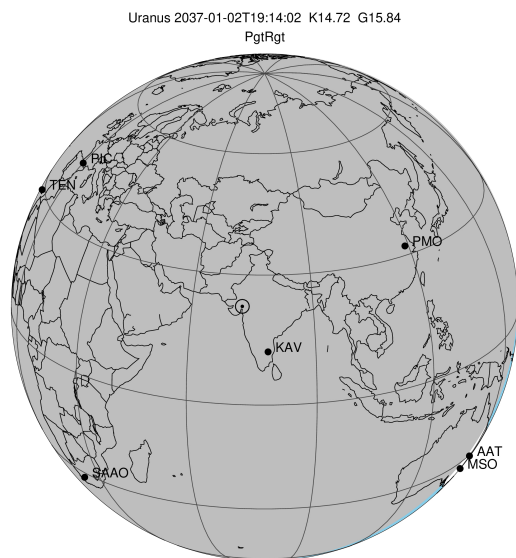


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-01-02T19:14:02.490
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3367478011898324608
 2Mass ID (if available) : 07150524+2245537

ICRS Star Coord at Epoch: 07h 15m 05.24469s +22:45:53.68262s

RUWE (>1.4 is poor) : 1.20
 K magnitude : 14.718
 G magnitude : 15.836
 RP magnitude : 15.414
 BP magnitude : 16.103
 DUPflag : 0
 Distance (au) : 17.785
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.19
 Sun-Target sep (deg) : 174.95
 Sun-Moon sep (deg) : 4.85
 B (ring opening deg) : 59.36
 PA of pole (deg) : 81.29

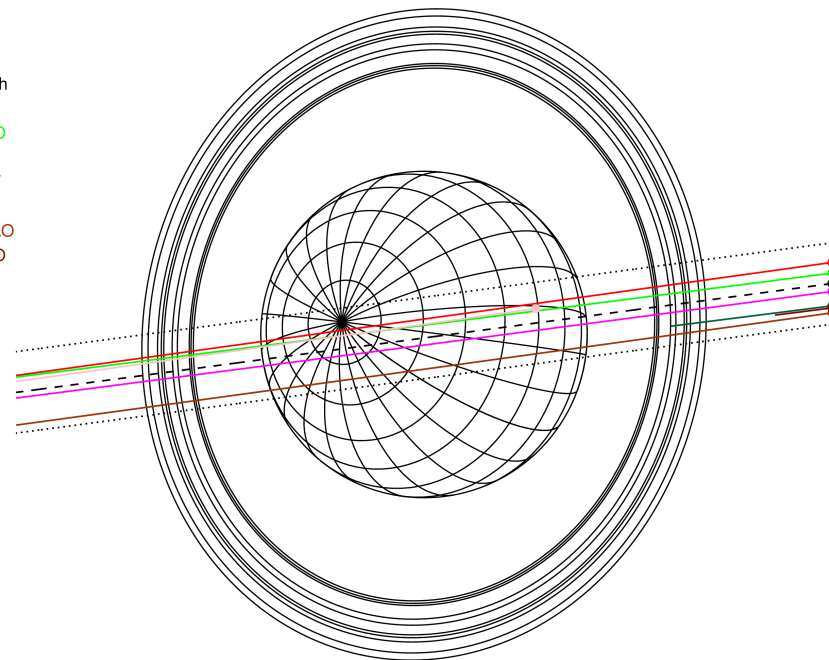
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2037-01-02T19:14:02.4900 a: 07 15 05.2447 & +22 45 53.683 C/A 0.033" PA 7.57 deg v_sky -23.19 km/s D 17.79 AU
 Credit: Styled after SORA/Lucky Star

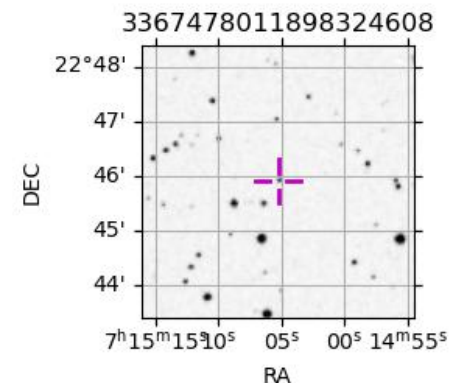
Uranus 2037-01-02T19:14:02 K14.72 G15.84 PgtRgt

Earth
 PIC
 PMO
 TEN
 KAV
 AAT
 SAAO
 MSO

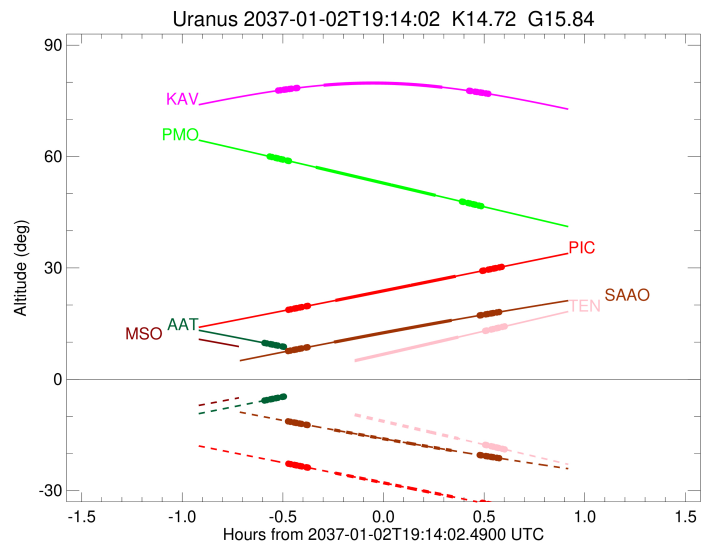
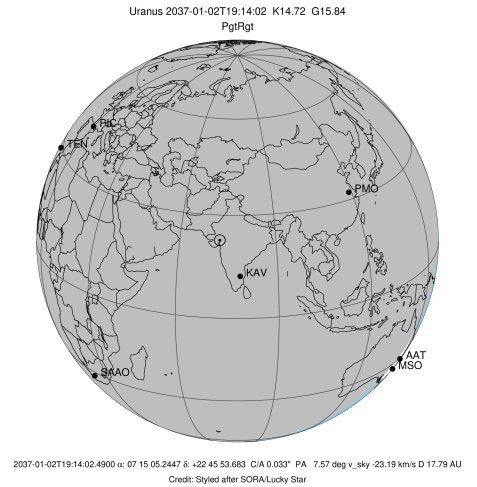


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	JAN 02 18:45 - JAN 02 19:49	PieRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	JAN 02 18:39 - JAN 02 19:43	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		+	+++++	JAN 02 19:36 - JAN 02 19:50	PneRne
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++	+ +	+++++	JAN 02 18:42 - JAN 02 19:45	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	+++++			JAN 02 18:38 - JAN 02 18:41	PnnRin
