

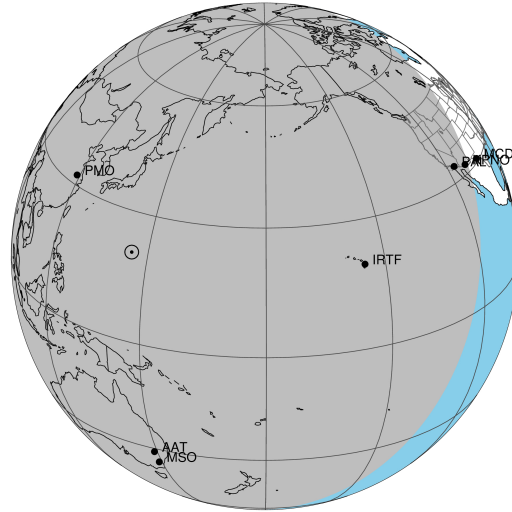
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-25T14:05:05.620
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3377535347838285056
 2Mass ID (if available) : 06205439+2337072

Uranus 2033-11-25T14:05:05 K12.84 G14.40 PgtRgt

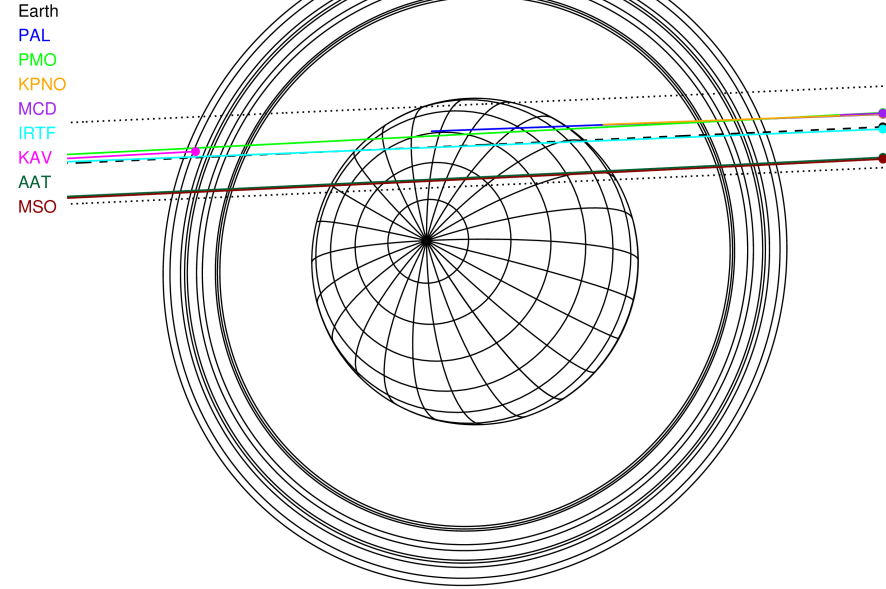
ICRS Star Coord at Epoch: 06h 20m 54.39133s +23:37:07.49823s

RUWE (>1.4 is poor) : 1.10
 K magnitude : 12.842
 G magnitude : 14.401
 RP magnitude : 13.850
 BP magnitude : 14.780
 DUPflag : 0
 Distance (au) : 18.111
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.98
 Sun-Target sep (deg) : 148.36
 Sun-Moon sep (deg) : 169.77
 B (ring opening deg) : 71.13
 PA of pole (deg) : 66.66

Uranus 2033-11-25T14:05:05 K12.84 G14.40
 PgtRgt



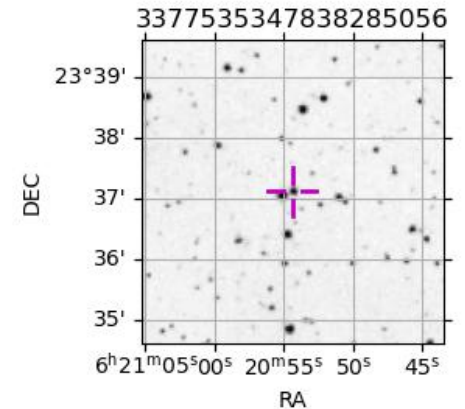
2033-11-25T14:05:05.6200 ra: 06 20 54.3913 s: +23 37 07.498 C/A 1.394° PA 182.56 deg v_sky -18.98 km/s D 18.11 AU
 Credit: Styled after SORA/Lucky Star



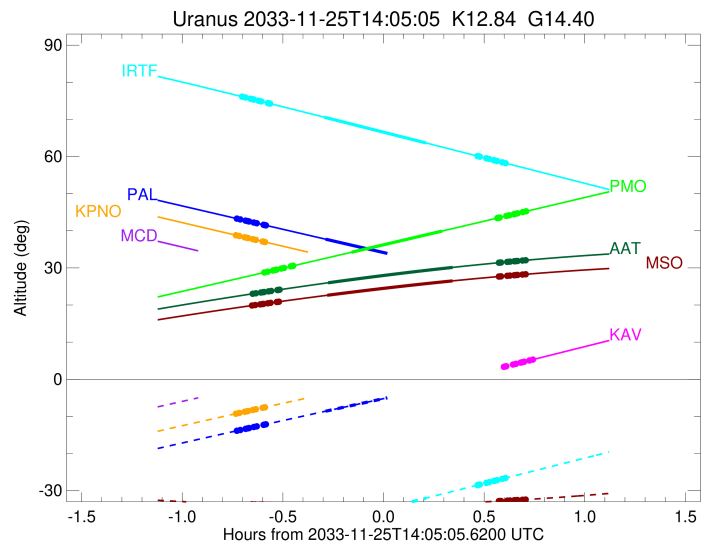
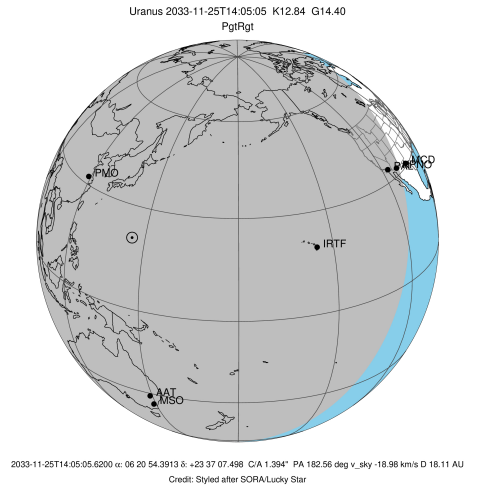
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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	+++++	+		NOV 25 13:21 - NOV 25 13:47	PinRin
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	NOV 25 13:29 - NOV 25 14:47	PieRie
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++			NOV 25 13:21 - NOV 25 13:29	PnnRin
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	+++++	+ +	+++++	NOV 25 13:23 - NOV 25 14:41	PieRie
KAV	Kavalur Observatory	12.6	78.8			++	NOV 25 14:48 - NOV 25 14:49	PnnRne
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 25 13:26 - NOV 25 14:47	PieRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++	+ +	+++++	NOV 25 13:26 - NOV 25 14:47	PieRie

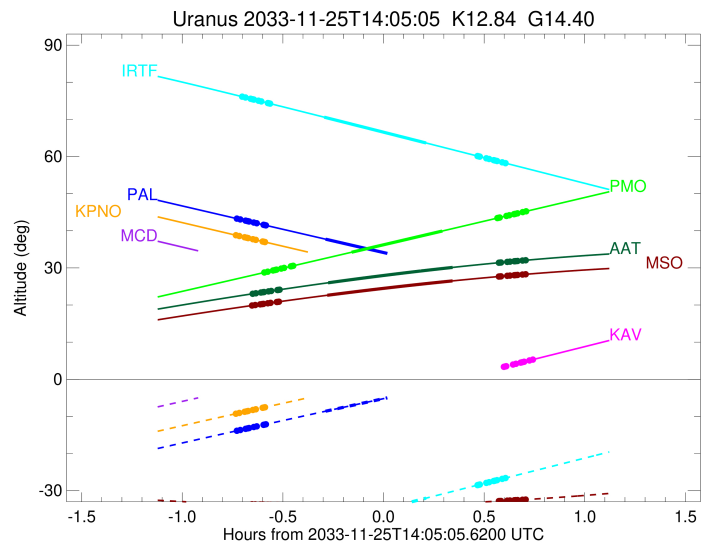
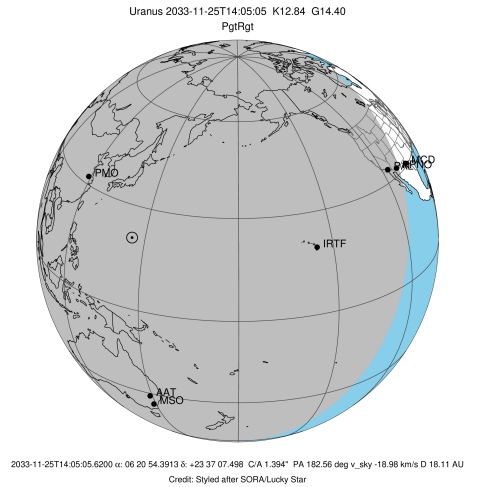


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-25T14:00:54.030
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3377535347838285056
 2Mass ID (if available) : 06205439+2337072
 ICRS Star Coord at Epoch: 06h 20m 54.39133s +23:37:07.49823s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 12.842
 G magnitude : 14.401
 RP magnitude : 13.850
