

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-11-17T19:00:01.380
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3379777114608602496
 2Mass ID (if available) : 06420129+2324329

ICRS Star Coord at Epoch: 06h 42m 01.30382s +23:24:32.91054s

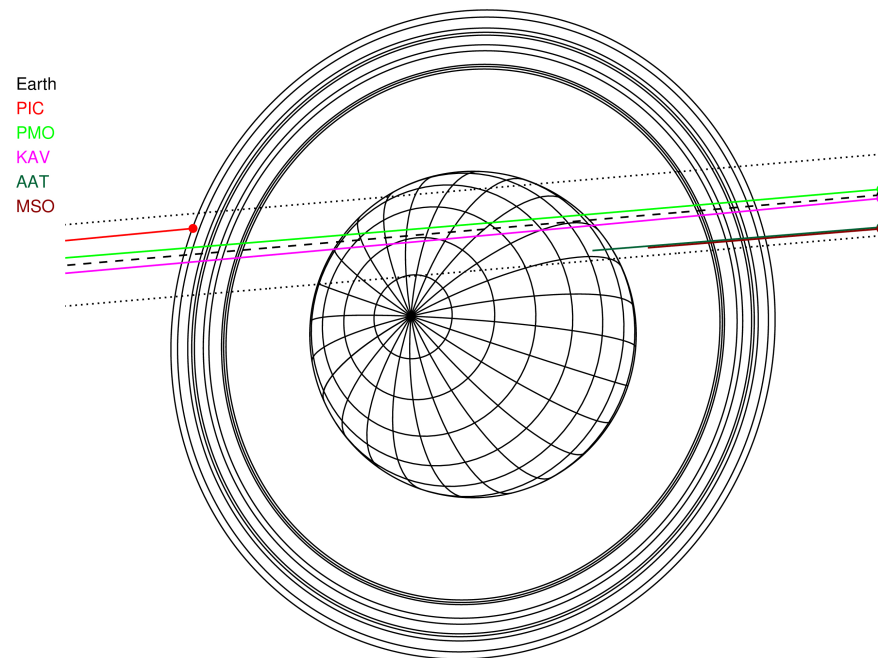
RUWE (>1.4 is poor) : 1.11
 K magnitude : 13.603
 G magnitude : 15.126
 RP magnitude : 14.606
 BP magnitude : 15.482
 DUPflag : 0
 Distance (au) : 18.180
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.80
 Sun-Target sep (deg) : 135.38
 Sun-Moon sep (deg) : 150.39
 B (ring opening deg) : 66.65
 PA of pole (deg) : 73.55

#	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



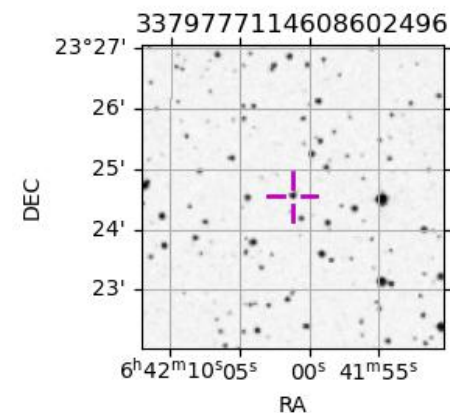
2034-11-17T19:00:01.3800 ra: 06 42 01.3038 s: +23 24 32.911 C/A 1.244" PA 184.94 deg v_sky -14.80 km/s D 18.18 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2034-11-17T19:00:01 K13.60 G15.13 PgtRgt

