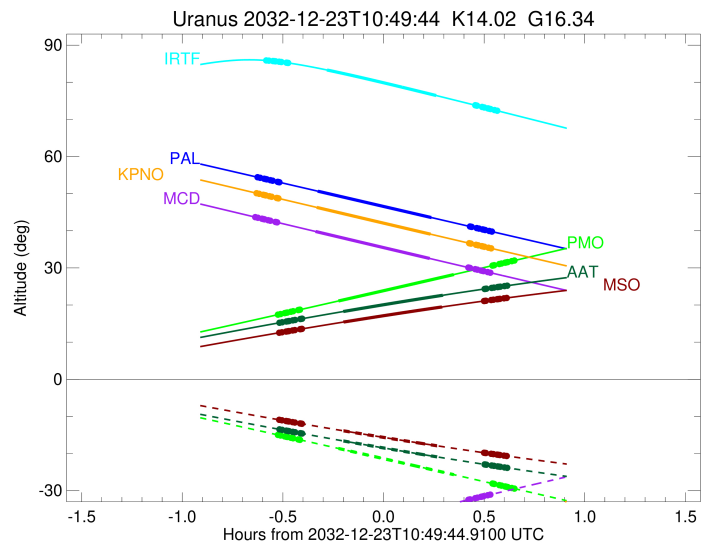
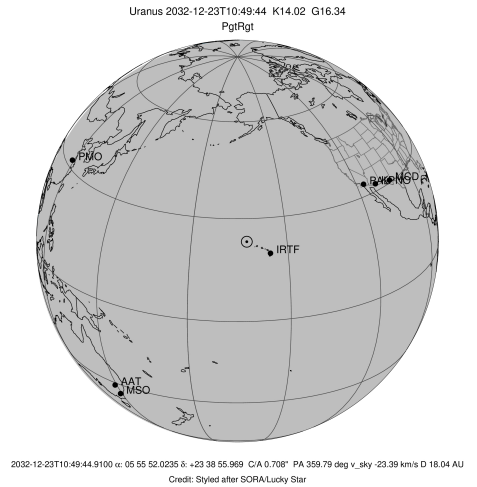
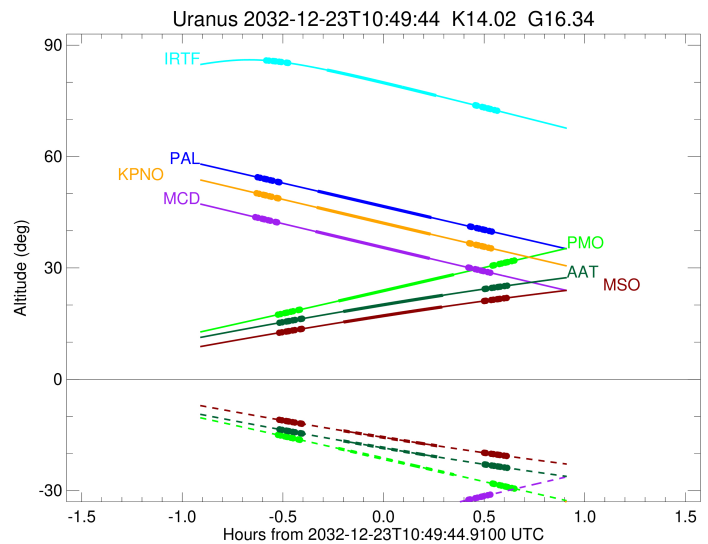
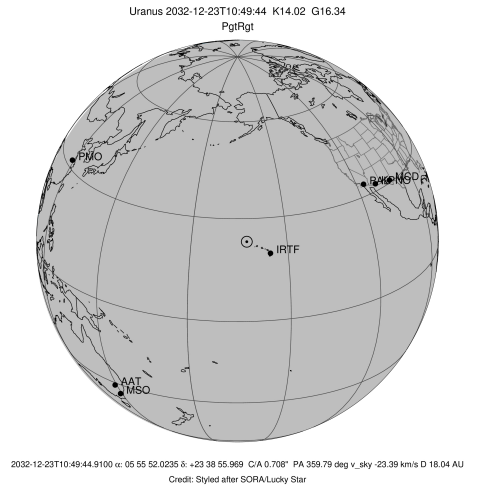


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-23T10:46:57.160
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3424835062458456192
 2Mass ID (if available) : 05555201+2338560
 ICRS Star Coord at Epoch: 05h 55m 52.02348s +23:38:55.96860s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.021
 G magnitude : 16.341
 RP magnitude : 15.580
 BP magnitude : 16.955
 DUPflag : 0
 Distance (au) : 18.036
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.39
 Sun-Target sep (deg) : 177.34
 Sun-Moon sep (deg) : 77.98
 B (ring opening deg) : 76.13
 PA of pole (deg) : 54.44
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.580
 C/A sky separation (km) : 7592.1
 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	2032-12-23T10:12:18.194		54.41	-56.69	51009.73	-23.86		
lambda	I	2032-12-23T10:12:59.358		54.26	-56.54	50026.71	-23.87		
delta	I	2032-12-23T10:14:11.701		54.01	-56.29	48300.35	-23.85		
gamma	I	2032-12-23T10:14:39.760		53.91	-56.20	47631.21	-23.84		
eta	I	2032-12-23T10:14:58.850		53.85	-56.13	47176.12	-23.84		
beta	I	2032-12-23T10:16:01.766		53.63	-55.91	45676.46	-23.81		
alpha	I	2032-12-23T10:16:41.369		53.49	-55.78	44737.17	-23.80		
4	I	2032-12-23T10:18:10.552		53.18	-55.47	42614.39	-23.76		
5	I	2032-12-23T10:18:26.281		53.12	-55.41	42244.85	-23.74		
6	I	2032-12-23T10:18:44.823		53.06	-55.35	41796.72	-23.74		
Uranus	I	2032-12-23T10:30:07.941		50.67	-52.98	25055.18		-13.22	-13.82
Uranus	E	2032-12-23T11:04:00.377		43.57	-45.90	25350.12		8.39	8.78
6	E	2032-12-23T11:15:33.112		41.15	-43.48	41879.67	23.67		
5	E	2032-12-23T11:15:46.310		41.10	-43.44	42197.36	23.67		
4	E	2032-12-23T11:16:00.881		41.05	-43.39	42535.73	23.69		
alpha	E	2032-12-23T11:17:31.700		40.73	-43.07	44691.42	23.72		
beta	E	2032-12-23T11:18:11.882		40.59	-42.93	45642.40	23.73		
eta	E	2032-12-23T11:19:16.457		40.37	-42.71	47176.12	23.75		
