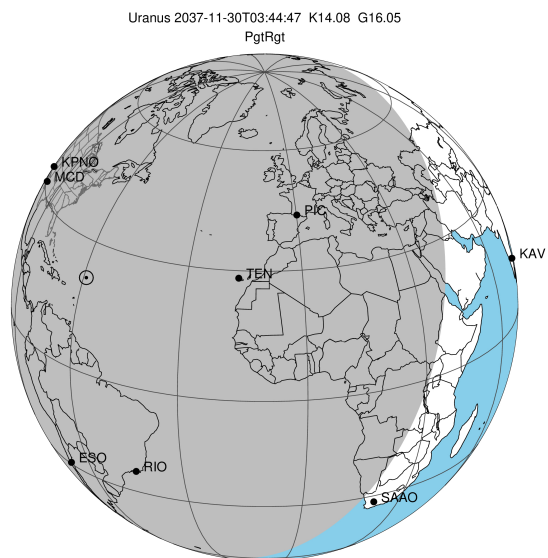


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-11-30T03:44:47.730
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 865439041177109632
 2Mass ID (if available) : 07403963+2154570

ICRS Star Coord at Epoch: 07h 40m 39.63600s +21:54:56.91516s

RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.082
 G magnitude : 16.048
 RP magnitude : 15.448
 BP magnitude : 16.470
 DUPflag : 0
 Distance (au) : 18.006
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.37
 Sun-Target sep (deg) : 134.51
 Sun-Moon sep (deg) : 43.31
 B (ring opening deg) : 53.58
 PA of pole (deg) : 85.98

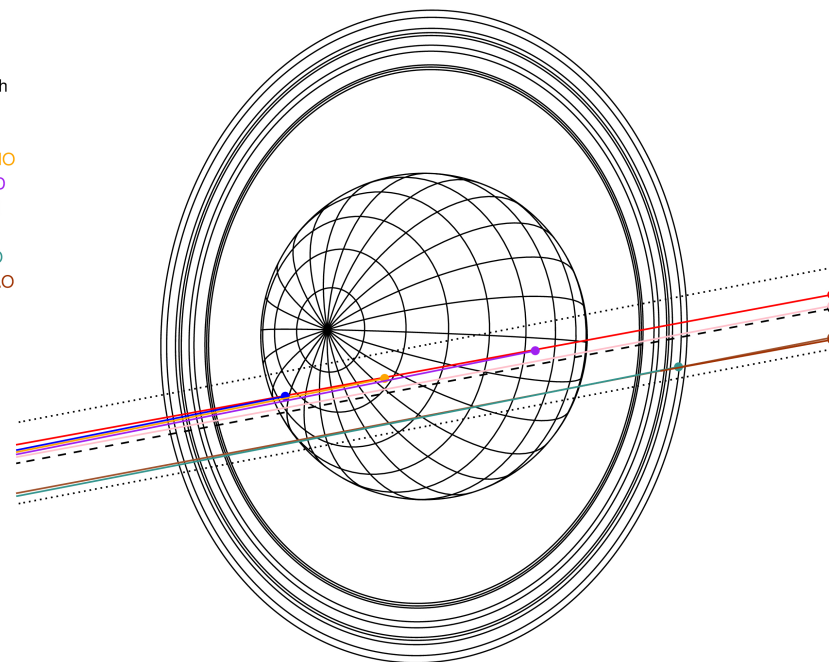
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2037-11-30T03:44:47.7300 α: 07 40 39.6360 δ: +21 54 56.915 C/A 0.571° PA 10.75 deg v_sky -14.37 km/s D 18.01 AU
 Credit: Styled after SORA/Lucky Star

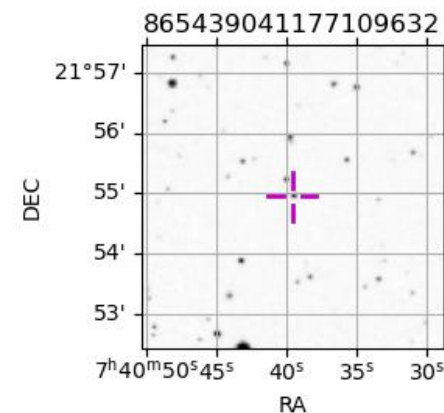
Uranus 2037-11-30T03:44:47 K14.08 G16.05 PgtRgt

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 RIO
 ESO
 SAAO

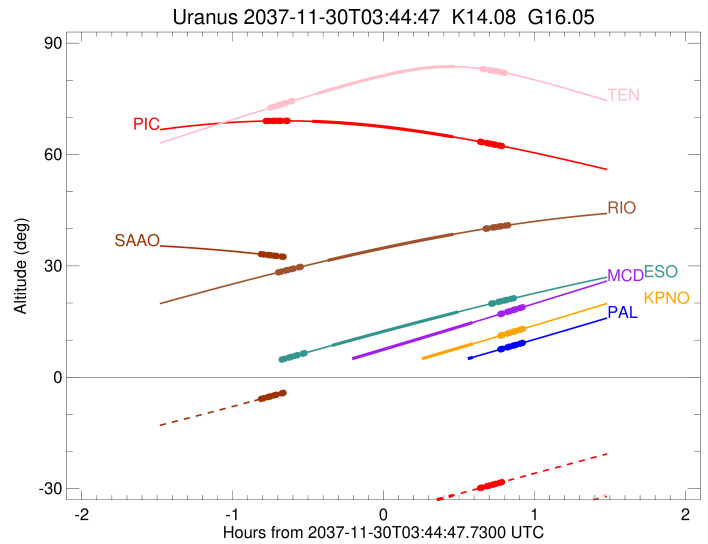
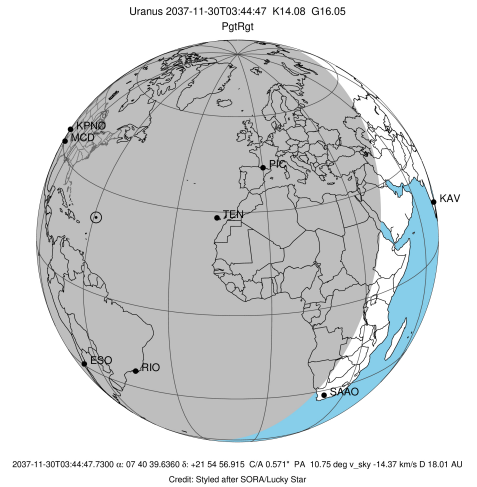


