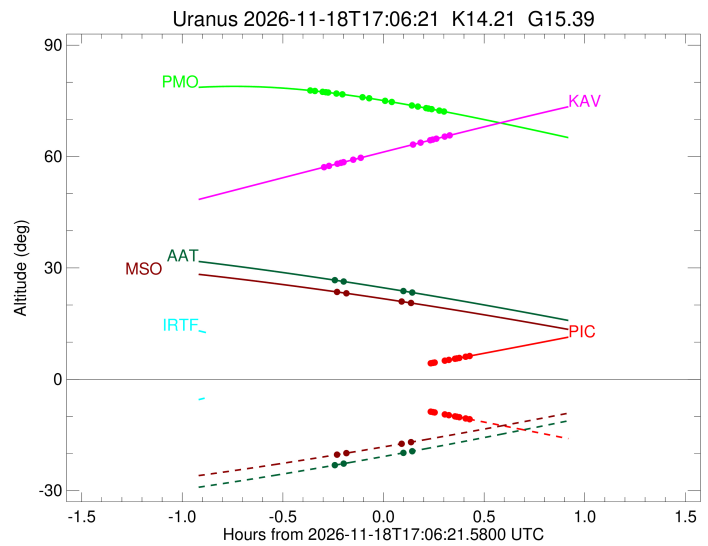
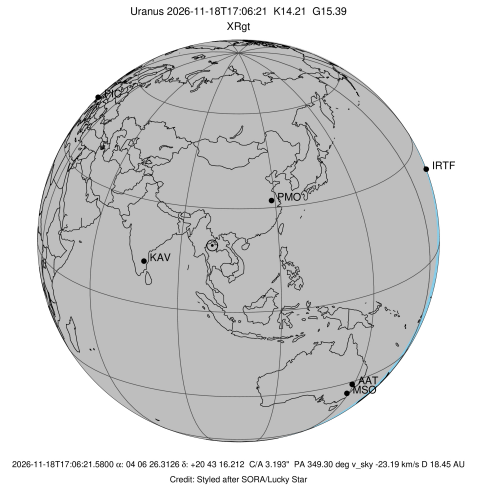
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-11-18T16:48:08.125		57.02	-64.63	51555.15	-13.19		
lambda	I	2026-11-18T16:50:08.499		57.48	-65.09	50026.71	-12.18		
delta	I	2026-11-18T16:52:38.645		58.06	-65.67	48300.35	-10.79		
gamma	I	2026-11-18T16:53:43.421		58.31	-65.91	47622.37	-10.14		
eta	I	2026-11-18T16:54:28.460		58.48	-66.09	47176.12	-9.67		
beta	I	2026-11-18T16:57:22.484		59.15	-66.75	45657.43	-7.76		
alpha	I	2026-11-18T16:59:35.161		59.66	-67.26	44733.03	-6.18		

