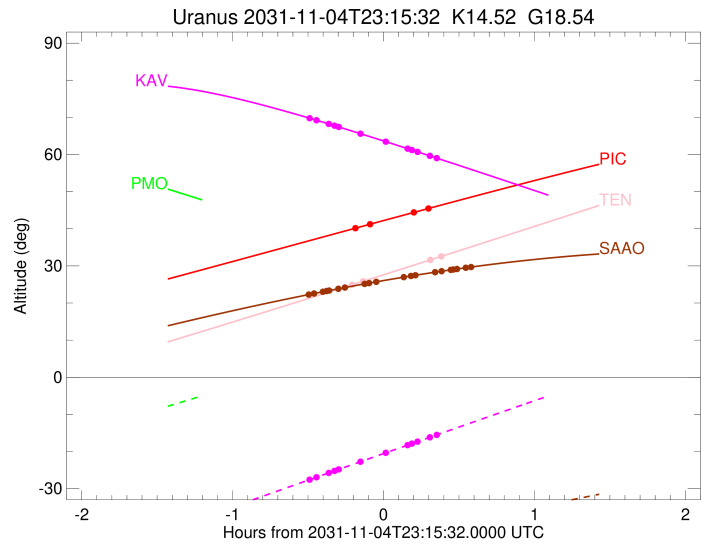
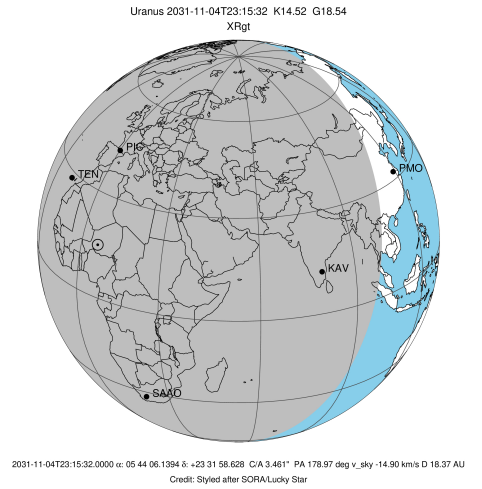



```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2031-11-04T23:20:01.920
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      : 3427623977998780672
2Mass ID (if available) : 05440612+2331589
ICRS Star Coord at Epoch: 05h 44m 06.13936s +23:31:58.62850s
RUWE (>1.4 is poor) : 2.23
K magnitude          : 14.524
G magnitude          : 18.537
RP magnitude         : 17.163
BP magnitude         : 19.194
DUPflag             : 0
Distance (au)       : 18.374
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -14.90
Sun-Target sep (deg) : 135.53
Sun-Moon sep (deg)  : 21.54
B (ring opening deg) : 78.28
PA of pole (deg)    : 46.06
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.670
C/A sky separation (km) : 48903.6
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_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
```



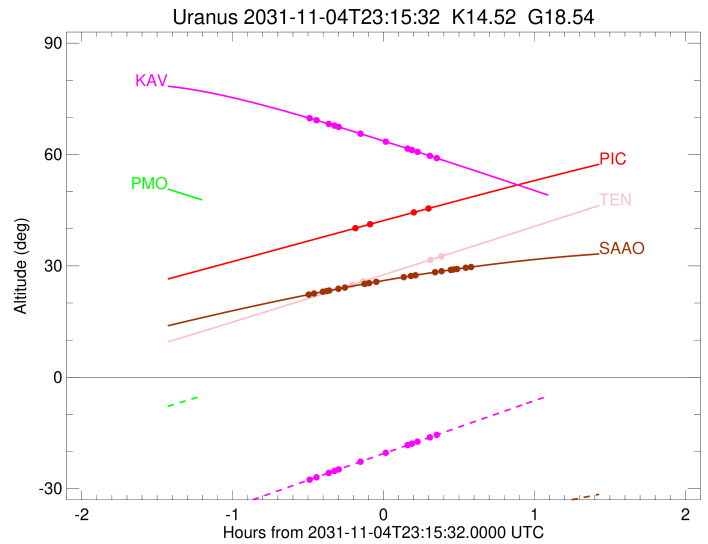
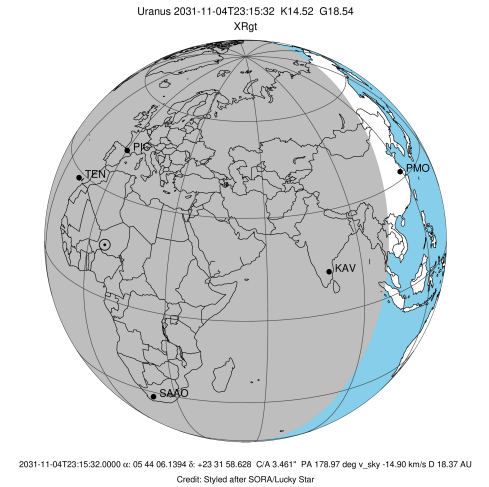
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-11-04T23:06:14.758		40.50	-61.68	50743.82	-3.49		
lambda	I	2031-11-04T23:10:17.451		41.24	-61.90	50026.71	-2.41		

No planet occultations

lambda	E	2031-11-04T23:27:30.135		44.39	-62.59	50026.71	2.41		
epsilon	E	2031-11-04T23:31:45.989		45.17	-62.69	50792.02	3.50		

```

target            : Uranus
target radius (km) : 25559.00
C/A epoch        : 2031-11-04T23:21:54.300
Event type       : XRgt
: No Uranus occs
: Ring occs: geocentric, topocentric
Observer code    : TEN
Location         : Teide Obs./Tenerife
Latitude (deg)   : 28.30050
E. Longitude (deg) : 343.48909
Altitude (km)    : 2.395
Gaia source ID   : 3427623977998780672