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	NOV 30 02:57 - NOV 30 04:31	PieRie
PAL	Palomar Mt (200")	33.4	243.1		+	+++++	NOV 30 04:20 - NOV 30 04:39	PneRne
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4		+	+++++	NOV 30 04:20 - NOV 30 04:39	PneRne
MCD	McDonald Obs. 2.7m	30.7	256.0		+	+++++	NOV 30 04:20 - NOV 30 04:39	PneRne
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+ +	+++++	NOV 30 02:59 - NOV 30 04:32	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	+++++	+ +	+++++	NOV 30 03:02 - NOV 30 04:33	PieRie
ESO	European Southern Obs	-29.3	289.3	+++++	+ +	+++++	NOV 30 03:07 - NOV 30 04:36	PieRie
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++			NOV 30 02:55 - NOV 30 02:59	PnnRin
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

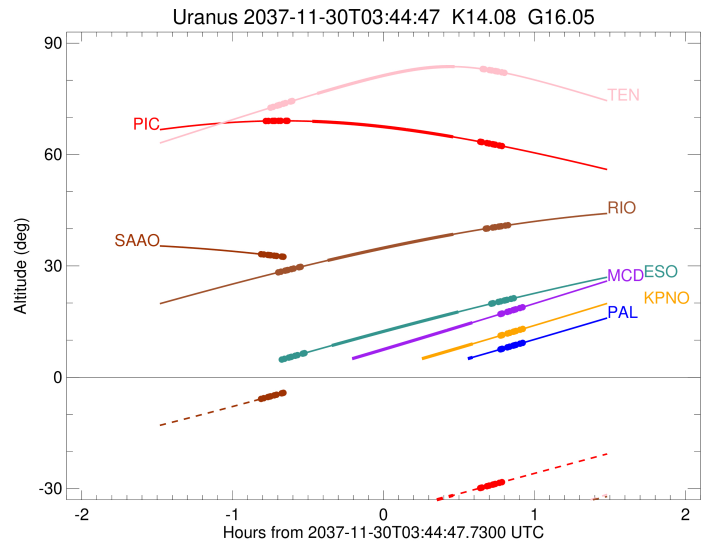
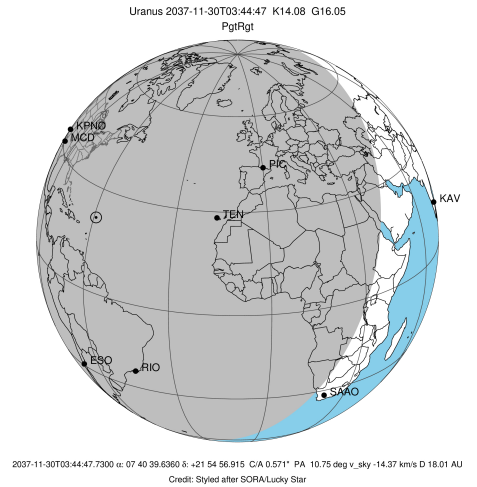


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-11-30T03:44:25.310
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 865439041177109632
 2Mass ID (if available) : 07403963+2154570
 ICRS Star Coord at Epoch: 07h 40m 39.63600s +21:54:56.91516s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.082
 G magnitude : 16.048
 RP magnitude : 15.448
 BP magnitude : 16.470
 DUPflag : 0
 Distance (au) : 18.006
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.37
 Sun-Target sep (deg) : 134.51
 Sun-Moon sep (deg) : 43.87
 B (ring opening deg) : 53.58
 PA of pole (deg) : 85.98
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.398
 C/A sky separation (km) : 5196.5
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