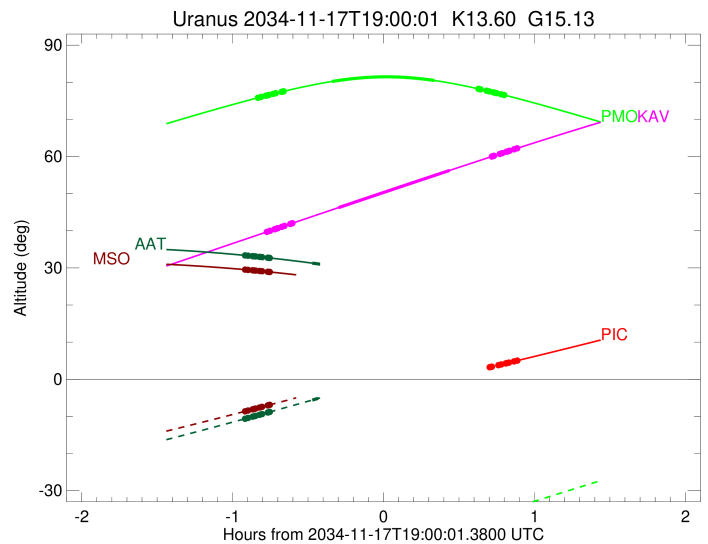
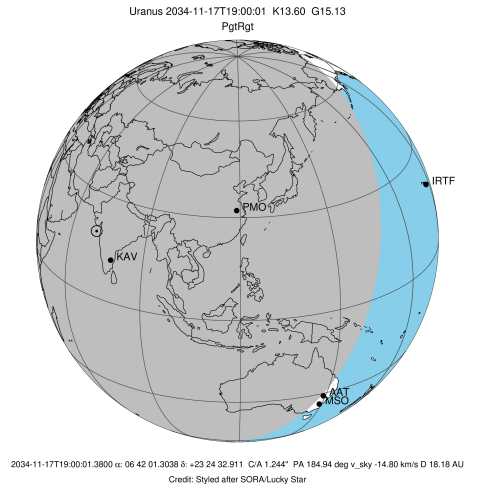


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	NOV 17 18:09 - NOV 17 19:47	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	+++++	+ +	+++++	NOV 17 18:13 - NOV 17 19:52	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	+++++	+		NOV 17 18:04 - NOV 17 18:31	PinRin
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++			NOV 17 18:04 - NOV 17 18:14	PnnRin

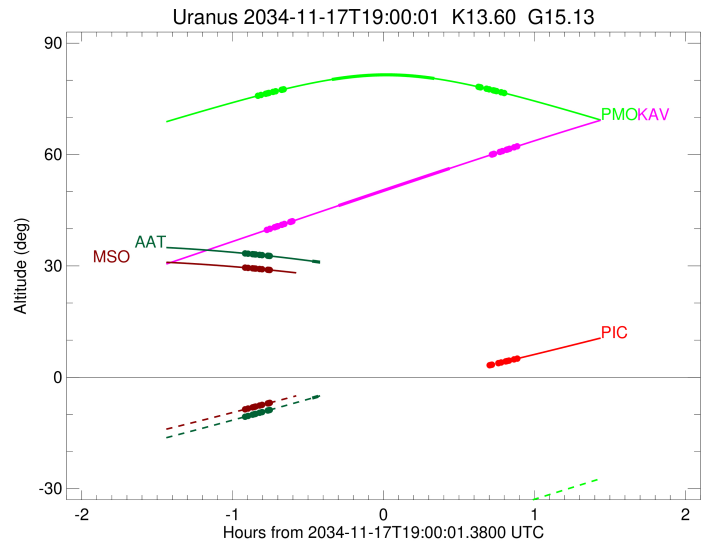
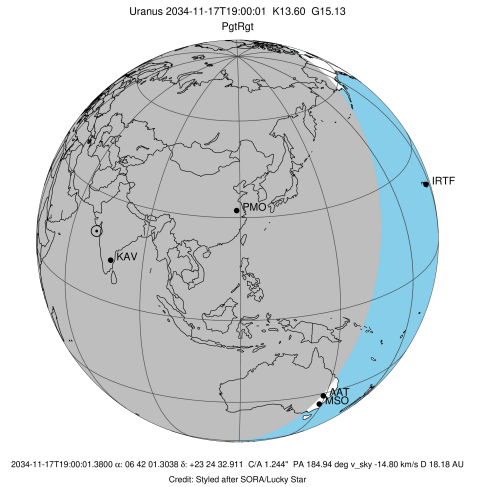