2Mass ID (if available) : 05440612+2331589
ICRS Star Coord at Epoch: 05h 44m 06.13936s +23:31:58.62850s
RUWE (>1.4 is poor) : 2.23
K magnitude      : 14.524
G magnitude      : 18.537
RP magnitude     : 17.163
BP magnitude     : 19.194
DUPflag         : 0
Distance (au)    : 18.374
f0 (km)          : 0.000
g0 (km)          : 0.000
skyplane vel. (km/s) : -14.90
Sun-Target sep (deg) : 135.53
Sun-Moon sep (deg) : 21.64
B (ring opening deg) : 78.28
PA of pole (deg) : 46.06
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.605
C/A sky separation (km) : 48038.0
NAIF SPICE kernels : RAJobs_U111+rgf15.spk
URKALLvl.spk
ural11.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.ural11.bsp
ural161.bsp
vgr2.ural161.bsp
peph.ural160.bsp
earthstns_itr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```



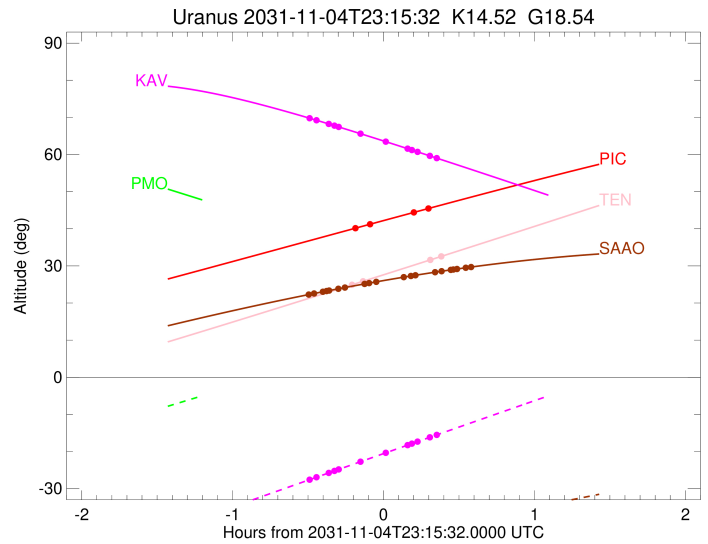
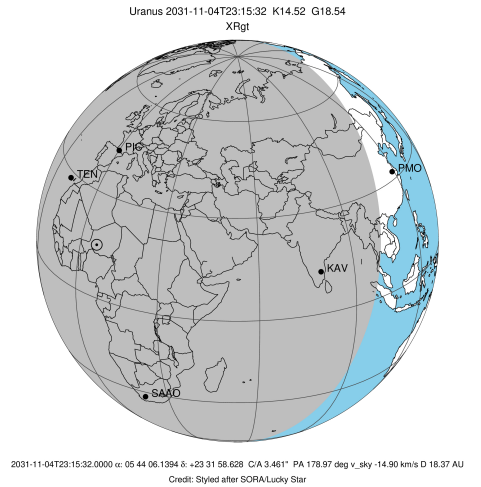
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-11-04T23:04:32.647	25.24	-62.67	50743.72	-4.43		
lambda	I	2031-11-04T23:07:28.971	25.87	-63.27	50026.71	-3.69		

No planet occultations

lambda	E	2031-11-04T23:34:04.185	31.60	-68.48	50026.71	3.70		
epsilon	E	2031-11-04T23:37:13.688	32.28	-69.07	50805.89	4.45		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-11-04T23:12:26.530
 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 : 3427623977998780672
 2Mass ID (if available) : 05440612+2331589
 ICRS Star Coord at Epoch: 05h 44m 06.13936s +23:31:58.62850s
 RUWE (>1.4 is poor) : 2.23
 K magnitude : 14.524
 G magnitude : 18.537
 RP magnitude : 17.163
 BP magnitude : 19.194
 DUPflag : 0
 Distance (au) : 18.374
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.90