 BP magnitude : 14.780
 DUPflag : 0
 Distance (au) : 18.111
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.98
 Sun-Target sep (deg) : 148.36
 Sun-Moon sep (deg) : 169.45
 B (ring opening deg) : 71.13
 PA of pole (deg) : 66.66
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.571
 C/A sky separation (km) : 20637.4
 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



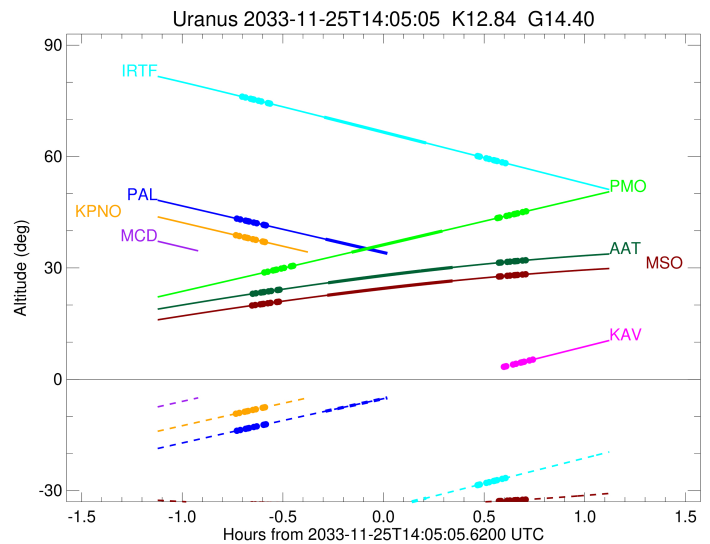
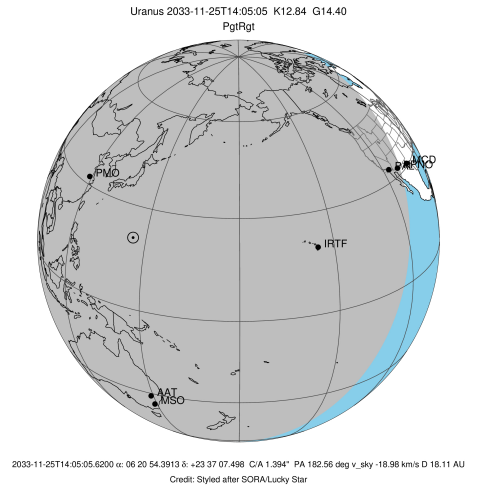
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-11-25T13:21:45.465		43.19	-13.80	50744.31	-18.32		
lambda	I	2033-11-25T13:22:24.693		43.06	-13.66	50026.71	-18.27		
delta	I	2033-11-25T13:23:59.571		42.73	-13.35	48300.35	-18.12		
gamma	I	2033-11-25T13:24:37.063		42.59	-13.22	47622.01	-18.06		
eta	I	2033-11-25T13:25:01.777		42.51	-13.14	47176.12	-18.02		
beta	I	2033-11-25T13:26:25.197		42.22	-12.86	45678.19	-17.87		
alpha	I	2033-11-25T13:27:17.617		42.03	-12.69	44746.08	-17.78		
4	I	2033-11-25T13:29:21.211		41.60	-12.27	42564.65	-17.52		
5	I	2033-11-25T13:29:42.924		41.53	-12.20	42176.66	-17.44		
6	I	2033-11-25T13:30:00.017		41.47	-12.14	41879.31	-17.41		
Uranus	I	2033-11-25T13:47:48.911		37.74	-8.61	25540.61		-3.42	-3.58
Uranus	E	2033-11-25T14:13:25.644		32.41	-3.61x	25160.25		16.32	17.05
6	E	2033-11-25T14:30:18.746		28.92	-0.38x	41821.35	17.34		
5	E	2033-11-25T14:30:41.814		28.84	-0.30x	42217.21	17.37		
4	E	2033-11-25T14:31:04.758		28.76	-0.23x	42612.98	17.44		
alpha	E	2033-11-25T14:33:04.077		28.35	0.15x	44719.26	17.70		
beta	E	2033-11-25T14:33:56.439		28.17	0.31x	45642.58	17.79		
eta	E	2033-11-25T14:35:22.229		27.87	0.58x	47176.12	17.93		
gamma	E	2033-11-25T14:35:47.309		27.79	0.66x	47626.38	17.97		
delta	E	2033-11-25T14:36:24.746		27.66	0.78x	48300.35	18.03		
lambda	E	2033-11-25T14:38:00.115		27.33	1.08x	50026.71	18.17		
epsilon	E	2033-11-25T14:39:17.492		27.07	1.32x	51436.59	18.23		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-25T14:09:23.510
 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 : 3377535347838285056
 2Mass ID (if available) : 06205439+2337072
 ICRS Star Coord at Epoch: 06h 20m 54.39133s +23:37:07.49823s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 12.842
