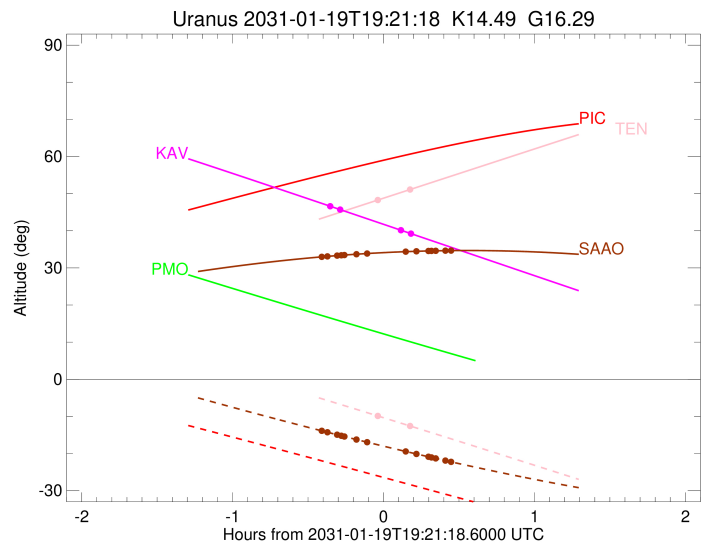
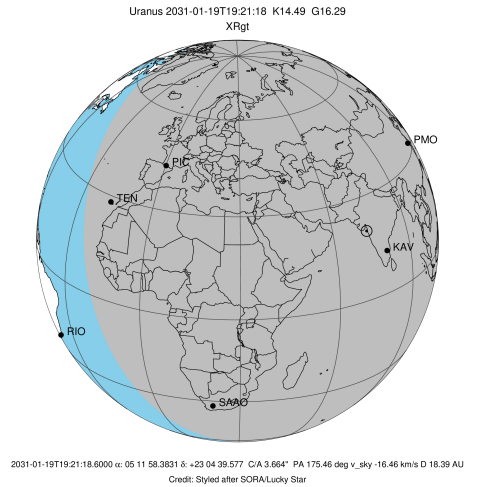




```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2031-01-19T19:25:36.630
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       : 3415726643709521664
2Mass ID (if available) : 05115837+2304395
ICRS Star Coord at Epoch: 05h 11m 58.38309s +23:04:39.57657s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 14.488
G magnitude           : 16.292
RP magnitude         : 15.665
BP magnitude         : 16.741
DUPflag             : 0
Distance (au)        : 18.385
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -16.46
Sun-Target sep (deg) : 139.88
Sun-Moon sep (deg)   : 172.46
B (ring opening deg) : 82.07
PA of pole (deg)     : 4.78
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.770
C/A sky separation (km) : 50267.5
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
  
```



```

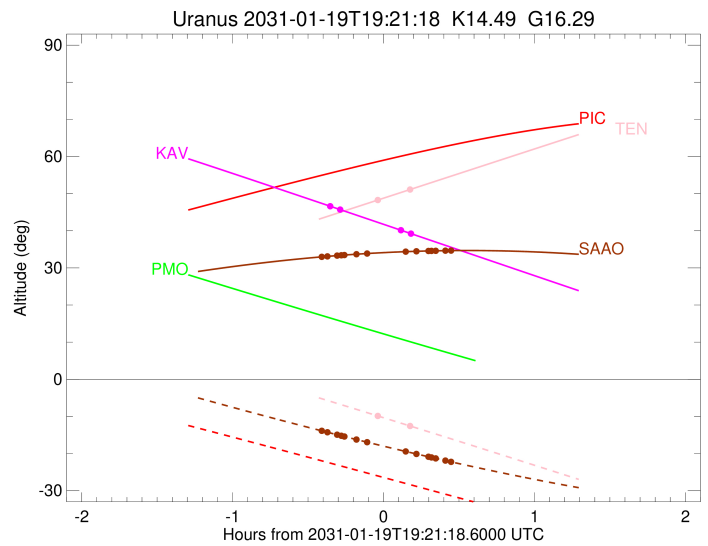
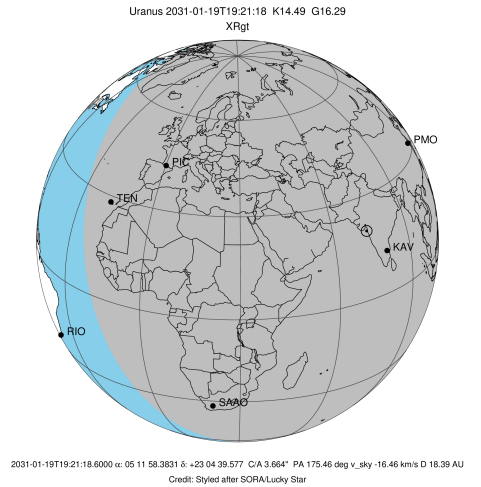
b: ring blocked by planet  x: target alt < 5.0 deg or sun > -5.0 deg
Ring      I/E      UTC      b? alt  alt-sun  radius  r-dot  lat-geo lat-geodetic
-----
epsilon   I  2031-01-19T19:22:11.974  48.98 -10.55  50866.56 -1.19

No planet occultations

epsilon   E  2031-01-19T19:29:19.919  50.55 -12.05  50908.04  1.19
  