gamma	E	2032-12-23T11:19:35.182		40.30	-42.64	47620.96	23.76		
delta	E	2032-12-23T11:20:03.769		40.20	-42.54	48300.35	23.77		
lambda	E	2032-12-23T11:21:16.370		39.95	-42.29	50026.71	23.79		
epsilon	E	2032-12-23T11:22:04.174		39.78	-42.12	51164.18	23.77		

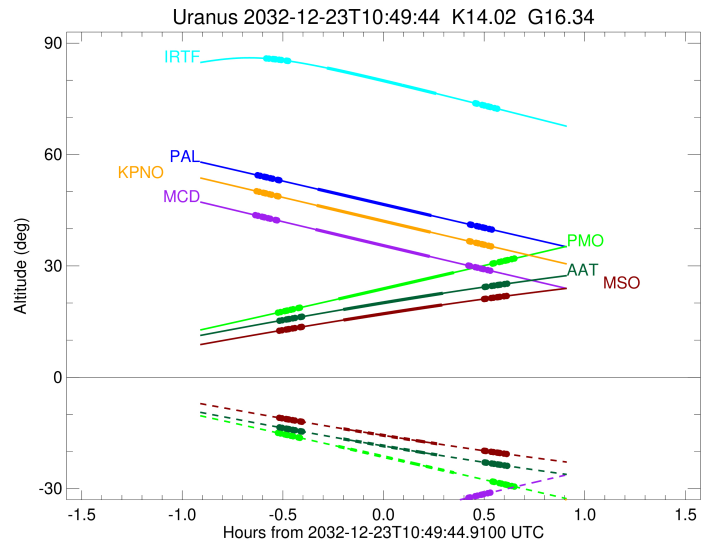
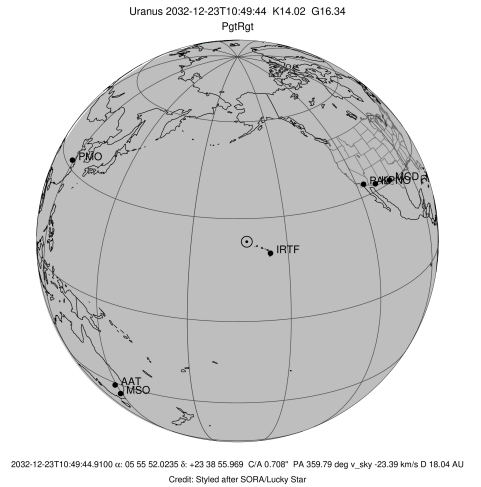
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-23T10:53:26.170
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 3424835062458456192
 2Mass ID (if available) : 05555201+2338560
 ICRS Star Coord at Epoch: 05h 55m 52.02348s +23:38:55.96860s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.021
 G magnitude : 16.341
 RP magnitude : 15.580
 BP magnitude : 16.955
 DUPflag : 0
 Distance (au) : 18.036
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.39
 Sun-Target sep (deg) : 177.34
 Sun-Moon sep (deg) : 77.97
 B (ring opening deg) : 76.13
 PA of pole (deg) : 54.44
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.523
 C/A sky separation (km) : 6840.3
 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	2032-12-23T10:18:22.502		17.43	-15.01	51019.65	-23.65		
lambda	I	2032-12-23T10:19:04.452		17.57	-15.15	50026.71	-23.67		
delta	I	2032-12-23T10:20:17.424		17.82	-15.39	48300.35	-23.65		
gamma	I	2032-12-23T10:20:45.719		17.91	-15.49	47631.26	-23.64		
eta	I	2032-12-23T10:21:04.971		17.98	-15.55	47176.12	-23.64		
beta	I	2032-12-23T10:22:08.386		18.19	-15.77	45676.82	-23.62		
alpha	I	2032-12-23T10:22:48.282		18.33	-15.90	44737.96	-23.61		
4	I	2032-12-23T10:24:18.188		18.63	-16.20	42613.97	-23.59		
5	I	2032-12-23T10:24:33.930		18.69	-16.26	42247.16	-23.57		
6	I	2032-12-23T10:24:52.725		18.75	-16.32	41796.36	-23.57		
Uranus	I	2032-12-23T10:36:18.950		21.09	-18.64	25069.13		-13.03	-13.62
Uranus	E	2032-12-23T11:10:44.120		28.21	-25.70	25339.67		8.60	9.01
6	E	2032-12-23T11:22:15.740		30.62	-28.10	41879.68	23.67		
5	E	2032-12-23T11:22:28.958		30.67	-28.14	42197.85	23.67		
4	E	2032-12-23T11:22:43.500		30.72	-28.19	42535.54	23.68		
alpha	E	2032-12-23T11:24:14.351		31.03	-28.51	44691.54	23.71		
