

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-18T02:17:12.750
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3382411505812840320
 2Mass ID (if available) : 06372040+2329322

Uranus 2034-12-18T02:17:12 K14.29 G16.03 PgtRgt

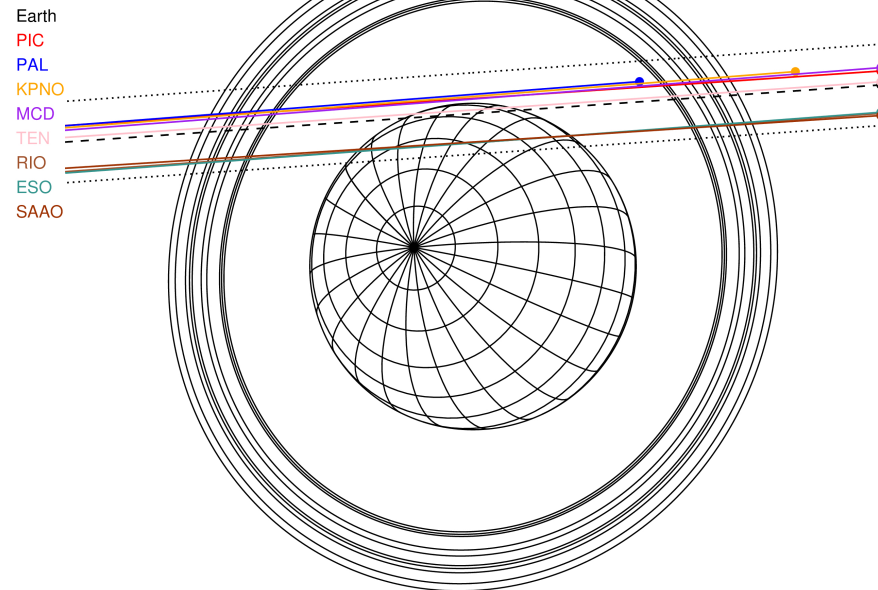
ICRS Star Coord at Epoch: 06h 37m 20.40002s +23:29:32.07354s

RUWE (>1.4 is poor) : 1.15
 K magnitude : 14.287
 G magnitude : 16.027
 RP magnitude : 15.395
 BP magnitude : 16.360
 DUPflag : 0
 Distance (au) : 17.930
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.63
 Sun-Target sep (deg) : 167.17
 Sun-Moon sep (deg) : 110.71
 B (ring opening deg) : 67.65
 PA of pole (deg) : 72.15

#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

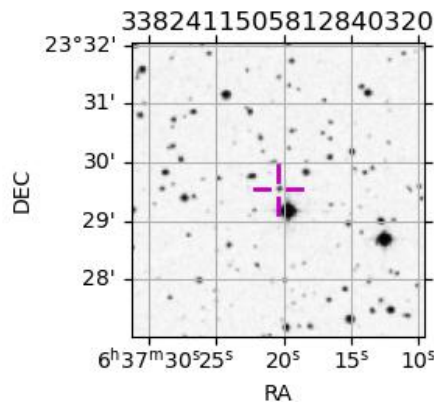


2034-12-18T02:17:12.7500 α: 06 37 20.4000 δ: +23 29 32.074 C/A 1.846° PA 184.01 deg v_sky -22.63 km/s D 17.93 AU
 Credit: Styled after SORA/Lucky Star



