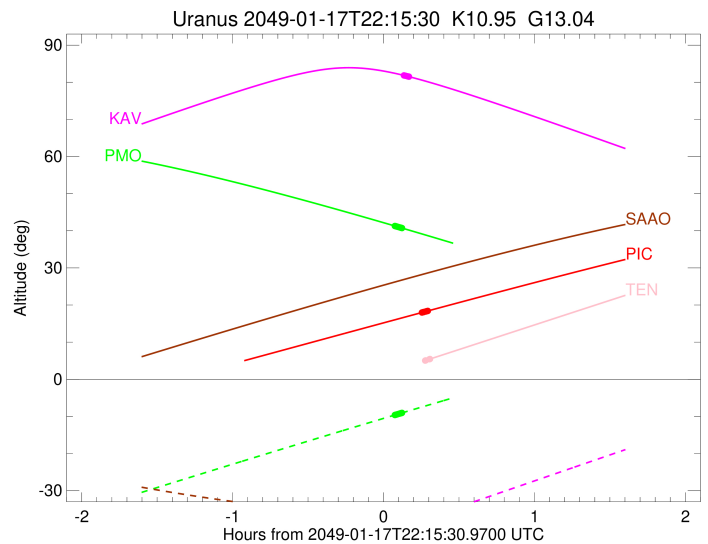
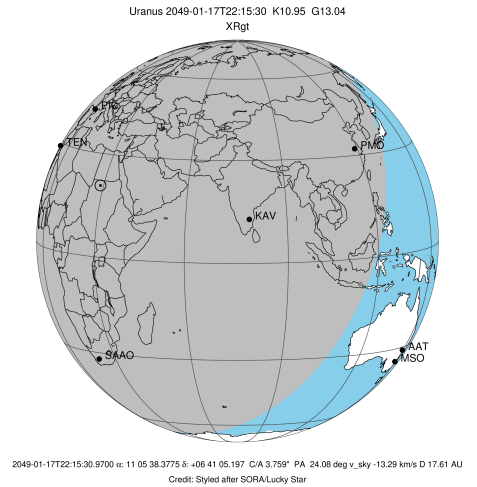


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2049-01-17T22:22:48.250
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3816723894476969856
 2Mass ID (if available) : 11053838+0641057
 ICRS Star Coord at Epoch: 11h 05m 38.37747s +06:41:05.19700s
 RUWE (>1.4 is poor) : 2.48
 K magnitude : 10.946
 G magnitude : 13.044
 RP magnitude : 12.385
 BP magnitude : 13.539
 DUPflag : 0
 Distance (au) : 17.608
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -13.29
 Sun-Target sep (deg) : 132.65
 Sun-Moon sep (deg) : 60.01
 B (ring opening deg) : 2.61
 PA of pole (deg) : 104.98
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.620
 C/A sky separation (km) : 46231.2
 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



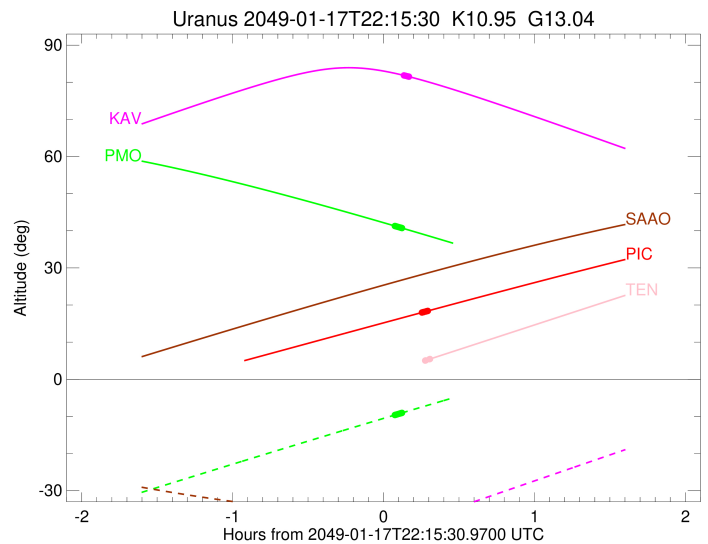
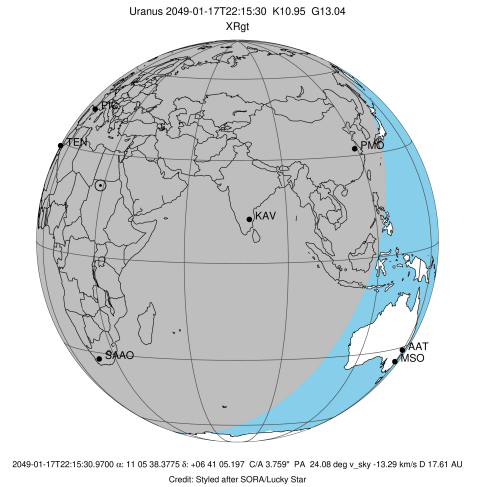
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2049-01-17T22:30:48.075		17.98	-59.62	51014.29	-117.34		
lambda	I	2049-01-17T22:30:57.139		18.01	-59.64	50026.71	-102.28		
delta	I	2049-01-17T22:31:16.961		18.07	-59.68	48300.35	-71.20		
gamma	I	2049-01-17T22:31:27.756		18.10	-59.71	47628.27	-53.05		
eta	I	2049-01-17T22:31:37.976		18.14	-59.73	47176.12	-35.20		