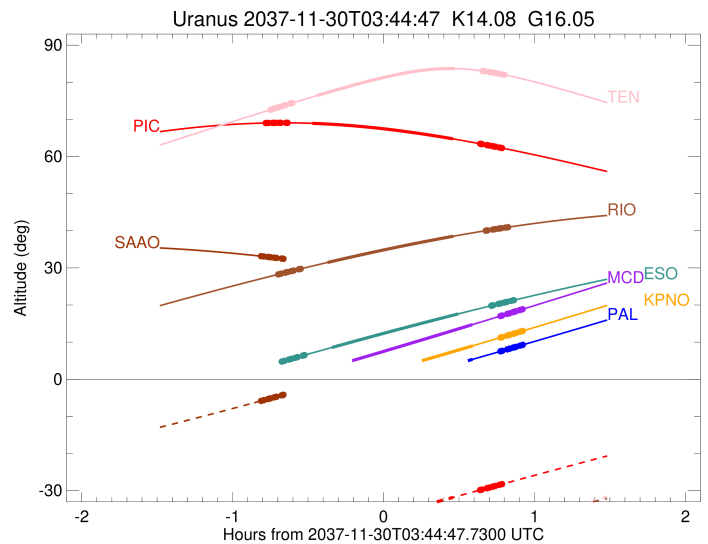
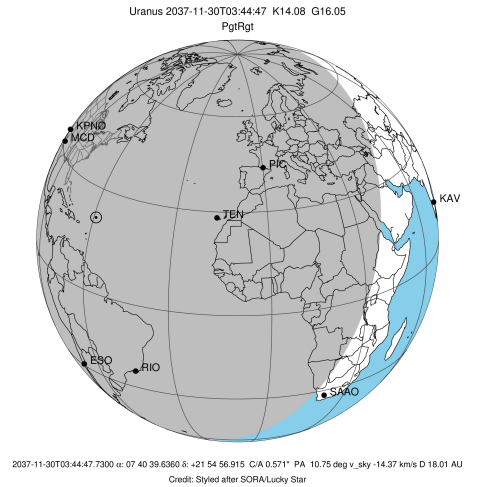
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2037-11-30T02:57:44.327		69.03	-45.42	51438.04	-17.95		
lambda	I	2037-11-30T02:59:02.938		69.04	-45.19	50026.71	-17.95		
delta	I	2037-11-30T03:00:39.130		69.06	-44.90	48300.35	-17.94		
gamma	I	2037-11-30T03:01:16.574		69.07	-44.79	47628.55	-17.94		
eta	I	2037-11-30T03:01:41.795		69.07	-44.72	47176.12	-17.94		
beta	I	2037-11-30T03:03:06.432		69.08	-44.46	45658.43	-17.93		
alpha	I	2037-11-30T03:03:57.711		69.08	-44.31	44747.12	-17.93		
4	I	2037-11-30T03:05:56.400		69.08	-43.95	42614.36	-17.91		
5	I	2037-11-30T03:06:21.690		69.08	-43.88	42169.46	-17.91		
6	I	2037-11-30T03:06:39.457		69.08	-43.82	41808.34	-17.89		
Uranus	I	2037-11-30T03:16:28.811		68.94	-42.05	25181.85		-36.38	-37.65
Uranus	E	2037-11-30T04:12:27.102		64.76	-31.81	25253.91		32.16	33.36
6	E	2037-11-30T04:23:15.637		63.43	-29.83	41857.55	17.89		
5	E	2037-11-30T04:23:39.096		63.38	-29.76	42309.84	17.91		
4	E	2037-11-30T04:23:51.809		63.36	-29.72	42532.77	17.91		
alpha	E	2037-11-30T04:25:51.453		63.10	-29.36	44686.49	17.92		
beta	E	2037-11-30T04:26:46.148		62.98	-29.19	45659.28	17.93		
eta	E	2037-11-30T04:28:10.792		62.79	-28.93	47176.12	17.93		
gamma	E	2037-11-30T04:28:35.825		62.74	-28.86	47625.08	17.94		
delta	E	2037-11-30T04:29:13.471		62.65	-28.74	48300.35	17.94		
lambda	E	2037-11-30T04:30:49.688		62.44	-28.45	50026.71	17.95		
epsilon	E	2037-11-30T04:31:33.162		62.34	-28.31	50806.96	17.94		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-11-30T03:51:25.140
 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 : 865439041177109632
 2Mass ID (if available) : 07403963+2154570
 ICRS Star Coord at Epoch: 07h 40m 39.63600s +21:54:56.91516s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.082
 G magnitude : 16.048
 RP magnitude : 15.448
 BP magnitude : 16.470
 DUPflag : 0
 Distance (au) : 18.006
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.37
 Sun-Target sep (deg) : 134.51
 Sun-Moon sep (deg) : 43.90
 B (ring opening deg) : 53.58
 PA of pole (deg) : 85.98
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.375
 C/A sky separation (km) : 4892.0
 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



