

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-02T00:05:19.320
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 145339253756105856
 2Mass ID (if available) : 04224314+2127543

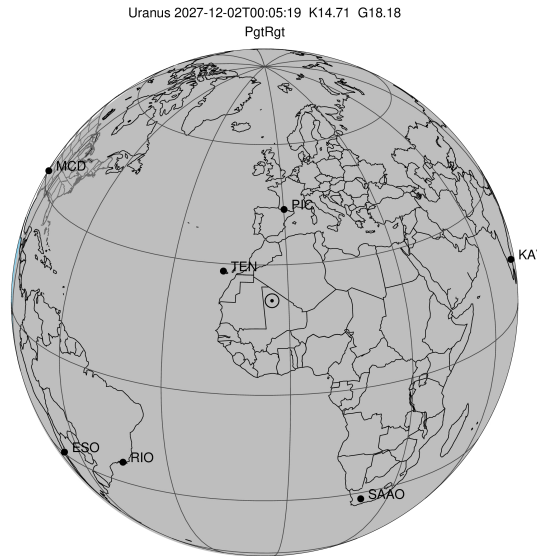
Uranus 2027-12-02T00:05:19 K14.71 G18.18 PgtRgt

ICRS Star Coord at Epoch: 04h 22m 43.14193s +21:27:53.89206s

RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.706
 G magnitude : 18.179
 RP magnitude : 17.194
 BP magnitude : 19.207
 DUPflag : 0
 Distance (au) : 18.377
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.45
 Sun-Target sep (deg) : 178.28
 Sun-Moon sep (deg) : 134.00
 B (ring opening deg) : 77.30
 PA of pole (deg) : -62.27

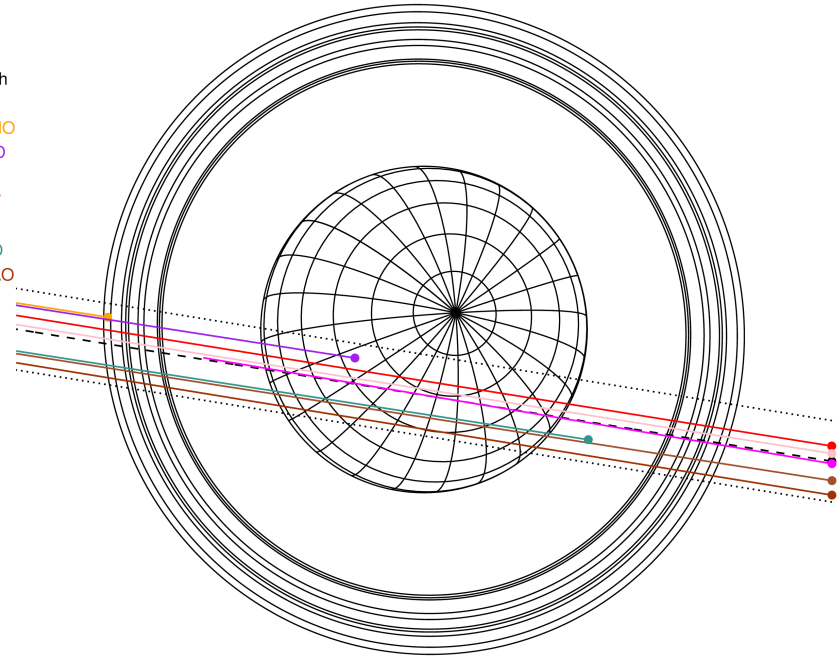
a(km) ring

- 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



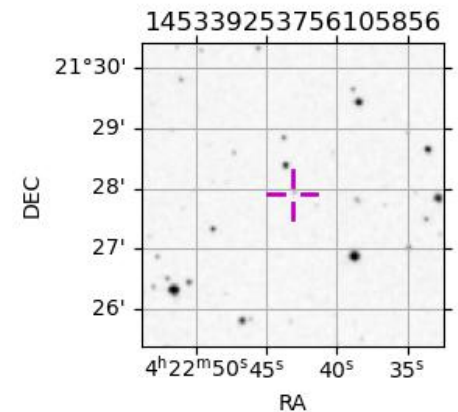
2027-12-02T00:05:19.3200 ra: 04 22 43.1419 s: +21 27 53.892 C/A 0.758° PA 350.80 deg v_sky -23.45 km/s D 18.38 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 KPNO
 MCD
 TEN
 KAV
 RIO
 ESO
 SAAO

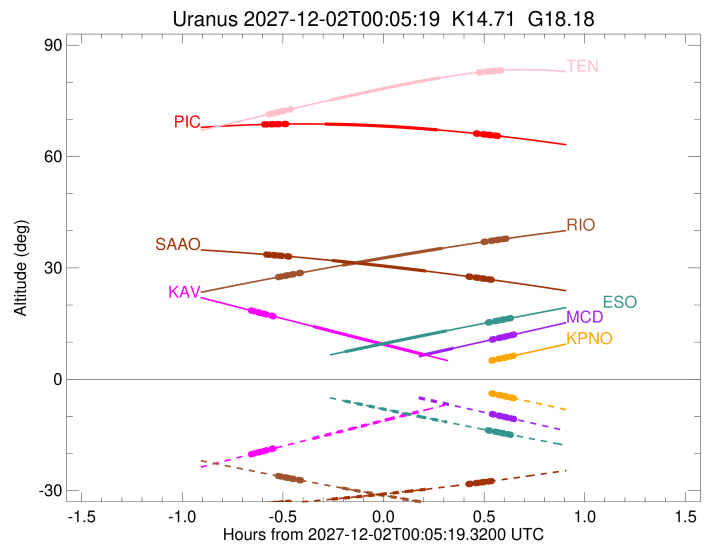
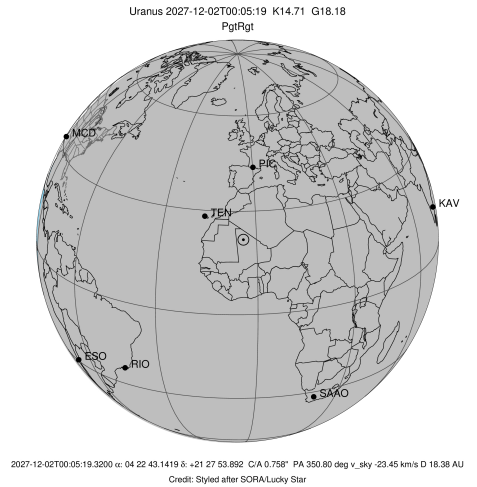


