

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-11T18:03:13.080
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3382408482155801984
 2Mass ID (if available) : 06382813+2328253

ICRS Star Coord at Epoch: 06h 38m 28.12835s +23:28:24.89637s

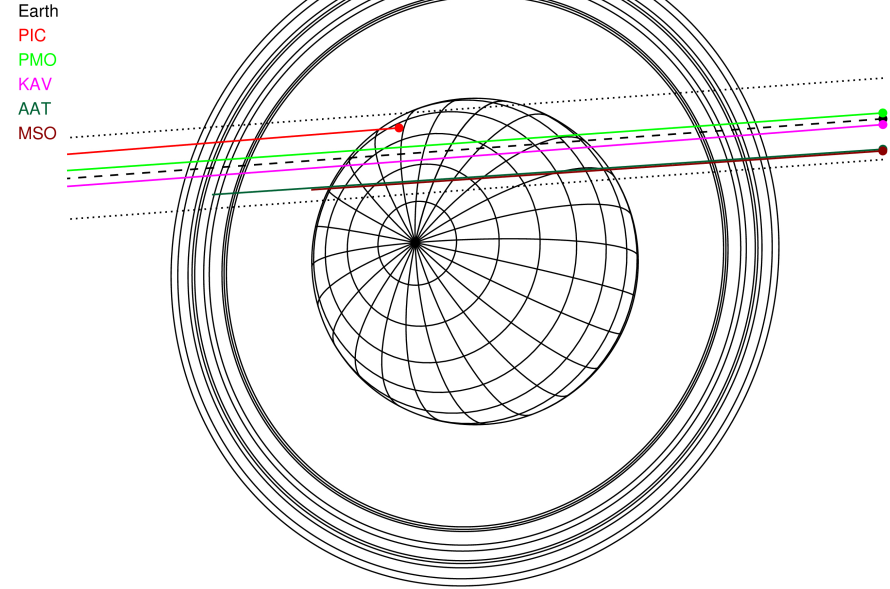
RUWE (>1.4 is poor) : 1.09
 K magnitude : 14.708
 G magnitude : 16.586
 RP magnitude : 16.000
 BP magnitude : 17.003
 DUPflag : 0
 Distance (au) : 17.961
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.67
 Sun-Target sep (deg) : 160.46
 Sun-Moon sep (deg) : 169.07
 B (ring opening deg) : 67.41
 PA of pole (deg) : 72.49

#	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



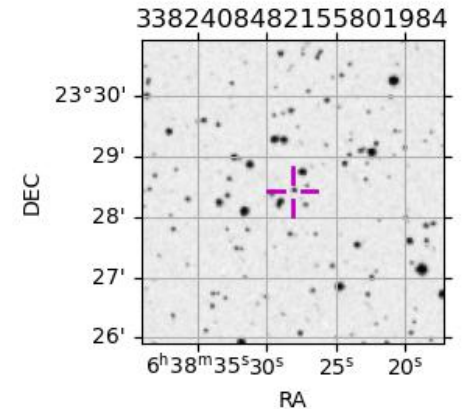
2034-12-11T18:03:13.0800 ra: 06 38 28.1283 s: +23 28 24.896 C/A 1.3611 PA 184.18 deg v_sky -21.67 km/s D 17.96 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2034-12-11T18:03:13 K14.71 G16.59 PgtRgt

