

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-11T06:56:43.170
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3382408516515537920
 2Mass ID (if available) : 06383295+2328208

ICRS Star Coord at Epoch: 06h 38m 32.94440s +23:28:20.81142s

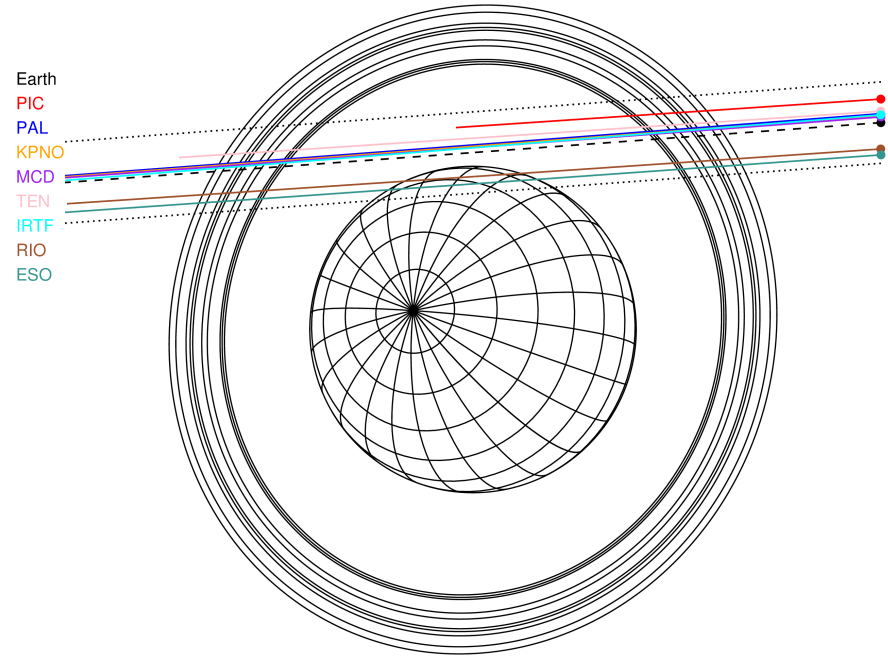
RUWE (>1.4 is poor) : 0.91
 K magnitude : 14.957
 G magnitude : 16.428
 RP magnitude : 15.911
 BP magnitude : 16.787
 DUPflag : 0
 Distance (au) : 17.964
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.58
 Sun-Target sep (deg) : 159.97
 Sun-Moon sep (deg) : 163.96
 B (ring opening deg) : 67.39
 PA of pole (deg) : 72.52

#	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



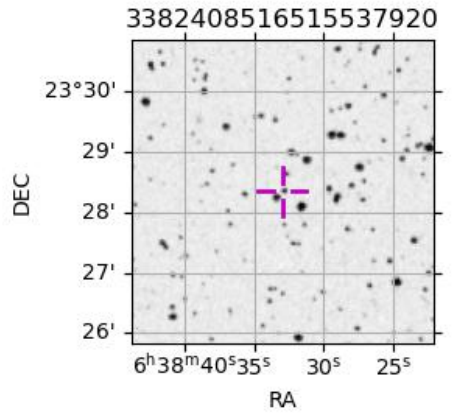
2034-12-11T06:56:43.1700 ra: 06 38 32.9444 s: +23 28 20.8111 C/A 2.129° PA 184.20 deg v_sky -21.58 km/s D 17.96 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2034-12-11T06:56:43 K14.96 G16.43 PtRgt

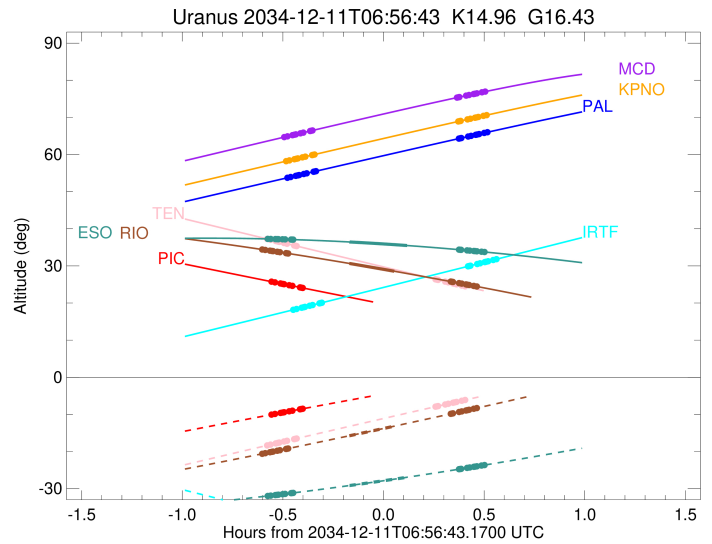
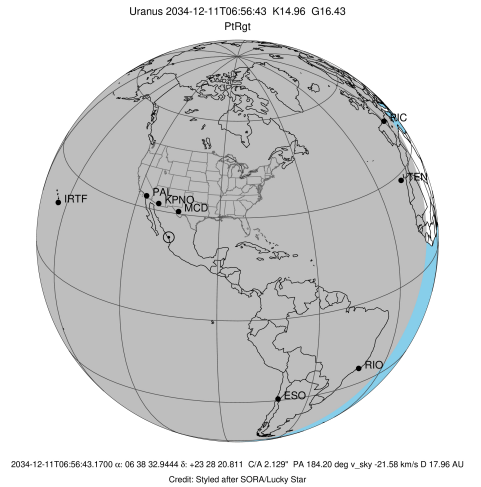