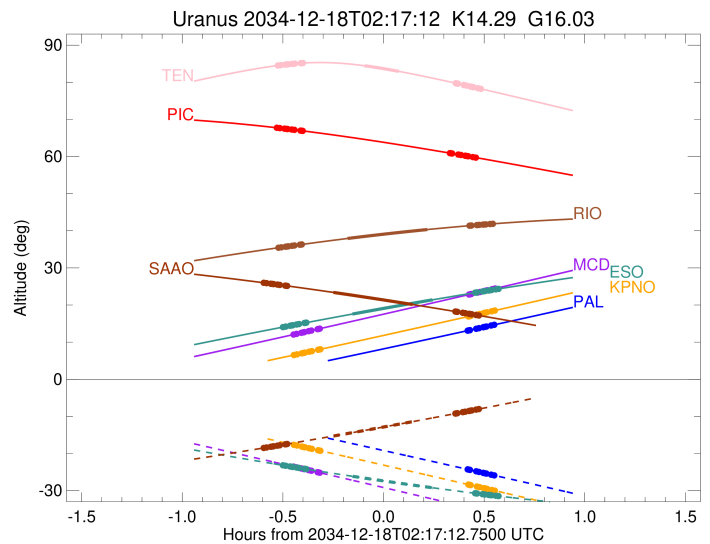
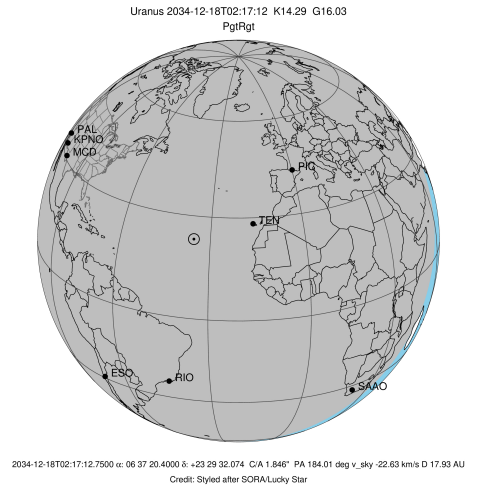
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++		+++++	DEC 18 01:45 - DEC 18 02:44	PnnRie
PAL	Palomar Mt (200")	33.4	243.1			+++++	DEC 18 02:42 - DEC 18 02:49	PnnRne
PMP	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	DEC 18 01:50 - DEC 18 02:50	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	DEC 18 01:50 - DEC 18 02:50	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+ +	+++++	DEC 18 01:45 - DEC 18 02:45	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++	+ +	+++++	DEC 18 01:45 - DEC 18 02:49	PieRie
ESO	European Southern Obs	-29.3	289.3	+++++	+ +	+++++	DEC 18 01:46 - DEC 18 02:51	PieRie
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++	+ +	+++++	DEC 18 01:41 - DEC 18 02:45	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2034-12-18T02:16:02.220
Event type           : PgtRgt
: Uranus occs: geocentric, topocentric
: 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       : 3382411505812840320
2Mass ID (if available) : 06372040+2329322
ICRS Star Coord at Epoch: 06h 37m 20.40002s +23:29:32.07354s
RUWE (>1.4 is poor) : 1.15
K magnitude          : 14.287
G magnitude          : 16.027
RP magnitude         : 15.395
BP magnitude         : 16.360
DUPflag             : 0
Distance (au)        : 17.930
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -22.63
Sun-Target sep (deg) : 167.17
Sun-Moon sep (deg)  : 111.42
B (ring opening deg) : 67.65
PA of pole (deg)    : 72.15
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.019
C/A sky separation (km) : 26251.0
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
  
```

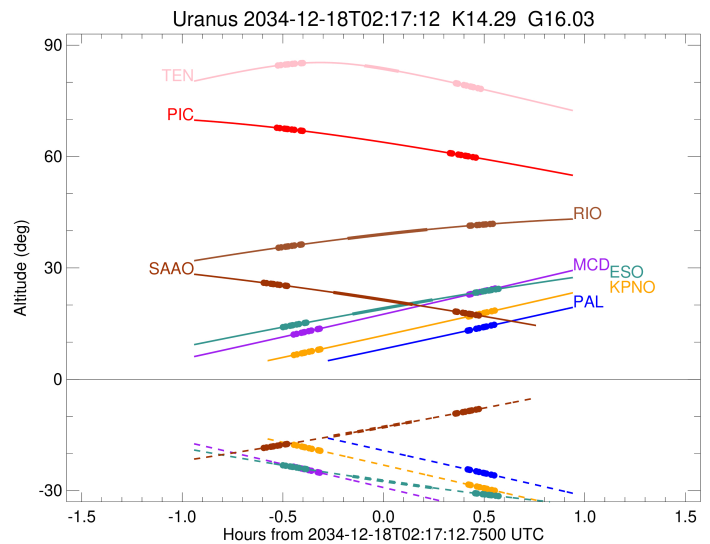
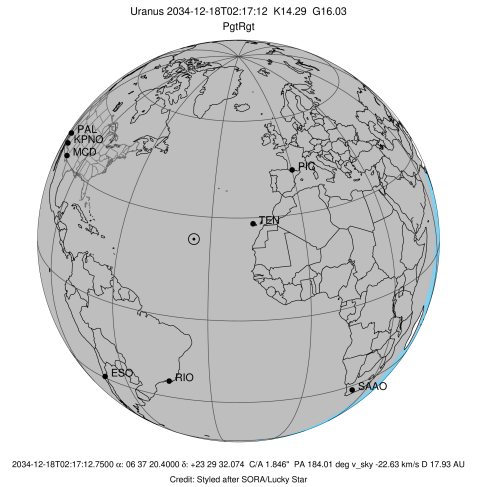


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-18T01:45:07.360		67.78	-60.25	51525.19	-21.03		
lambda	I	2034-12-18T01:46:18.866		67.66	-60.06	50026.71	-20.84		
delta	I	2034-12-18T01:47:42.304		67.51	-59.84	48300.35	-20.54		
gamma	I	2034-12-18T01:48:15.480		67.45	-59.75	47621.08	-20.41		
eta	I	2034-12-18T01:48:37.328		67.41	-59.70	47176.12	-20.32		
beta	I	2034-12-18T01:49:51.574		67.28	-59.50	45679.10	-20.01		
alpha	I	2034-12-18T01:50:41.239		67.19	-59.37	44688.10	-19.78		
4	I	2034-12-18T01:52:27.422		66.99	-59.09	42614.83	-19.23		
5	I	2034-12-18T01:52:51.335		66.94	-59.02	42156.23	-19.10		
6	I	2034-12-18T01:53:05.752		66.91	-58.99	41878.97	-19.01		

No planet occultations

6	E	2034-12-18T02:36:59.504		60.93	-51.58	41821.16	18.99		
5	E	2034-12-18T02:37:22.711		60.87	-51.51	42265.94	19.08		
4	E	2034-12-18T02:37:39.717		60.82	-51.46	42573.62	19.21		
alpha	E	2034-12-18T02:39:30.718		60.54	-51.14	44741.79	19.76		
beta	E	2034-12-18T02:40:17.066		60.41	-51.00	45663.84	19.99		
eta	E	2034-12-18T02:41:32.083		60.22	-50.78	47176.12	20.30		
gamma	E	2034-12-18T02:41:54.358		60.16	-50.72	47629.29	20.39		
delta	E	2034-12-18T02:42:27.170		60.07	-50.62	48300.35	20.51		
lambda	E	2034-12-18T02:43:50.708		59.86	-50.37	50026.71	20.81		