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++	+ +	+++++	JAN 02 18:45 - JAN 02 19:48	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

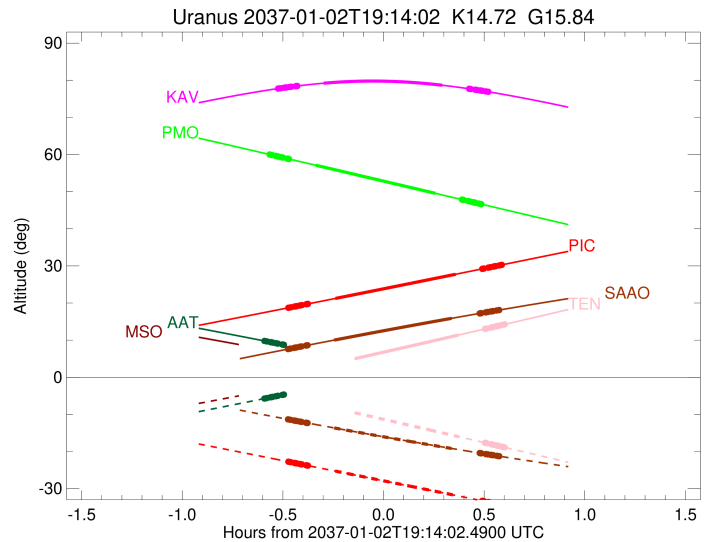
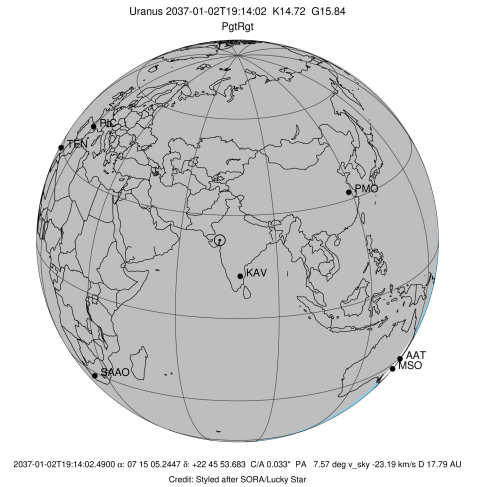


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-01-02T19:17:38.760
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3367478011898324608
 2Mass ID (if available) : 07150524+2245537
 ICRS Star Coord at Epoch: 07h 15m 05.24469s +22:45:53.68262s
 RUWE (>1.4 is poor) : 1.20
 K magnitude : 14.718
 G magnitude : 15.836
 RP magnitude : 15.414
 BP magnitude : 16.103
 DUPflag : 0
 Distance (au) : 17.785
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.19
 Sun-Target sep (deg) : 174.95
 Sun-Moon sep (deg) : 5.80
 B (ring opening deg) : 59.36
 PA of pole (deg) : 81.29
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.185
 C/A sky separation (km) : 2392.7
 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
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



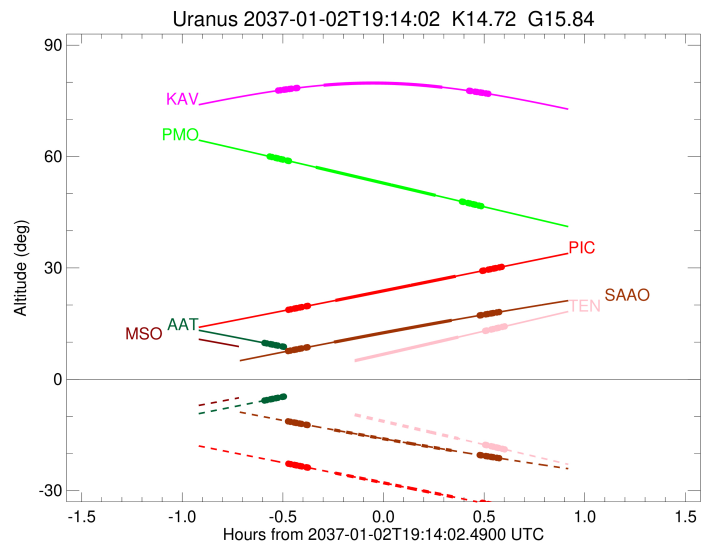
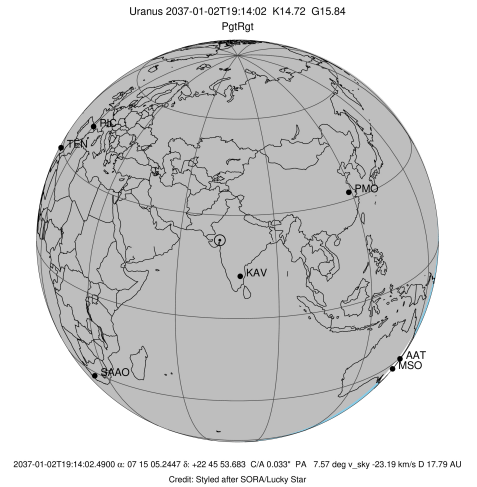
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2037-01-02T18:45:33.213		18.69	-22.72	51374.69	-26.67		
lambda	I	2037-01-02T18:46:23.739		18.84	-22.88	50026.71	-26.68		
delta	I	2037-01-02T18:47:28.450		19.04	-23.07	48300.35	-26.68		
gamma	I	2037-01-02T18:47:53.637		19.11	-23.15	47628.43	-26.68		
eta	I	2037-01-02T18:48:10.593		19.16	-23.20	47176.12	-26.68		
beta	I	2037-01-02T18:49:07.994		19.33	-23.37	45646.87	-26.68		
alpha	I	2037-01-02T18:49:41.764		19.44	-23.47	44750.65	-26.68		