```

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch             : 2031-01-19T19:16:18.890
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        : 3415726643709521664
2Mass ID (if available) : 05115837+2304395
ICRS Star Coord at Epoch: 05h 11m 58.38309s +23:04:39.57657s
RUWE (>1.4 is poor)  : 1.02
K magnitude           : 14.488
G magnitude           : 16.292
RP magnitude          : 15.665
BP magnitude          : 16.741
DUPflag              : 0
Distance (au)         : 18.385
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s)  : -16.46
Sun-Target sep (deg)  : 139.88
Sun-Moon sep (deg)    : 173.75
B (ring opening deg)  : 82.07
PA of pole (deg)      : 4.78
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.605
C/A sky separation (km) : 48072.9
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
  
```



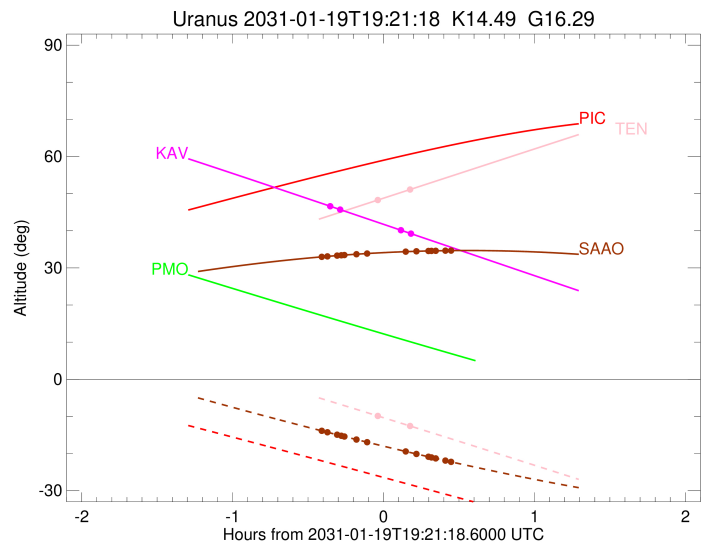
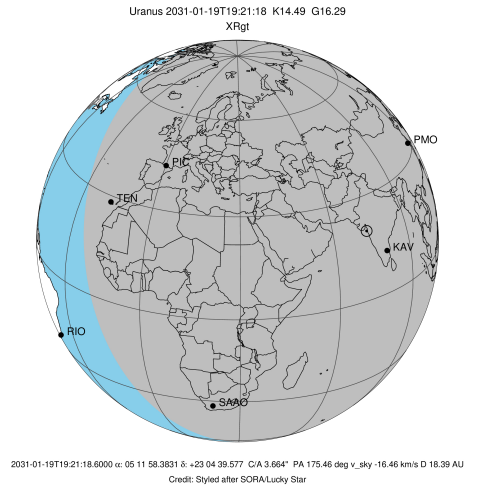
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-01-19T19:01:17.719		46.34	-82.12	50800.90	-5.03		
lambda	I	2031-01-19T19:04:08.969		45.69	-81.97	50026.71	-4.07		

No planet occultations

lambda	E	2031-01-19T19:28:11.235		40.16	-78.96	50026.71	4.06		
epsilon	E	2031-01-19T19:31:38.811		39.37	-78.36	50981.56	5.01		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2031-01-19T19:22:36.220
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      : 3415726643709521664
2Mass ID (if available) : 05115837+2304395
ICRS Star Coord at Epoch: 05h 11m 58.38309s +23:04:39.57657s
RUWE (>1.4 is poor) : 1.02
K magnitude         : 14.488
G magnitude         : 16.292
RP magnitude        : 15.665
BP magnitude        : 16.741
DUPflag            : 0
Distance (au)       : 18.385
f0 (km)            : 0.000
g0 (km)            : 0.000
skyplane vel. (km/s) : -16.46
Sun-Target sep (deg) : 139.88
Sun-Moon sep (deg)  : 172.72
B (ring opening deg) : 82.07
PA of pole (deg)    : 4.78
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.272
C/A sky separation (km) : 43629.0
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	2031-01-19T18:57:32.827		33.02	-14.02	50765.30	-8.42		
lambda	I	2031-01-19T18:59:03.054		33.11	-14.28	50026.71	-7.99		
delta	I	2031-01-19T19:02:54.437		33.32	-14.94	48300.35	-6.91		
gamma	I	2031-01-19T19:04:36.351		33.40	-15.23	47621.59	-6.40		
eta	I	2031-01-19T19:05:47.986		33.46	-15.43	47176.12	-6.03		
beta	I	2031-01-19T19:10:32.945		33.69	-16.24	45677.90	-4.45		
alpha	I	2031-01-19T19:15:00.854		33.88	-16.98	44695.97	-2.84		

No planet occultations

alpha	E	2031-01-19T19:29:53.301		34.37	-19.41	44688.85	2.84		
beta	E	2031-01-19T19:34:21.935		34.47	-20.12	45669.94	4.45		
eta	E	2031-01-19T19:39:08.609		34.56	-20.87	47176.12	6.03		
gamma	E	2031-01-19T19:40:20.720		34.58	-21.05	47624.69	6.41		
delta	E	2031-01-19T19:42:02.134		34.60	-21.31	48300.35	6.91		
lambda	E	2031-01-19T19:45:53.477		34.64	-21.90	50026.71	7.99		
epsilon	E	2031-01-19T19:47:59.663		34.66	-22.22	51069.51	8.42		