 Sun-Target sep (deg) : 135.53
 Sun-Moon sep (deg) : 20.67
 B (ring opening deg) : 78.28
 PA of pole (deg) : 46.06
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.376
 C/A sky separation (km) : 44989.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ural11.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ural11.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

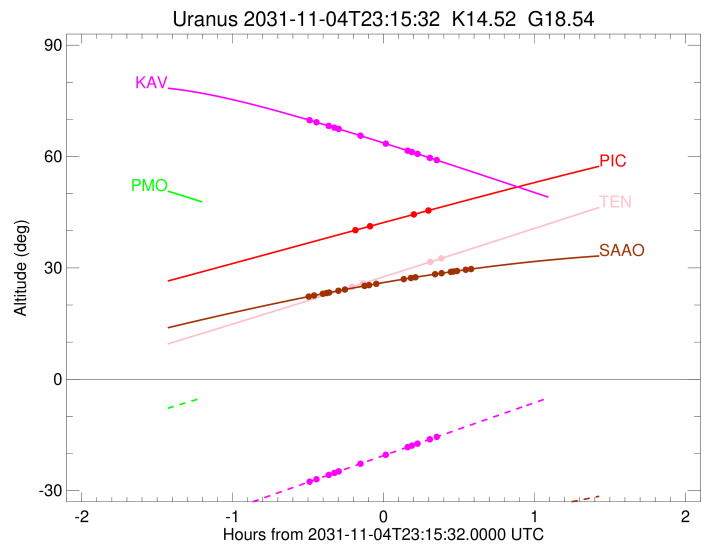
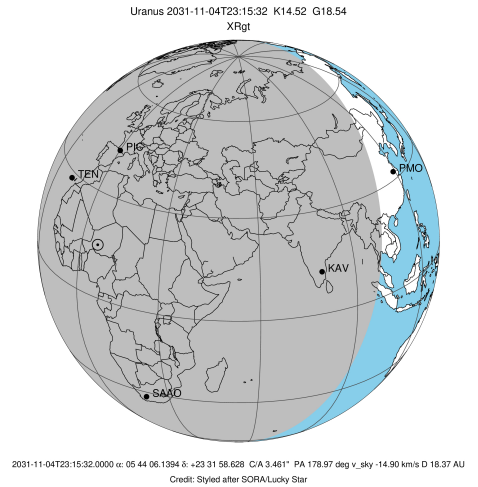


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-11-04T22:47:07.859		69.59	-27.36	50752.26	-6.89		
lambda	I	2031-11-04T22:48:56.047		69.23	-26.92	50026.71	-6.49		
delta	I	2031-11-04T22:53:49.150		68.24	-25.76	48300.35	-5.26		
gamma	I	2031-11-04T22:56:04.609		67.77	-25.22	47628.38	-4.65		
eta	I	2031-11-04T22:57:47.049		67.42	-24.81	47176.12	-4.17		
beta	I	2031-11-04T23:06:47.435		65.53	-22.65	45641.11	-1.46		

No planet occultations

beta	E	2031-11-04T23:16:02.819		63.55	-20.45	45641.20	1.46		
eta	E	2031-11-04T23:25:03.558		61.60	-18.30	47176.12	4.17		
gamma	E	2031-11-04T23:26:45.426		61.22	-17.89	47625.22	4.65		
delta	E	2031-11-04T23:29:01.727		60.73	-17.35	48300.35	5.26		
lambda	E	2031-11-04T23:33:55.257		59.65	-16.19	50026.71	6.48		
epsilon	E	2031-11-04T23:35:56.543		59.20	-15.70	50841.73	6.88		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-11-04T23:19:04.150
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : SAAO
 Location : So. Afr. Astro. Obs. (Sutherland)
 Latitude (deg) : -32.37953
 E. Longitude (deg) : 20.81070
 Altitude (km) : 1.768
 Gaia source ID : 3427623977998780672
 2Mass ID (if available) : 05440612+2331589
 ICRS Star Coord at Epoch: 05h 44m 06.13936s +23:31:58.62850s
 RUWE (>1.4 is poor) : 2.23