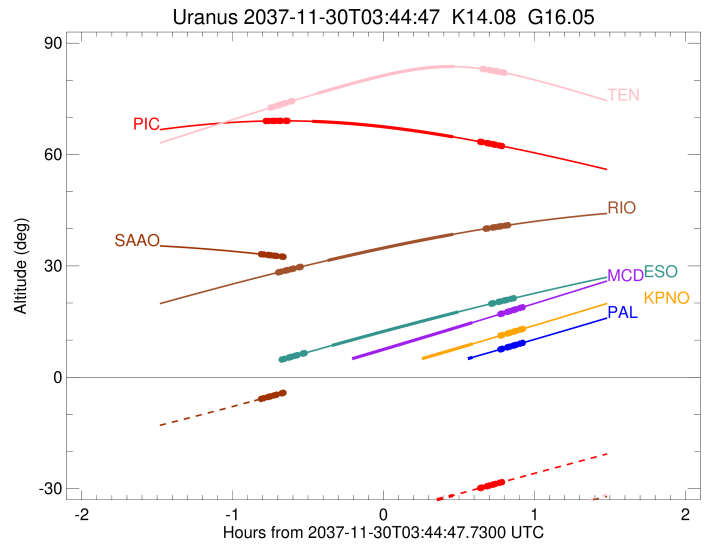
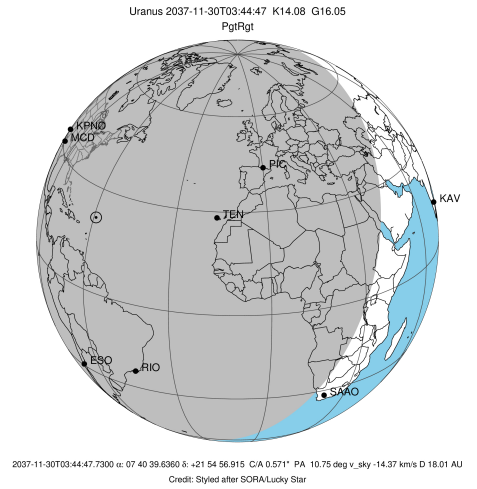
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2037-11-30T03:03:11.018	-8.89x	-29.40	51443.47	-17.34			
lambda	I	2037-11-30T03:04:32.677	-8.66x	-29.68	50026.71	-17.35			
delta	I	2037-11-30T03:06:12.196	-8.36x	-30.03	48300.35	-17.35			
gamma	I	2037-11-30T03:06:50.934	-8.25x	-30.16	47628.45	-17.34			
eta	I	2037-11-30T03:07:17.015	-8.17x	-30.25	47176.12	-17.34			
beta	I	2037-11-30T03:08:44.527	-7.92x	-30.55	45658.82	-17.34			
alpha	I	2037-11-30T03:09:37.553	-7.76x	-30.74	44747.48	-17.34			
4	I	2037-11-30T03:11:40.265	-7.40x	-31.16	42614.07	-17.33			
5	I	2037-11-30T03:12:06.427	-7.32x	-31.25	42168.53	-17.33			
6	I	2037-11-30T03:12:24.741	-7.27x	-31.31	41808.98	-17.31			
Uranus	I	2037-11-30T03:22:34.316	-5.45x	-33.43	25183.11	-36.31		-37.57	
Uranus	E	2037-11-30T04:20:14.498	5.37	-45.48	25255.30	32.08		33.28	
6	E	2037-11-30T04:31:19.026	7.53	-47.79	41857.31	17.50			
5	E	2037-11-30T04:31:43.055	7.61	-47.88	42310.04	17.52			
4	E	2037-11-30T04:31:56.046	7.65	-47.92	42532.93	17.52			
alpha	E	2037-11-30T04:33:58.331	8.05	-48.35	44686.41	17.54			
beta	E	2037-11-30T04:34:54.227	8.23	-48.54	45659.14	17.54			
eta	E	2037-11-30T04:36:20.734	8.52	-48.84	47176.12	17.55			
gamma	E	2037-11-30T04:36:46.315	8.60	-48.93	47625.12	17.55			
delta	E	2037-11-30T04:37:24.777	8.73	-49.06	48300.35	17.56			
lambda	E	2037-11-30T04:39:03.069	9.05	-49.41	50026.71	17.57			
epsilon	E	2037-11-30T04:39:47.375	9.19	-49.56	50805.23	17.57			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-11-30T03:51:34.090
 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 : 865439041177109632
 2Mass ID (if available) : 07403963+2154570
 ICRS Star Coord at Epoch: 07h 40m 39.63600s +21:54:56.91516s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.082
 G magnitude : 16.048
 RP magnitude : 15.448
 BP magnitude : 16.470
 DUPflag : 0
 Distance (au) : 18.006
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.37
 Sun-Target sep (deg) : 134.51
 Sun-Moon sep (deg) : 43.96
 B (ring opening deg) : 53.58
 PA of pole (deg) : 85.98
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.399
 C/A sky separation (km) : 5217.0
 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