No planet occultations

alpha	E	2026-11-18T17:15:11.498		63.23	-70.80	44746.25	6.18		
beta	E	2026-11-18T17:17:23.631		63.73	-71.29	45670.16	7.77		
eta	E	2026-11-18T17:20:15.850		64.38	-71.93	47176.12	9.69		
gamma	E	2026-11-18T17:21:00.700		64.55	-72.09	47620.99	10.15		
delta	E	2026-11-18T17:22:05.532		64.80	-72.33	48300.35	10.80		
lambda	E	2026-11-18T17:24:35.469		65.36	-72.88	50026.71	12.20		
epsilon	E	2026-11-18T17:26:16.624		65.74	-73.25	51305.11	13.21		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2026-11-18T17:04:29.040
Event type          : XRgt
: No Uranus occs
: Ring occs: geocentric, topocentric
Observer code       : AAT
Location            : Siding Spring (AAT)
Latitude (deg)      : -31.27703
E. Longitude (deg)  : 149.06608
Altitude (km)       : 1.164
Gaia source ID      : 52121734537849216
2Mass ID (if available) : 04062631+2043163
ICRS Star Coord at Epoch: 04h 06m 26.31259s +20:43:16.21222s
RUWE (>1.4 is poor) : 3.23
K magnitude          : 14.212
G magnitude          : 15.386
RP magnitude         : 14.951
BP magnitude         : 15.613
DUPflag             : 0
Distance (au)       : 18.452
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.19
Sun-Target sep (deg) : 172.40
Sun-Moon sep (deg)  : 84.16
B (ring opening deg) : 74.08
PA of pole (deg)    : -72.19
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.580
C/A sky separation (km) : 47905.5
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
  
```



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

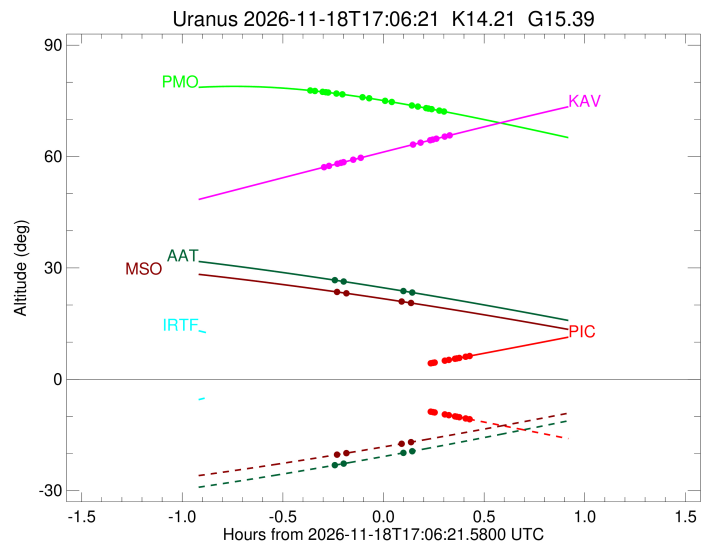
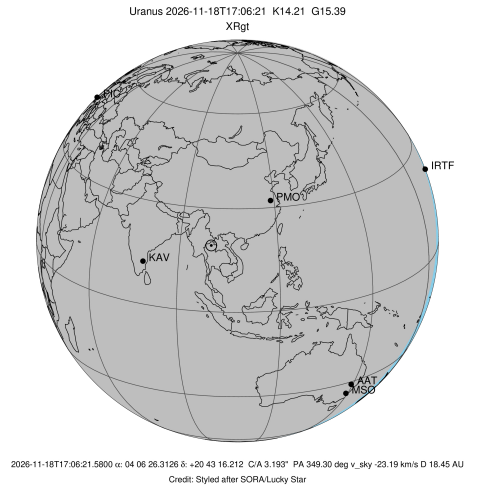
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-11-18T16:51:04.922		26.80	-23.26	51542.02	-8.36		
lambda	I	2026-11-18T16:54:31.362		26.33	-22.72	50026.71	-6.24		

No planet occultations

lambda	E	2026-11-18T17:12:15.518		23.77	-19.83	50026.71	6.24		
epsilon	E	2026-11-18T17:15:22.808		23.30	-19.31	51381.44	8.35		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2026-11-18T17:04:38.060
Event type          : XRgt
: No Uranus occs
: Ring occs: geocentric, topocentric
Observer code       : MSO
Location            : Mt. Stromlo Observatory
Latitude (deg)      : -35.32000
E. Longitude (deg)  : 149.00833
Altitude (km)       : 0.770
Gaia source ID      : 52121734537849216
2Mass ID (if available) : 04062631+2043163
ICRS Star Coord at Epoch: 04h 06m 26.31259s +20:43:16.21222s
RUWE (>1.4 is poor) : 3.23
K magnitude         : 14.212
G magnitude         : 15.386
RP magnitude        : 14.951
BP magnitude        : 15.613
DUPflag            : 0
Distance (au)       : 18.452
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -23.19
Sun-Target sep (deg) : 172.40
Sun-Moon sep (deg)  : 84.11
B (ring opening deg) : 74.08
PA of pole (deg)    : -72.19
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.598
C/A sky separation (km) : 48155.3
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
  
```



```

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 2026-11-18T16:51:42.061 23.62 -20.43 51540.49 -8.03
lambda    I 2026-11-18T16:55:20.372 23.15 -19.89 50026.71 -5.76

No planet occultations

lambda    E 2026-11-18T17:11:43.774 20.95 -17.39 50026.71 5.76
epsilon   E 2026-11-18T17:15:02.917 20.48 -16.87 51386.29 8.02
  
```