4	I	2037-01-02T18:51:05.240		19.68	-23.72	42526.75	-26.68		
5	I	2037-01-02T18:51:13.626		19.71	-23.75	42296.77	-26.67		
6	I	2037-01-02T18:51:31.226		19.76	-23.80	41849.77	-26.68		
Uranus	I	2037-01-02T18:59:41.346		21.23	-25.28	25186.16		-28.18	-29.30
Uranus	E	2037-01-02T19:35:33.082		27.75	-31.83	25142.22		30.00	31.16
6	E	2037-01-02T19:43:27.649		29.20	-33.28	41819.97	26.77		
5	E	2037-01-02T19:43:42.046		29.24	-33.32	42179.54	26.76		
4	E	2037-01-02T19:43:57.997		29.29	-33.37	42614.45	26.77		
alpha	E	2037-01-02T19:45:15.531		29.53	-33.61	44687.77	26.77		
beta	E	2037-01-02T19:45:52.651		29.64	-33.72	45676.85	26.77		
eta	E	2037-01-02T19:46:48.721		29.81	-33.89	47176.12	26.78		
gamma	E	2037-01-02T19:47:05.471		29.87	-33.94	47624.61	26.78		
delta	E	2037-01-02T19:47:30.706		29.94	-34.02	48300.35	26.78		
lambda	E	2037-01-02T19:48:35.168		30.14	-34.22	50026.71	26.78		
epsilon	E	2037-01-02T19:49:07.354		30.24	-34.32	50888.79	26.78		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-01-02T19:11:41.800
 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 : 3367478011898324608
 2Mass ID (if available) : 07150524+2245537
 ICRS Star Coord at Epoch: 07h 15m 05.24469s +22:45:53.68262s
 RUWE (>1.4 is poor) : 1.20
 K magnitude : 14.718
 G magnitude : 15.836
 RP magnitude : 15.414
 BP magnitude : 16.103
 DUPflag : 0
 Distance (au) : 17.785
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.19
 Sun-Target sep (deg) : 174.95
 Sun-Moon sep (deg) : 4.58
 B (ring opening deg) : 59.36
 PA of pole (deg) : 81.29
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.111