beta	E	2032-12-23T11:24:54.541		31.17	-28.65	45642.44	23.73		
eta	E	2032-12-23T11:25:59.134		31.40	-28.87	47176.12	23.75		
gamma	E	2032-12-23T11:26:17.865		31.47	-28.94	47620.97	23.75		
delta	E	2032-12-23T11:26:46.462		31.57	-29.03	48300.35	23.76		
lambda	E	2032-12-23T11:27:59.089		31.82	-29.29	50026.71	23.78		
epsilon	E	2032-12-23T11:28:46.972		31.99	-29.45	51165.66	23.77		

```

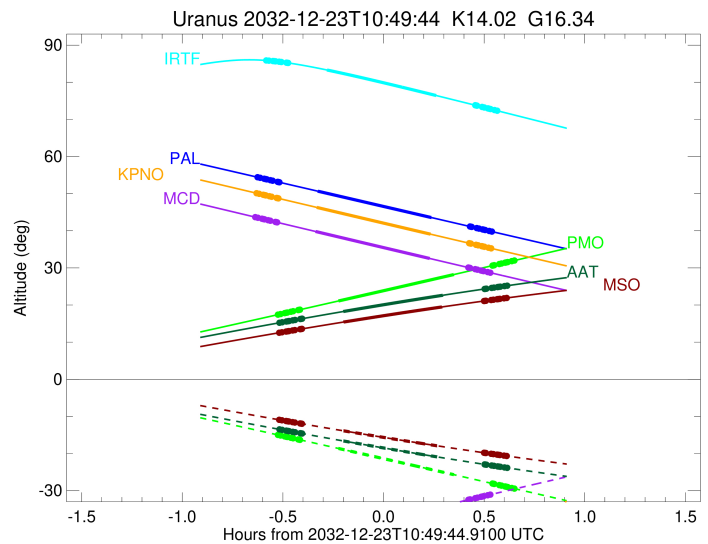
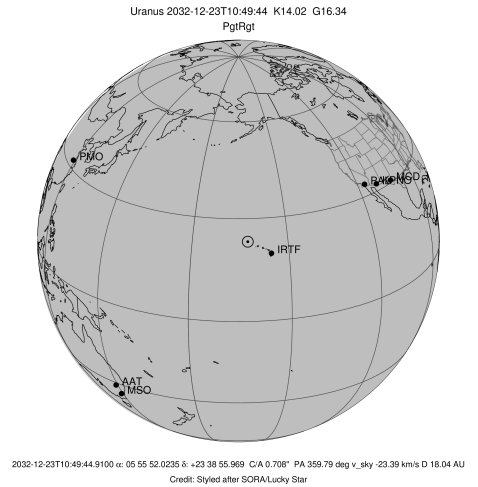
target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2032-12-23T10:46:41.300
Event type            : PgtRgt
: Uranus occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : KPNO
Location              : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)   : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 3424835062458456192
2Mass ID (if available) : 05555201+2338560
ICRS Star Coord at Epoch: 05h 55m 52.02348s +23:38:55.96860s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 14.021
G magnitude           : 16.341
RP magnitude          : 15.580
BP magnitude          : 16.955
DUPflag              : 0
Distance (au)         : 18.036
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.39
Sun-Target sep (deg) : 177.34
Sun-Moon sep (deg)   : 77.92
B (ring opening deg) : 76.13
PA of pole (deg)     : 54.44
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.580
C/A sky separation (km) : 7581.4
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_itrff93_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	2032-12-23T10:12:00.417		50.10	-52.44	51009.63	-23.84		
lambda	I	2032-12-23T10:12:41.608		49.95	-52.30	50026.71	-23.86		
delta	I	2032-12-23T10:13:54.006		49.70	-52.04	48300.35	-23.83		
gamma	I	2032-12-23T10:14:22.086		49.60	-51.94	47631.21	-23.82		
eta	I	2032-12-23T10:14:41.191		49.53	-51.87	47176.12	-23.82		
beta	I	2032-12-23T10:15:44.155		49.30	-51.65	45676.46	-23.79		
alpha	I	2032-12-23T10:16:23.788		49.16	-51.51	44737.17	-23.78		
4	I	2032-12-23T10:17:53.040		48.85	-51.19	42614.39	-23.74		
5	I	2032-12-23T10:18:08.782		48.79	-51.14	42244.83	-23.73		