 G magnitude : 14.401
 RP magnitude : 13.850
 BP magnitude : 14.780
 DUPflag : 0
 Distance (au) : 18.111
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.98
 Sun-Target sep (deg) : 148.36
 Sun-Moon sep (deg) : 170.59
 B (ring opening deg) : 71.13
 PA of pole (deg) : 66.66
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.520
 C/A sky separation (km) : 19969.0
 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



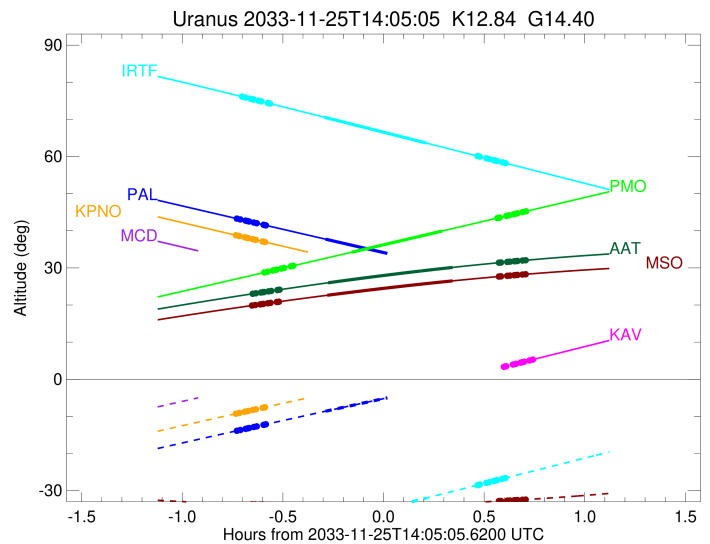
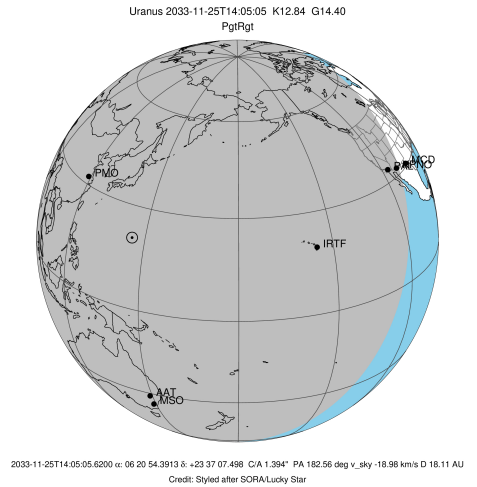
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-11-25T13:29:56.367		28.84	-56.55	50744.30	-18.35		
lambda	I	2033-11-25T13:30:35.535		28.98	-56.69	50026.71	-18.30		
delta	I	2033-11-25T13:32:10.217		29.31	-57.02	48300.35	-18.17		
gamma	I	2033-11-25T13:32:47.608		29.44	-57.15	47622.02	-18.11		
eta	I	2033-11-25T13:33:12.249		29.53	-57.23	47176.12	-18.08		
beta	I	2033-11-25T13:34:35.375		29.82	-57.52	45678.21	-17.94		
alpha	I	2033-11-25T13:35:27.580		30.00	-57.70	44746.02	-17.86		
4	I	2033-11-25T13:37:30.534		30.43	-58.13	42564.46	-17.62		
5	I	2033-11-25T13:37:52.089		30.50	-58.20	42176.90	-17.55		
6	I	2033-11-25T13:38:09.089		30.56	-58.26	41879.28	-17.53		
Uranus	I	2033-11-25T13:55:33.804		34.22	-61.85	25534.61		-3.94	-4.13
Uranus	E	2033-11-25T14:22:38.469		39.94	-67.27	25135.54		16.84	17.59
6	E	2033-11-25T14:39:00.939		43.41	-70.37	41820.12	17.62		
5	E	2033-11-25T14:39:23.847		43.49	-70.45	42219.67	17.65		
4	E	2033-11-25T14:39:46.226		43.57	-70.51	42612.41	17.72		
alpha	E	2033-11-25T14:41:43.716		43.99	-70.87	44718.25	17.96		
beta	E	2033-11-25T14:42:35.357		44.17	-71.03	45642.36	18.05		
eta	E	2033-11-25T14:43:59.933		44.47	-71.28	47176.12	18.19		
gamma	E	2033-11-25T14:44:24.669		44.56	-71.36	47626.54	18.23		
delta	E	2033-11-25T14:45:01.577		44.69	-71.47	48300.35	18.28		
lambda	E	2033-11-25T14:46:35.644		45.02	-71.75	50026.71	18.42		
epsilon	E	2033-11-25T14:47:52.408		45.30	-71.97	51444.42	18.47		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-25T14:00:38.900
 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 : 3377535347838285056
 2Mass ID (if available) : 06205439+2337072