epsilon	E	2034-12-18T02:44:29.633		59.75	-50.26	50839.32	21.01		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-18T02:21:26.180
 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 : 3382411505812840320
 2Mass ID (if available) : 06372040+2329322
 ICRS Star Coord at Epoch: 06h 37m 20.40002s +23:29:32.07354s
 RUWE (>1.4 is poor) : 1.15
 K magnitude : 14.287
 G magnitude : 16.027
 RP magnitude : 15.395
 BP magnitude : 16.360
 DUPflag : 0
 Distance (au) : 17.930
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.63
 Sun-Target sep (deg) : 167.17
 Sun-Moon sep (deg) : 111.13
 B (ring opening deg) : 67.65
 PA of pole (deg) : 72.15
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.067
 C/A sky separation (km) : 26874.1
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



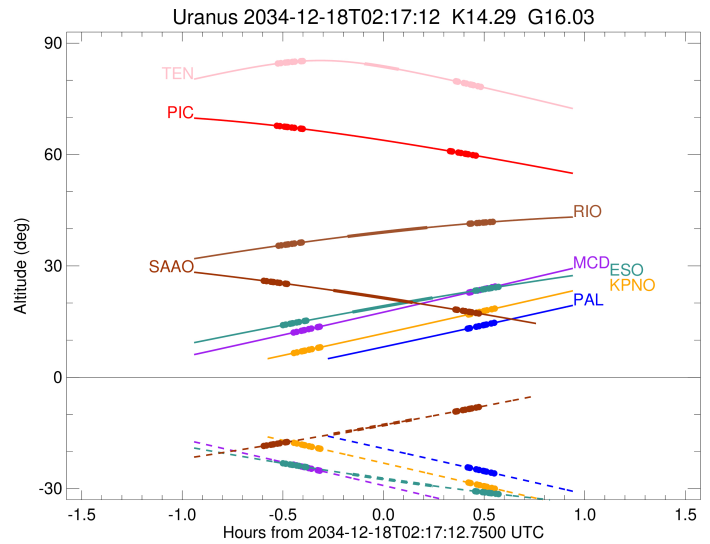
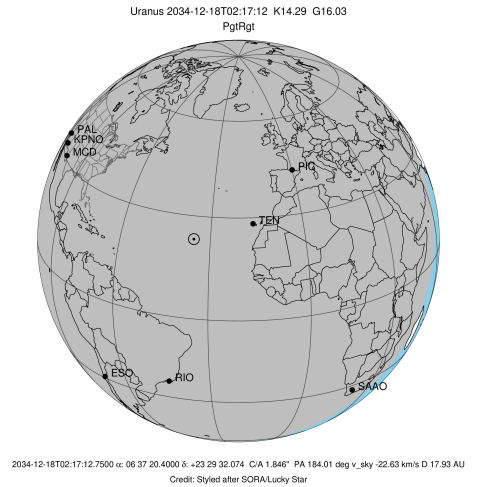
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-18T01:50:13.641		3.03x	-13.81	51521.41	-20.46		
lambda	I	2034-12-18T01:51:26.957		3.26x	-14.05	50026.71	-20.27		
delta	I	2034-12-18T01:52:52.787		3.53x	-14.33	48300.35	-19.96		
gamma	I	2034-12-18T01:53:26.935		3.64x	-14.45	47621.12	-19.82		
eta	I	2034-12-18T01:53:49.433		3.71x	-14.52	47176.12	-19.73		
beta	I	2034-12-18T01:55:05.923		3.95x	-14.77	45679.33	-19.41		
alpha	I	2034-12-18T01:55:57.140		4.11x	-14.94	44688.52	-19.17		
4	I	2034-12-18T01:57:46.816		4.46x	-15.30	42615.16	-18.60		
5	I	2034-12-18T01:58:11.526		4.54x	-15.39	42156.69	-18.47		
6	I	2034-12-18T01:58:26.490		4.59x	-15.44	41878.71	-18.37		

No planet occultations

6	E	2034-12-18T02:42:16.529	13.09	-24.27	41821.58	18.43
5	E	2034-12-18T02:42:40.373	13.17	-24.35	42265.18	18.53
4	E	2034-12-18T02:42:57.946	13.23	-24.41	42574.06	18.67
alpha	E	2034-12-18T02:44:52.015	13.60	-24.79	44741.58	19.24
beta	E	2034-12-18T02:45:39.600	13.76	-24.96	45664.00	19.49
eta	E	2034-12-18T02:46:56.489	14.01	-25.22	47176.12	19.82
gamma	E	2034-12-18T02:47:19.303	14.09	-25.30	47629.26	19.91
delta	E	2034-12-18T02:47:52.897	14.20	-25.41	48300.35	20.04
lambda	E	2034-12-18T02:49:18.348	14.48	-25.70	50026.71	20.36
epsilon	E	2034-12-18T02:49:58.199	14.62	-25.84	50840.70	20.56

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch             : 2034-12-18T02:21:29.490
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       : 3382411505812840320
2Mass ID (if available) : 06372040+2329322
ICRS Star Coord at Epoch: 06h 37m 20.40002s +23:29:32.07354s
RUWE (>1.4 is poor) : 1.15
K magnitude           : 14.287
G magnitude           : 16.027
RP magnitude          : 15.395
BP magnitude          : 16.360
DUPflag              : 0
Distance (au)        : 17.930
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -22.63
Sun-Target sep (deg) : 167.17
Sun-Moon sep (deg)   : 111.19
B (ring opening deg) : 67.65
PA of pole (deg)     : 72.15
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.042
C/A sky separation (km) : 26552.6
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
    
```