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	DEC 01 23:29 - DEC 02 00:39	PieRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4			+	DEC 02 00:44 - DEC 02 00:44	PnnRne
MCD	McDonald Obs. 2.7m	30.7	256.0		+	+++++	DEC 02 00:26 - DEC 02 00:44	PneRne
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+ +	+++++	DEC 01 23:31 - DEC 02 00:40	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++	+ +		DEC 01 23:25 - DEC 02 00:17	PieRin
RIO	Rio de Janeiro	-22.9	316.8	+++++	+ +	+++++	DEC 01 23:34 - DEC 02 00:41	PieRie
ESO	European Southern Obs	-29.3	289.3		+ +	+++++	DEC 01 23:53 - DEC 02 00:43	PieRne
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++	+ +	+++++	DEC 01 23:30 - DEC 02 00:37	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

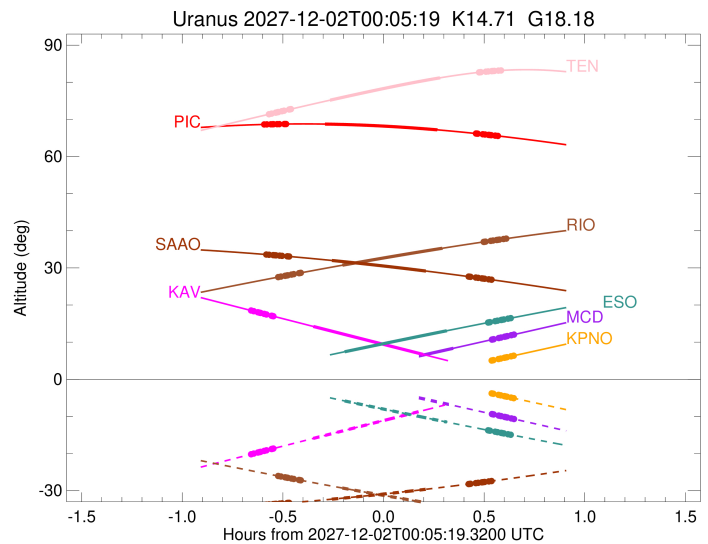
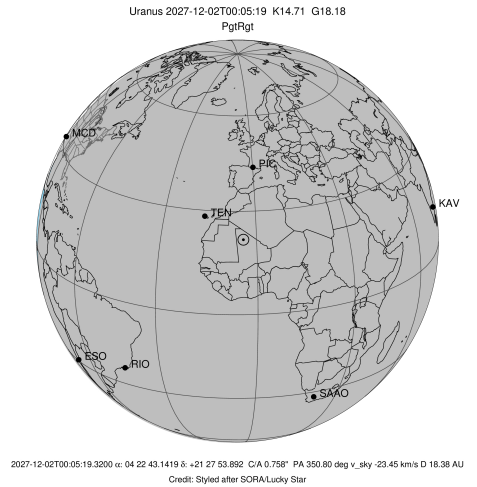


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-02T00:04:43.150
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 145339253756105856
 2Mass ID (if available) : 04224314+2127543
 ICRS Star Coord at Epoch: 04h 22m 43.14193s +21:27:53.89206s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.706
 G magnitude : 18.179
 RP magnitude : 17.194
 BP magnitude : 19.207
 DUPflag : 0
 Distance (au) : 18.377
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.45
 Sun-Target sep (deg) : 178.28
 Sun-Moon sep (deg) : 134.51
 B (ring opening deg) : 77.30
 PA of pole (deg) : -62.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.597
 C/A sky separation (km) : 7950.9
 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