 ICRS Star Coord at Epoch: 06h 20m 54.39133s +23:37:07.49823s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 12.842
 G magnitude : 14.401
 RP magnitude : 13.850
 BP magnitude : 14.780
 DUPflag : 0
 Distance (au) : 18.111
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.98
 Sun-Target sep (deg) : 148.36
 Sun-Moon sep (deg) : 169.41
 B (ring opening deg) : 71.13
 PA of pole (deg) : 66.66
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.575
 C/A sky separation (km) : 20695.0
 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



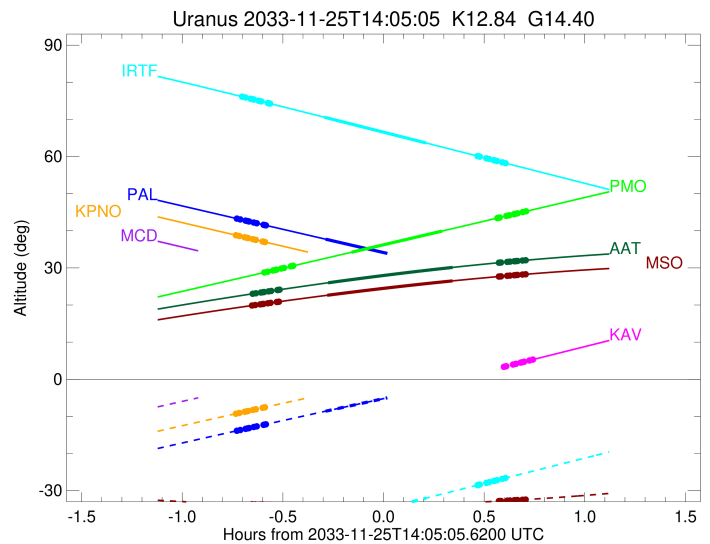
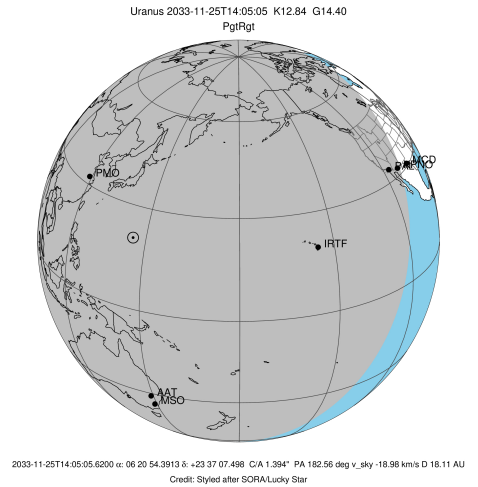
Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-11-25T13:21:28.072	38.72	-9.20	50744.33	-18.29		
lambda	I	2033-11-25T13:22:07.378	38.58	-9.07	50026.71	-18.23		
delta	I	2033-11-25T13:23:42.445	38.25	-8.75	48300.35	-18.09		
gamma	I	2033-11-25T13:24:20.013	38.12	-8.63	47622.01	-18.03		
eta	I	2033-11-25T13:24:44.777	38.03	-8.54	47176.12	-17.98		
beta	I	2033-11-25T13:26:08.372	37.73	-8.27	45678.17	-17.83		
alpha	I	2033-11-25T13:27:00.902	37.55	-8.09	44746.10	-17.74		
4	I	2033-11-25T13:29:04.770	37.11	-7.68	42564.70	-17.48		
5	I	2033-11-25T13:29:26.541	37.04	-7.60	42176.59	-17.40		
6	I	2033-11-25T13:29:43.669	36.97	-7.55	41879.32	-17.37		
Uranus	I	2033-11-25T13:47:36.633	33.20	-4.00x	25541.27		-3.36	-3.52
Uranus	E	2033-11-25T14:13:07.574	27.86	0.96x	25162.13		16.28	17.01
6	E	2033-11-25T14:30:04.762	24.33	4.17x	41821.43	17.30		
5	E	2033-11-25T14:30:27.879	24.25	4.25x	42217.07	17.32		
4	E	2033-11-25T14:30:50.894	24.17	4.32x	42613.01	17.40		
alpha	E	2033-11-25T14:32:50.518	23.76	4.69x	44719.32	17.65		
beta	E	2033-11-25T14:33:43.007	23.58	4.86x	45642.60	17.74		
eta	E	2033-11-25T14:35:09.005	23.28	5.12x	47176.12	17.89		
gamma	E	2033-11-25T14:35:34.145	23.20	5.20x	47626.38	17.93		
delta	E	2033-11-25T14:36:11.671	23.07	5.32x	48300.35	17.99		
lambda	E	2033-11-25T14:37:47.264	22.74	5.62x	50026.71	18.13		
epsilon	E	2033-11-25T14:39:04.796	22.47	5.86x	51436.15	18.18		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-25T14:02:50.340
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 3377535347838285056
 2Mass ID (if available) : 06205439+2337072