No planet occultations

eta	E	2049-01-17T22:32:17.308		18.26	-59.83	47176.12	35.38		
gamma	E	2049-01-17T22:32:27.558		18.29	-59.85	47629.90	53.23		
delta	E	2049-01-17T22:32:38.320		18.32	-59.88	48300.35	71.38		
lambda	E	2049-01-17T22:32:58.138		18.38	-59.92	50026.71	102.45		
epsilon	E	2049-01-17T22:33:09.984		18.42	-59.95	51340.99	117.51		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2049-01-17T22:13:22.920
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       : 3816723894476969856
2Mass ID (if available) : 11053838+0641057
ICRS Star Coord at Epoch: 11h 05m 38.37747s +06:41:05.19700s
RUWE (>1.4 is poor) : 2.48
K magnitude           : 10.946
G magnitude           : 13.044
RP magnitude          : 12.385
BP magnitude          : 13.539
DUPflag              : 0
Distance (au)         : 17.608
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -13.29
Sun-Target sep (deg) : 132.65
Sun-Moon sep (deg)   : 60.90
B (ring opening deg) : 2.61
PA of pole (deg)     : 104.98
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.448
C/A sky separation (km) : 44029.2
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
  
```



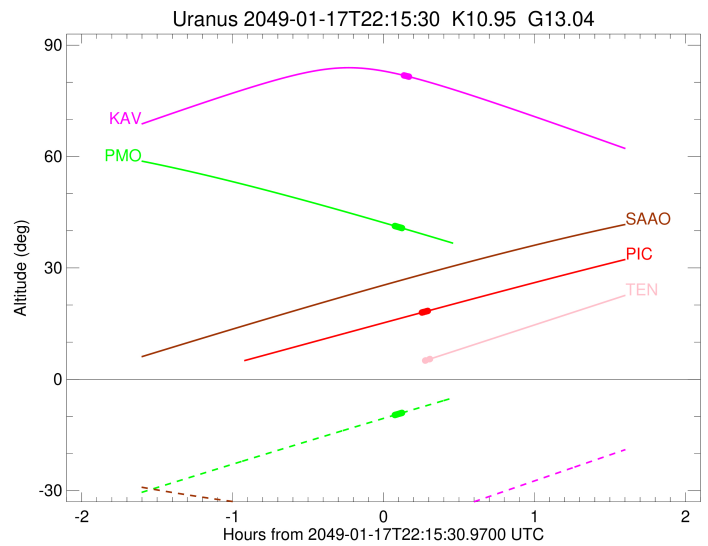
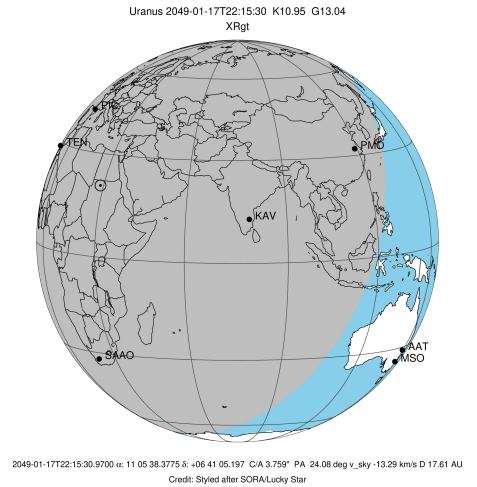
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2049-01-17T22:20:02.485		41.29	-9.63	50976.81	-144.94		
lambda	I	2049-01-17T22:20:09.338		41.27	-9.61	50026.71	-133.96		
delta	I	2049-01-17T22:20:23.244		41.22	-9.56	48300.36	-113.83		
gamma	I	2049-01-17T22:20:29.410		41.20	-9.54	47627.36	-104.27		
eta	I	2049-01-17T22:20:33.890		41.19	-9.52	47176.12	-97.02		
beta	I	2049-01-17T22:20:52.483		41.13	-9.46	45644.03	-64.36		
alpha	I	2049-01-17T22:21:11.103		41.07	-9.40	44752.41	-29.07		

No planet occultations

alpha	E	2049-01-17T22:21:41.555		40.97	-9.30	44751.95	29.26		
beta	E	2049-01-17T22:22:00.648		40.90	-9.23	45641.17	64.54		
eta	E	2049-01-17T22:22:19.814		40.84	-9.17	47176.12	97.17		
gamma	E	2049-01-17T22:22:24.325		40.82	-9.15	47630.54	104.41		
delta	E	2049-01-17T22:22:30.461		40.80	-9.13	48300.35	113.97		
lambda	E	2049-01-17T22:22:44.370		40.76	-9.09	50026.71	134.07		
epsilon	E	2049-01-17T22:22:53.979		40.73	-9.05	51375.87	145.04		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2049-01-17T22:23:17.800
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      : 3816723894476969856
2Mass ID (if available) : 11053838+0641057
ICRS Star Coord at Epoch: 11h 05m 38.37747s +06:41:05.19700s
RUWE (>1.4 is poor) : 2.48
K magnitude         : 10.946
G magnitude         : 13.044
RP magnitude        : 12.385
BP magnitude        : 13.539
DUPflag            : 0
Distance (au)       : 17.608
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -13.29
Sun-Target sep (deg) : 132.65
Sun-Moon sep (deg)  : 59.77
B (ring opening deg) : 2.61
PA of pole (deg)    : 104.98
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.740
C/A sky separation (km) : 47757.0
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
  