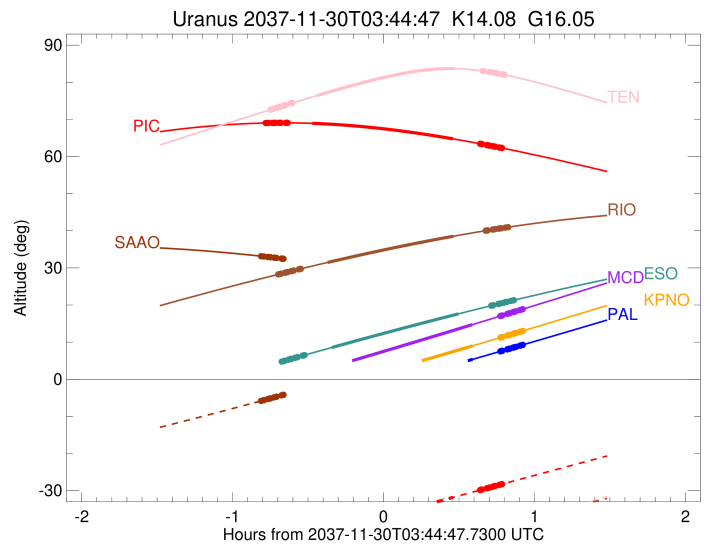
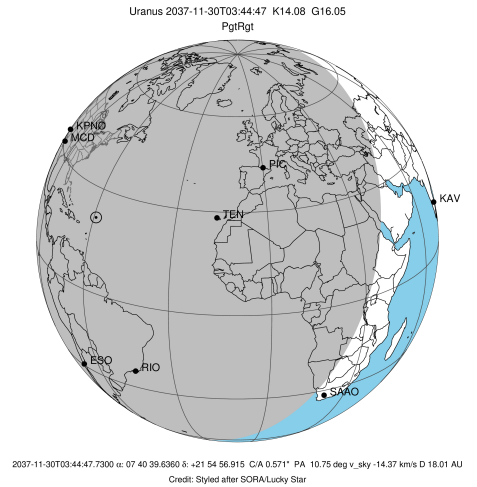
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2037-11-30T03:03:30.731	-5.79x	-33.70	51441.65	-17.37			
lambda	I	2037-11-30T03:04:52.159	-5.54x	-33.99	50026.71	-17.38			
delta	I	2037-11-30T03:06:31.528	-5.24x	-34.34	48300.35	-17.37			
gamma	I	2037-11-30T03:07:10.206	-5.12x	-34.48	47628.49	-17.37			
eta	I	2037-11-30T03:07:36.251	-5.04x	-34.57	47176.12	-17.37			
beta	I	2037-11-30T03:09:03.645	-4.77x	-34.88	45658.68	-17.36			
alpha	I	2037-11-30T03:09:56.595	-4.60x	-35.06	44747.34	-17.36			
4	I	2037-11-30T03:11:59.137	-4.22x	-35.49	42614.19	-17.35			
5	I	2037-11-30T03:12:25.256	-4.14x	-35.59	42168.88	-17.35			
6	I	2037-11-30T03:12:43.566	-4.09x	-35.65	41808.72	-17.33			
Uranus	I	2037-11-30T03:22:52.024	-2.18x	-37.80	25182.46			-36.34	-37.61
Uranus	E	2037-11-30T04:20:14.929	9.00	-49.98	25259.19			31.84	33.04
6	E	2037-11-30T04:31:21.865	11.24	-52.34	41857.01	17.52			
5	E	2037-11-30T04:31:45.908	11.32	-52.42	42310.25	17.54			
4	E	2037-11-30T04:31:58.871	11.36	-52.47	42533.11	17.54			
alpha	E	2037-11-30T04:34:00.940	11.77	-52.90	44686.34	17.56			
beta	E	2037-11-30T04:34:56.738	11.96	-53.09	45659.00	17.57			
eta	E	2037-11-30T04:36:23.107	12.25	-53.40	47176.12	17.58			
gamma	E	2037-11-30T04:36:48.645	12.34	-53.49	47625.15	17.58			
delta	E	2037-11-30T04:37:27.037	12.47	-53.62	48300.35	17.59			
lambda	E	2037-11-30T04:39:05.153	12.80	-53.97	50026.71	17.60			
epsilon	E	2037-11-30T04:39:49.302	12.95	-54.12	50803.89	17.60			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-11-30T03:51:39.380
 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 : 865439041177109632
 2Mass ID (if available) : 07403963+2154570
 ICRS Star Coord at Epoch: 07h 40m 39.63600s +21:54:56.91516s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.082
 G magnitude : 16.048
 RP magnitude : 15.448
 BP magnitude : 16.470
 DUPflag : 0
 Distance (au) : 18.006
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.37
 Sun-Target sep (deg) : 134.51
 Sun-Moon sep (deg) : 44.03
 B (ring opening deg) : 53.58
 PA of pole (deg) : 85.98
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.430
 C/A sky separation (km) : 5616.9
 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	2037-11-30T03:03:51.390	-0.61x	-40.13	51439.32	-17.41			
lambda	I	2037-11-30T03:05:12.473	-0.35x	-40.42	50026.71	-17.42			
delta	I	2037-11-30T03:06:51.590	-0.03x	-40.77	48300.35	-17.42			
gamma	I	2037-11-30T03:07:30.169	0.10x	-40.91	47628.53	-17.41			
eta	I	2037-11-30T03:07:56.151	0.18x	-41.00	47176.12	-17.41			
beta	I	2037-11-30T03:09:23.340	0.47x	-41.32	45658.49	-17.40			
alpha	I	2037-11-30T03:10:16.163	0.64x	-41.51	44747.18	-17.40			
4	I	2037-11-30T03:12:18.415	1.04x	-41.94	42614.32	-17.39			
5	I	2037-11-30T03:12:44.465	1.12x	-42.04	42169.34	-17.39			
6	I	2037-11-30T03:13:02.758	1.18x	-42.10	41808.41	-17.37			
Uranus	I	2037-11-30T03:23:09.605	3.18x	-44.28	25181.82	-36.38		-37.65	
Uranus	E	2037-11-30T04:20:08.336	14.72	-56.53	25264.00	31.55		32.74	
6	E	2037-11-30T04:31:17.956	17.04	-58.91	41856.66	17.56			
5	E	2037-11-30T04:31:42.003	17.12	-59.00	42310.51	17.59			
4	E	2037-11-30T04:31:54.926	17.16	-59.05	42533.34	17.59			
alpha	E	2037-11-30T04:33:56.672	17.59	-59.48	44686.24	17.61			
beta	E	2037-11-30T04:34:52.323	17.78	-59.68	45658.83	17.61			
eta	E	2037-11-30T04:36:18.480	18.08	-59.98	47176.12	17.63			
gamma	E	2037-11-30T04:36:43.953	18.17	-60.07	47625.20	17.63			
delta	E	2037-11-30T04:37:22.241	18.30	-60.21	48300.35	17.64			
lambda	E	2037-11-30T04:39:00.093	18.64	-60.55	50026.71	17.65			
epsilon	E	2037-11-30T04:39:44.031	18.79	-60.71	50802.31	17.65			