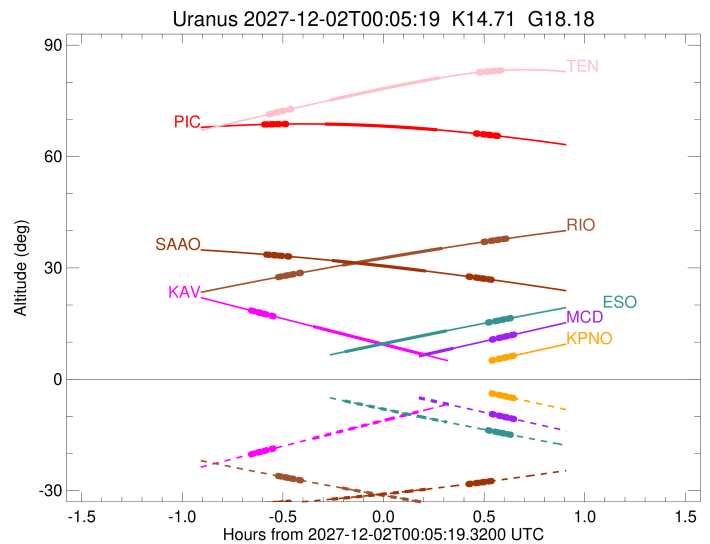
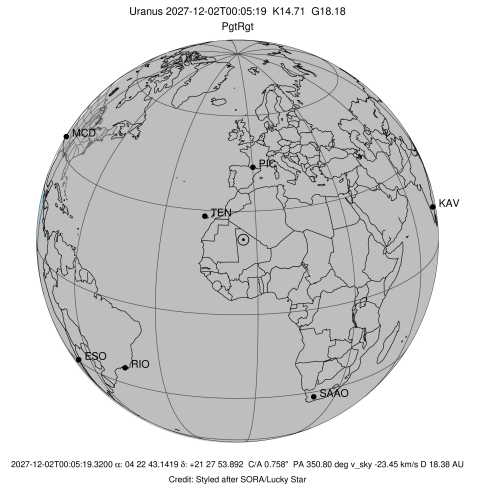
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-12-01T23:29:51.768		68.65	-68.77	51011.37	-23.84		
lambda	I	2027-12-01T23:30:33.040		68.66	-68.80	50026.71	-23.85		
delta	I	2027-12-01T23:31:45.455		68.69	-68.84	48300.35	-23.83		
gamma	I	2027-12-01T23:32:13.547		68.70	-68.86	47631.11	-23.82		
eta	I	2027-12-01T23:32:32.652		68.70	-68.87	47176.12	-23.81		
beta	I	2027-12-01T23:33:36.634		68.72	-68.90	45653.13	-23.79		
alpha	I	2027-12-01T23:34:14.608		68.73	-68.92	44749.79	-23.77		
4	I	2027-12-01T23:35:47.692		68.75	-68.97	42536.43	-23.73		
5	I	2027-12-01T23:36:03.733		68.76	-68.97	42155.09	-23.72		
6	I	2027-12-01T23:36:18.784		68.76	-68.98	41808.68	-23.71		
Uranus	I	2027-12-01T23:47:50.285		68.74	-69.14	25372.36		7.23	7.57
Uranus	E	2027-12-02T00:21:22.021		67.19	-68.05	25055.24		-12.04	-12.60
6	E	2027-12-02T00:32:53.708		66.20	-67.19	41851.90	23.71		
5	E	2027-12-02T00:33:13.506		66.17	-67.16	42311.70	23.71		
4	E	2027-12-02T00:33:26.358		66.15	-67.14	42614.28	23.72		
alpha	E	2027-12-02T00:34:53.802		66.01	-67.01	44693.83	23.77		
beta	E	2027-12-02T00:35:35.010		65.94	-66.95	45675.00	23.78		
eta	E	2027-12-02T00:36:38.098		65.84	-66.86	47176.12	23.81		
gamma	E	2027-12-02T00:36:56.783		65.80	-66.83	47620.98	23.81		
delta	E	2027-12-02T00:37:25.307		65.76	-66.79	48300.35	23.82		
lambda	E	2027-12-02T00:38:37.741		65.63	-66.68	50026.71	23.84		
epsilon	E	2027-12-02T00:39:25.119		65.55	-66.60	51156.77	23.83		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-02T00:08:34.100
 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 : 145339253756105856
 2Mass ID (if available) : 04224314+2127543
 ICRS Star Coord at Epoch: 04h 22m 43.14193s +21:27:53.89206s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.706
 G magnitude : 18.179
 RP magnitude : 17.194
 BP magnitude : 19.207
 DUPflag : 0
 Distance (au) : 18.377
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.45
 Sun-Target sep (deg) : 178.28
 Sun-Moon sep (deg) : 134.43
 B (ring opening deg) : 77.30
 PA of pole (deg) : -62.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.431
 C/A sky separation (km) : 5747.6
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