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-11-17T19:00:06.170
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 3379777114608602496
 2Mass ID (if available) : 06420129+2324329
 ICRS Star Coord at Epoch: 06h 42m 01.30382s +23:24:32.91054s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 13.603
 G magnitude : 15.126
 RP magnitude : 14.606
 BP magnitude : 15.482
 DUPflag : 0
 Distance (au) : 18.180
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.80
 Sun-Target sep (deg) : 135.38
 Sun-Moon sep (deg) : 150.86
 B (ring opening deg) : 66.65
 PA of pole (deg) : 73.55
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.305
 C/A sky separation (km) : 17212.4
 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



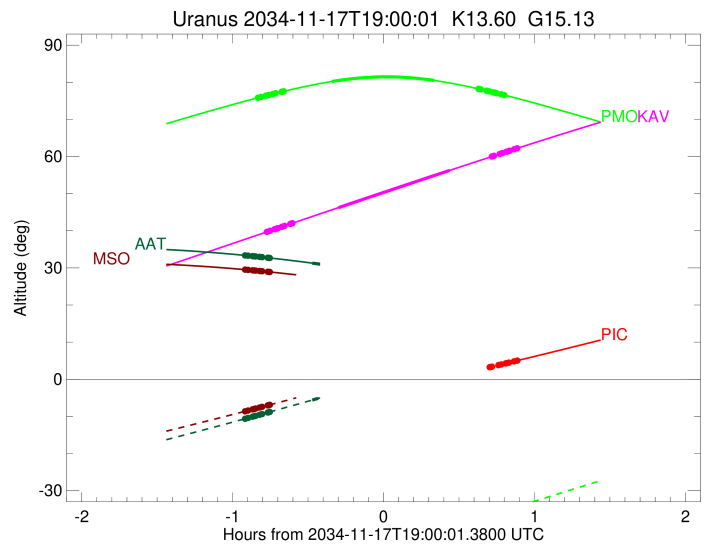
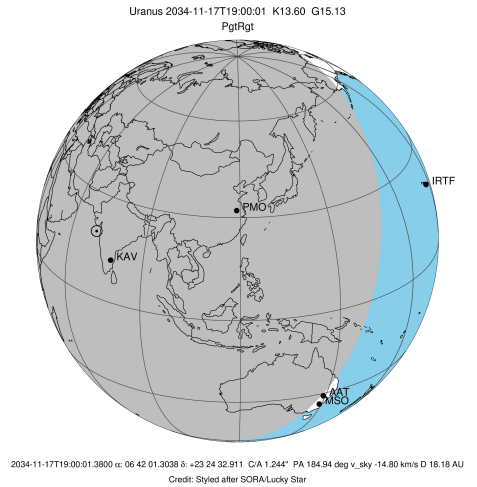
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-11-17T18:09:51.895		75.79	-56.09	51393.28	-15.35		
lambda	I	2034-11-17T18:11:20.854		76.05	-55.78	50026.71	-15.33		
delta	I	2034-11-17T18:13:13.713		76.38	-55.39	48300.35	-15.26		
gamma	I	2034-11-17T18:13:58.145		76.51	-55.24	47623.13	-15.23		
eta	I	2034-11-17T18:14:27.525		76.59	-55.14	47176.12	-15.20		
beta	I	2034-11-17T18:16:06.134		76.87	-54.80	45679.72	-15.12		
alpha	I	2034-11-17T18:17:10.202		77.05	-54.58	44712.32	-15.07		
4	I	2034-11-17T18:19:30.780		77.43	-54.09	42600.96	-14.93		
5	I	2034-11-17T18:19:57.483		77.51	-54.00	42217.66	-14.92		
6	I	2034-11-17T18:20:22.501		77.57	-53.91	41844.23	-14.88		
Uranus	I	2034-11-17T18:39:31.559		80.22	-49.91	25460.72		-10.07	-10.54
Uranus	E	2034-11-17T19:20:11.061		80.49	-41.32	25133.40		21.56	22.48
6	E	2034-11-17T19:37:42.082		78.24	-37.60	41800.83	14.89		
5	E	2034-11-17T19:38:16.102		78.16	-37.48	42305.34	14.94		
4	E	2034-11-17T19:38:31.757		78.12	-37.43	42525.93	14.94		
alpha	E	2034-11-17T19:40:59.682		77.73	-36.90	44746.80	15.09		
beta	E	2034-11-17T19:41:59.212		77.57	-36.69	45642.61	15.14		
eta	E	2034-11-17T19:43:40.096		77.30	-36.34	47176.12	15.22		
gamma	E	2034-11-17T19:44:09.984		77.21	-36.23	47631.49	15.25		
delta	E	2034-11-17T19:44:53.805		77.09	-36.07	48300.35	15.28		
lambda	E	2034-11-17T19:46:46.499		76.78	-35.68	50026.71	15.36		
epsilon	E	2034-11-17T19:47:33.761		76.64	-35.51	50753.23	15.38		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-11-17T19:04:27.670
 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 : 3379777114608602496
 2Mass ID (if available) : 06420129+2324329
 ICRS Star Coord at Epoch: 06h 42m 01.30382s +23:24:32.91054s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 13.603
 G magnitude : 15.126
 RP magnitude : 14.606
 BP magnitude : 15.482
 DUPflag : 0
 Distance (au) : 18.180
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.80
 Sun-Target sep (deg) : 135.38
 Sun-Moon sep (deg) : 151.22
 B (ring opening deg) : 66.65
 PA of pole (deg) : 73.55
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.159
 C/A sky separation (km) : 15275.7
 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