 C/A sky separation (km) : 1434.4
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



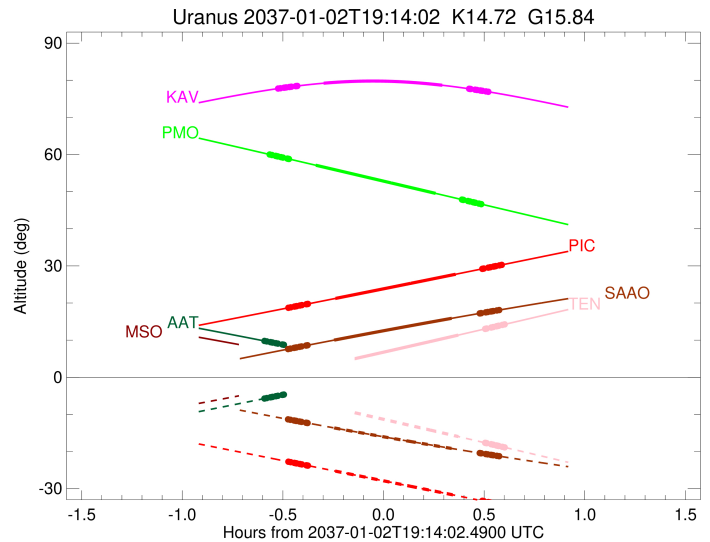
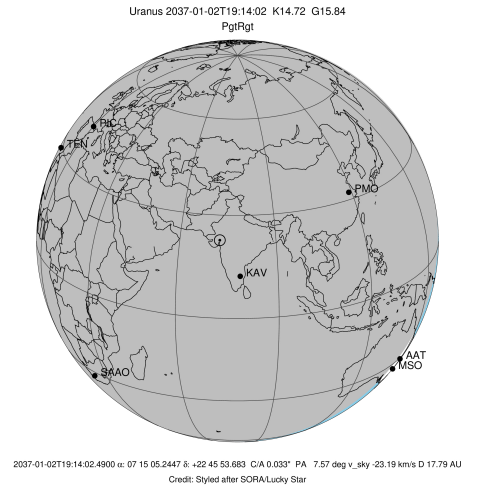
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2037-01-02T18:39:58.172		60.04	-55.46	51384.21	-27.03		
lambda	I	2037-01-02T18:40:48.393		59.86	-55.28	50026.71	-27.03		
delta	I	2037-01-02T18:41:52.265		59.64	-55.06	48300.35	-27.03		
gamma	I	2037-01-02T18:42:17.131		59.55	-54.97	47628.29	-27.03		
eta	I	2037-01-02T18:42:33.863		59.49	-54.91	47176.12	-27.03		
beta	I	2037-01-02T18:43:30.540		59.29	-54.71	45646.44	-27.02		
alpha	I	2037-01-02T18:44:03.874		59.18	-54.59	44750.30	-27.03		
4	I	2037-01-02T18:45:26.248		58.89	-54.30	42527.05	-27.02		
5	I	2037-01-02T18:45:34.581		58.86	-54.27	42295.08	-27.02		
6	I	2037-01-02T18:45:51.882		58.80	-54.21	41851.08	-27.03		
Uranus	I	2037-01-02T18:53:51.694		57.11	-52.52	25172.44		-28.76	-29.89
Uranus	E	2037-01-02T19:29:31.731		49.55	-44.96	25146.88		29.81	30.96
6	E	2037-01-02T19:37:23.875		47.87	-43.29	41820.51	26.96		
5	E	2037-01-02T19:37:38.108		47.82	-43.24	42178.76	26.95		
4	E	2037-01-02T19:37:53.989		47.76	-43.18	42614.63	26.95		
alpha	E	2037-01-02T19:39:10.979		47.49	-42.91	44687.59	26.95		
beta	E	2037-01-02T19:39:47.851		47.36	-42.78	45676.70	26.95		
eta	E	2037-01-02T19:40:43.558		47.16	-42.58	47176.12	26.95		
gamma	E	2037-01-02T19:41:00.197		47.10	-42.52	47624.56	26.95		
delta	E	2037-01-02T19:41:25.272		47.01	-42.43	48300.35	26.95		
lambda	E	2037-01-02T19:42:29.328		46.79	-42.21	50026.71	26.95		