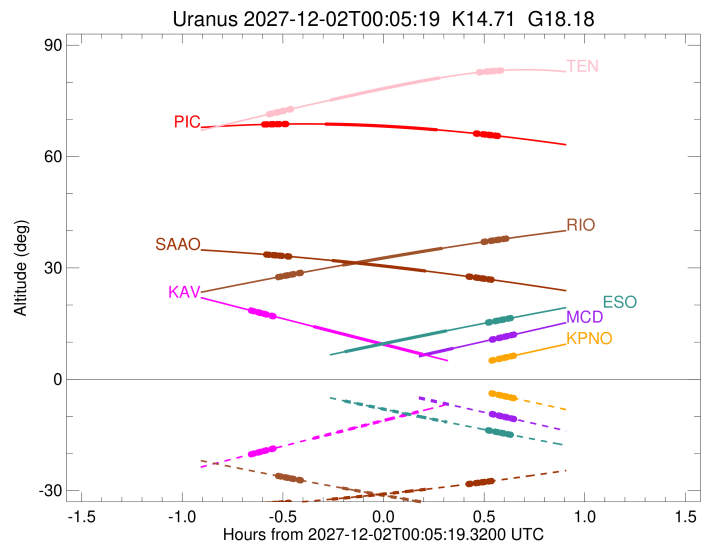
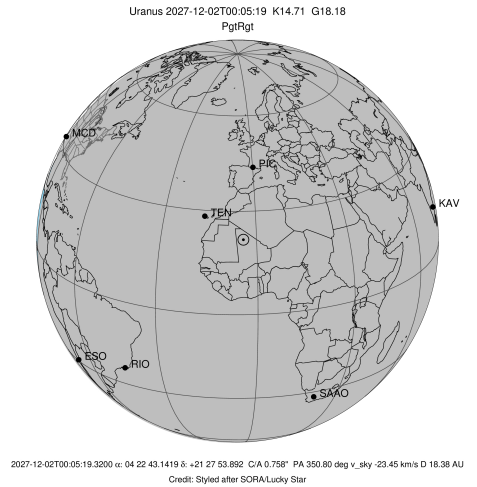
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-12-01T23:32:47.931	-7.29x	8.36x	51029.31	-23.47			
lambda	I	2027-12-01T23:33:30.614	-7.16x	8.23x	50026.71	-23.49			
delta	I	2027-12-01T23:34:44.132	-6.94x	8.01x	48300.35	-23.48			
gamma	I	2027-12-01T23:35:12.637	-6.85x	7.93x	47631.21	-23.47			
eta	I	2027-12-01T23:35:32.027	-6.79x	7.87x	47176.12	-23.47			
beta	I	2027-12-01T23:36:36.966	-6.59x	7.67x	45652.18	-23.46			
alpha	I	2027-12-01T23:37:15.450	-6.48x	7.56x	44749.05	-23.45			
4	I	2027-12-01T23:38:49.791	-6.19x	7.27x	42534.87	-23.43			
5	I	2027-12-01T23:39:05.992	-6.14x	7.22x	42154.85	-23.43			
6	I	2027-12-01T23:39:21.150	-6.09x	7.18x	41810.51	-23.43			
Uranus	I	2027-12-01T23:50:56.451	-3.93x	5.06x	25321.95			8.16	8.55
Uranus	E	2027-12-02T00:26:00.132	2.78x	-1.56x	25087.01			-11.64	-12.18
6	E	2027-12-02T00:37:33.745	5.05	-3.80x	41853.87	23.52			
5	E	2027-12-02T00:37:53.682	5.11	-3.87x	42312.77	23.52			
4	E	2027-12-02T00:38:06.544	5.15	-3.91x	42613.53	23.53			
alpha	E	2027-12-02T00:39:34.737	5.44	-4.20x	44692.78	23.55			
beta	E	2027-12-02T00:40:16.346	5.58	-4.33x	45674.32	23.56			
eta	E	2027-12-02T00:41:20.063	5.79	-4.54x	47176.12	23.58			
gamma	E	2027-12-02T00:41:38.931	5.85	-4.60x	47621.00	23.58			
delta	E	2027-12-02T00:42:07.738	5.95	-4.70x	48300.35	23.59			
lambda	E	2027-12-02T00:43:20.909	6.19	-4.93x	50026.71	23.60			
epsilon	E	2027-12-02T00:44:09.467	6.35	-5.09	51172.91	23.59			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-02T00:08:45.320
 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 : 145339253756105856
 2Mass ID (if available) : 04224314+2127543
 ICRS Star Coord at Epoch: 04h 22m 43.14193s +21:27:53.89206s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.706
 G magnitude : 18.179
 RP magnitude : 17.194
 BP magnitude : 19.207
 DUPflag : 0
 Distance (au) : 18.377
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.45
 Sun-Target sep (deg) : 178.28
 Sun-Moon sep (deg) : 134.52
 B (ring opening deg) : 77.30
 PA of pole (deg) : -62.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.456
 C/A sky separation (km) : 6079.5
 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