 K magnitude : 14.524
 G magnitude : 18.537
 RP magnitude : 17.163
 BP magnitude : 19.194
 DUPflag : 0
 Distance (au) : 18.374
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.90
 Sun-Target sep (deg) : 135.53
 Sun-Moon sep (deg) : 21.15
 B (ring opening deg) : 78.28
 PA of pole (deg) : 46.06
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.086
 C/A sky separation (km) : 41125.9
 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	2031-11-04T22:46:32.919		22.38	-41.85	50767.73	-8.80		
lambda	I	2031-11-04T22:47:58.063		22.57	-41.81	50026.71	-8.57		
delta	I	2031-11-04T22:51:28.267		23.04	-41.68	48300.35	-7.85		
gamma	I	2031-11-04T22:52:55.577		23.23	-41.63	47629.29	-7.52		
eta	I	2031-11-04T22:53:56.758		23.36	-41.59	47176.12	-7.29		
beta	I	2031-11-04T22:57:41.037		23.85	-41.43	45642.57	-6.37		
alpha	I	2031-11-04T23:00:19.340		24.19	-41.31	44688.68	-5.68		
4	I	2031-11-04T23:08:09.235		25.16	-40.90	42560.66	-3.32		
5	I	2031-11-04T23:09:30.291		25.33	-40.83	42300.72	-2.89		
6	I	2031-11-04T23:12:29.952		25.69	-40.65	41870.54	-1.93		

No planet occultations

6	E	2031-11-04T23:23:48.887		26.99	-39.89	41876.04	1.93		
5	E	2031-11-04T23:26:37.540		27.30	-39.68	42279.19	2.89		
4	E	2031-11-04T23:27:59.733		27.45	-39.58	42543.12	3.33		
alpha	E	2031-11-04T23:35:57.822		28.30	-38.93	44707.79	5.69		
beta	E	2031-11-04T23:38:32.102		28.56	-38.71	45643.15	6.39		
eta	E	2031-11-04T23:42:15.554		28.93	-38.38	47176.12	7.32		
gamma	E	2031-11-04T23:43:15.814		29.02	-38.29	47624.13	7.55		
delta	E	2031-11-04T23:44:43.451		29.16	-38.15	48300.35	7.88		
lambda	E	2031-11-04T23:48:12.716		29.49	-37.82	50026.71	8.61		
epsilon	E	2031-11-04T23:49:50.919		29.65	-37.66	50887.66	8.85		