epsilon	E	2037-01-02T19:43:01.426		46.67	-42.09	50891.78	26.95		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-01-02T19:18:19.750
 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 : 3367478011898324608
 2Mass ID (if available) : 07150524+2245537
 ICRS Star Coord at Epoch: 07h 15m 05.24469s +22:45:53.68262s
 RUWE (>1.4 is poor) : 1.20
 K magnitude : 14.718
 G magnitude : 15.836
 RP magnitude : 15.414
 BP magnitude : 16.103
 DUPflag : 0
 Distance (au) : 17.785
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.19
 Sun-Target sep (deg) : 174.95
 Sun-Moon sep (deg) : 5.86
 B (ring opening deg) : 59.36
 PA of pole (deg) : 81.29
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.122
 C/A sky separation (km) : 1577.0
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



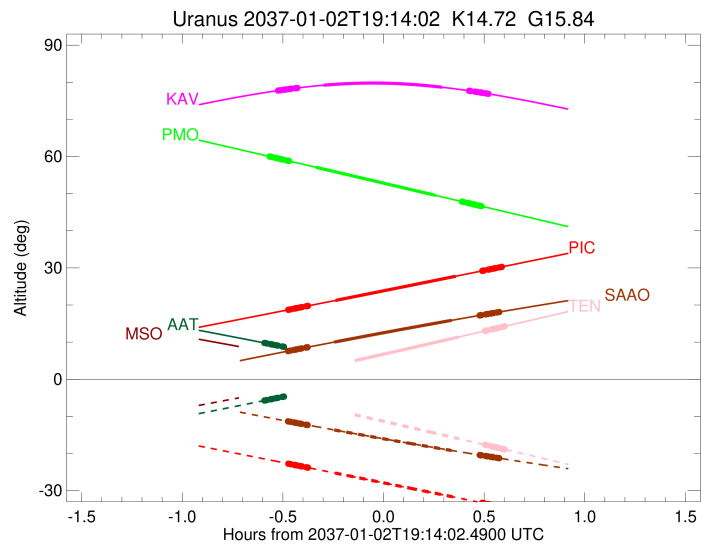
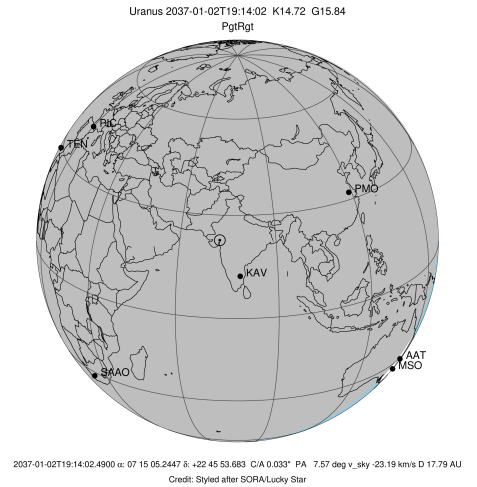
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2037-01-02T18:46:06.581		1.10x	-5.60	51379.57	-26.56		
lambda	I	2037-01-02T18:46:57.498		1.27x	-5.77	50026.71	-26.57		
delta	I	2037-01-02T18:48:02.472		1.49x	-5.99	48300.35	-26.57		
gamma	I	2037-01-02T18:48:27.763		1.57x	-6.07	47628.36	-26.57		
eta	I	2037-01-02T18:48:44.783		1.63x	-6.13	47176.12	-26.57		
beta	I	2037-01-02T18:49:42.419		1.82x	-6.33	45646.64	-26.57		
alpha	I	2037-01-02T18:50:16.320		1.94x	-6.44	44750.47	-26.58		
4	I	2037-01-02T18:51:40.097		2.22x	-6.73	42526.91	-26.58		
5	I	2037-01-02T18:51:48.545		2.24x	-6.75	42295.83	-26.57		
6	I	2037-01-02T18:52:06.169		2.30x	-6.81	41850.50	-26.59		
Uranus	I	2037-01-02T19:00:15.291		3.95x	-8.48	25177.40		-28.55	-29.67