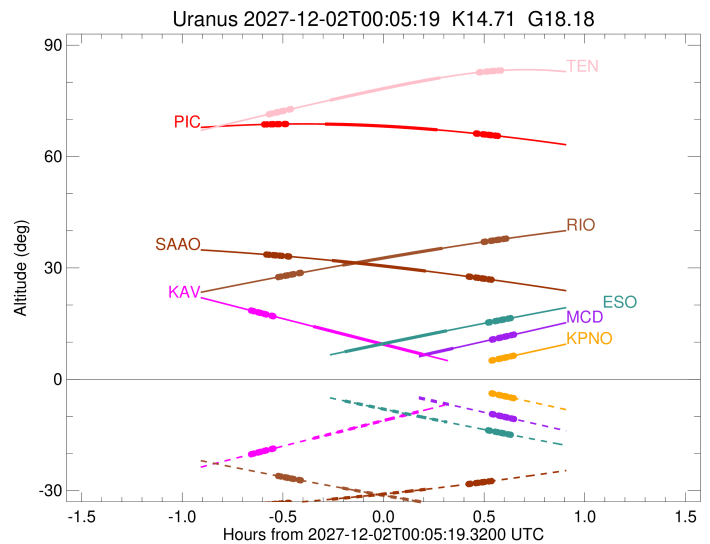
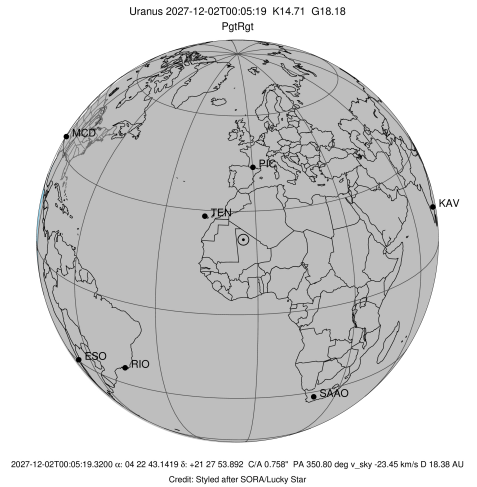
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-12-01T23:33:04.996	-2.18x	3.34x	51027.00	-23.50			
lambda	I	2027-12-01T23:33:47.529	-2.04x	3.21x	50026.71	-23.51			
delta	I	2027-12-01T23:35:00.963	-1.80x	2.97x	48300.35	-23.50			
gamma	I	2027-12-01T23:35:29.436	-1.71x	2.88x	47631.20	-23.50			
eta	I	2027-12-01T23:35:48.804	-1.65x	2.82x	47176.12	-23.49			
beta	I	2027-12-01T23:36:53.669	-1.44x	2.61x	45652.30	-23.48			
alpha	I	2027-12-01T23:37:32.116	-1.31x	2.49x	44749.15	-23.47			
4	I	2027-12-01T23:39:06.364	-1.01x	2.19x	42535.07	-23.45			
5	I	2027-12-01T23:39:22.556	-0.96x	2.14x	42154.87	-23.45			
6	I	2027-12-01T23:39:37.712	-0.91x	2.09x	41810.26	-23.45			
Uranus	I	2027-12-01T23:51:12.969	1.36x	-0.15x	25329.02			8.04	8.41
Uranus	E	2027-12-02T00:26:05.434	8.33	-7.04	25081.44			-11.71	-12.25
6	E	2027-12-02T00:37:38.834	10.69	-9.37	41853.54	23.54			
5	E	2027-12-02T00:37:58.755	10.75	-9.44	42312.60	23.55			
4	E	2027-12-02T00:38:11.620	10.80	-9.48	42613.67	23.55			
alpha	E	2027-12-02T00:39:39.715	11.10	-9.78	44692.96	23.58			
beta	E	2027-12-02T00:40:21.271	11.24	-9.92	45674.44	23.59			
eta	E	2027-12-02T00:41:24.903	11.46	-10.14	47176.12	23.61			
gamma	E	2027-12-02T00:41:43.746	11.52	-10.20	47621.00	23.61			
delta	E	2027-12-02T00:42:12.515	11.62	-10.30	48300.35	23.62			
lambda	E	2027-12-02T00:43:25.587	11.87	-10.54	50026.71	23.63			
epsilon	E	2027-12-02T00:44:13.954	12.04	-10.71	51170.03	23.62			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-02T00:05:55.780
 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 : 145339253756105856
 2Mass ID (if available) : 04224314+2127543
 ICRS Star Coord at Epoch: 04h 22m 43.14193s +21:27:53.89206s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.706
 G magnitude : 18.179
 RP magnitude : 17.194
 BP magnitude : 19.207
 DUPflag : 0
 Distance (au) : 18.377
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.45
 Sun-Target sep (deg) : 178.28
 Sun-Moon sep (deg) : 134.73
 B (ring opening deg) : 77.30
 PA of pole (deg) : -62.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.693
 C/A sky separation (km) : 9242.8
 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



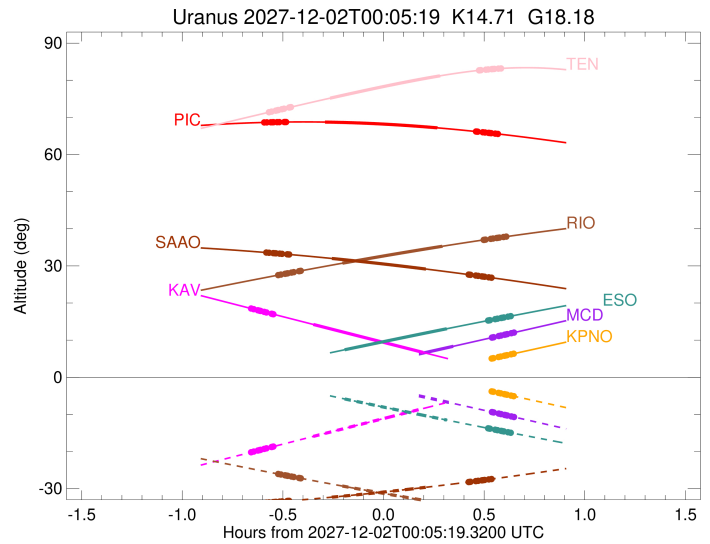
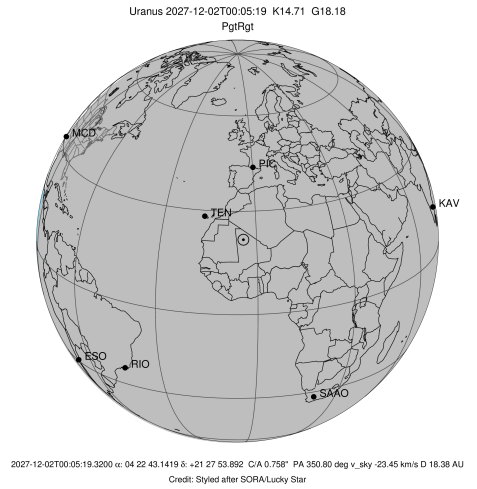
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-12-01T23:31:17.123		71.42	-70.04	51002.31	-23.76		
lambda	I	2027-12-01T23:31:58.134		71.56	-70.19	50026.71	-23.78		
delta	I	2027-12-01T23:33:10.774		71.82	-70.45	48300.35	-23.75		
gamma	I	2027-12-01T23:33:38.962		71.92	-70.55	47631.05	-23.74		
eta	I	2027-12-01T23:33:58.131		71.99	-70.61	47176.12	-23.73		
beta	I	2027-12-01T23:35:02.328		72.21	-70.84	45653.62	-23.70		
alpha	I	2027-12-01T23:35:40.462		72.34	-70.98	44750.14	-23.68		
4	I	2027-12-01T23:37:13.937		72.67	-71.31	42537.29	-23.62		
5	I	2027-12-01T23:37:30.074		72.73	-71.37	42155.32	-23.61		
6	I	2027-12-01T23:37:45.241		72.78	-71.42	41807.76	-23.60		
Uranus	I	2027-12-01T23:49:23.456		75.19	-73.87	25399.15		6.68	7.00
Uranus	E	2027-12-02T00:22:11.554		81.21	-80.28	25038.16		-12.26	-12.82
6	E	2027-12-02T00:33:49.131		82.68	-82.11	41850.54	23.62		
5	E	2027-12-02T00:34:09.010		82.71	-82.16	42310.86	23.63		
4	E	2027-12-02T00:34:21.977		82.73	-82.19	42614.73	23.64		
alpha	E	2027-12-02T00:35:49.712		82.86	-82.38	44694.58	23.70		
beta	E	2027-12-02T00:36:31.015		82.92	-82.47	45675.44	23.72		
eta	E	2027-12-02T00:37:34.238		83.00	-82.60	47176.12	23.75		
gamma	E	2027-12-02T00:37:52.962		83.03	-82.64	47620.97	23.76		
delta	E	2027-12-02T00:38:21.545		83.06	-82.69	48300.35	23.78		
lambda	E	2027-12-02T00:39:34.107		83.14	-82.83	50026.71	23.81		
epsilon	E	2027-12-02T00:40:21.079		83.19	-82.92	51145.45	23.79		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-02T00:00:54.710
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 145339253756105856
 2Mass ID (if available) : 04224314+2127543
 ICRS Star Coord at Epoch: 04h 22m 43.14193s +21:27:53.89206s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.706
 G magnitude : 18.179
 RP magnitude : 17.194
 BP magnitude : 19.207
 DUPflag : 0
 Distance (au) : 18.377
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.45
 Sun-Target sep (deg) : 178.28
 Sun-Moon sep (deg) : 133.49
 B (ring opening deg) : 77.30
 PA of pole (deg) : -62.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.759
 C/A sky separation (km) : 10119.5
 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