6	I	2032-12-23T10:18:27.338		48.73	-51.07	41796.72	-23.72		
Uranus	I	2032-12-23T10:29:50.984		46.30	-48.65	25055.17		-13.22	-13.82
Uranus	E	2032-12-23T11:03:45.696		39.09	-41.46	25349.64		8.40	8.79
6	E	2032-12-23T11:15:19.124		36.64	-39.01	41879.67	23.65		
5	E	2032-12-23T11:15:32.338		36.60	-38.96	42197.41	23.65		
4	E	2032-12-23T11:15:46.921		36.55	-38.91	42535.71	23.66		
alpha	E	2032-12-23T11:17:17.839		36.23	-38.59	44691.44	23.69		
beta	E	2032-12-23T11:17:58.065		36.08	-38.45	45642.40	23.71		
eta	E	2032-12-23T11:19:02.711		35.86	-38.22	47176.12	23.73		
gamma	E	2032-12-23T11:19:21.456		35.79	-38.16	47620.97	23.73		
delta	E	2032-12-23T11:19:50.075		35.69	-38.06	48300.35	23.74		
lambda	E	2032-12-23T11:21:02.756		35.43	-37.80	50026.71	23.76		
epsilon	E	2032-12-23T11:21:50.624		35.27	-37.63	51164.45	23.75		

```

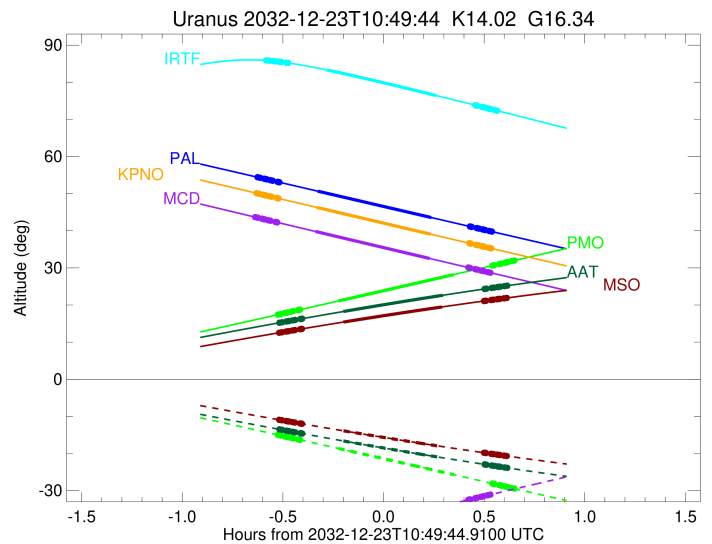
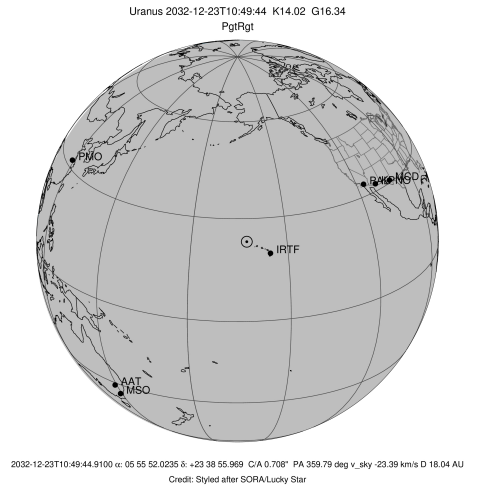
target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2032-12-23T10:46:22.130
Event type           : PgtRgt
: Ring occs: geocentric, topocentric
Observer code        : MCD
Location             : McDonald Obs. 2.7m
Latitude (deg)       : 30.67158
E. Longitude (deg)   : 255.97844
Altitude (km)       : 2.075
Gaia source ID       : 3424835062458456192
2Mass ID (if available) : 05555201+2338560
ICRS Star Coord at Epoch: 05h 55m 52.02348s +23:38:55.96860s
RUWE (>1.4 is poor) : 1.03
K magnitude          : 14.021
G magnitude          : 16.341
RP magnitude         : 15.580
BP magnitude         : 16.955
DUPflag             : 0
Distance (au)       : 18.036
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -23.39
Sun-Target sep (deg) : 177.34
Sun-Moon sep (deg)  : 77.82
B (ring opening deg) : 76.13
PA of pole (deg)    : 54.44
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation ("): 0.571
C/A sky separation (km): 7470.2
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_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	2032-12-23T10:11:37.106		43.65	-46.03	51010.25	-23.82		