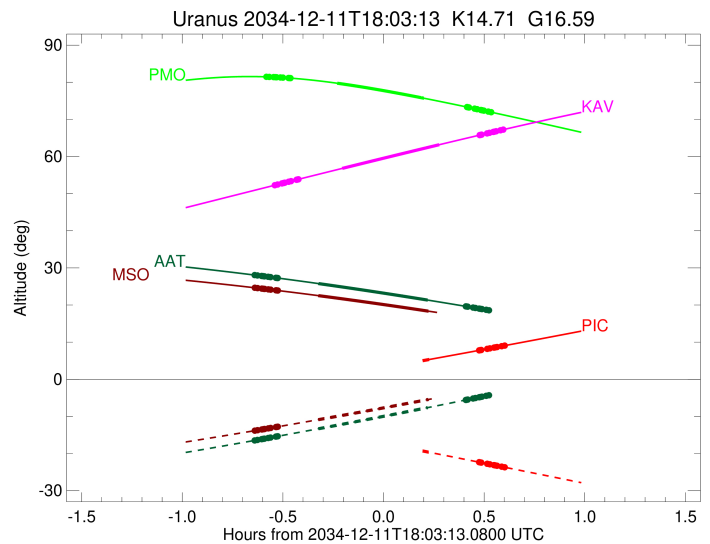
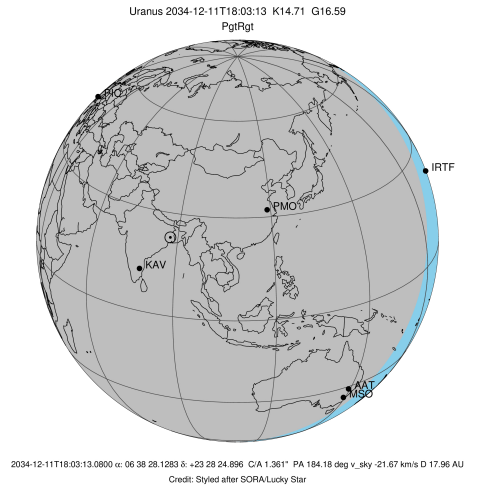


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1		+	+++++	DEC 11 18:16 - DEC 11 18:39	PneRne
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	DEC 11 17:28 - DEC 11 18:35	PieRie
KPNO	Kitt Peak Natl Obs	32.0	248.4					PnnRnn
MCD	McDonald Obs. 2.7m	30.7	256.0					PnnRnn
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++	+ +	+++++	DEC 11 17:30 - DEC 11 18:38	PieRie
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European Southern Obs	-29.3	289.3					PnnRnn
AAT	Siding Spring (AAT)	-31.3	149.1	+++++	+ +	++++	DEC 11 17:24 - DEC 11 18:30	PieRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++	+ +		DEC 11 17:24 - DEC 11 18:16	PieRin

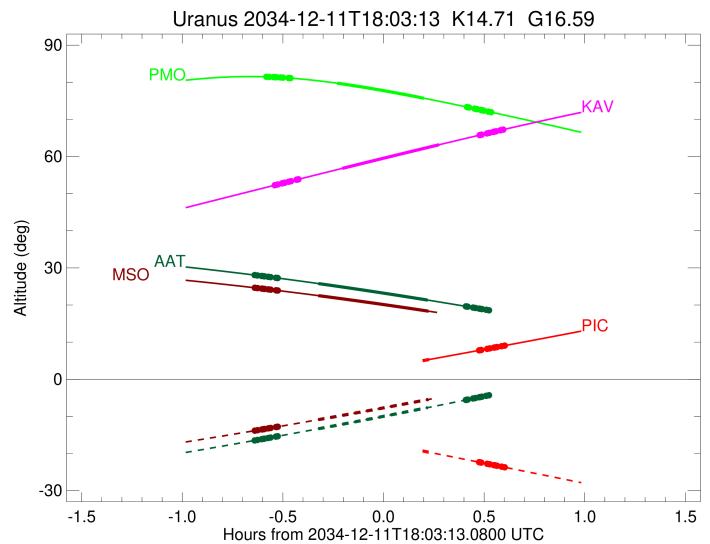
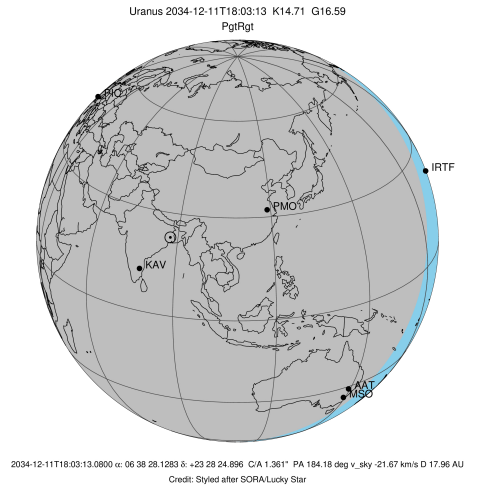