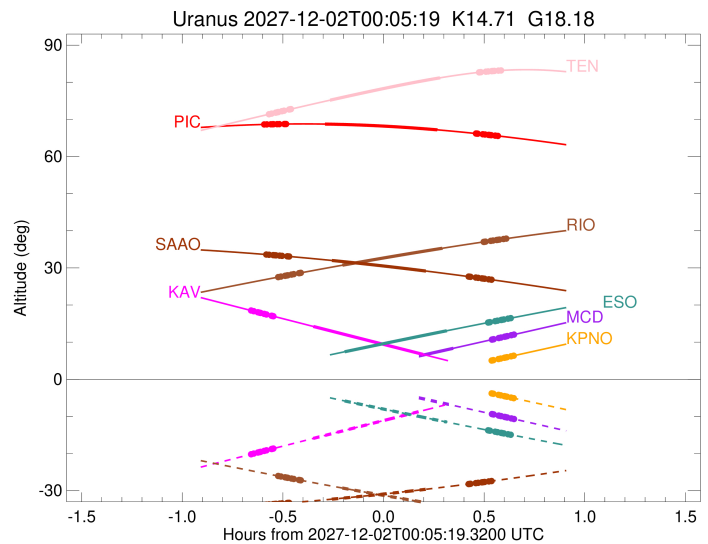
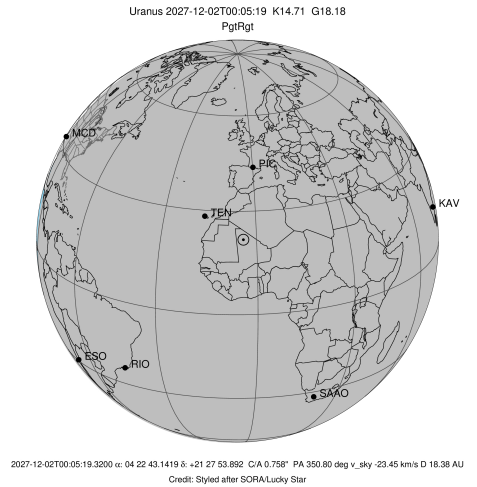
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-12-01T23:25:58.004		18.49	-20.18	50991.77	-23.44		
lambda	I	2027-12-01T23:26:39.126		18.33	-20.02	50026.71	-23.46		
delta	I	2027-12-01T23:27:52.783		18.05	-19.73	48300.35	-23.42		
gamma	I	2027-12-01T23:28:21.377		17.94	-19.62	47630.98	-23.40		
eta	I	2027-12-01T23:28:40.819		17.86	-19.55	47176.12	-23.39		
beta	I	2027-12-01T23:29:45.935		17.61	-19.30	45654.19	-23.35		
alpha	I	2027-12-01T23:30:24.653		17.46	-19.15	44750.50	-23.32		
4	I	2027-12-01T23:31:59.554		17.10	-18.79	42538.26	-23.25		
5	I	2027-12-01T23:32:15.969		17.03	-18.72	42155.64	-23.23		
6	I	2027-12-01T23:32:31.426		16.97	-18.66	41806.79	-23.22		
Uranus	I	2027-12-01T23:44:24.133		14.23	-15.93	25422.65		6.16	6.45
Uranus	E	2027-12-02T00:17:08.447		6.70	-8.42	25030.98		-12.34	-12.91
6	E	2027-12-02T00:29:03.380		3.97x	-5.71	41850.06	23.11		
5	E	2027-12-02T00:29:23.693		3.89x	-5.63	42310.56	23.12		
4	E	2027-12-02T00:29:36.965		3.84x	-5.58	42614.87	23.14		
alpha	E	2027-12-02T00:31:06.587		3.50x	-5.24	44694.83	23.21		
beta	E	2027-12-02T00:31:48.760		3.34x	-5.08	45675.58	23.23		
eta	E	2027-12-02T00:32:53.306		3.10x	-4.84x	47176.12	23.27		
gamma	E	2027-12-02T00:33:12.423		3.02x	-4.77x	47620.96	23.28		
delta	E	2027-12-02T00:33:41.602		2.91x	-4.65x	48300.35	23.29		
lambda	E	2027-12-02T00:34:55.668		2.63x	-4.37x	50026.71	23.33		
epsilon	E	2027-12-02T00:35:43.476		2.45x	-4.19x	51142.36	23.31		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-02T00:08:10.500
 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 : 145339253756105856
 2Mass ID (if available) : 04224314+2127543
 ICRS Star Coord at Epoch: 04h 22m 43.14193s +21:27:53.89206s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.706
 G magnitude : 18.179
 RP magnitude : 17.194
 BP magnitude : 19.207
 DUPflag : 0
 Distance (au) : 18.377
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.45
 Sun-Target sep (deg) : 178.28
 Sun-Moon sep (deg) : 134.78
 B (ring opening deg) : 77.30
 PA of pole (deg) : -62.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.019
 C/A sky separation (km) : 13584.8
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