lambda	I	2032-12-23T10:12:18.369		43.51	-45.88	50026.71	-23.83		
delta	I	2032-12-23T10:13:30.846		43.25	-45.62	48300.35	-23.81		
gamma	I	2032-12-23T10:13:58.958		43.14	-45.52	47631.21	-23.80		
eta	I	2032-12-23T10:14:18.083		43.08	-45.45	47176.12	-23.79		
beta	I	2032-12-23T10:15:21.113		42.85	-45.23	45676.48	-23.77		
alpha	I	2032-12-23T10:16:00.787		42.71	-45.09	44737.22	-23.75		
4	I	2032-12-23T10:17:30.134		42.39	-44.77	42614.36	-23.72		
5	I	2032-12-23T10:17:45.884		42.33	-44.71	42245.00	-23.70		
6	I	2032-12-23T10:18:04.467		42.26	-44.64	41796.69	-23.70		
Uranus	I	2032-12-23T10:29:28.606		39.81	-42.19	25056.43		-13.20	-13.80
Uranus	E	2032-12-23T11:03:29.683		32.55	-34.92	25346.89		8.46	8.85
6	E	2032-12-23T11:15:03.752		30.09	-32.47	41879.68	23.61		
5	E	2032-12-23T11:15:16.992		30.04	-32.42	42197.64	23.62		
4	E	2032-12-23T11:15:31.581		29.99	-32.37	42535.62	23.63		
alpha	E	2032-12-23T11:17:02.634		29.67	-32.05	44691.50	23.66		
beta	E	2032-12-23T11:17:42.917		29.53	-31.90	45642.42	23.67		
eta	E	2032-12-23T11:18:47.657		29.30	-31.67	47176.12	23.69		
gamma	E	2032-12-23T11:19:06.430		29.23	-31.61	47620.97	23.70		
delta	E	2032-12-23T11:19:35.092		29.13	-31.51	48300.35	23.71		
lambda	E	2032-12-23T11:20:47.884		28.88	-31.25	50026.71	23.73		
epsilon	E	2032-12-23T11:21:35.874		28.71	-31.08	51165.56	23.71		

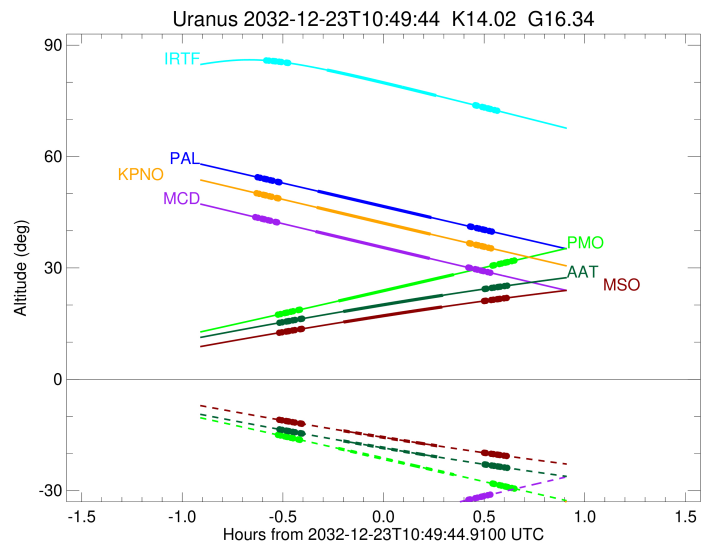
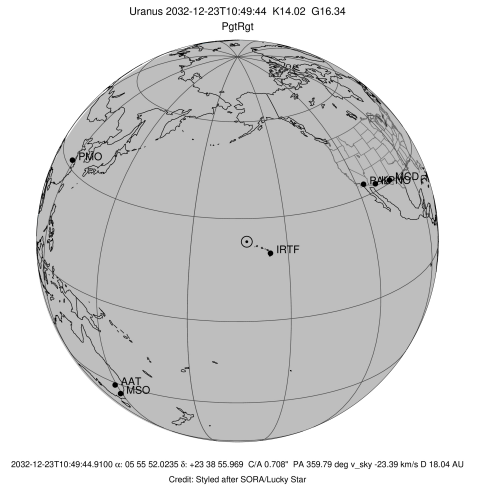
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2032-12-23T10:49:01.480
Event type           : PgtRgt
: Uranus occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : IRTF
Location             : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)   : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 3424835062458456192
2Mass ID (if available) : 05555201+2338560
ICRS Star Coord at Epoch: 05h 55m 52.02348s +23:38:55.96860s
RUWE (>1.4 is poor) : 1.03
K magnitude          : 14.021
G magnitude          : 16.341
RP magnitude         : 15.580
BP magnitude         : 16.955
DUPflag             : 0
Distance (au)        : 18.036