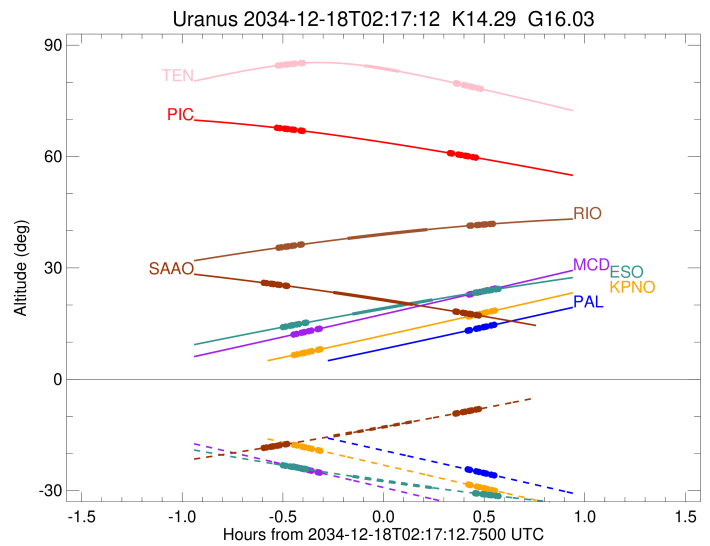
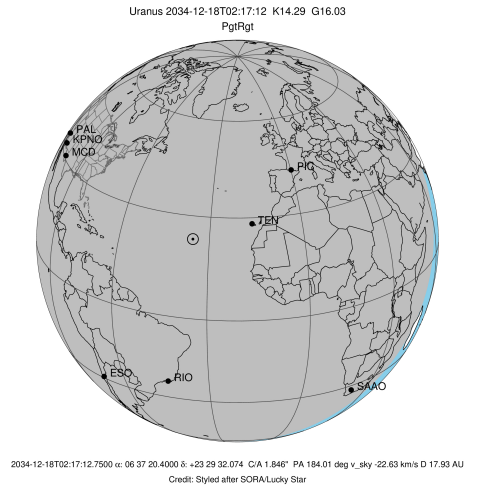