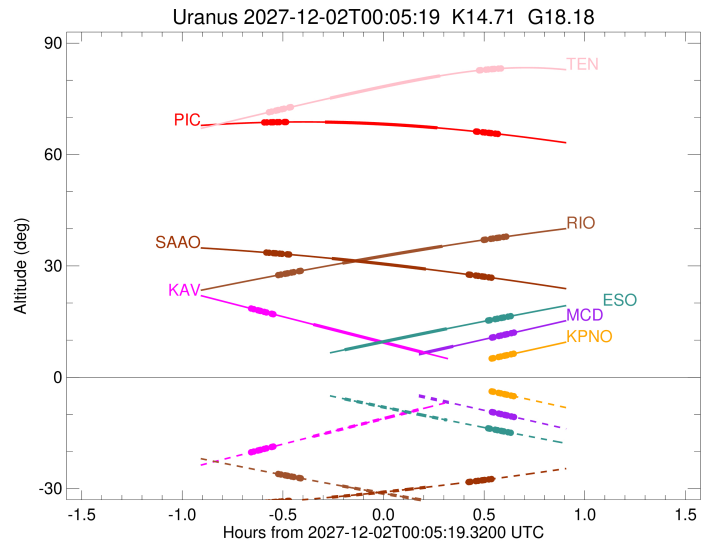
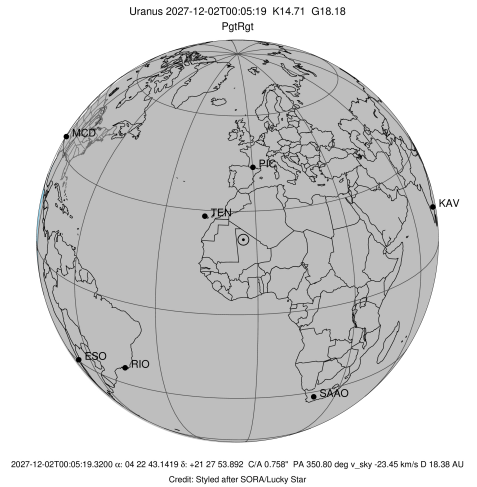
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-12-01T23:34:03.991		27.55	-26.08	50970.37	-23.18		
lambda	I	2027-12-01T23:34:44.655		27.66	-26.20	50026.71	-23.19		
delta	I	2027-12-01T23:35:59.207		27.87	-26.41	48300.35	-23.12		
gamma	I	2027-12-01T23:36:28.181		27.96	-26.50	47630.82	-23.09		
eta	I	2027-12-01T23:36:47.879		28.01	-26.55	47176.12	-23.07		
beta	I	2027-12-01T23:37:53.871		28.20	-26.74	45655.47	-23.01		
alpha	I	2027-12-01T23:38:33.220		28.31	-26.86	44751.20	-22.96		
4	I	2027-12-01T23:40:09.678		28.59	-27.13	42540.62	-22.83		
5	I	2027-12-01T23:40:26.441		28.63	-27.18	42156.70	-22.81		
6	I	2027-12-01T23:40:42.305		28.68	-27.22	41804.66	-22.78		
Uranus	I	2027-12-01T23:53:03.301		30.72	-29.30	25483.91		4.56	4.78
Uranus	E	2027-12-02T00:22:53.084		35.29	-33.96	25003.86		-12.67	-13.25
6	E	2027-12-02T00:35:11.376		37.00	-35.72	41845.97	22.84		
5	E	2027-12-02T00:35:31.916		37.05	-35.76	42307.52	22.87		
4	E	2027-12-02T00:35:45.551		37.08	-35.79	42615.86	22.90		
alpha	E	2027-12-02T00:37:16.065		37.28	-36.00	44697.20	23.02		
beta	E	2027-12-02T00:37:58.487		37.37	-36.10	45676.80	23.07		
eta	E	2027-12-02T00:39:03.375		37.51	-36.25	47176.12	23.14		
gamma	E	2027-12-02T00:39:22.587		37.56	-36.29	47620.96	23.16		
delta	E	2027-12-02T00:39:51.898		37.62	-36.36	48300.35	23.19		
lambda	E	2027-12-02T00:41:06.215		37.78	-36.52	50026.71	23.26		
epsilon	E	2027-12-02T00:41:52.685		37.88	-36.62	51108.74	23.25		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-02T00:09:11.560
 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 : 145339253756105856
 2Mass ID (if available) : 04224314+2127543
 ICRS Star Coord at Epoch: 04h 22m 43.14193s +21:27:53.89206s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.706
 G magnitude : 18.179
 RP magnitude : 17.194
 BP magnitude : 19.207
 DUPflag : 0
 Distance (au) : 18.377
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.45
 Sun-Target sep (deg) : 178.28
 Sun-Moon sep (deg) : 134.68
 B (ring opening deg) : 77.30
 PA of pole (deg) : -62.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.984
 C/A sky separation (km) : 13111.4
 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	2027-12-01T23:34:44.757		3.75x	-2.17x	50974.05	-23.06		
lambda	I	2027-12-01T23:35:25.781		3.88x	-2.30x	50026.71	-23.08		
delta	I	2027-12-01T23:36:40.689		4.13x	-2.55x	48300.35	-23.02		
gamma	I	2027-12-01T23:37:09.795		4.22x	-2.64x	47630.85	-22.99		
eta	I	2027-12-01T23:37:29.583		4.28x	-2.71x	47176.12	-22.97		
beta	I	2027-12-01T23:38:35.872		4.50x	-2.92x	45655.25	-22.91		
alpha	I	2027-12-01T23:39:15.378		4.63x	-3.05x	44751.09	-22.86		
4	I	2027-12-01T23:40:52.219		4.94x	-3.36x	42540.21	-22.75		
5	I	2027-12-01T23:41:09.036		4.99x	-3.42x	42156.49	-22.73		
6	I	2027-12-01T23:41:24.936		5.04	-3.47x	41805.00	-22.70		