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-11T18:07:00.570
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3382408482155801984
 2Mass ID (if available) : 06382813+2328253
 ICRS Star Coord at Epoch: 06h 38m 28.12835s +23:28:24.89637s
 RUWE (>1.4 is poor) : 1.09
 K magnitude : 14.708
 G magnitude : 16.586
 RP magnitude : 16.000
 BP magnitude : 17.003
 DUPflag : 0
 Distance (au) : 17.961
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.67
 Sun-Target sep (deg) : 160.46
 Sun-Moon sep (deg) : 168.75
 B (ring opening deg) : 67.41
 PA of pole (deg) : 72.49
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.674
 C/A sky separation (km) : 21801.5
 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	2034-12-11T17:32:32.048	-1.67x	-11.89	51514.90	-20.81			
lambda	I	2034-12-11T17:33:43.676	-1.49x	-12.10	50026.71	-20.71			
delta	I	2034-12-11T17:35:07.413	-1.28x	-12.34	48300.35	-20.52			
gamma	I	2034-12-11T17:35:40.563	-1.19x	-12.43	47621.21	-20.45			
eta	I	2034-12-11T17:36:02.359	-1.14x	-12.50	47176.12	-20.39			
beta	I	2034-12-11T17:37:16.051	-0.95x	-12.71	45680.04	-20.21			
alpha	I	2034-12-11T17:38:05.038	-0.83x	-12.85	44690.33	-20.07			
4	I	2034-12-11T17:39:49.055	-0.56x	-13.15	42616.30	-19.74			
5	I	2034-12-11T17:40:12.440	-0.50x	-13.22	42160.02	-19.68			
6	I	2034-12-11T17:40:26.692	-0.46x	-13.26	41876.78	-19.61			
Uranus	I	2034-12-11T17:56:43.266	2.08x	-16.10	25545.43			-3.58	-3.75
Uranus	E	2034-12-11T18:16:50.096	5.32	-19.66	25243.16			17.70	18.48
6	E	2034-12-11T18:31:41.064	7.78	-22.33	41805.73	19.68			
5	E	2034-12-11T18:32:05.731	7.85	-22.40	42294.34	19.75			
4	E	2034-12-11T18:32:19.879	7.89	-22.44	42554.72	19.82			
alpha	E	2034-12-11T18:34:09.456	8.19	-22.77	44749.16	20.15			
beta	E	2034-12-11T18:34:54.328	8.32	-22.91	45656.84	20.29			
eta	E	2034-12-11T18:36:08.786	8.52	-23.13	47176.12	20.48			
gamma	E	2034-12-11T18:36:30.940	8.59	-23.20	47630.49	20.54			
delta	E	2034-12-11T18:37:03.494	8.68	-23.29	48300.35	20.62			
lambda	E	2034-12-11T18:38:26.852	8.91	-23.54	50026.71	20.80			
epsilon	E	2034-12-11T18:39:03.122	9.01	-23.65	50782.53	20.91			