```



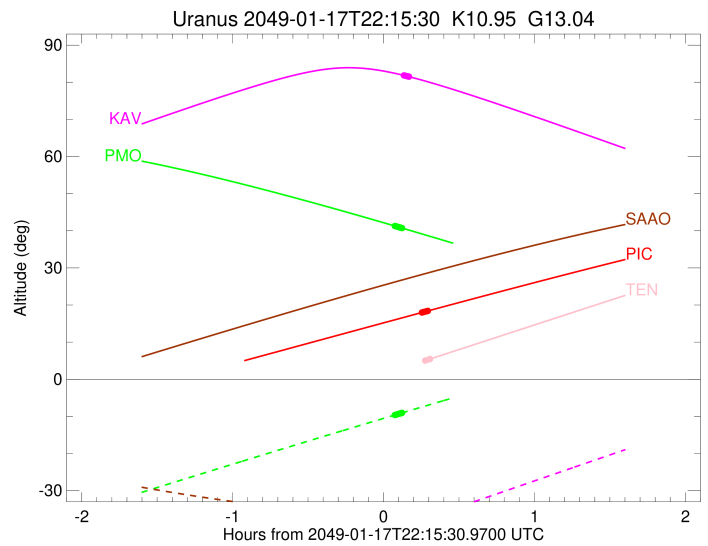
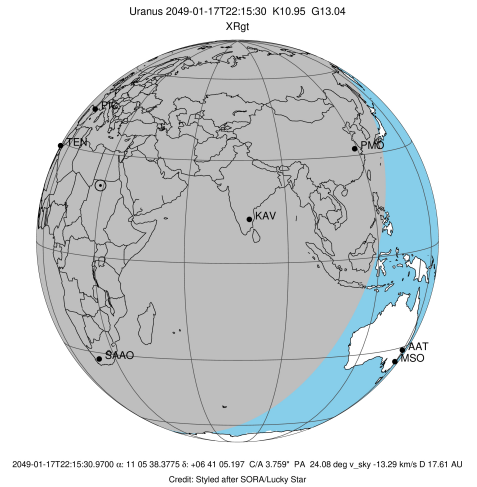
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2049-01-17T22:32:05.909		5.04	-52.03	51046.92	-93.90		
lambda	I	2049-01-17T22:32:18.261		5.08	-52.08	50026.71	-73.04		

No planet occultations

lambda	E	2049-01-17T22:33:45.845		5.40	-52.40	50026.71	73.22		
epsilon	E	2049-01-17T22:34:00.997		5.46	-52.46	51310.14	94.07		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2049-01-17T22:16:13.650
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       : 3816723894476969856
2Mass ID (if available) : 11053838+0641057
ICRS Star Coord at Epoch: 11h 05m 38.37747s +06:41:05.19700s
RUWE (>1.4 is poor) : 2.48
K magnitude           : 10.946
G magnitude           : 13.044
RP magnitude          : 12.385
BP magnitude          : 13.539
DUPflag              : 0
Distance (au)         : 17.608
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -13.29
Sun-Target sep (deg) : 132.65
Sun-Moon sep (deg)   : 60.99
B (ring opening deg) : 2.61
PA of pole (deg)     : 104.98
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.712
C/A sky separation (km) : 47407.7
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.bsp
ural161.bsp
vgr2.ural161.bsp
peph.ural160.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	2049-01-17T22:23:38.935		81.85	-39.52	51036.39	-104.51		
lambda	I	2049-01-17T22:23:49.671		81.82	-39.48	50026.72	-85.39		
delta	I	2049-01-17T22:24:17.635		81.75	-39.37	48300.35	-37.06		

No planet occultations

delta	E	2049-01-17T22:24:58.070		81.63	-39.21	48300.35	37.24		
lambda	E	2049-01-17T22:25:26.035		81.55	-39.10	50026.70	85.55		
epsilon	E	2049-01-17T22:25:39.490		81.51	-39.05	51320.56	104.66		