 ICRS Star Coord at Epoch: 06h 20m 54.39133s +23:37:07.49823s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 12.842
 G magnitude : 14.401
 RP magnitude : 13.850
 BP magnitude : 14.780
 DUPflag : 0
 Distance (au) : 18.111
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.98
 Sun-Target sep (deg) : 148.36
 Sun-Moon sep (deg) : 169.60
 B (ring opening deg) : 71.13
 PA of pole (deg) : 66.66
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.378
 C/A sky separation (km) : 18102.7
 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
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 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



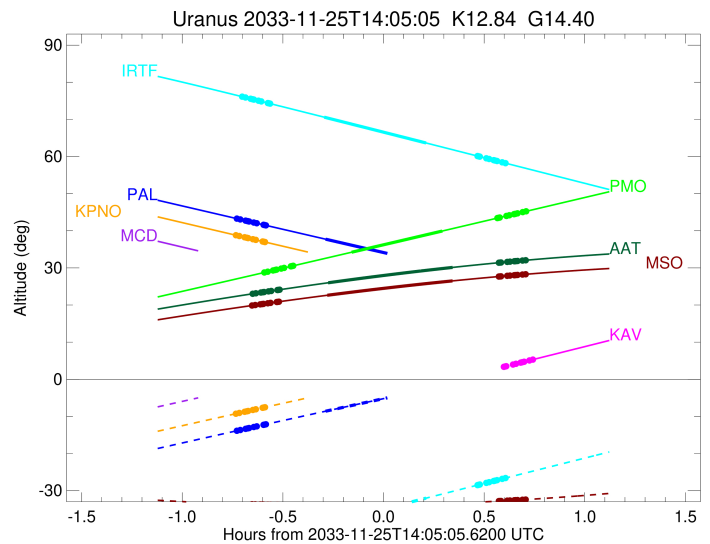
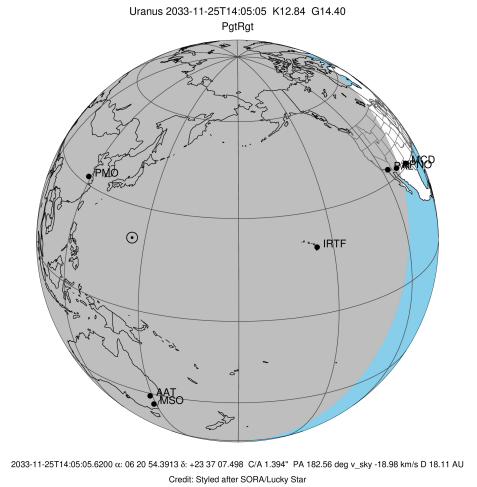
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-11-25T13:23:19.459		76.05	-44.58	50743.54	-18.93		
lambda	I	2033-11-25T13:23:57.367		75.90	-44.44	50026.71	-18.89		
delta	I	2033-11-25T13:25:29.018		75.56	-44.08	48300.35	-18.78		
gamma	I	2033-11-25T13:26:05.168		75.43	-43.94	47622.19	-18.74		
eta	I	2033-11-25T13:26:28.996		75.34	-43.85	47176.12	-18.71		
beta	I	2033-11-25T13:27:49.240		75.04	-43.54	45678.78	-18.59		
alpha	I	2033-11-25T13:28:39.705		74.85	-43.35	44744.84	-18.52		
4	I	2033-11-25T13:30:38.140		74.40	-42.89	42561.77	-18.33		
5	I	2033-11-25T13:30:58.513		74.33	-42.81	42180.38	-18.27		
6	I	2033-11-25T13:31:15.072		74.27	-42.75	41878.82	-18.25		
Uranus	I	2033-11-25T13:47:23.861		70.61	-39.02	25501.11		-6.08	-6.37
Uranus	E	2033-11-25T14:17:47.472		63.65	-32.03	25097.76		17.62	18.40
6	E	2033-11-25T14:33:05.892		60.14	-28.52	41818.57	18.21		
5	E	2033-11-25T14:33:28.314		60.05	-28.44	42222.80	18.23		
4	E	2033-11-25T14:33:49.731		59.97	-28.35	42611.64	18.29		
alpha	E	2033-11-25T14:35:43.710		59.53	-27.92	44717.02	18.48		
beta	E	2033-11-25T14:36:33.973		59.34	-27.73	45642.13	18.55		
eta	E	2033-11-25T14:37:56.341		59.03	-27.41	47176.12	18.66		
gamma	E	2033-11-25T14:38:20.464		58.93	-27.32	47626.71	18.69		
delta	E	2033-11-25T14:38:56.456		58.80	-27.19	48300.35	18.74		
lambda	E	2033-11-25T14:40:28.324		58.45	-26.84	50026.71	18.84		