Uranus	E	2037-01-02T19:36:21.417		11.36	-15.98	25148.20		29.76	30.91
6	E	2037-01-02T19:44:18.987		13.02	-17.65	41820.80	26.70		
5	E	2037-01-02T19:44:33.328		13.07	-17.70	42178.33	26.68		
4	E	2037-01-02T19:44:49.393		13.13	-17.76	42614.73	26.69		
alpha	E	2037-01-02T19:46:07.143		13.40	-18.03	44687.49	26.69		
beta	E	2037-01-02T19:46:44.376		13.53	-18.16	45676.60	26.69		
eta	E	2037-01-02T19:47:40.627		13.73	-18.36	47176.12	26.69		
gamma	E	2037-01-02T19:47:57.424		13.78	-18.42	47624.52	26.70		
delta	E	2037-01-02T19:48:22.740		13.87	-18.51	48300.35	26.70		
lambda	E	2037-01-02T19:49:27.402		14.10	-18.74	50026.71	26.70		
epsilon	E	2037-01-02T19:49:59.897		14.21	-18.85	50894.37	26.70		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-01-02T19:13:52.560
 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 : 3367478011898324608
 2Mass ID (if available) : 07150524+2245537
 ICRS Star Coord at Epoch: 07h 15m 05.24469s +22:45:53.68262s
 RUWE (>1.4 is poor) : 1.20
 K magnitude : 14.718
 G magnitude : 15.836
 RP magnitude : 15.414
 BP magnitude : 16.103
 DUPflag : 0
 Distance (au) : 17.785
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.19
 Sun-Target sep (deg) : 174.95
 Sun-Moon sep (deg) : 4.83
 B (ring opening deg) : 59.36
 PA of pole (deg) : 81.29
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.128
 C/A sky separation (km) : 1645.7
 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
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



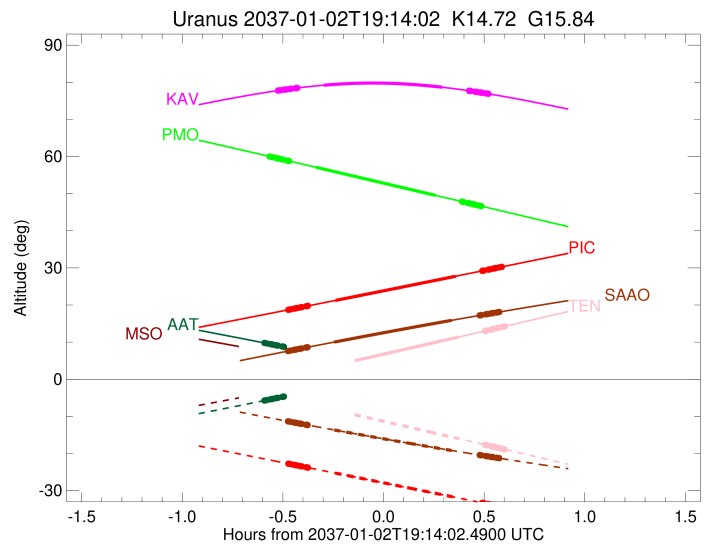
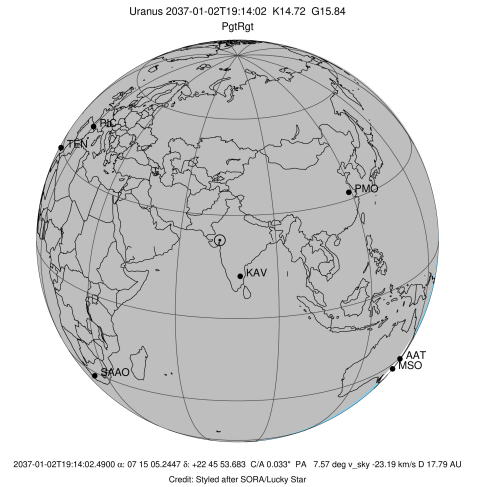