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.39
Sun-Target sep (deg) : 177.34
Sun-Moon sep (deg)   : 78.29
B (ring opening deg) : 76.13
PA of pole (deg)     : 54.44
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.746
C/A sky separation (km) : 9757.0
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_itr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```



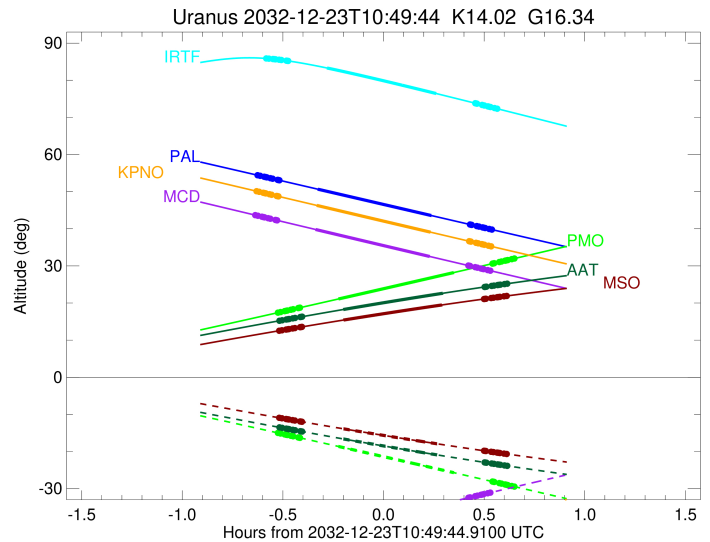
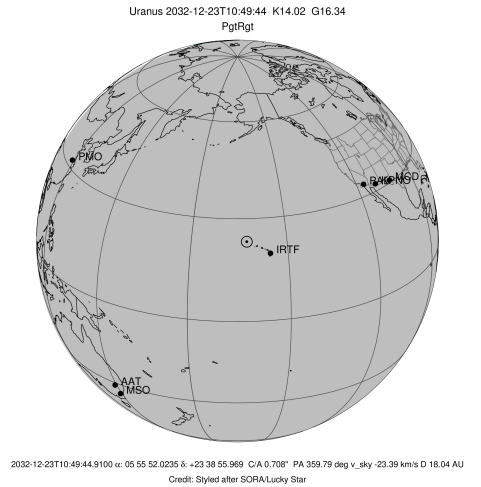
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-12-23T10:14:54.470		85.87	-86.02	50994.71	-23.80		
lambda	I	2032-12-23T10:15:35.092		85.82	-86.07	50026.71	-23.82		
delta	I	2032-12-23T10:16:47.620		85.72	-86.15	48300.35	-23.78		
gamma	I	2032-12-23T10:17:15.767		85.68	-86.18	47631.12	-23.77		
eta	I	2032-12-23T10:17:34.913		85.65	-86.20	47176.12	-23.76		
beta	I	2032-12-23T10:18:38.073		85.54	-86.24	45675.86	-23.72		
alpha	I	2032-12-23T10:19:17.869		85.47	-86.26	44735.84	-23.69		
4	I	2032-12-23T10:20:47.398		85.29	-86.29	42615.02	-23.64		
5	I	2032-12-23T10:21:03.379		85.25	-86.29	42240.91	-23.61		
6	I	2032-12-23T10:21:21.818		85.21	-86.29	41797.41	-23.61		
Uranus	I	2032-12-23T10:32:53.755		83.31	-85.39	25031.53		-13.54	-14.16
Uranus	E	2032-12-23T11:05:26.169		76.44	-79.06	25399.06		7.33	7.67
6	E	2032-12-23T11:17:07.705		73.82	-76.48	41879.45	23.59		
5	E	2032-12-23T11:17:20.808		73.77	-76.43	42193.43	23.60		
4	E	2032-12-23T11:17:35.661		73.71	-76.37	42537.36	23.62		
alpha	E	2032-12-23T11:19:06.580		73.37	-76.03	44690.38	23.68		
beta	E	2032-12-23T11:19:46.845		73.22	-75.88	45642.05	23.70		
eta	E	2032-12-23T11:20:51.501		72.97	-75.64	47176.12	23.74		
gamma	E	2032-12-23T11:21:10.236		72.90	-75.57	47620.96	23.75		
delta	E	2032-12-23T11:21:38.834		72.80	-75.46	48300.35	23.76		
lambda	E	2032-12-23T11:22:51.426		72.52	-75.19	50026.71	23.80		
epsilon	E	2032-12-23T11:23:38.402		72.34	-75.02	51145.18	23.78		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-23T10:52:26.350
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 3424835062458456192
 2Mass ID (if available) : 05555201+2338560