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-18T01:50:12.335		6.47	-17.59	51522.60	-20.59		
lambda	I	2034-12-18T01:51:25.249		6.71	-17.84	50026.71	-20.40		
delta	I	2034-12-18T01:52:50.500		6.99	-18.13	48300.35	-20.10		
gamma	I	2034-12-18T01:53:24.406		7.10	-18.25	47621.11	-19.97		
eta	I	2034-12-18T01:53:46.739		7.17	-18.32	47176.12	-19.88		
beta	I	2034-12-18T01:55:02.644		7.42	-18.58	45679.25	-19.57		
alpha	I	2034-12-18T01:55:53.442		7.58	-18.75	44688.37	-19.33		
4	I	2034-12-18T01:57:42.126		7.94	-19.12	42615.05	-18.78		
5	I	2034-12-18T01:58:06.603		8.02	-19.20	42156.52	-18.65		
6	I	2034-12-18T01:58:21.400		8.07	-19.25	41878.80	-18.55		

No planet occultations

6	E	2034-12-18T02:42:29.843	16.90	-28.36	41821.18	18.62
5	E	2034-12-18T02:42:53.506	16.98	-28.44	42265.92	18.72
4	E	2034-12-18T02:43:10.844	17.04	-28.50	42573.62	18.85
alpha	E	2034-12-18T02:45:03.911	17.42	-28.90	44741.81	19.41
beta	E	2034-12-18T02:45:51.079	17.58	-29.06	45663.82	19.64
eta	E	2034-12-18T02:47:07.379	17.84	-29.32	47176.12	19.97
gamma	E	2034-12-18T02:47:30.025	17.92	-29.40	47629.30	20.06
delta	E	2034-12-18T02:48:03.375	18.03	-29.52	48300.35	20.19
lambda	E	2034-12-18T02:49:28.244	18.32	-29.81	50026.71	20.49
epsilon	E	2034-12-18T02:50:07.742	18.46	-29.95	50838.75	20.69

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-18T02:21:28.650
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 3382411505812840320
 2Mass ID (if available) : 06372040+2329322
 ICRS Star Coord at Epoch: 06h 37m 20.40002s +23:29:32.07354s
 RUWE (>1.4 is poor) : 1.15
 K magnitude : 14.287
 G magnitude : 16.027
 RP magnitude : 15.395
 BP magnitude : 16.360
 DUPflag : 0
 Distance (au) : 17.930
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.63
 Sun-Target sep (deg) : 167.17
 Sun-Moon sep (deg) : 111.28
 B (ring opening deg) : 67.65
 PA of pole (deg) : 72.15
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.011
 C/A sky separation (km) : 26151.8
 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