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2037-01-02T18:42:29.020		77.76	-79.56	51402.96	-27.18		
lambda	I	2037-01-02T18:43:19.675		77.87	-79.58	50026.71	-27.17		
delta	I	2037-01-02T18:44:23.220		78.00	-79.61	48300.35	-27.17		
gamma	I	2037-01-02T18:44:47.970		78.05	-79.62	47627.98	-27.17		
eta	I	2037-01-02T18:45:04.603		78.09	-79.63	47176.12	-27.17		
beta	I	2037-01-02T18:46:01.017		78.20	-79.65	45645.58	-27.16		
alpha	I	2037-01-02T18:46:34.177		78.27	-79.65	44749.44	-27.17		
4	I	2037-01-02T18:47:56.037		78.42	-79.67	42527.86	-27.17		
5	I	2037-01-02T18:48:04.461		78.44	-79.67	42291.16	-27.16		
6	I	2037-01-02T18:48:21.496		78.47	-79.67	41853.92	-27.18		
Uranus	I	2037-01-02T18:56:11.098		79.21	-79.53	25146.02		-29.85	-31.00
Uranus	E	2037-01-02T19:31:35.350		78.66	-75.53	25175.43		28.63	29.76
6	E	2037-01-02T19:39:32.470		77.72	-74.15	41823.56	27.17		
5	E	2037-01-02T19:39:46.247		77.69	-74.11	42174.57	27.16		
4	E	2037-01-02T19:40:02.236		77.65	-74.06	42615.50	27.16		
alpha	E	2037-01-02T19:41:18.588		77.48	-73.83	44686.67	27.16		
beta	E	2037-01-02T19:41:55.172		77.39	-73.71	45675.76	27.16		
eta	E	2037-01-02T19:42:50.482		77.26	-73.54	47176.12	27.16		
gamma	E	2037-01-02T19:43:06.978		77.22	-73.49	47624.22	27.16		
delta	E	2037-01-02T19:43:31.869		77.16	-73.42	48300.35	27.16		
lambda	E	2037-01-02T19:44:35.420		77.01	-73.22	50026.71	27.17		
epsilon	E	2037-01-02T19:45:08.014		76.93	-73.12	50912.16	27.17		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-01-02T19:10:02.410
 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 : 3367478011898324608