Uranus	I	2027-12-01T23:53:45.875		7.41	-5.84	25475.19		4.82	5.05
Uranus	E	2027-12-02T00:24:13.024		13.08	-11.53	25005.61		-12.65	-13.23
6	E	2027-12-02T00:36:30.736		15.28	-13.75	41846.44	22.79		
5	E	2027-12-02T00:36:51.329		15.34	-13.81	42307.90	22.81		
4	E	2027-12-02T00:37:04.972		15.38	-13.85	42615.77	22.84		
alpha	E	2027-12-02T00:38:35.726		15.65	-14.12	44696.93	22.96		
beta	E	2027-12-02T00:39:18.282		15.78	-14.25	45676.67	23.00		
eta	E	2027-12-02T00:40:23.380		15.97	-14.44	47176.12	23.07		
gamma	E	2027-12-02T00:40:42.655		16.02	-14.50	47620.96	23.09		
delta	E	2027-12-02T00:41:12.065		16.11	-14.59	48300.35	23.12		
lambda	E	2027-12-02T00:42:26.642		16.33	-14.80	50026.71	23.18		
epsilon	E	2027-12-02T00:43:13.435		16.46	-14.94	51112.33	23.17		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-02T00:04:11.690
 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 : 145339253756105856
 2Mass ID (if available) : 04224314+2127543
 ICRS Star Coord at Epoch: 04h 22m 43.14193s +21:27:53.89206s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.706
 G magnitude : 18.179
 RP magnitude : 17.194
 BP magnitude : 19.207
 DUPflag : 0
 Distance (au) : 18.377
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.45
 Sun-Target sep (deg) : 178.28
 Sun-Moon sep (deg) : 134.18
 B (ring opening deg) : 77.30
 PA of pole (deg) : -62.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.156
 C/A sky separation (km) : 15410.1
 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	2027-12-01T23:30:31.865		33.59	-33.75	50954.57	-23.00		
lambda	I	2027-12-01T23:31:12.161		33.54	-33.71	50026.71	-23.00		
delta	I	2027-12-01T23:32:27.356		33.45	-33.62	48300.35	-22.91		
gamma	I	2027-12-01T23:32:56.607		33.41	-33.59	47630.68	-22.87		
eta	I	2027-12-01T23:33:16.491		33.38	-33.57	47176.12	-22.85		
beta	I	2027-12-01T23:34:23.131		33.30	-33.49	45656.41	-22.76		
alpha	I	2027-12-01T23:35:02.955		33.25	-33.44	44751.61	-22.69		
4	I	2027-12-01T23:36:40.584		33.12	-33.33	42542.40	-22.53		
5	I	2027-12-01T23:36:57.607		33.10	-33.31	42157.72	-22.49		
6	I	2027-12-01T23:37:13.782		33.08	-33.29	41803.25	-22.46		
Uranus	I	2027-12-01T23:49:57.607		32.00	-32.30	25515.84		3.45	3.62
Uranus	E	2027-12-02T00:17:58.859		29.15	-29.64	25001.83		-12.70	-13.28
6	E	2027-12-02T00:30:42.005		27.66	-28.23	41844.27	22.42		
5	E	2027-12-02T00:31:02.912		27.62	-28.19	42306.08	22.46		
4	E	2027-12-02T00:31:16.886		27.59	-28.16	42616.14	22.49		
alpha	E	2027-12-02T00:32:48.988		27.41	-27.98	44698.20	22.65		
beta	E	2027-12-02T00:33:32.060		27.32	-27.90	45677.24	22.72		
eta	E	2027-12-02T00:34:37.918		27.18	-27.77	47176.12	22.81		
gamma	E	2027-12-02T00:34:57.413		27.14	-27.73	47620.97	22.83		
delta	E	2027-12-02T00:35:27.143		27.08	-27.67	48300.35	22.87		
lambda	E	2027-12-02T00:36:42.479		26.92	-27.52	50026.71	22.96		
epsilon	E	2027-12-02T00:37:29.009		26.83	-27.43	51096.18	22.95		