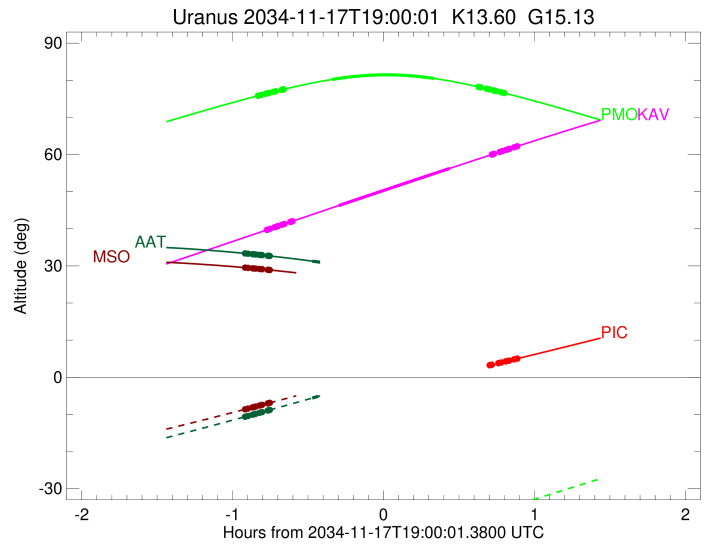
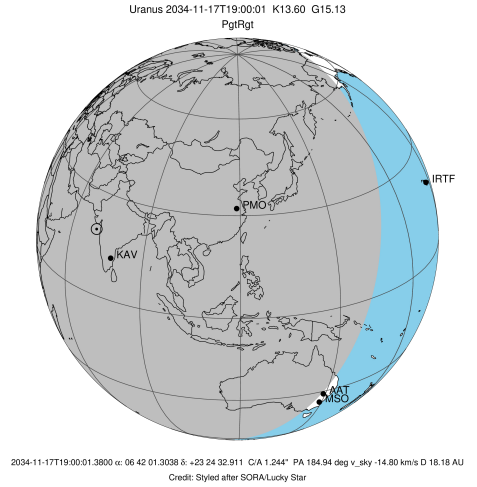
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-11-17T18:13:24.538		39.65	-82.30	51403.89	-15.46		
lambda	I	2034-11-17T18:14:53.532		39.99	-82.48	50026.71	-15.45		
delta	I	2034-11-17T18:16:45.439		40.41	-82.68	48300.35	-15.40		
gamma	I	2034-11-17T18:17:29.464		40.58	-82.75	47622.97	-15.37		
eta	I	2034-11-17T18:17:58.545		40.69	-82.80	47176.12	-15.36		
beta	I	2034-11-17T18:19:36.075		41.07	-82.94	45680.00	-15.30		
alpha	I	2034-11-17T18:20:39.496		41.31	-83.02	44711.00	-15.26		
4	I	2034-11-17T18:22:57.994		41.84	-83.18	42602.39	-15.15		
5	I	2034-11-17T18:23:24.649		41.94	-83.20	42214.31	-15.15		
6	I	2034-11-17T18:23:48.947		42.04	-83.22	41846.05	-15.11		
Uranus	I	2034-11-17T18:42:06.366		46.23	-82.72	25422.73		-11.90	-12.44
Uranus	E	2034-11-17T19:26:19.596		56.26	-74.85	25101.63		22.42	23.36
6	E	2034-11-17T19:43:02.559		59.99	-71.16	41802.15	15.23		
5	E	2034-11-17T19:43:35.580		60.11	-71.04	42303.03	15.27		
4	E	2034-11-17T19:43:51.118		60.17	-70.98	42526.03	15.27		
alpha	E	2034-11-17T19:46:15.941		60.70	-70.44	44745.75	15.39		
beta	E	2034-11-17T19:47:14.371		60.91	-70.22	45642.22	15.43		
eta	E	2034-11-17T19:48:53.462		61.28	-69.84	47176.12	15.49		
gamma	E	2034-11-17T19:49:22.829		61.38	-69.73	47631.43	15.51		
delta	E	2034-11-17T19:50:05.911		61.54	-69.57	48300.35	15.54		
lambda	E	2034-11-17T19:51:56.780		61.95	-69.15	50026.71	15.60		
epsilon	E	2034-11-17T19:52:43.604		62.12	-68.97	50757.84	15.62		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-11-17T18:56:27.620
 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 : 3379777114608602496
 2Mass ID (if available) : 06420129+2324329
 ICRS Star Coord at Epoch: 06h 42m 01.30382s +23:24:32.91054s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 13.603
 G magnitude : 15.126
 RP magnitude : 14.606
 BP magnitude : 15.482
 DUPflag : 0