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++			DEC 11 06:23 - DEC 11 06:32	PnnRin
PAL	Palomar Mt (200")	33.4	243.1	+++++		+++++	DEC 11 06:27 - DEC 11 07:27	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	DEC 11 06:27 - DEC 11 07:27	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	DEC 11 06:26 - DEC 11 07:26	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++		+++++	DEC 11 06:21 - DEC 11 07:20	PnnRie
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++		+++++	DEC 11 06:29 - DEC 11 07:30	PnnRie
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++	+ +	+++++	DEC 11 06:20 - DEC 11 07:24	PieRie
ESO	European Southern Obs	-29.3	289.3	+++++	+ +	+++++	DEC 11 06:21 - DEC 11 07:26	PieRie
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-11T06:53:12.480
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 3382408516515537920
 2Mass ID (if available) : 06383295+2328208
 ICRS Star Coord at Epoch: 06h 38m 32.94440s +23:28:20.81142s
 RUWE (>1.4 is poor) : 0.91
 K magnitude : 14.957
 G magnitude : 16.428
 RP magnitude : 15.911
 BP magnitude : 16.787
 DUPflag : 0
 Distance (au) : 17.964
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.58
 Sun-Target sep (deg) : 159.97
 Sun-Moon sep (deg) : 164.78
 B (ring opening deg) : 67.39
 PA of pole (deg) : 72.52
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.436
 C/A sky separation (km) : 31732.7
 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

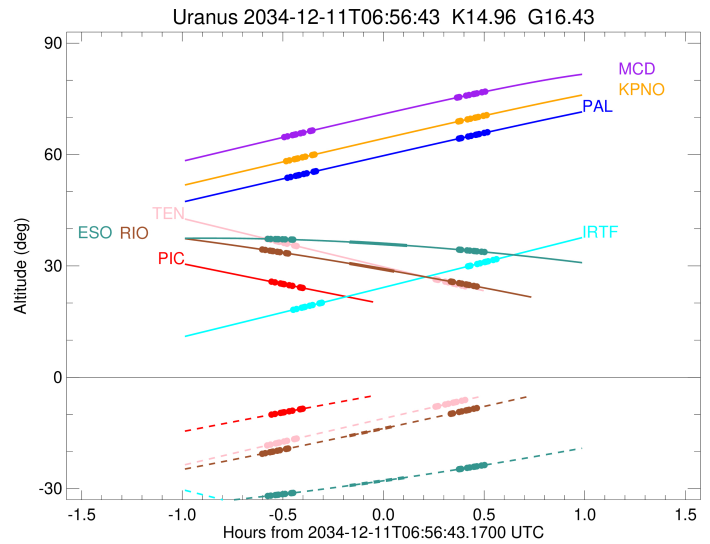
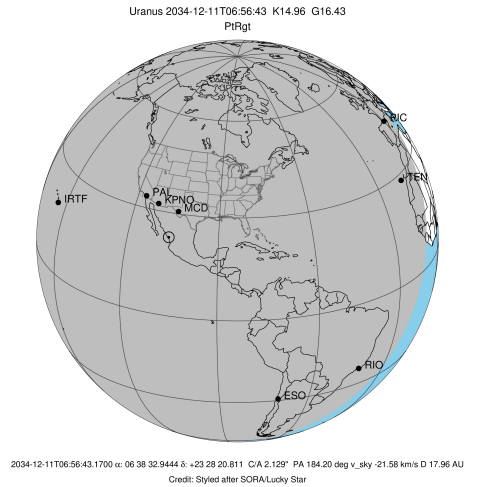


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-11T06:23:02.870		25.81	-10.11	51464.74	-18.09		
lambda	I	2034-12-11T06:24:22.774		25.56	-9.88	50026.71	-17.82		
delta	I	2034-12-11T06:26:00.872		25.27	-9.60	48300.35	-17.36		
gamma	I	2034-12-11T06:26:40.172		25.15	-9.49	47621.80	-17.17		
eta	I	2034-12-11T06:27:06.238		25.07	-9.42	47176.12	-17.03		
beta	I	2034-12-11T06:28:35.307		24.80	-9.17	45681.19	-16.53		
alpha	I	2034-12-11T06:29:35.349		24.62	-9.00	44696.90	-16.18		
4	I	2034-12-11T06:31:47.495		24.22	-8.63	42615.58	-15.28		
5	I	2034-12-11T06:32:16.704		24.13	-8.55	42172.90	-15.10		
6	I	2034-12-11T06:32:36.804		24.07	-8.49	41869.63	-14.91		