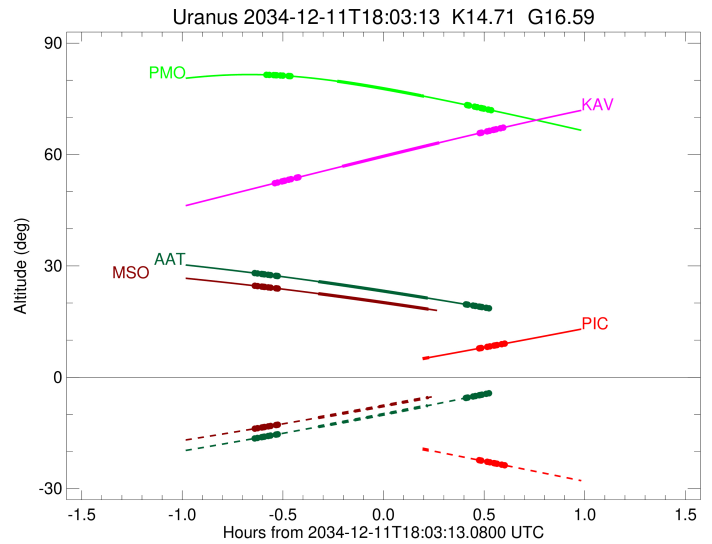
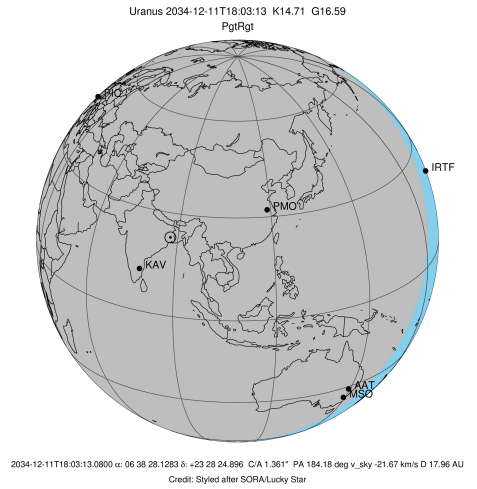
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-11T18:02:31.750
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 3382408482155801984
 2Mass ID (if available) : 06382813+2328253
 ICRS Star Coord at Epoch: 06h 38m 28.12835s +23:28:24.89637s
 RUWE (>1.4 is poor) : 1.09
 K magnitude : 14.708
 G magnitude : 16.586
 RP magnitude : 16.000
 BP magnitude : 17.003
 DUPflag : 0
 Distance (au) : 17.961
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.67
 Sun-Target sep (deg) : 160.46
 Sun-Moon sep (deg) : 169.41
 B (ring opening deg) : 67.41
 PA of pole (deg) : 72.49
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.432
 C/A sky separation (km) : 18658.8
 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