epsilon	E	2033-11-25T14:41:43.822		58.16	-26.55	51452.37	18.88		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-25T14:10:43.080
 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 : 3377535347838285056
 2Mass ID (if available) : 06205439+2337072
 ICRS Star Coord at Epoch: 06h 20m 54.39133s +23:37:07.49823s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 12.842
 G magnitude : 14.401
 RP magnitude : 13.850
 BP magnitude : 14.780
 DUPflag : 0
 Distance (au) : 18.111
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.98
 Sun-Target sep (deg) : 148.36
 Sun-Moon sep (deg) : 170.62
 B (ring opening deg) : 71.13
 PA of pole (deg) : 66.66
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.490
 C/A sky separation (km) : 19576.3
 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



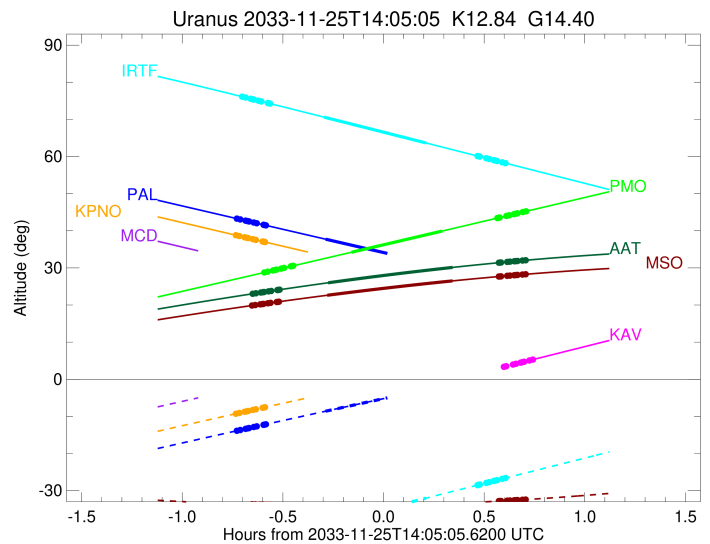
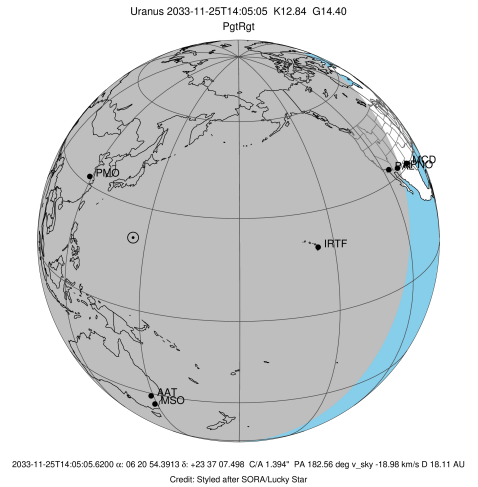
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-11-25T13:30:32.333	-12.21x	-17.98	50744.16	-18.13			
lambda	I	2033-11-25T13:31:11.955	-12.07x	-18.13	50026.71	-18.08			
delta	I	2033-11-25T13:32:47.729	-11.72x	-18.50	48300.35	-17.96			
gamma	I	2033-11-25T13:33:25.540	-11.58x	-18.65	47622.04	-17.91			
eta	I	2033-11-25T13:33:50.457	-11.49x	-18.74	47176.12	-17.88			
beta	I	2033-11-25T13:35:14.485	-11.19x	-19.07	45678.29	-17.75			
alpha	I	2033-11-25T13:36:07.257	-11.00x	-19.27	44745.87	-17.67			
4	I	2033-11-25T13:38:11.461	-10.55x	-19.75	42564.10	-17.45			
5	I	2033-11-25T13:38:33.176	-10.47x	-19.84	42177.35	-17.38			
6	I	2033-11-25T13:38:50.368	-10.41x	-19.90	41879.23	-17.36			
Uranus	I	2033-11-25T13:56:16.172	-6.59x	-23.95	25529.66			-4.32	-4.53
Uranus	E	2033-11-25T14:24:34.846	-0.32x	-30.55	25124.36			17.08	17.84
6	E	2033-11-25T14:40:57.051	3.35x	-34.37	41819.58	17.49			
5	E	2033-11-25T14:41:20.230	3.43x	-34.46	42220.76	17.51			
4	E	2033-11-25T14:41:42.693	3.52x	-34.55	42612.14	17.58			
alpha	E	2033-11-25T14:43:41.145	3.96x	-35.01	44717.80	17.81			
beta	E	2033-11-25T14:44:33.251	4.16x	-35.21	45642.27	17.89			
eta	E	2033-11-25T14:45:58.584	4.48x	-35.55	47176.12	18.03			
gamma	E	2033-11-25T14:46:23.549	4.57x	-35.64	47626.60	18.06			
delta	E	2033-11-25T14:47:00.792	4.71x	-35.79	48300.35	18.12			