No planet occultations

6	E	2034-12-11T07:11:14.757		17.15	-2.16x	41815.84	14.87		
5	E	2034-12-11T07:11:45.440		17.06	-2.08x	42275.52	15.06		
4	E	2034-12-11T07:12:05.851		17.00	-2.02x	42567.87	15.24		
alpha	E	2034-12-11T07:14:24.334		16.59	-1.66x	44744.00	16.13		
beta	E	2034-12-11T07:15:20.708		16.43	-1.51x	45662.22	16.49		
eta	E	2034-12-11T07:16:51.107		16.16	-1.27x	47176.12	16.98		
gamma	E	2034-12-11T07:17:17.711		16.09	-1.20x	47629.55	17.11		
delta	E	2034-12-11T07:17:56.689		15.97	-1.10x	48300.35	17.31		
lambda	E	2034-12-11T07:19:35.128		15.68	-0.84x	50026.71	17.76		
epsilon	E	2034-12-11T07:20:20.246		15.55	-0.72x	50832.43	18.03		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-11T06:59:02.900
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 3382408516515537920
 2Mass ID (if available) : 06383295+2328208
 ICRS Star Coord at Epoch: 06h 38m 32.94440s +23:28:20.81142s
 RUWE (>1.4 is poor) : 0.91
 K magnitude : 14.957
 G magnitude : 16.428
 RP magnitude : 15.911
 BP magnitude : 16.787
 DUPflag : 0
 Distance (au) : 17.964
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.58
 Sun-Target sep (deg) : 159.97
 Sun-Moon sep (deg) : 163.85
 B (ring opening deg) : 67.39
 PA of pole (deg) : 72.52
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.212
 C/A sky separation (km) : 28816.3
 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



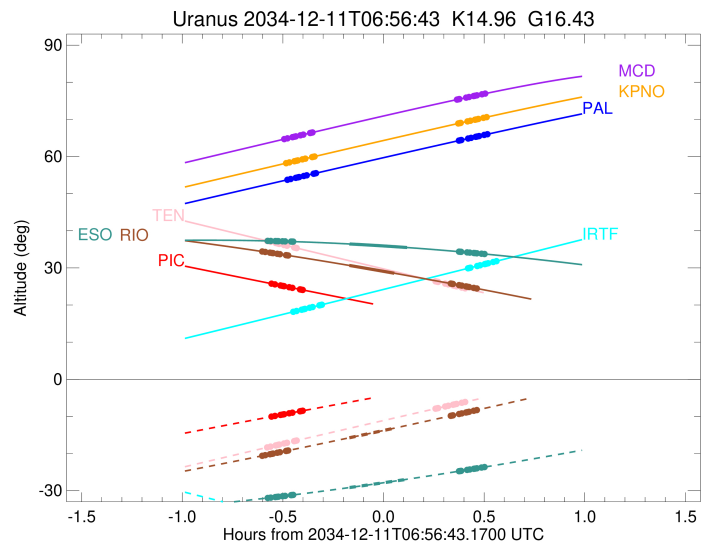
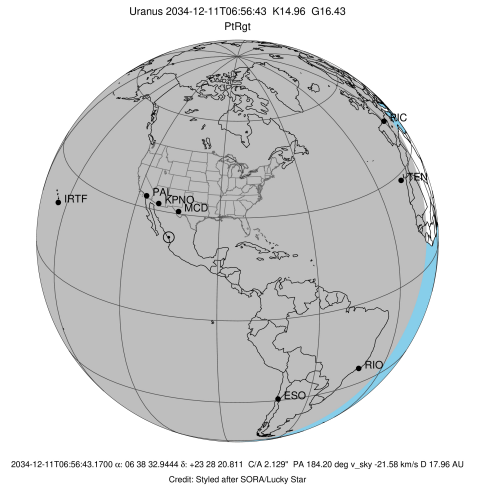
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-11T06:27:47.522		53.68	-71.04	51480.13	-19.29		
lambda	I	2034-12-11T06:29:03.166		53.94	-71.27	50026.71	-19.08		
delta	I	2034-12-11T06:30:34.502		54.26	-71.55	48300.35	-18.72		
gamma	I	2034-12-11T06:31:10.910		54.39	-71.66	47621.61	-18.57		
eta	I	2034-12-11T06:31:34.974		54.47	-71.74	47176.12	-18.46		
beta	I	2034-12-11T06:32:56.805		54.76	-71.98	45681.02	-18.08		
alpha	I	2034-12-11T06:33:51.626		54.95	-72.15	44694.85	-17.81		
4	I	2034-12-11T06:35:50.473		55.36	-72.50	42616.25	-17.13		
5	I	2034-12-11T06:36:16.831		55.45	-72.58	42168.49	-16.99		
6	I	2034-12-11T06:36:34.218		55.51	-72.63	41872.08	-16.85		

No planet occultations

6	E	2034-12-11T07:19:08.695		64.29	-78.78	41811.91	16.88		
5	E	2034-12-11T07:19:36.411		64.38	-78.83	42282.81	17.02		
4	E	2034-12-11T07:19:53.872		64.44	-78.85	42563.06	17.16		
alpha	E	2034-12-11T07:21:58.362		64.86	-79.03	44746.07	17.85		
beta	E	2034-12-11T07:22:49.244		65.03	-79.10	45660.32	18.12		
eta	E	2034-12-11T07:24:11.937		65.31	-79.20	47176.12	18.50		
gamma	E	2034-12-11T07:24:36.388		65.39	-79.23	47629.90	18.61		
delta	E	2034-12-11T07:25:12.260		65.51	-79.27	48300.35	18.77		
lambda	E	2034-12-11T07:26:43.360		65.81	-79.38	50026.71	19.13		
epsilon	E	2034-12-11T07:27:24.321		65.95	-79.42	50813.32	19.34		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2034-12-11T06:58:43.610
Event type          : PtRgt
: Uranus occs: topocentric, not geocentric
: 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      : 3382408516515537920
2Mass ID (if available) : 06383295+2328208
ICRS Star Coord at Epoch: 06h 38m 32.94440s +23:28:20.81142s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 14.957
G magnitude          : 16.428
RP magnitude         : 15.911
BP magnitude         : 16.787
DUPflag             : 0
Distance (au)       : 17.964
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -21.58
Sun-Target sep (deg) : 159.97
Sun-Moon sep (deg)  : 163.90
B (ring opening deg) : 67.39
PA of pole (deg)    : 72.52
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.195
C/A sky separation (km) : 28602.7
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
  