 Distance (au) : 18.180
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.80
 Sun-Target sep (deg) : 135.38
 Sun-Moon sep (deg) : 150.14
 B (ring opening deg) : 66.65
 PA of pole (deg) : 73.55
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.881
 C/A sky separation (km) : 11617.0
 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	2034-11-17T18:04:42.821		33.38	-10.69	51430.46	-15.89		
lambda	I	2034-11-17T18:06:11.103		33.29	-10.42	50026.71	-15.89		
delta	I	2034-11-17T18:07:59.880		33.16	-10.08	48300.35	-15.85		
gamma	I	2034-11-17T18:08:42.651		33.11	-9.95	47622.60	-15.84		
eta	I	2034-11-17T18:09:10.850		33.08	-9.86	47176.12	-15.83		
beta	I	2034-11-17T18:10:45.359		32.97	-9.57	45680.58	-15.79		
alpha	I	2034-11-17T18:11:47.033		32.90	-9.37	44707.77	-15.77		
4	I	2034-11-17T18:14:00.460		32.74	-8.96	42605.63	-15.70		
5	I	2034-11-17T18:14:26.956		32.70	-8.87	42206.35	-15.71		
6	I	2034-11-17T18:14:49.621		32.67	-8.80	41850.38	-15.69		
Uranus	I	2034-11-17T18:31:41.229		31.29	-5.60	25337.20		-15.29	-15.98
Uranus	E	2034-11-17T19:20:55.855		25.93	4.09x	25072.38		23.18	24.16
6	E	2034-11-17T19:36:44.051		23.86	7.29x	41804.25	15.63		
5	E	2034-11-17T19:37:15.850		23.79	7.40x	42299.34	15.66		
4	E	2034-11-17T19:37:31.343		23.75	7.46x	42526.41	15.65		
alpha	E	2034-11-17T19:39:52.760		23.43	7.94x	44744.14	15.71		
beta	E	2034-11-17T19:40:50.069		23.30	8.13x	45641.78	15.73		
eta	E	2034-11-17T19:42:27.367		23.07	8.46x	47176.12	15.77		
gamma	E	2034-11-17T19:42:56.227		23.00	8.56x	47631.33	15.78		
delta	E	2034-11-17T19:43:38.609		22.90	8.71x	48300.35	15.79		
lambda	E	2034-11-17T19:45:27.815		22.65	9.08x	50026.71	15.82		
epsilon	E	2034-11-17T19:46:14.484		22.54	9.24x	50765.50	15.83		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-11-17T18:56:34.640
 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 : 3379777114608602496
 2Mass ID (if available) : 06420129+2324329
