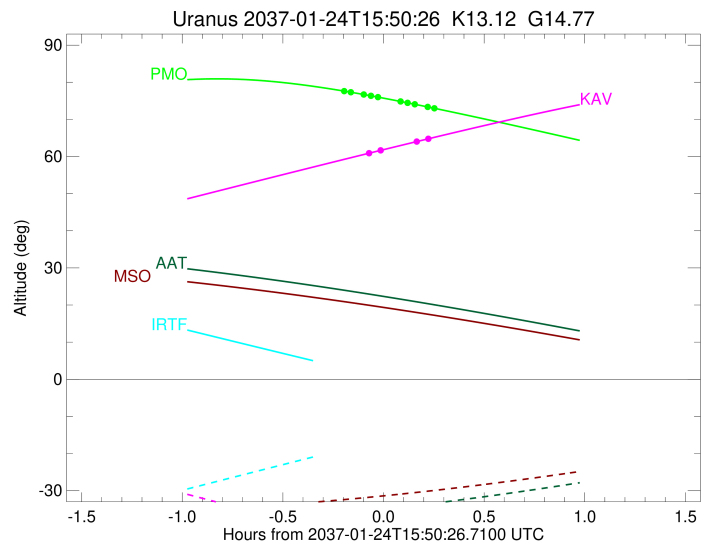
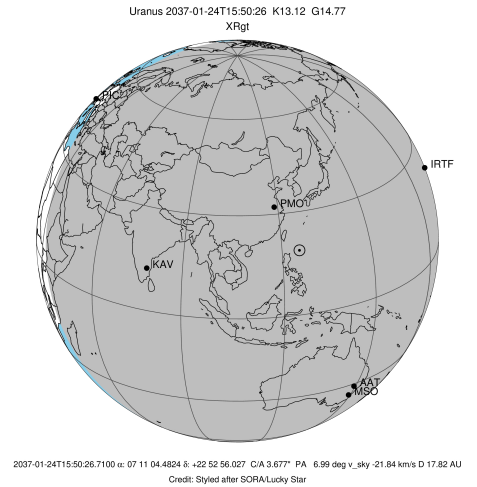




target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2037-01-24T15:49:48.220  
 Event type : XRgt  
 : No Uranus occs  
 : Ring occs: geocentric, topocentric  
 Observer code : PMO  
 Location : Purple Mtn Obs. Nanking  
 Latitude (deg) : 32.06667  
 E. Longitude (deg) : 118.82089  
 Altitude (km) : 0.364  
 Gaia source ID : 3368279349717735168  
 2Mass ID (if available) : 07110446+2252565  
 ICRS Star Coord at Epoch: 07h 11m 04.48244s +22:52:56.02666s  
 RUWE (>1.4 is poor) : 1.22  
 K magnitude : 13.122  
 G magnitude : 14.767  
 RP magnitude : 14.211  
 BP magnitude : 15.160  
 DUPflag : 0  
 Distance (au) : 17.823  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.84  
 Sun-Target sep (deg) : 161.83  
 Sun-Moon sep (deg) : 72.44  
 B (ring opening deg) : 60.26  
 PA of pole (deg) : 80.45  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.592  
 C/A sky separation (km) : 46438.2  
 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