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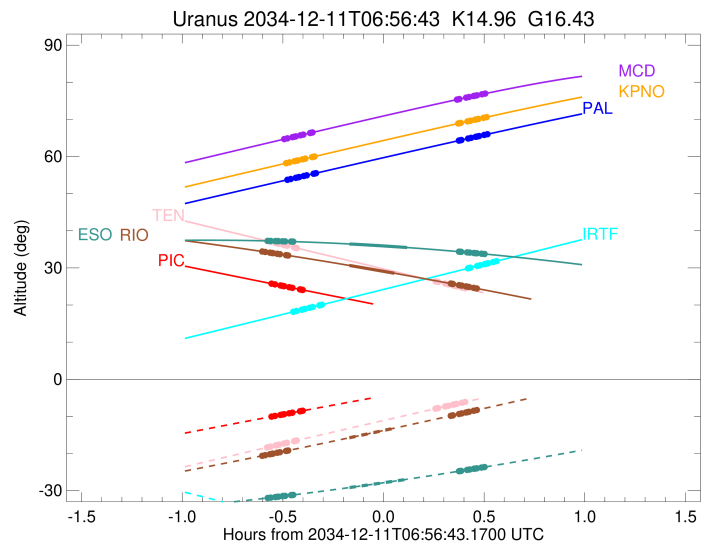
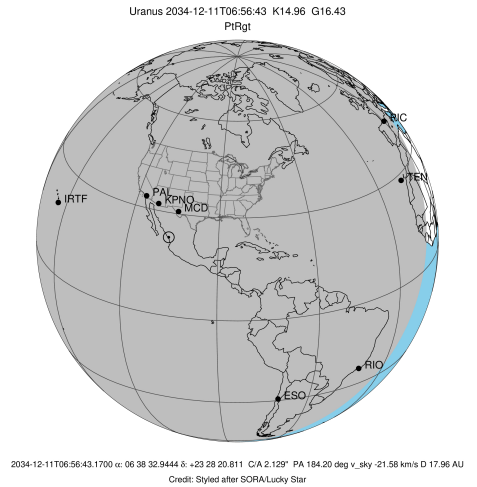


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-11T06:27:24.570		58.15	-75.49	51481.46	-19.38		
lambda	I	2034-12-11T06:28:39.919		58.42	-75.71	50026.71	-19.17		
delta	I	2034-12-11T06:30:10.782		58.74	-75.98	48300.35	-18.82		
gamma	I	2034-12-11T06:30:46.991		58.87	-76.08	47621.59	-18.67		
eta	I	2034-12-11T06:31:10.918		58.95	-76.15	47176.12	-18.57		
beta	I	2034-12-11T06:32:32.263		59.24	-76.38	45681.00	-18.19		
alpha	I	2034-12-11T06:33:26.741		59.43	-76.53	44694.68	-17.92		
4	I	2034-12-11T06:35:24.734		59.85	-76.86	42616.29	-17.26		
5	I	2034-12-11T06:35:50.916		59.94	-76.93	42168.15	-17.12		
6	I	2034-12-11T06:36:08.132		60.00	-76.98	41872.26	-16.99		

No planet occultations

6	E	2034-12-11T07:18:57.685		68.90	-81.21	41811.68	17.02		
5	E	2034-12-11T07:19:25.224		68.99	-81.21	42283.23	17.15		
4	E	2034-12-11T07:19:42.517		69.05	-81.21	42562.77	17.29		
alpha	E	2034-12-11T07:21:46.180		69.47	-81.20	44746.18	17.96		
beta	E	2034-12-11T07:22:36.736		69.64	-81.18	45660.21	18.23		
eta	E	2034-12-11T07:23:58.966		69.91	-81.16	47176.12	18.61		
gamma	E	2034-12-11T07:24:23.287		70.00	-81.15	47629.92	18.71		
delta	E	2034-12-11T07:24:58.972		70.11	-81.13	48300.35	18.86		
lambda	E	2034-12-11T07:26:29.630		70.42	-81.08	50026.71	19.22		
epsilon	E	2034-12-11T07:27:10.350		70.55	-81.05	50812.28	19.42		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-11T06:58:12.780
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 3382408516515537920
 2Mass ID (if available) : 06383295+2328208
 ICRS Star Coord at Epoch: 06h 38m 32.94440s +23:28:20.81142s
 RUWE (>1.4 is poor) : 0.91
 K magnitude : 14.957
 G magnitude : 16.428
 RP magnitude : 15.911
 BP magnitude : 16.787
 DUPflag : 0
 Distance (au) : 17.964
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.58
 Sun-Target sep (deg) : 159.97
 Sun-Moon sep (deg) : 163.98
 B (ring opening deg) : 67.39
 PA of pole (deg) : 72.52
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.180
 C/A sky separation (km) : 28400.3
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