 ICRS Star Coord at Epoch: 06h 42m 01.30382s +23:24:32.91054s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 13.603
 G magnitude : 15.126
 RP magnitude : 14.606
 BP magnitude : 15.482
 DUPflag : 0
 Distance (au) : 18.180
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.80
 Sun-Target sep (deg) : 135.38
 Sun-Moon sep (deg) : 150.12
 B (ring opening deg) : 66.65
 PA of pole (deg) : 73.55
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.861
 C/A sky separation (km) : 11348.2
 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	2034-11-17T18:04:43.412		29.55	-8.68	51431.97	-15.89		
lambda	I	2034-11-17T18:06:11.776		29.46	-8.42	50026.71	-15.89		
delta	I	2034-11-17T18:08:00.527		29.35	-8.10	48300.35	-15.86		
gamma	I	2034-11-17T18:08:43.286		29.30	-7.98	47622.58	-15.84		
eta	I	2034-11-17T18:09:11.474		29.27	-7.89	47176.12	-15.83		
beta	I	2034-11-17T18:10:45.940		29.17	-7.61	45680.61	-15.80		
alpha	I	2034-11-17T18:11:47.599		29.10	-7.43	44707.58	-15.78		
4	I	2034-11-17T18:14:00.916		28.96	-7.04	42605.82	-15.72		
5	I	2034-11-17T18:14:27.438		28.93	-6.96	42205.87	-15.72		
6	I	2034-11-17T18:14:50.038		28.90	-6.89	41850.64	-15.70		
Uranus	I	2034-11-17T18:31:38.069		27.63	-3.85x	25331.55		-15.49	-16.19
Uranus	E	2034-11-17T19:21:13.391		22.64	5.47x	25071.09		23.22	24.19
6	E	2034-11-17T19:36:59.194		20.71	8.53x	41804.44	15.65		
5	E	2034-11-17T19:37:30.925		20.65	8.63x	42299.00	15.67		
4	E	2034-11-17T19:37:46.434		20.61	8.68x	42526.46	15.67		
alpha	E	2034-11-17T19:40:07.714		20.31	9.14x	44743.99	15.73		
beta	E	2034-11-17T19:41:04.986		20.19	9.33x	45641.74	15.75		
eta	E	2034-11-17T19:42:42.223		19.98	9.64x	47176.12	15.78		
gamma	E	2034-11-17T19:43:11.064		19.92	9.74x	47631.32	15.79		
delta	E	2034-11-17T19:43:53.424		19.82	9.88x	48300.35	15.80		
lambda	E	2034-11-17T19:45:42.578		19.58	10.23x	50026.71	15.83		
epsilon	E	2034-11-17T19:46:29.275		19.48	10.39x	50766.27	15.83		