 ICRS Star Coord at Epoch: 05h 55m 52.02348s +23:38:55.96860s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.021
 G magnitude : 16.341
 RP magnitude : 15.580
 BP magnitude : 16.955
 DUPflag : 0
 Distance (au) : 18.036
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.39
 Sun-Target sep (deg) : 177.34
 Sun-Moon sep (deg) : 77.86
 B (ring opening deg) : 76.13
 PA of pole (deg) : 54.44
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.064
 C/A sky separation (km) : 13924.4
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-12-23T10:18:52.306		15.25	-13.52	50965.50	-23.11		
lambda	I	2032-12-23T10:19:32.882		15.36	-13.63	50026.71	-23.12		
delta	I	2032-12-23T10:20:47.668		15.56	-13.84	48300.35	-23.05		
gamma	I	2032-12-23T10:21:16.732		15.64	-13.92	47630.92	-23.02		
eta	I	2032-12-23T10:21:36.500		15.69	-13.98	47176.12	-23.00		
beta	I	2032-12-23T10:22:41.861		15.87	-14.16	45674.57	-22.92		
alpha	I	2032-12-23T10:23:23.139		15.98	-14.27	44733.09	-22.87		
4	I	2032-12-23T10:24:55.890		16.23	-14.53	42615.95	-22.75		
5	I	2032-12-23T10:25:12.832		16.27	-14.57	42233.02	-22.71		
6	I	2032-12-23T10:25:31.573		16.32	-14.63	41799.07	-22.69		
Uranus	I	2032-12-23T10:37:48.416		18.26	-16.62	25007.56		-13.86	-14.49
Uranus	E	2032-12-23T11:07:27.764		22.63	-21.16	25484.31		4.99	5.22
6	E	2032-12-23T11:19:54.752		24.33	-22.94	41878.64	22.76		
5	E	2032-12-23T11:20:08.090		24.36	-22.97	42186.15	22.77		
4	E	2032-12-23T11:20:23.939		24.39	-23.01	42540.84	22.81		
alpha	E	2032-12-23T11:21:57.704		24.60	-23.22	44688.57	22.94		
beta	E	2032-12-23T11:22:39.278		24.69	-23.32	45641.51	22.99		
eta	E	2032-12-23T11:23:45.897		24.83	-23.47	47176.12	23.07		
gamma	E	2032-12-23T11:24:05.170		24.88	-23.51	47620.98	23.09		
delta	E	2032-12-23T11:24:34.570		24.94	-23.58	48300.35	23.12		
lambda	E	2032-12-23T11:25:49.107		25.10	-23.75	50026.71	23.20		
epsilon	E	2032-12-23T11:26:35.690		25.20	-23.86	51108.33	23.19		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-23T10:52:19.240
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 3424835062458456192