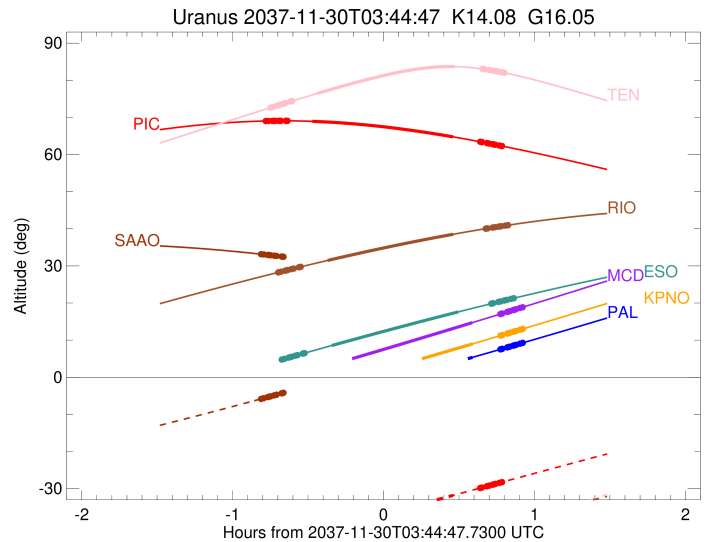
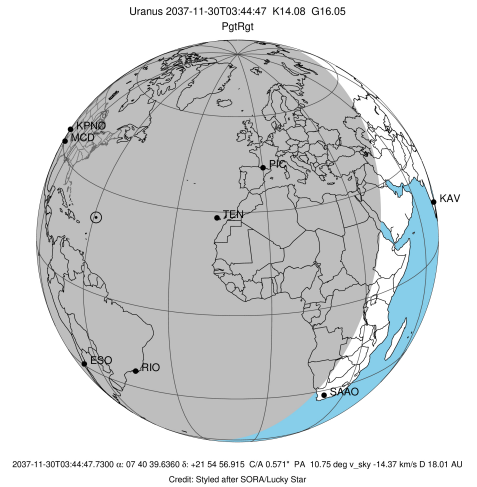
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-11-30T03:45:42.110
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 865439041177109632
 2Mass ID (if available) : 07403963+2154570
 ICRS Star Coord at Epoch: 07h 40m 39.63600s +21:54:56.91516s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.082
 G magnitude : 16.048
 RP magnitude : 15.448
 BP magnitude : 16.470
 DUPflag : 0
 Distance (au) : 18.006
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.37
 Sun-Target sep (deg) : 134.51
 Sun-Moon sep (deg) : 44.06
 B (ring opening deg) : 53.58
 PA of pole (deg) : 85.98
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.538
 C/A sky separation (km) : 7027.2
 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	2037-11-30T02:59:37.324		72.56	-61.00	51427.91	-17.93		
lambda	I	2037-11-30T03:00:55.442		72.83	-60.72	50026.71	-17.93		
delta	I	2037-11-30T03:02:31.746		73.17	-60.36	48300.35	-17.92		
gamma	I	2037-11-30T03:03:09.231		73.30	-60.23	47628.73	-17.91		
eta	I	2037-11-30T03:03:34.499		73.39	-60.13	47176.12	-17.91		
beta	I	2037-11-30T03:04:59.315		73.69	-59.82	45657.64	-17.90		
alpha	I	2037-11-30T03:05:50.692		73.86	-59.64	44746.36	-17.89		
4	I	2037-11-30T03:07:49.629		74.28	-59.20	42614.92	-17.87		
5	I	2037-11-30T03:08:14.931		74.36	-59.11	42171.49	-17.87		
6	I	2037-11-30T03:08:32.858		74.43	-59.04	41807.01	-17.84		
Uranus	I	2037-11-30T03:18:24.666		76.44	-56.87	25181.42		-36.40	-37.67
Uranus	E	2037-11-30T04:13:05.309		83.68	-44.83	25277.66		30.72	31.89
6	E	2037-11-30T04:24:15.176		83.04	-42.38	41855.82	17.88		
5	E	2037-11-30T04:24:38.939		83.00	-42.29	42311.08	17.90		
4	E	2037-11-30T04:24:51.615		82.98	-42.24	42533.88	17.90		
alpha	E	2037-11-30T04:26:51.131		82.77	-41.81	44686.04	17.93		
beta	E	2037-11-30T04:27:45.766		82.67	-41.61	45658.44	17.94		
eta	E	2037-11-30T04:29:10.390		82.50	-41.30	47176.12	17.95		
gamma	E	2037-11-30T04:29:35.407		82.45	-41.20	47625.29	17.96		
delta	E	2037-11-30T04:30:12.994		82.37	-41.07	48300.35	17.96		
lambda	E	2037-11-30T04:31:49.065		82.16	-40.72	50026.71	17.98		
epsilon	E	2037-11-30T04:32:32.019		82.06	-40.56	50799.01	17.97		