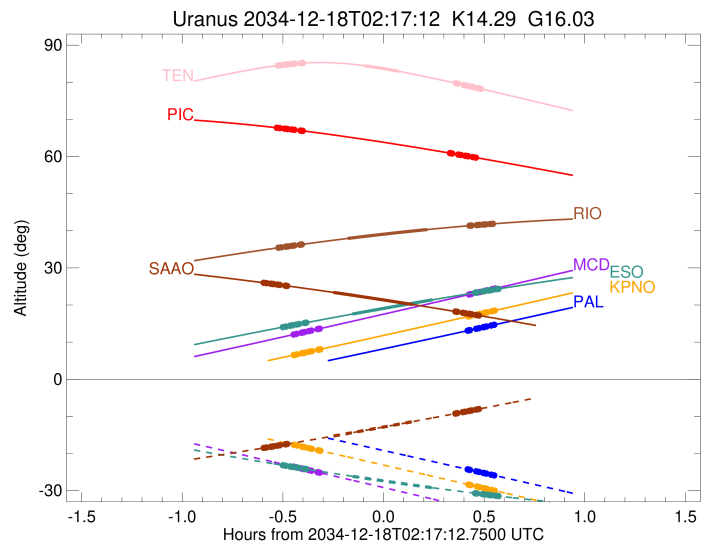
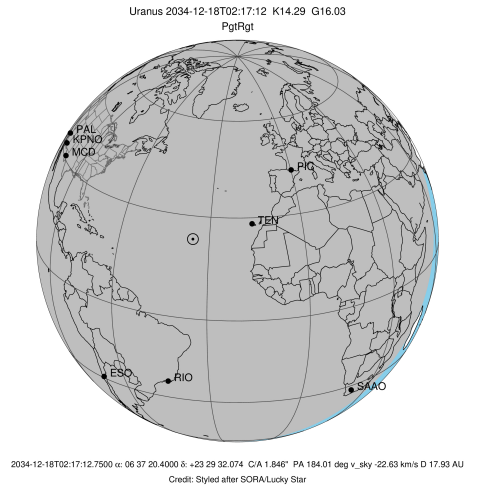


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-18T01:50:06.696		11.99	-23.47	51524.08	-20.76		
lambda	I	2034-12-18T01:51:19.091		12.23	-23.73	50026.71	-20.57		
delta	I	2034-12-18T01:52:43.606		12.52	-24.02	48300.35	-20.28		
gamma	I	2034-12-18T01:53:17.204		12.63	-24.14	47621.09	-20.15		
eta	I	2034-12-18T01:53:39.328		12.71	-24.21	47176.12	-20.07		
beta	I	2034-12-18T01:54:54.497		12.96	-24.48	45679.16	-19.77		
alpha	I	2034-12-18T01:55:44.768		13.13	-24.65	44688.20	-19.54		
4	I	2034-12-18T01:57:32.217		13.50	-25.03	42614.91	-19.01		
5	I	2034-12-18T01:57:56.404		13.58	-25.11	42156.32	-18.88		
6	I	2034-12-18T01:58:10.996		13.63	-25.16	41878.91	-18.79		

No planet occultations

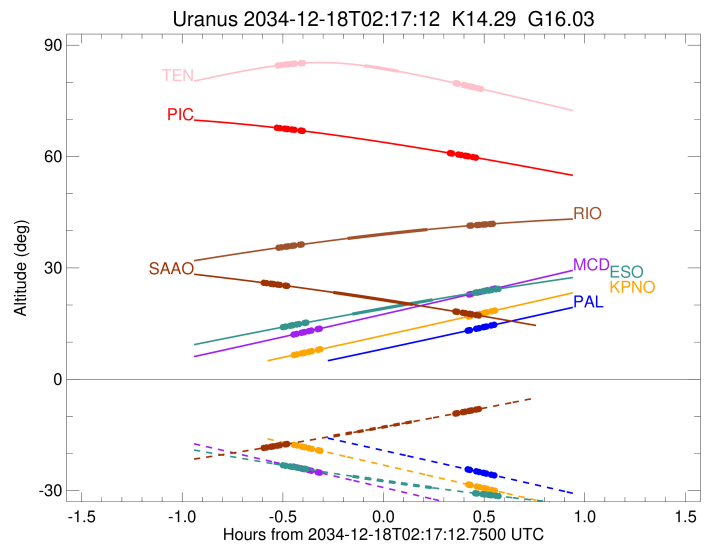
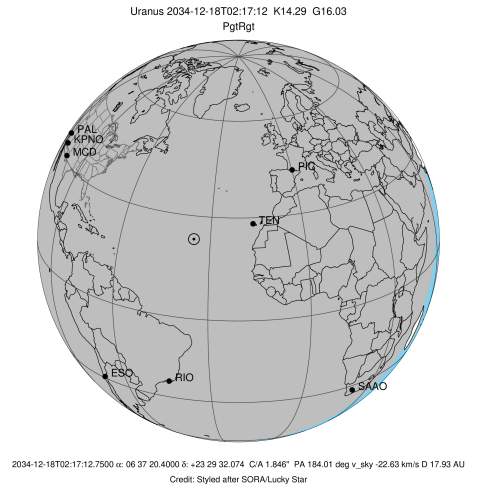
6	E	2034-12-18T02:42:40.725		22.82	-34.56	41820.69	18.86		
5	E	2034-12-18T02:43:04.161		22.90	-34.64	42266.82	18.95		
4	E	2034-12-18T02:43:21.213		22.96	-34.70	42573.08	19.08		
alpha	E	2034-12-18T02:45:13.037		23.35	-35.10	44742.08	19.62		
beta	E	2034-12-18T02:45:59.686		23.51	-35.27	45663.61	19.85		
eta	E	2034-12-18T02:47:15.250		23.77	-35.53	47176.12	20.16		
gamma	E	2034-12-18T02:47:37.687		23.85	-35.61	47629.34	20.24		
delta	E	2034-12-18T02:48:10.731		23.97	-35.73	48300.35	20.37		
lambda	E	2034-12-18T02:49:34.866		24.26	-36.03	50026.71	20.66		
epsilon	E	2034-12-18T02:50:13.927		24.40	-36.17	50836.39	20.86		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-18T02:16:52.380
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 3382411505812840320
 2Mass ID (if available) : 06372040+2329322
 ICRS Star Coord at Epoch: 06h 37m 20.40002s +23:29:32.07354s
 RUWE (>1.4 is poor) : 1.15
 K magnitude : 14.287
 G magnitude : 16.027
 RP magnitude : 15.395
 BP magnitude : 16.360
 DUPflag : 0
 Distance (au) : 17.930
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.63
 Sun-Target sep (deg) : 167.17
 Sun-Moon sep (deg) : 111.56
 B (ring opening deg) : 67.65
 PA of pole (deg) : 72.15
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.881
 C/A sky separation (km) : 24463.2
 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