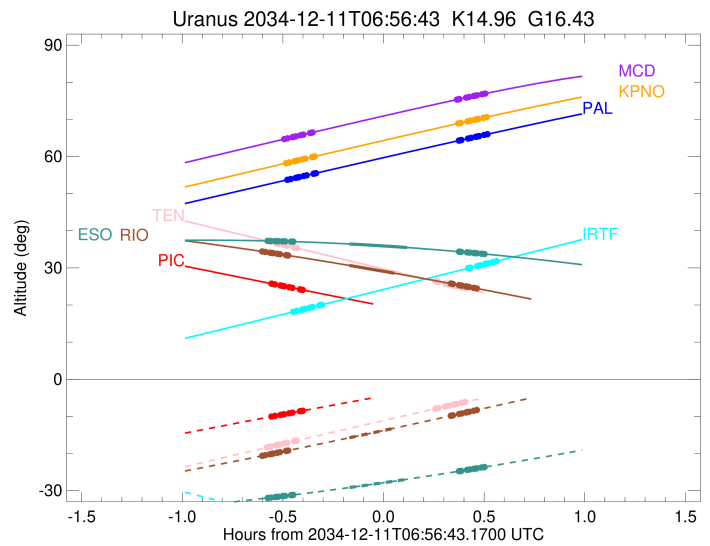
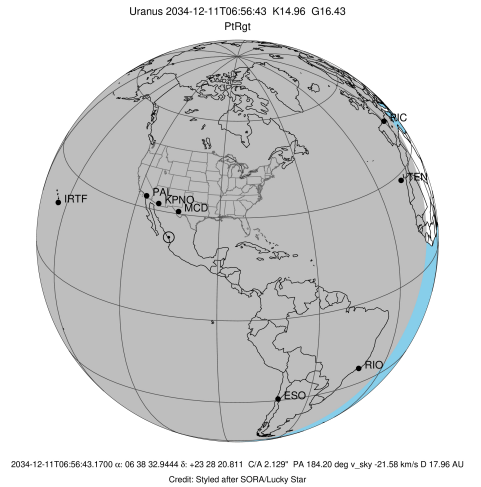


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-11T06:26:50.792		64.64	-80.99	51482.79	-19.47		
lambda	I	2034-12-11T06:28:05.847		64.90	-81.14	50026.71	-19.27		
delta	I	2034-12-11T06:29:36.244		65.22	-81.32	48300.35	-18.92		
gamma	I	2034-12-11T06:30:12.258		65.35	-81.38	47621.58	-18.77		
eta	I	2034-12-11T06:30:36.051		65.43	-81.43	47176.12	-18.67		
beta	I	2034-12-11T06:31:56.922		65.72	-81.57	45680.98	-18.30		
alpha	I	2034-12-11T06:32:51.066		65.91	-81.66	44694.51	-18.04		
4	I	2034-12-11T06:34:48.236		66.33	-81.84	42616.32	-17.39		
5	I	2034-12-11T06:35:14.250		66.42	-81.88	42167.82	-17.25		
6	I	2034-12-11T06:35:31.301		66.48	-81.90	41872.45	-17.12		

No planet occultations

6	E	2034-12-11T07:18:34.492		75.33	-80.04	41811.48	17.14		
5	E	2034-12-11T07:19:01.863		75.42	-79.98	42283.60	17.28		
4	E	2034-12-11T07:19:19.001		75.47	-79.93	42562.52	17.41		
alpha	E	2034-12-11T07:21:21.885		75.87	-79.63	44746.28	18.07		
beta	E	2034-12-11T07:22:12.136		76.03	-79.50	45660.11	18.33		
eta	E	2034-12-11T07:23:33.929		76.29	-79.28	47176.12	18.70		
gamma	E	2034-12-11T07:23:58.128		76.37	-79.22	47629.94	18.80		
delta	E	2034-12-11T07:24:33.636		76.48	-79.12	48300.35	18.95		
lambda	E	2034-12-11T07:26:03.875		76.77	-78.88	50026.71	19.30		
epsilon	E	2034-12-11T07:26:44.372		76.89	-78.76	50811.37	19.51		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-11T06:52:41.170
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 3382408516515537920
 2Mass ID (if available) : 06383295+2328208
 ICRS Star Coord at Epoch: 06h 38m 32.94440s +23:28:20.81142s
 RUWE (>1.4 is poor) : 0.91
 K magnitude : 14.957
 G magnitude : 16.428
 RP magnitude : 15.911
 BP magnitude : 16.787
 DUPflag : 0
 Distance (au) : 17.964
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.58
 Sun-Target sep (deg) : 159.97
 Sun-Moon sep (deg) : 164.83
 B (ring opening deg) : 67.39
 PA of pole (deg) : 72.52
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.295
 C/A sky separation (km) : 29895.1
 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