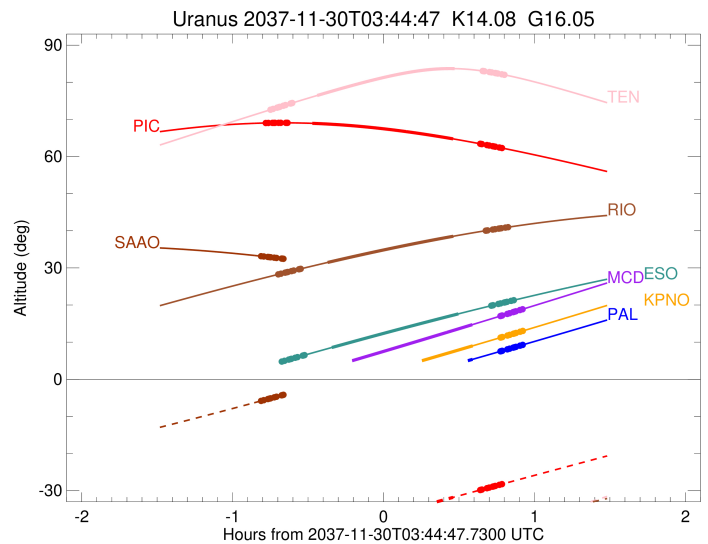
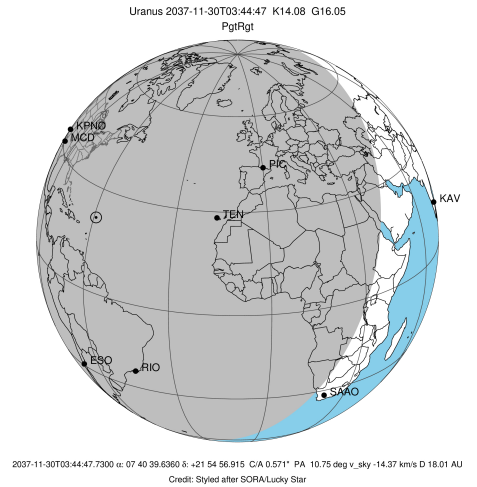
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2037-11-30T03:47:29.130
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       : 865439041177109632
2Mass ID (if available) : 07403963+2154570
ICRS Star Coord at Epoch: 07h 40m 39.63600s +21:54:56.91516s
RUWE (>1.4 is poor) : 1.08
K magnitude           : 14.082
G magnitude           : 16.048
RP magnitude          : 15.448
BP magnitude          : 16.470
DUPflag              : 0
Distance (au)        : 18.006
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -14.37
Sun-Target sep (deg) : 134.51
Sun-Moon sep (deg)   : 44.02
B (ring opening deg) : 53.58
PA of pole (deg)     : 85.98
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.939
C/A sky separation (km) : 12265.0
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	2037-11-30T03:02:44.498		28.22	-45.27	51396.54	-17.46		
lambda	I	2037-11-30T03:04:02.884		28.44	-45.23	50026.71	-17.46		
delta	I	2037-11-30T03:05:41.862		28.72	-45.18	48300.35	-17.42		
gamma	I	2037-11-30T03:06:20.402		28.83	-45.16	47629.23	-17.41		
eta	I	2037-11-30T03:06:46.443		28.90	-45.14	47176.12	-17.39		
beta	I	2037-11-30T03:08:13.962		29.14	-45.09	45655.40	-17.35		
alpha	I	2037-11-30T03:09:06.984		29.29	-45.06	44743.90	-17.33		
4	I	2037-11-30T03:11:09.905		29.63	-44.98	42616.08	-17.25		
5	I	2037-11-30T03:11:35.872		29.70	-44.97	42178.10	-17.25		
6	I	2037-11-30T03:11:54.861		29.75	-44.95	41803.49	-17.21		
Uranus	I	2037-11-30T03:22:33.668		31.47	-44.45	25203.54		-35.13	-36.38
Uranus	E	2037-11-30T04:12:33.782		38.53	-40.33	25359.51		25.41	26.45
6	E	2037-11-30T04:25:27.858		40.03	-38.85	41850.51	17.31		
5	E	2037-11-30T04:25:53.253		40.07	-38.80	42313.80	17.35		
4	E	2037-11-30T04:26:06.281		40.10	-38.77	42537.59	17.36		
alpha	E	2037-11-30T04:28:09.004		40.32	-38.52	44685.08	17.44		
beta	E	2037-11-30T04:29:05.022		40.42	-38.41	45656.02	17.47		
eta	E	2037-11-30T04:30:31.994		40.58	-38.23	47176.12	17.51		
gamma	E	2037-11-30T04:30:57.666		40.62	-38.17	47625.91	17.53		
delta	E	2037-11-30T04:31:36.125		40.69	-38.09	48300.35	17.55		
lambda	E	2037-11-30T04:33:14.392		40.86	-37.89	50026.71	17.59		
epsilon	E	2037-11-30T04:33:57.119		40.93	-37.80	50778.65	17.59		