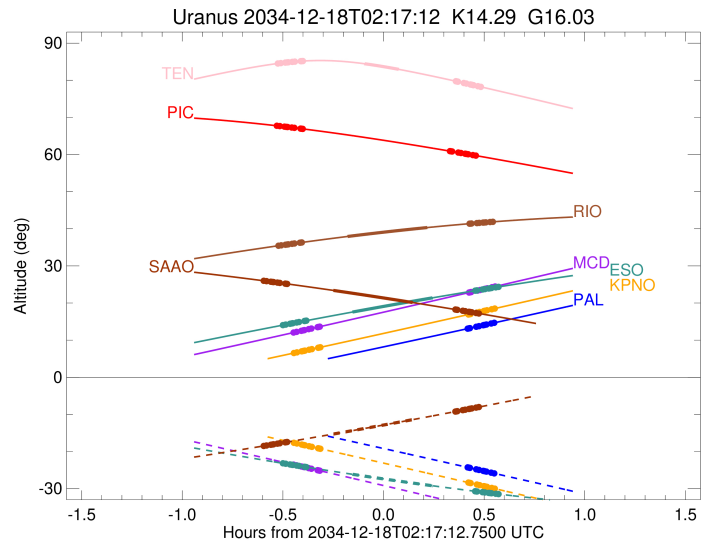
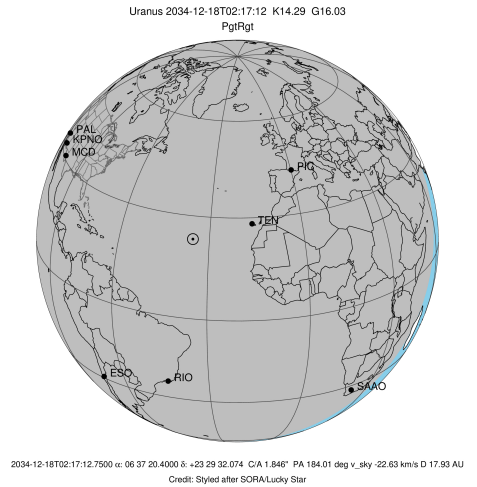
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-18T01:45:26.120		84.49	-79.20	51530.94	-21.61		
lambda	I	2034-12-18T01:46:35.951		84.63	-78.97	50026.71	-21.44		
delta	I	2034-12-18T01:47:56.942		84.77	-78.69	48300.35	-21.19		
gamma	I	2034-12-18T01:48:29.087		84.82	-78.58	47621.04	-21.08		
eta	I	2034-12-18T01:48:50.232		84.86	-78.51	47176.12	-21.00		
beta	I	2034-12-18T01:50:01.988		84.96	-78.27	45678.66	-20.74		
alpha	I	2034-12-18T01:50:49.854		85.03	-78.10	44687.42	-20.55		
4	I	2034-12-18T01:52:31.792		85.14	-77.75	42614.13	-20.09		
5	I	2034-12-18T01:52:54.698		85.17	-77.67	42155.55	-19.98		
6	I	2034-12-18T01:53:08.409		85.18	-77.62	41879.34	-19.90		
Uranus	I	2034-12-18T02:11:31.699		84.46	-73.73	25555.17		1.88	1.97
Uranus	E	2034-12-18T02:21:44.582		82.95	-71.53	25373.13		13.27	13.88
6	E	2034-12-18T02:38:44.915		79.76	-67.82	41819.00	19.90		
5	E	2034-12-18T02:39:07.374		79.68	-67.74	42269.96	19.97		
4	E	2034-12-18T02:39:23.312		79.63	-67.68	42571.16	20.08		
alpha	E	2034-12-18T02:41:09.975		79.27	-67.30	44743.00	20.54		
beta	E	2034-12-18T02:41:54.487		79.12	-67.13	45662.87	20.74		
eta	E	2034-12-18T02:43:06.951		78.87	-66.87	47176.12	21.00		
gamma	E	2034-12-18T02:43:28.502		78.80	-66.79	47629.49	21.07		
delta	E	2034-12-18T02:44:00.254		78.69	-66.67	48300.35	21.18		
lambda	E	2034-12-18T02:45:21.265		78.41	-66.38	50026.71	21.44		
epsilon	E	2034-12-18T02:45:58.583		78.28	-66.24	50828.66	21.60		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-18T02:18:35.160
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 3382411505812840320
 2Mass ID (if available) : 06372040+2329322
 ICRS Star Coord at Epoch: 06h 37m 20.40002s +23:29:32.07354s
 RUWE (>1.4 is poor) : 1.15
 K magnitude : 14.287
 G magnitude : 16.027
 RP magnitude : 15.395
 BP magnitude : 16.360
 DUPflag : 0
 Distance (au) : 17.930
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.63
 Sun-Target sep (deg) : 167.17
 Sun-Moon sep (deg) : 111.37
 B (ring opening deg) : 67.65
 PA of pole (deg) : 72.15
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.486
 C/A sky separation (km) : 19319.6
 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