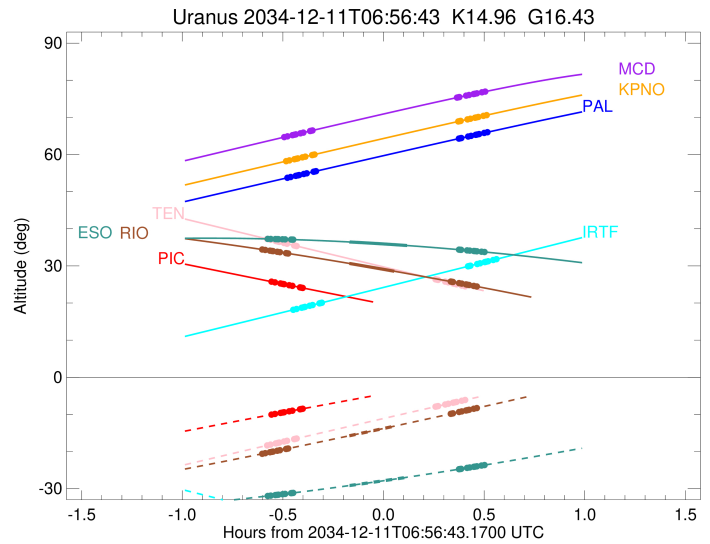
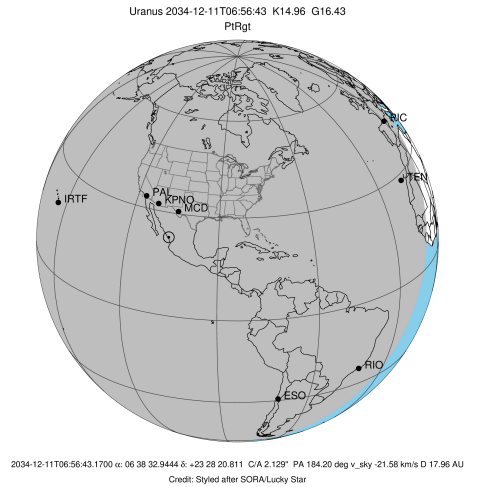


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-11T06:21:45.681		37.32	-18.42	51476.31	-18.85		
lambda	I	2034-12-11T06:23:02.905		37.04	-18.14	50026.71	-18.62		
delta	I	2034-12-11T06:24:36.590		36.70	-17.81	48300.35	-18.23		
gamma	I	2034-12-11T06:25:14.000		36.56	-17.68	47621.66	-18.06		
eta	I	2034-12-11T06:25:38.754		36.47	-17.60	47176.12	-17.94		
beta	I	2034-12-11T06:27:03.071		36.17	-17.30	45681.08	-17.52		
alpha	I	2034-12-11T06:27:59.682		35.96	-17.10	44695.40	-17.22		
4	I	2034-12-11T06:30:02.990		35.51	-16.67	42616.10	-16.46		
5	I	2034-12-11T06:30:30.329		35.42	-16.57	42169.69	-16.31		
6	I	2034-12-11T06:30:48.575		35.35	-16.51	41871.41	-16.16		

No planet occultations

6	E	2034-12-11T07:12:10.795		26.40	-7.93	41813.48	16.11		
5	E	2034-12-11T07:12:39.563		26.30	-7.83	42279.88	16.26		
4	E	2034-12-11T07:12:58.101		26.23	-7.77	42565.04	16.41		
alpha	E	2034-12-11T07:15:07.752		25.77	-7.33	44745.23	17.16		
beta	E	2034-12-11T07:16:00.722		25.58	-7.15	45661.12	17.46		
eta	E	2034-12-11T07:17:26.397		25.27	-6.86	47176.12	17.87		
gamma	E	2034-12-11T07:17:51.694		25.18	-6.77	47629.75	17.99		
delta	E	2034-12-11T07:18:28.797		25.05	-6.65	48300.35	18.16		
lambda	E	2034-12-11T07:20:02.857		24.71	-6.33	50026.71	18.55		
epsilon	E	2034-12-11T07:20:45.520		24.56	-6.18	50821.43	18.77		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-11T07:01:17.620
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 3382408516515537920
 2Mass ID (if available) : 06383295+2328208
 ICRS Star Coord at Epoch: 06h 38m 32.94440s +23:28:20.81142s
 RUWE (>1.4 is poor) : 0.91
 K magnitude : 14.957
 G magnitude : 16.428
 RP magnitude : 15.911
 BP magnitude : 16.787
 DUPflag : 0
 Distance (au) : 17.964
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.58
 Sun-Target sep (deg) : 159.97
 Sun-Moon sep (deg) : 163.36
 B (ring opening deg) : 67.39
 PA of pole (deg) : 72.52
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.177
 C/A sky separation (km) : 28362.6
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