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

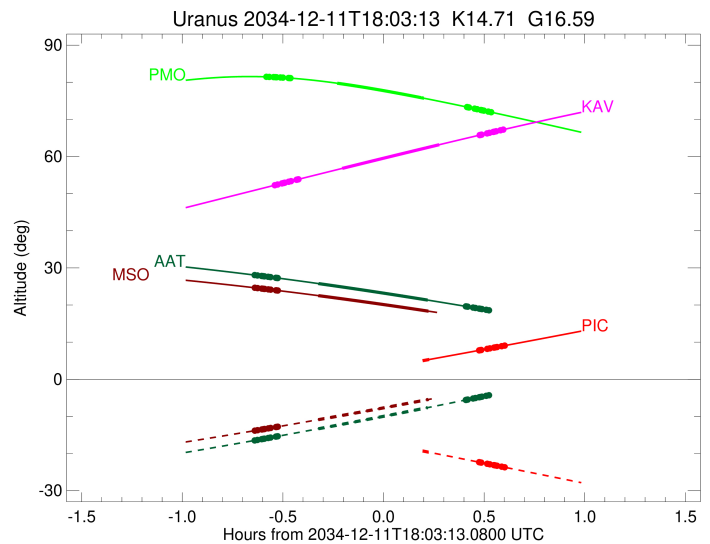
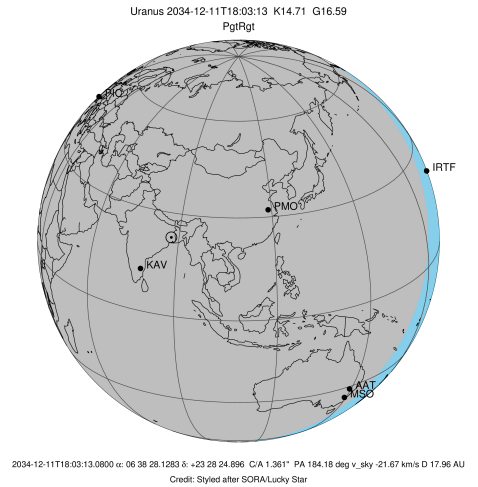
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-11T17:28:01.615		81.48	-68.22	51527.21	-21.98		
lambda	I	2034-12-11T17:29:09.950		81.44	-67.99	50026.71	-21.91		
delta	I	2034-12-11T17:30:28.995		81.39	-67.72	48300.35	-21.77		
gamma	I	2034-12-11T17:31:00.233		81.37	-67.62	47621.10	-21.72		
eta	I	2034-12-11T17:31:20.742		81.36	-67.55	47176.12	-21.68		
beta	I	2034-12-11T17:32:30.000		81.30	-67.32	45679.38	-21.54		
alpha	I	2034-12-11T17:33:15.940		81.26	-67.16	44688.79	-21.44		
4	I	2034-12-11T17:34:52.994		81.16	-66.83	42615.65	-21.20		
5	I	2034-12-11T17:35:14.913		81.14	-66.76	42157.68	-21.16		
6	I	2034-12-11T17:35:27.972		81.12	-66.71	41878.08	-21.11		
Uranus	I	2034-12-11T17:49:24.490		79.75	-63.85	25490.94		-8.05	-8.43
Uranus	E	2034-12-11T18:15:16.679		75.71	-58.45	25156.21		20.13	21.01
6	E	2034-12-11T18:28:04.609		73.34	-55.75	41803.59	21.10		
5	E	2034-12-11T18:28:27.908		73.27	-55.67	42298.35	21.15		
4	E	2034-12-11T18:28:40.791		73.22	-55.62	42551.53	21.19		
alpha	E	2034-12-11T18:30:23.730		72.90	-55.26	44750.12	21.43		
beta	E	2034-12-11T18:31:05.848		72.76	-55.11	45655.49	21.53		
eta	E	2034-12-11T18:32:16.197		72.53	-54.86	47176.12	21.67		
gamma	E	2034-12-11T18:32:37.160		72.47	-54.79	47630.69	21.70		
delta	E	2034-12-11T18:33:07.974		72.37	-54.68	48300.35	21.76		
lambda	E	2034-12-11T18:34:27.065		72.11	-54.40	50026.71	21.89		
epsilon	E	2034-12-11T18:35:01.108		72.00	-54.28	50772.89	21.97		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-11T18:05:32.550
 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 : 3382408482155801984
 2Mass ID (if available) : 06382813+2328253
 ICRS Star Coord at Epoch: 06h 38m 28.12835s +23:28:24.89637s
 RUWE (>1.4 is poor) : 1.09
 K magnitude : 14.708
 G magnitude : 16.586
 RP magnitude : 16.000
 BP magnitude : 17.003
 DUPflag : 0
 Distance (au) : 17.961
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.67
 Sun-Target sep (deg) : 160.46
 Sun-Moon sep (deg) : 168.78
 B (ring opening deg) : 67.41
 PA of pole (deg) : 72.49
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.267
 C/A sky separation (km) : 16498.6
 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	2034-12-11T17:30:31.802		52.21	-70.82	51532.90	-22.32		
lambda	I	2034-12-11T17:31:39.334		52.47	-71.04	50026.71	-22.26		
delta	I	2034-12-11T17:32:57.049		52.76	-71.30	48300.35	-22.16		
gamma	I	2034-12-11T17:33:27.729		52.88	-71.40	47621.05	-22.12		
eta	I	2034-12-11T17:33:47.856		52.95	-71.46	47176.12	-22.09		
beta	I	2034-12-11T17:34:55.778		53.21	-71.68	45678.97	-21.99		
alpha	I	2034-12-11T17:35:40.771		53.38	-71.83	44688.04	-21.91		
4	I	2034-12-11T17:37:15.580		53.73	-72.13	42615.12	-21.73		
5	I	2034-12-11T17:37:37.026		53.81	-72.20	42156.68	-21.70		
6	I	2034-12-11T17:37:49.675		53.86	-72.24	41878.65	-21.66		
Uranus	I	2034-12-11T17:50:54.544		56.80	-74.63	25448.52		-10.30	-10.77
Uranus	E	2034-12-11T18:19:49.915		63.18	-78.61	25113.07		21.26	22.17
6	E	2034-12-11T18:31:51.317		65.76	-79.35	41802.04	21.72		
5	E	2034-12-11T18:32:14.149		65.84	-79.37	42301.26	21.76		
4	E	2034-12-11T18:32:26.420		65.89	-79.37	42549.08	21.79		
alpha	E	2034-12-11T18:34:06.808		66.24	-79.41	44750.78	21.97		
beta	E	2034-12-11T18:34:47.811		66.38	-79.43	45654.41	22.05		
eta	E	2034-12-11T18:35:56.597		66.63	-79.44	47176.12	22.16		
gamma	E	2034-12-11T18:36:17.105		66.70	-79.45	47630.84	22.19		
delta	E	2034-12-11T18:36:47.249		66.80	-79.45	48300.35	22.23		
lambda	E	2034-12-11T18:38:04.719		67.07	-79.46	50026.71	22.34		
epsilon	E	2034-12-11T18:38:37.777		67.19	-79.45	50765.77	22.40		