lambda	E	2033-11-25T14:48:35.743	5.07	-36.16	50026.71	18.24			
epsilon	E	2033-11-25T14:49:53.423	5.36	-36.46	51447.67	18.30			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-25T14:07:19.010
 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 : 3377535347838285056
 2Mass ID (if available) : 06205439+2337072
 ICRS Star Coord at Epoch: 06h 20m 54.39133s +23:37:07.49823s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 12.842
 G magnitude : 14.401
 RP magnitude : 13.850
 BP magnitude : 14.780
 DUPflag : 0
 Distance (au) : 18.111
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.98
 Sun-Target sep (deg) : 148.36
 Sun-Moon sep (deg) : 169.75
 B (ring opening deg) : 71.13
 PA of pole (deg) : 66.66
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.002
 C/A sky separation (km) : 13167.5
 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	2033-11-25T13:26:26.688		23.08	-37.70	50744.92	-19.46		
lambda	I	2033-11-25T13:27:03.611		23.16	-37.72	50026.71	-19.44		
delta	I	2033-11-25T13:28:32.526		23.37	-37.76	48300.35	-19.39		
gamma	I	2033-11-25T13:29:07.503		23.45	-37.77	47622.57	-19.37		
eta	I	2033-11-25T13:29:30.565		23.50	-37.78	47176.12	-19.35		
beta	I	2033-11-25T13:30:47.952		23.68	-37.81	45679.72	-19.30		
alpha	I	2033-11-25T13:31:36.738		23.79	-37.83	44742.29	-19.26		
4	I	2033-11-25T13:33:30.378		24.04	-37.86	42556.59	-19.17		
5	I	2033-11-25T13:33:49.192		24.08	-37.87	42187.79	-19.13		
6	I	2033-11-25T13:34:05.484		24.12	-37.87	41877.45	-19.13		
Uranus	I	2033-11-25T13:48:34.828		25.99	-38.02	25402.82		-10.05	-10.52
Uranus	E	2033-11-25T14:25:40.084		30.13	-37.35	25039.86		18.77	19.59
6	E	2033-11-25T14:39:27.916		31.40	-36.73	41813.56	19.20		
5	E	2033-11-25T14:39:50.006		31.43	-36.71	42233.57	19.20		
4	E	2033-11-25T14:40:09.501		31.45	-36.69	42608.54	19.24		
alpha	E	2033-11-25T14:41:58.148		31.61	-36.59	44712.76	19.34		
beta	E	2033-11-25T14:42:46.417		31.68	-36.55	45641.47	19.37		
eta	E	2033-11-25T14:44:05.448		31.78	-36.47	47176.12	19.43		
gamma	E	2033-11-25T14:44:28.660		31.82	-36.45	47627.33	19.45		
delta	E	2033-11-25T14:45:03.248		31.86	-36.42	48300.35	19.47		
lambda	E	2033-11-25T14:46:31.786		31.98	-36.33	50026.71	19.53		