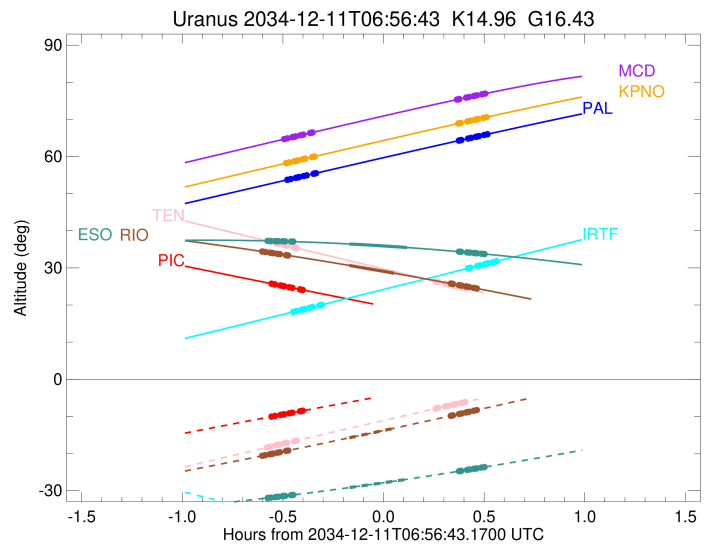
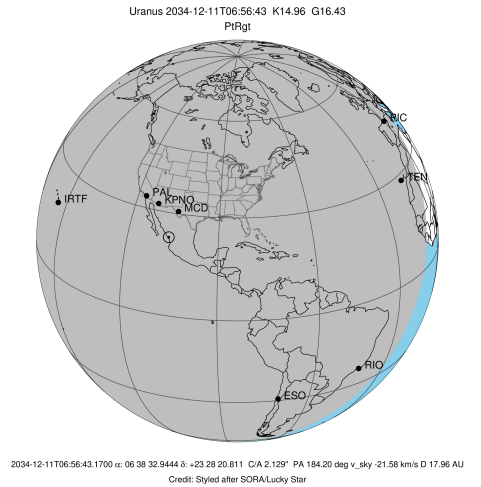
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-11T06:29:32.585		18.11	-37.72	51481.71	-19.24		
lambda	I	2034-12-11T06:30:48.466		18.39	-38.01	50026.71	-19.04		
delta	I	2034-12-11T06:32:19.915		18.73	-38.36	48300.35	-18.70		
gamma	I	2034-12-11T06:32:56.344		18.87	-38.49	47621.59	-18.56		
eta	I	2034-12-11T06:33:20.412		18.96	-38.59	47176.12	-18.46		
beta	I	2034-12-11T06:34:42.204		19.26	-38.90	45680.99	-18.10		
alpha	I	2034-12-11T06:35:36.955		19.47	-39.10	44694.62	-17.84		
4	I	2034-12-11T06:37:35.436		19.91	-39.56	42616.30	-17.20		
5	I	2034-12-11T06:38:01.720		20.01	-39.66	42168.01	-17.07		
6	I	2034-12-11T06:38:18.976		20.07	-39.72	41872.34	-16.93		