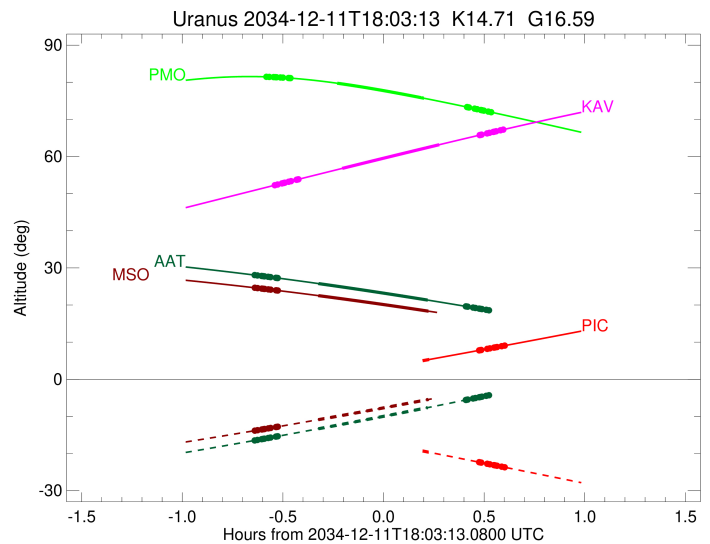
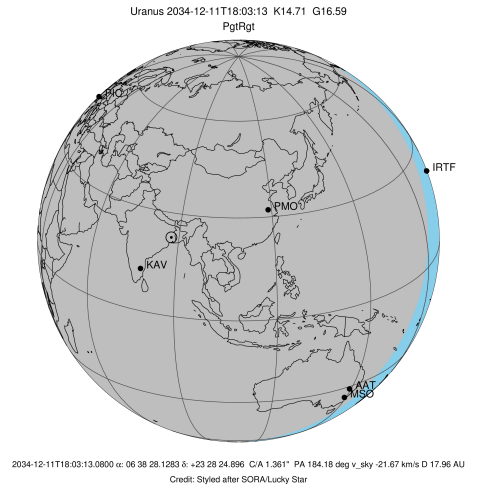
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-11T18:00:13.310
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 3382408482155801984
 2Mass ID (if available) : 06382813+2328253
 ICRS Star Coord at Epoch: 06h 38m 28.12835s +23:28:24.89637s
 RUWE (>1.4 is poor) : 1.09
 K magnitude : 14.708
 G magnitude : 16.586
 RP magnitude : 16.000
 BP magnitude : 17.003
 DUPflag : 0
 Distance (au) : 17.961
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.67
 Sun-Target sep (deg) : 160.46
 Sun-Moon sep (deg) : 169.28
 B (ring opening deg) : 67.41
 PA of pole (deg) : 72.49
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.014
 C/A sky separation (km) : 13206.1
 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