epsilon	E	2033-11-25T14:47:46.144		32.08	-36.25	51480.22	19.54		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-25T14:07:12.100
 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 : 3377535347838285056
 2Mass ID (if available) : 06205439+2337072
 ICRS Star Coord at Epoch: 06h 20m 54.39133s +23:37:07.49823s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 12.842
 G magnitude : 14.401
 RP magnitude : 13.850
 BP magnitude : 14.780
 DUPflag : 0
 Distance (au) : 18.111
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.98
 Sun-Target sep (deg) : 148.36
 Sun-Moon sep (deg) : 169.70
 B (ring opening deg) : 71.13
 PA of pole (deg) : 66.66
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.983
 C/A sky separation (km) : 12917.3
 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	2033-11-25T13:26:14.998		19.91	-33.69	50745.10	-19.47		
lambda	I	2033-11-25T13:26:51.906		19.99	-33.71	50026.71	-19.45		
delta	I	2033-11-25T13:28:20.756		20.18	-33.74	48300.35	-19.40		
gamma	I	2033-11-25T13:28:55.704		20.26	-33.75	47622.59	-19.38		
eta	I	2033-11-25T13:29:18.747		20.31	-33.76	47176.12	-19.37		
beta	I	2033-11-25T13:30:36.060		20.47	-33.79	45679.77	-19.31		
alpha	I	2033-11-25T13:31:24.808		20.58	-33.80	44742.14	-19.28		
4	I	2033-11-25T13:33:18.319		20.81	-33.84	42556.32	-19.19		
5	I	2033-11-25T13:33:37.074		20.85	-33.85	42188.20	-19.16		
6	I	2033-11-25T13:33:53.373		20.89	-33.85	41877.36	-19.15		
Uranus	I	2033-11-25T13:48:19.564		22.63	-33.99	25397.25		-10.24	-10.71
Uranus	E	2033-11-25T14:25:41.948		26.50	-33.39	25038.77		18.79	19.61
6	E	2033-11-25T14:39:27.363		27.67	-32.82	41813.34	19.22		
5	E	2033-11-25T14:39:49.462		27.70	-32.80	42234.07	19.22		
4	E	2033-11-25T14:40:08.895		27.72	-32.79	42608.38	19.26		
alpha	E	2033-11-25T14:41:57.429		27.87	-32.70	44712.56	19.36		
beta	E	2033-11-25T14:42:45.663		27.93	-32.66	45641.45	19.39		
eta	E	2033-11-25T14:44:04.632		28.03	-32.59	47176.12	19.44		
gamma	E	2033-11-25T14:44:27.829		28.06	-32.57	47627.36	19.46		
delta	E	2033-11-25T14:45:02.392		28.10	-32.54	48300.35	19.48		
lambda	E	2033-11-25T14:46:30.878		28.21	-32.46	50026.71	19.54		
epsilon	E	2033-11-25T14:47:45.259		28.30	-32.39	51481.40	19.55		