 2Mass ID (if available) : 05555201+2338560
 ICRS Star Coord at Epoch: 05h 55m 52.02348s +23:38:55.96860s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.021
 G magnitude : 16.341
 RP magnitude : 15.580
 BP magnitude : 16.955
 DUPflag : 0
 Distance (au) : 18.036
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.39
 Sun-Target sep (deg) : 177.34
 Sun-Moon sep (deg) : 77.81
 B (ring opening deg) : 76.13
 PA of pole (deg) : 54.44
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.085
 C/A sky separation (km) : 14195.0
 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_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	2032-12-23T10:18:47.869		12.56	-10.94	50963.40	-23.06		
lambda	I	2032-12-23T10:19:28.440		12.66	-11.05	50026.71	-23.07		
delta	I	2032-12-23T10:20:43.392		12.85	-11.25	48300.35	-22.99		
gamma	I	2032-12-23T10:21:12.525		12.93	-11.32	47630.90	-22.96		
eta	I	2032-12-23T10:21:32.338		12.98	-11.37	47176.12	-22.94		
beta	I	2032-12-23T10:22:37.865		13.14	-11.55	45674.47	-22.86		
alpha	I	2032-12-23T10:23:19.254		13.25	-11.65	44732.88	-22.81		
4	I	2032-12-23T10:24:52.252		13.49	-11.90	42616.00	-22.68		
5	I	2032-12-23T10:25:09.266		13.53	-11.94	42232.45	-22.64		
6	I	2032-12-23T10:25:28.031		13.58	-11.99	41799.21	-22.63		
Uranus	I	2032-12-23T10:37:48.636		15.41	-13.88	25007.21		-13.87	-14.50
Uranus	E	2032-12-23T11:07:13.846		19.49	-18.13	25488.99		4.83	5.06
6	E	2032-12-23T11:19:44.829		21.08	-19.80	41878.58	22.69		
5	E	2032-12-23T11:19:58.195		21.11	-19.83	42185.72	22.70		
4	E	2032-12-23T11:20:14.120		21.14	-19.87	42541.06	22.74		
alpha	E	2032-12-23T11:21:48.144		21.34	-20.07	44688.47	22.87		
beta	E	2032-12-23T11:22:29.834		21.42	-20.16	45641.49	22.93		
eta	E	2032-12-23T11:23:36.627		21.56	-20.30	47176.12	23.01		
gamma	E	2032-12-23T11:23:55.950		21.60	-20.34	47620.98	23.03		
delta	E	2032-12-23T11:24:25.422		21.66	-20.41	48300.35	23.07		
lambda	E	2032-12-23T11:25:40.136		21.81	-20.56	50026.71	23.14		
epsilon	E	2032-12-23T11:26:26.731		21.90	-20.66	51106.16	23.13		