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	2034-12-11T17:24:31.830		28.10	-16.52	51541.91	-22.77		
lambda	I	2034-12-11T17:25:38.404		27.97	-16.34	50026.71	-22.73		
delta	I	2034-12-11T17:26:54.450		27.82	-16.14	48300.35	-22.67		
gamma	I	2034-12-11T17:27:24.438		27.77	-16.06	47620.99	-22.64		
eta	I	2034-12-11T17:27:44.095		27.73	-16.00	47176.12	-22.62		
beta	I	2034-12-11T17:28:50.398		27.60	-15.82	45678.12	-22.56		
alpha	I	2034-12-11T17:29:34.243		27.52	-15.70	44686.86	-22.51		
4	I	2034-12-11T17:31:06.390		27.33	-15.45	42613.90	-22.39		
5	I	2034-12-11T17:31:27.279		27.29	-15.39	42155.44	-22.37		
6	I	2034-12-11T17:31:39.446		27.27	-15.36	41879.36	-22.35		
Uranus	I	2034-12-11T17:43:47.555		25.78	-13.34	25372.81		-13.45	-14.06
Uranus	E	2034-12-11T18:16:23.957		21.33	-7.64	25076.17		22.20	23.14
6	E	2034-12-11T18:27:43.832		19.65	-5.58	41800.29	22.29		
5	E	2034-12-11T18:28:06.297		19.59	-5.51	42304.55	22.31		
4	E	2034-12-11T18:28:17.970		19.56	-5.48	42546.13	22.33		
alpha	E	2034-12-11T18:29:56.243		19.31	-5.18	44751.44	22.44		
beta	E	2034-12-11T18:30:36.311		19.21	-5.06	45653.10	22.49		
eta	E	2034-12-11T18:31:43.878		19.04	-4.85x	47176.12	22.56		
gamma	E	2034-12-11T18:32:04.037		18.98	-4.79x	47631.01	22.57		
delta	E	2034-12-11T18:32:33.671		18.91	-4.70x	48300.35	22.60		
lambda	E	2034-12-11T18:33:49.951		18.71	-4.46x	50026.71	22.66		
epsilon	E	2034-12-11T18:34:22.221		18.63	-4.36x	50758.43	22.70		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-11T18:00:19.900
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MSO
 Location : Mt. Stromlo Observatory
 Latitude (deg) : -35.32000
 E. Longitude (deg) : 149.00833
 Altitude (km) : 0.770
 Gaia source ID : 3382408482155801984
 2Mass ID (if available) : 06382813+2328253
 ICRS Star Coord at Epoch: 06h 38m 28.12835s +23:28:24.89637s
 RUWE (>1.4 is poor) : 1.09
 K magnitude : 14.708
 G magnitude : 16.586
 RP magnitude : 16.000
 BP magnitude : 17.003
 DUPflag : 0
 Distance (au) : 17.961
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.67
 Sun-Target sep (deg) : 160.46
 Sun-Moon sep (deg) : 169.23
 B (ring opening deg) : 67.41
 PA of pole (deg) : 72.49
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.992
 C/A sky separation (km) : 12926.0
 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



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	2034-12-11T17:24:34.424		24.67	-13.89	51542.47	-22.79		
lambda	I	2034-12-11T17:25:40.966		24.56	-13.72	50026.71	-22.75		
delta	I	2034-12-11T17:26:56.939		24.42	-13.52	48300.35	-22.69		
gamma	I	2034-12-11T17:27:26.895		24.37	-13.45	47620.98	-22.67		
eta	I	2034-12-11T17:27:46.530		24.33	-13.40	47176.12	-22.65		
beta	I	2034-12-11T17:28:52.757		24.22	-13.23	45678.05	-22.58		
alpha	I	2034-12-11T17:29:36.545		24.14	-13.11	44686.79	-22.54		
4	I	2034-12-11T17:31:08.557		23.97	-12.88	42613.80	-22.43		
5	I	2034-12-11T17:31:29.416		23.93	-12.82	42155.37	-22.41		
6	I	2034-12-11T17:31:41.558		23.91	-12.79	41879.40	-22.39		
Uranus	I	2034-12-11T17:43:46.180		22.53	-10.89	25366.74		-13.67	-14.29
Uranus	E	2034-12-11T18:16:38.800		18.34	-5.44	25073.96		22.25	23.20
6	E	2034-12-11T18:27:56.038		16.77	-3.49x	41800.14	22.33		
5	E	2034-12-11T18:28:18.482		16.71	-3.42x	42304.84	22.35		
4	E	2034-12-11T18:28:30.107		16.69	-3.39x	42545.86	22.37		
alpha	E	2034-12-11T18:30:08.237		16.45	-3.11x	44751.50	22.48		
beta	E	2034-12-11T18:30:48.237		16.36	-2.99x	45652.98	22.52		
eta	E	2034-12-11T18:31:55.720		16.20	-2.79x	47176.12	22.58		
gamma	E	2034-12-11T18:32:15.855		16.15	-2.73x	47631.03	22.60		
delta	E	2034-12-11T18:32:45.452		16.08	-2.65x	48300.35	22.63		
lambda	E	2034-12-11T18:34:01.647		15.89	-2.42x	50026.71	22.69		
epsilon	E	2034-12-11T18:34:33.856		15.81	-2.33x	50757.79	22.72		