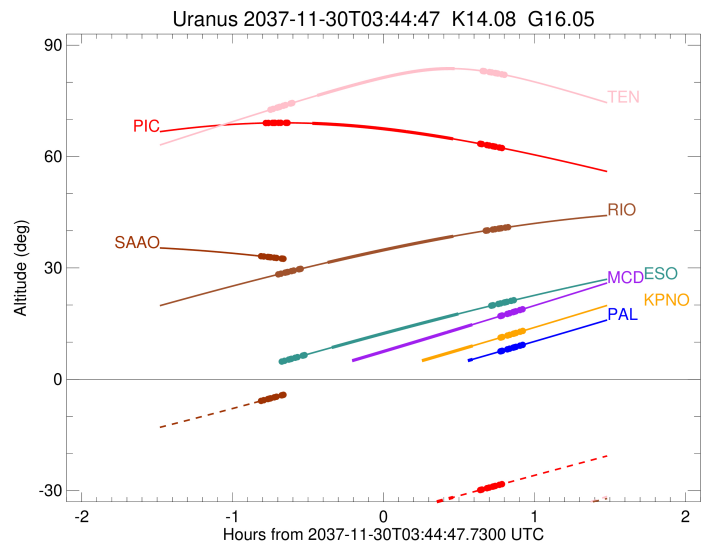
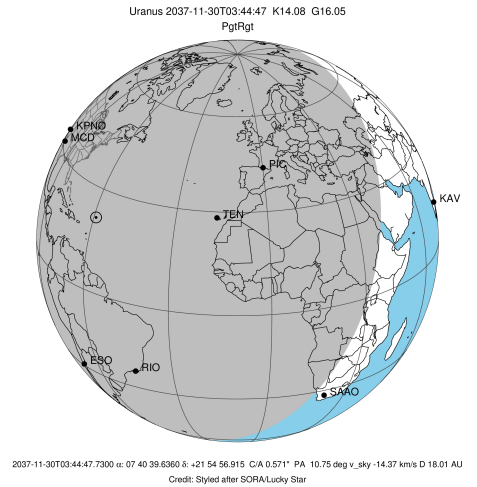
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-11-30T03:49:19.310
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 865439041177109632
 2Mass ID (if available) : 07403963+2154570
 ICRS Star Coord at Epoch: 07h 40m 39.63600s +21:54:56.91516s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.082
 G magnitude : 16.048
 RP magnitude : 15.448
 BP magnitude : 16.470
 DUPflag : 0
 Distance (au) : 18.006
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.37
 Sun-Target sep (deg) : 134.51
 Sun-Moon sep (deg) : 43.96
 B (ring opening deg) : 53.58
 PA of pole (deg) : 85.98
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.947
 C/A sky separation (km) : 12373.3
 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	2037-11-30T03:04:08.479		4.72x	-35.04	51397.07	-17.25		
lambda	I	2037-11-30T03:05:27.870		4.98x	-35.16	50026.71	-17.25		
delta	I	2037-11-30T03:07:08.079		5.30	-35.31	48300.35	-17.21		
gamma	I	2037-11-30T03:07:47.099		5.43	-35.37	47629.22	-17.19		
eta	I	2037-11-30T03:08:13.464		5.51	-35.41	47176.12	-17.18		
beta	I	2037-11-30T03:09:42.070		5.79	-35.54	45655.43	-17.14		
alpha	I	2037-11-30T03:10:35.752		5.96	-35.62	44743.93	-17.11		
4	I	2037-11-30T03:12:40.205		6.36	-35.79	42616.07	-17.04		
5	I	2037-11-30T03:13:06.499		6.44	-35.83	42178.03	-17.03		
6	I	2037-11-30T03:13:25.721		6.51	-35.86	41803.52	-16.99		
Uranus	I	2037-11-30T03:24:12.626		8.55	-36.70	25203.54		-35.13	-36.38
Uranus	E	2037-11-30T04:14:34.122		17.62	-39.06	25363.25		25.15	26.18
6	E	2037-11-30T04:27:39.669		19.83	-39.21	41850.23	17.15		
5	E	2037-11-30T04:28:05.351		19.90	-39.21	42313.91	17.19		
4	E	2037-11-30T04:28:18.504		19.93	-39.21	42537.81	17.20		
alpha	E	2037-11-30T04:30:22.364		20.28	-39.22	44685.04	17.28		
beta	E	2037-11-30T04:31:18.895		20.43	-39.22	45655.89	17.31		
eta	E	2037-11-30T04:32:46.674		20.67	-39.22	47176.12	17.36		
gamma	E	2037-11-30T04:33:12.582		20.74	-39.22	47625.95	17.37		
delta	E	2037-11-30T04:33:51.388		20.85	-39.22	48300.35	17.39		
lambda	E	2037-11-30T04:35:30.538		21.12	-39.21	50026.71	17.43		
epsilon	E	2037-11-30T04:36:13.583		21.23	-39.21	50777.58	17.44		


```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2037-11-30T03:40:48.320
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       : 865439041177109632
2Mass ID (if available) : 07403963+2154570
ICRS Star Coord at Epoch: 07h 40m 39.63600s +21:54:56.91516s
RUWE (>1.4 is poor) : 1.08
K magnitude           : 14.082
G magnitude           : 16.048
RP magnitude          : 15.448
BP magnitude          : 16.470
DUPflag              : 0
Distance (au)        : 18.006
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -14.37
Sun-Target sep (deg) : 134.51
Sun-Moon sep (deg)   : 43.28
B (ring opening deg) : 53.58
PA of pole (deg)     : 85.98
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.912
C/A sky separation (km) : 11907.8
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	2037-11-30T02:55:55.011		33.17	-5.87	51396.11	-17.55		
lambda	I	2037-11-30T02:57:12.976		33.07	-5.63	50026.71	-17.55		
delta	I	2037-11-30T02:58:51.459		32.95	-5.33	48300.35	-17.51		
gamma	I	2037-11-30T02:59:29.808		32.90	-5.21	47629.23	-17.49		
eta	I	2037-11-30T02:59:55.720		32.87	-5.13	47176.12	-17.48		
beta	I	2037-11-30T03:01:22.807		32.75	-4.86x	45655.40	-17.44		
alpha	I	2037-11-30T03:02:15.569		32.68	-4.70x	44743.90	-17.41		
4	I	2037-11-30T03:04:17.884		32.52	-4.33x	42616.08	-17.34		
5	I	2037-11-30T03:04:43.725		32.48	-4.25x	42178.06	-17.33		
6	I	2037-11-30T03:05:02.617		32.46	-4.19x	41803.51	-17.29		
Uranus	I	2037-11-30T03:15:37.154		31.54	-2.22x	25202.58		-35.19	-36.44
Uranus	E	2037-11-30T04:06:12.580		25.92	7.55x	25349.79		26.08	27.13
6	E	2037-11-30T04:18:59.336		24.22	10.08x	41851.21	17.24		
5	E	2037-11-30T04:19:24.730		24.16	10.17x	42313.53	17.28		
4	E	2037-11-30T04:19:37.815		24.13	10.21x	42537.08	17.28		
alpha	E	2037-11-30T04:21:41.159		23.85	10.62x	44685.17	17.35		
beta	E	2037-11-30T04:22:37.481		23.72	10.81x	45656.34	17.38		
eta	E	2037-11-30T04:24:04.898		23.52	11.10x	47176.12	17.42		
gamma	E	2037-11-30T04:24:30.709		23.46	11.19x	47625.83	17.43		
delta	E	2037-11-30T04:25:09.392		23.37	11.32x	48300.35	17.45		
lambda	E	2037-11-30T04:26:48.243		23.14	11.65x	50026.71	17.48		
epsilon	E	2037-11-30T04:27:31.382		23.03	11.79x	50781.22	17.48		