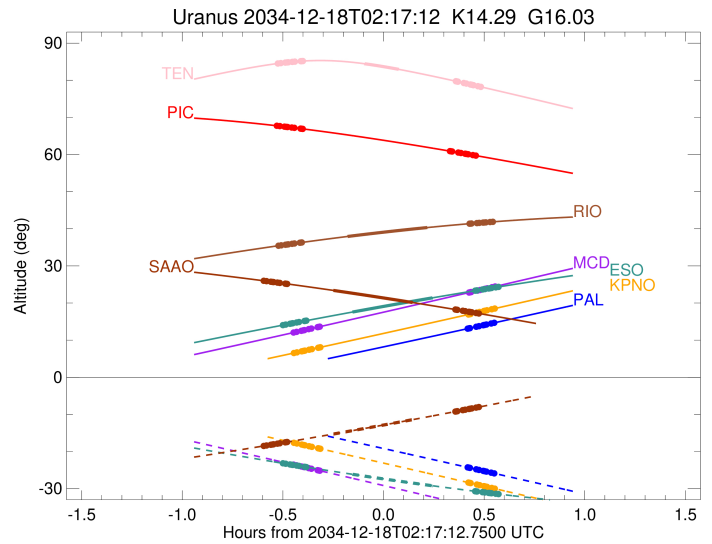
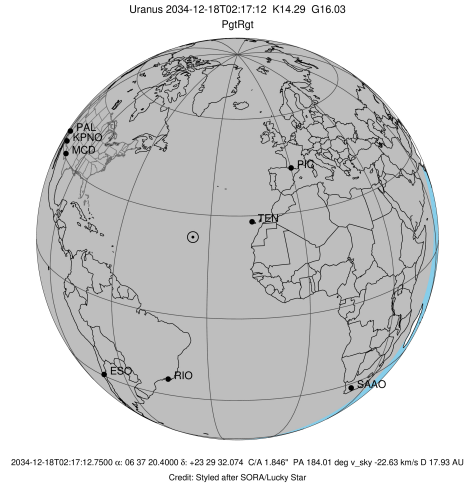
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-18T01:45:37.080		35.40	-41.34	51543.78	-22.77		
lambda	I	2034-12-18T01:46:43.826		35.54	-41.43	50026.71	-22.67		
delta	I	2034-12-18T01:48:00.225		35.70	-41.52	48300.35	-22.52		
gamma	I	2034-12-18T01:48:30.433		35.77	-41.56	47620.96	-22.46		
eta	I	2034-12-18T01:48:50.260		35.81	-41.59	47176.12	-22.42		
beta	I	2034-12-18T01:49:57.363		35.95	-41.67	45677.27	-22.26		
alpha	I	2034-12-18T01:50:41.843		36.05	-41.72	44685.93	-22.15		
4	I	2034-12-18T01:52:15.913		36.24	-41.83	42611.66	-21.89		
5	I	2034-12-18T01:52:36.912		36.29	-41.86	42154.83	-21.82		
6	I	2034-12-18T01:52:49.365		36.31	-41.87	41879.74	-21.78		
Uranus	I	2034-12-18T02:06:32.296		37.93	-42.71	25505.60		-7.04	-7.37
Uranus	E	2034-12-18T02:30:15.098		40.33	-43.64	25167.83		19.58	20.43
6	E	2034-12-18T02:42:50.232		41.37	-43.84	41813.48	21.82		
5	E	2034-12-18T02:43:11.423		41.40	-43.84	42280.21	21.86		
4	E	2034-12-18T02:43:25.211		41.41	-43.84	42564.58	21.92		
alpha	E	2034-12-18T02:45:03.864		41.54	-43.85	44745.97	22.19		
beta	E	2034-12-18T02:45:44.873		41.59	-43.86	45660.19	22.30		
eta	E	2034-12-18T02:46:52.563		41.67	-43.86	47176.12	22.46		
gamma	E	2034-12-18T02:47:12.753		41.69	-43.86	47630.00	22.50		
delta	E	2034-12-18T02:47:42.502		41.73	-43.86	48300.35	22.56		
lambda	E	2034-12-18T02:48:58.751		41.81	-43.87	50026.71	22.72		
epsilon	E	2034-12-18T02:49:32.839		41.85	-43.87	50802.10	22.82		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-18T02:20:07.180
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 3382411505812840320
 2Mass ID (if available) : 06372040+2329322
 ICRS Star Coord at Epoch: 06h 37m 20.40002s +23:29:32.07354s
 RUWE (>1.4 is poor) : 1.15
 K magnitude : 14.287
 G magnitude : 16.027
 RP magnitude : 15.395
 BP magnitude : 16.360
 DUPflag : 0
 Distance (au) : 17.930
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.63
 Sun-Target sep (deg) : 167.17
 Sun-Moon sep (deg) : 111.21
 B (ring opening deg) : 67.65
 PA of pole (deg) : 72.15
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.484
 C/A sky separation (km) : 19302.6
 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	2034-12-18T01:46:56.464		14.00	-23.13	51543.55	-22.62		
lambda	I	2034-12-18T01:48:03.631		14.19	-23.30	50026.71	-22.52		
delta	I	2034-12-18T01:49:20.520		14.41	-23.49	48300.35	-22.38		
gamma	I	2034-12-18T01:49:50.921		14.50	-23.56	47620.97	-22.32		
eta	I	2034-12-18T01:50:10.874		14.56	-23.61	47176.12	-22.27		
beta	I	2034-12-18T01:51:18.401		14.75	-23.78	45677.30	-22.12		
alpha	I	2034-12-18T01:52:03.162		14.88	-23.89	44685.95	-22.01		
4	I	2034-12-18T01:53:37.821		15.15	-24.12	42611.71	-21.75		
5	I	2034-12-18T01:53:58.951		15.21	-24.17	42154.83	-21.69		
6	I	2034-12-18T01:54:11.482		15.25	-24.20	41879.75	-21.65		
Uranus	I	2034-12-18T02:07:59.281		17.57	-26.14	25506.20		-7.00	-7.33
Uranus	E	2034-12-18T02:31:51.648		21.40	-29.23	25166.20		19.62	20.47
6	E	2034-12-18T02:44:30.063		23.32	-30.70	41813.37	21.71		
5	E	2034-12-18T02:44:51.369		23.37	-30.74	42280.42	21.76		
4	E	2034-12-18T02:45:05.206		23.41	-30.77	42564.43	21.82		
alpha	E	2034-12-18T02:46:44.333		23.65	-30.95	44746.04	22.08		
beta	E	2034-12-18T02:47:25.529		23.75	-31.03	45660.13	22.20		
eta	E	2034-12-18T02:48:33.538		23.92	-31.15	47176.12	22.35		
gamma	E	2034-12-18T02:48:53.824		23.97	-31.19	47630.01	22.40		
delta	E	2034-12-18T02:49:23.711		24.04	-31.24	48300.35	22.46		
lambda	E	2034-12-18T02:50:40.313		24.22	-31.38	50026.71	22.61		
epsilon	E	2034-12-18T02:51:14.530		24.31	-31.44	50801.43	22.71		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-18T02:14:15.880
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 3382411505812840320
 2Mass ID (if available) : 06372040+2329322
 ICRS Star Coord at Epoch: 06h 37m 20.40002s +23:29:32.07354s
 RUWE (>1.4 is poor) : 1.15
 K magnitude : 14.287
 G magnitude : 16.027
 RP magnitude : 15.395
 BP magnitude : 16.360
 DUPflag : 0
 Distance (au) : 17.930
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.63
 Sun-Target sep (deg) : 167.17
 Sun-Moon sep (deg) : 110.82
 B (ring opening deg) : 67.65
 PA of pole (deg) : 72.15
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.496
 C/A sky separation (km) : 19449.7
 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	2034-12-18T01:41:13.473		26.02	-18.54	51544.17	-22.70		
lambda	I	2034-12-18T01:42:20.452		25.89	-18.37	50026.71	-22.59		
delta	I	2034-12-18T01:43:37.112		25.74	-18.18	48300.35	-22.44		
gamma	I	2034-12-18T01:44:07.427		25.68	-18.11	47620.97	-22.38		
eta	I	2034-12-18T01:44:27.325		25.64	-18.06	47176.12	-22.33		
beta	I	2034-12-18T01:45:34.682		25.50	-17.89	45677.23	-22.18		
alpha	I	2034-12-18T01:46:19.336		25.41	-17.77	44685.89	-22.06		
4	I	2034-12-18T01:47:53.798		25.22	-17.53	42611.60	-21.79		
5	I	2034-12-18T01:48:14.887		25.18	-17.48	42154.83	-21.73		
6	I	2034-12-18T01:48:27.395		25.15	-17.45	41879.74	-21.69		
Uranus	I	2034-12-18T02:02:16.291		23.40	-15.29	25505.88		-7.02	-7.35
Uranus	E	2034-12-18T02:25:53.271		20.13	-11.42	25173.89		19.41	20.26
6	E	2034-12-18T02:38:36.922		18.25	-9.25	41813.82	21.63		
5	E	2034-12-18T02:38:58.249		18.20	-9.19	42279.57	21.68		
4	E	2034-12-18T02:39:12.206		18.16	-9.15	42565.00	21.74		
alpha	E	2034-12-18T02:40:51.659		17.91	-8.86	44745.79	22.00		
beta	E	2034-12-18T02:41:33.030		17.81	-8.74	45660.38	22.12		
eta	E	2034-12-18T02:42:41.275		17.64	-8.54	47176.12	22.27		
gamma	E	2034-12-18T02:43:01.632		17.58	-8.48	47629.96	22.32		
delta	E	2034-12-18T02:43:31.630		17.51	-8.40	48300.35	22.38		
lambda	E	2034-12-18T02:44:48.512		17.31	-8.17	50026.71	22.53		
epsilon	E	2034-12-18T02:45:22.966		17.22	-8.07	50803.96	22.63		