No planet occultations

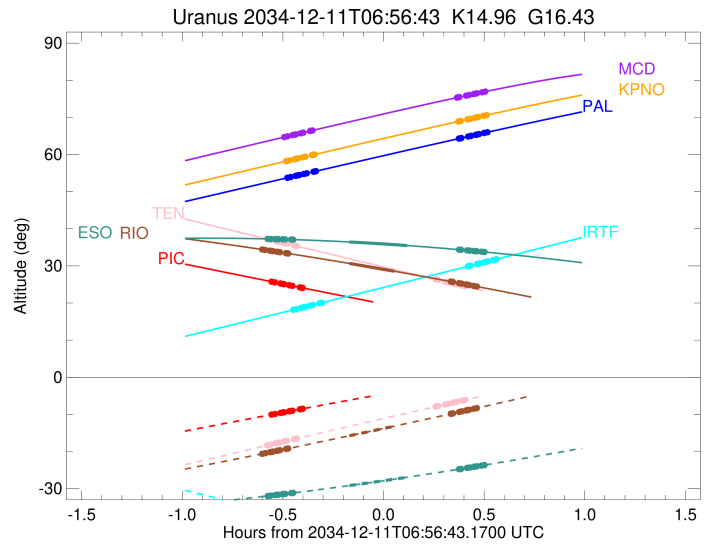
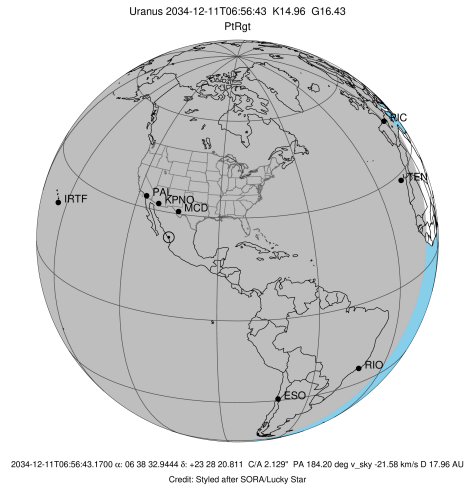
6	E	2034-12-11T07:21:51.825		29.88	-49.69	41811.26	17.00		
5	E	2034-12-11T07:22:19.460		29.98	-49.80	42284.02	17.13		
4	E	2034-12-11T07:22:36.704		30.04	-49.86	42562.23	17.26		
alpha	E	2034-12-11T07:24:40.641		30.51	-50.34	44746.41	17.92		
beta	E	2034-12-11T07:25:31.297		30.70	-50.53	45659.98	18.18		
eta	E	2034-12-11T07:26:53.782		31.02	-50.85	47176.12	18.55		
gamma	E	2034-12-11T07:27:18.185		31.11	-50.94	47629.96	18.65		
delta	E	2034-12-11T07:27:53.988		31.24	-51.08	48300.35	18.80		
lambda	E	2034-12-11T07:29:24.978		31.59	-51.43	50026.71	19.14		
epsilon	E	2034-12-11T07:30:05.738		31.74	-51.58	50809.97	19.35		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-11T06:53:27.200
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 3382408516515537920
 2Mass ID (if available) : 06383295+2328208
 ICRS Star Coord at Epoch: 06h 38m 32.94440s +23:28:20.81142s
 RUWE (>1.4 is poor) : 0.91
 K magnitude : 14.957
 G magnitude : 16.428
 RP magnitude : 15.911
 BP magnitude : 16.787
 DUPflag : 0
 Distance (au) : 17.964
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.58
 Sun-Target sep (deg) : 159.97
 Sun-Moon sep (deg) : 164.42
 B (ring opening deg) : 67.39
 PA of pole (deg) : 72.52
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.833
 C/A sky separation (km) : 23884.6
 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	2034-12-11T06:20:16.901		34.45	-20.67	51506.46	-20.74		
lambda	I	2034-12-11T06:21:28.397		34.29	-20.45	50026.71	-20.61		
delta	I	2034-12-11T06:22:52.635		34.10	-20.19	48300.35	-20.38		
gamma	I	2034-12-11T06:23:26.039		34.02	-20.09	47621.31	-20.28		
eta	I	2034-12-11T06:23:48.029		33.97	-20.03	47176.12	-20.21		
beta	I	2034-12-11T06:25:02.471		33.80	-19.80	45680.40	-19.97		
alpha	I	2034-12-11T06:25:52.049		33.69	-19.64	44691.54	-19.80		
4	I	2034-12-11T06:27:37.813		33.44	-19.32	42616.53	-19.38		
5	I	2034-12-11T06:28:01.522		33.38	-19.25	42162.17	-19.30		
6	I	2034-12-11T06:28:16.250		33.35	-19.20	41875.57	-19.21		
Uranus	I	2034-12-11T06:46:31.923		30.66	-15.76	25558.97		0.18	0.19
Uranus	E	2034-12-11T06:59:53.929		28.57	-13.18	25342.09		14.56	15.22
6	E	2034-12-11T07:16:44.023		25.79	-9.86	41807.17	19.16		
5	E	2034-12-11T07:17:09.156		25.72	-9.78	42291.61	19.25		
4	E	2034-12-11T07:17:23.907		25.68	-9.73	42556.81	19.33		
alpha	E	2034-12-11T07:19:15.862		25.36	-9.36	44748.42	19.75		
beta	E	2034-12-11T07:20:01.728		25.23	-9.20	45657.79	19.92		
eta	E	2034-12-11T07:21:17.447		25.01	-8.95	47176.12	20.15		
gamma	E	2034-12-11T07:21:39.948		24.95	-8.88	47630.33	20.22		
delta	E	2034-12-11T07:22:13.007		24.86	-8.77	48300.35	20.32		
lambda	E	2034-12-11T07:23:37.506		24.61	-8.48	50026.71	20.54		
epsilon	E	2034-12-11T07:24:14.630		24.51	-8.36	50791.03	20.68		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-11T06:55:24.140
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 3382408516515537920
 2Mass ID (if available) : 06383295+2328208
 ICRS Star Coord at Epoch: 06h 38m 32.94440s +23:28:20.81142s
 RUWE (>1.4 is poor) : 0.91
 K magnitude : 14.957
 G magnitude : 16.428
 RP magnitude : 15.911
 BP magnitude : 16.787
 DUPflag : 0
 Distance (au) : 17.964
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.58
 Sun-Target sep (deg) : 159.97
 Sun-Moon sep (deg) : 164.08
 B (ring opening deg) : 67.39
 PA of pole (deg) : 72.52
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.746
 C/A sky separation (km) : 22742.1
 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	2034-12-11T06:21:56.007		37.28	-32.01	51510.67	-21.06		
lambda	I	2034-12-11T06:23:06.611		37.25	-31.88	50026.71	-20.94		
delta	I	2034-12-11T06:24:29.462		37.22	-31.73	48300.35	-20.73		
gamma	I	2034-12-11T06:25:02.286		37.21	-31.68	47621.26	-20.65		
eta	I	2034-12-11T06:25:23.879		37.20	-31.64	47176.12	-20.59		
beta	I	2034-12-11T06:26:36.922		37.17	-31.50	45680.25	-20.37		
alpha	I	2034-12-11T06:27:25.515		37.15	-31.41	44690.99	-20.22		
4	I	2034-12-11T06:29:08.914		37.10	-31.22	42616.46	-19.84		
5	I	2034-12-11T06:29:32.129		37.09	-31.18	42161.20	-19.77		
6	I	2034-12-11T06:29:46.416		37.08	-31.15	41876.11	-19.70		
Uranus	I	2034-12-11T06:46:33.991		36.45	-29.17	25554.09		-2.16	-2.26
Uranus	E	2034-12-11T07:03:46.948		35.49	-26.93	25285.07		16.44	17.18
6	E	2034-12-11T07:19:11.452		34.38	-24.77	41806.11	19.68		
5	E	2034-12-11T07:19:36.075		34.35	-24.71	42293.60	19.76		
4	E	2034-12-11T07:19:50.281		34.33	-24.68	42555.30	19.83		
alpha	E	2034-12-11T07:21:39.651		34.18	-24.41	44748.93	20.20		
beta	E	2034-12-11T07:22:24.436		34.12	-24.30	45657.16	20.36		
eta	E	2034-12-11T07:23:38.603		34.02	-24.12	47176.12	20.57		
gamma	E	2034-12-11T07:24:00.659		33.98	-24.07	47630.44	20.63		
delta	E	2034-12-11T07:24:33.065		33.94	-23.99	48300.35	20.72		
lambda	E	2034-12-11T07:25:55.988		33.82	-23.78	50026.71	20.92		
epsilon	E	2034-12-11T07:26:32.203		33.77	-23.70	50785.82	21.04		