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

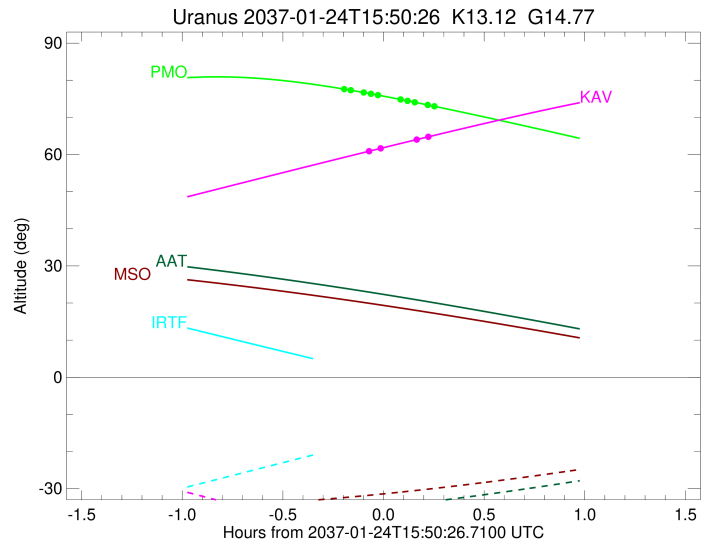
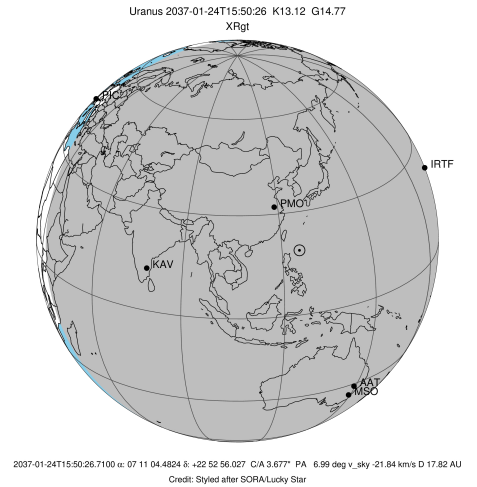
| Ring    | I/E | UTC                     | b? | alt   | alt-sun | radius   | r-dot  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| epsilon | I   | 2037-01-24T15:38:16.374 |    | 77.69 | -74.47  | 51444.71 | -10.27 |         |              |
| lambda  | I   | 2037-01-24T15:40:43.938 |    | 77.32 | -74.77  | 50026.71 | -8.80  |         |              |
| delta   | I   | 2037-01-24T15:44:36.011 |    | 76.70 | -75.22  | 48300.35 | -6.03  |         |              |
| gamma   | I   | 2037-01-24T15:46:46.684 |    | 76.35 | -75.45  | 47621.01 | -4.36  |         |              |
| eta     | I   | 2037-01-24T15:48:53.044 |    | 75.99 | -75.66  | 47176.12 | -2.68  |         |              |

No planet occultations

|         |   |                         |  |       |        |          |       |  |  |
|---------|---|-------------------------|--|-------|--------|----------|-------|--|--|
| eta     | E | 2037-01-24T15:55:27.006 |  | 74.85 | -76.25 | 47176.12 | 2.68  |  |  |
| gamma   | E | 2037-01-24T15:57:33.518 |  | 74.48 | -76.40 | 47621.57 | 4.36  |  |  |
| delta   | E | 2037-01-24T15:59:44.100 |  | 74.08 | -76.55 | 48300.35 | 6.03  |  |  |
| lambda  | E | 2037-01-24T16:03:36.272 |  | 73.37 | -76.77 | 50026.71 | 8.80  |  |  |
| epsilon | E | 2037-01-24T16:05:34.230 |  | 73.00 | -76.87 | 51140.80 | 10.27 |  |  |

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2037-01-24T15:52:27.450
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      : 3368279349717735168
2Mass ID (if available) : 07110446+2252565
ICRS Star Coord at Epoch: 07h 11m 04.48244s +22:52:56.02666s
RUWE (>1.4 is poor) : 1.22
K magnitude         : 13.122
G magnitude         : 14.767
RP magnitude        : 14.211
BP magnitude        : 15.160
DUPflag            : 0
Distance (au)       : 17.823
f0 (km)            : 0.000
g0 (km)            : 0.000
skyplane vel. (km/s) : -21.84
Sun-Target sep (deg) : 161.83
Sun-Moon sep (deg)  : 72.18
B (ring opening deg) : 60.26
PA of pole (deg)    : 80.45
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.779
C/A sky separation (km) : 48853.7
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   | 2037-01-24T15:45:33.604 |    | 60.77 | -43.66  | 51403.91 | -6.91 |         |              |
| lambda  | I   | 2037-01-24T15:49:39.342 |    | 61.68 | -44.63  | 50026.71 | -4.10 |         |              |

No planet occultations

|         |   |                         |  |       |        |          |      |  |  |
|---------|---|-------------------------|--|-------|--------|----------|------|--|--|
| lambda  | E | 2037-01-24T16:00:18.221 |  | 64.02 | -47.15 | 50026.71 | 4.11 |  |  |
| epsilon | E | 2037-01-24T16:03:54.242 |  | 64.80 | -48.00 | 51199.78 | 6.92 |  |  |