 2Mass ID (if available) : 07150524+2245537
 ICRS Star Coord at Epoch: 07h 15m 05.24469s +22:45:53.68262s
 RUWE (>1.4 is poor) : 1.20
 K magnitude : 14.718
 G magnitude : 15.836
 RP magnitude : 15.414
 BP magnitude : 16.103
 DUPflag : 0
 Distance (au) : 17.785
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.19
 Sun-Target sep (deg) : 174.95
 Sun-Moon sep (deg) : 3.86
 B (ring opening deg) : 59.36
 PA of pole (deg) : 81.29
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.276
 C/A sky separation (km) : 3563.1
 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_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	2037-01-02T18:38:23.467		9.81	-5.76	51416.04	-26.81		
lambda	I	2037-01-02T18:39:15.308		9.66	-5.60	50026.71	-26.80		
delta	I	2037-01-02T18:40:19.742		9.46	-5.40	48300.35	-26.79		
gamma	I	2037-01-02T18:40:44.850		9.39	-5.33	47627.75	-26.79		
eta	I	2037-01-02T18:41:01.712		9.34	-5.28	47176.12	-26.78		
beta	I	2037-01-02T18:41:58.956		9.17	-5.10	45645.01	-26.78		
alpha	I	2037-01-02T18:42:32.603		9.07	-5.00x	44748.75	-26.77		
4	I	2037-01-02T18:43:55.610		8.82	-4.74x	42528.56	-26.76		
5	I	2037-01-02T18:44:04.269		8.80	-4.71x	42288.23	-26.75		
6	I	2037-01-02T18:44:21.427		8.74	-4.66x	41855.86	-26.77		
Uranus	I	2037-01-02T18:52:15.473		7.32	-3.19x	25134.19		-30.33	-31.49
Uranus	E	2037-01-02T19:27:53.391		0.67x	3.61x	25196.77		27.73	28.84
6	E	2037-01-02T19:36:06.455		-0.90x	5.21x	41825.31	26.68		
5	E	2037-01-02T19:36:20.293		-0.95x	5.26x	42172.37	26.66		
4	E	2037-01-02T19:36:36.700		-1.00x	5.31x	42615.87	26.67		
alpha	E	2037-01-02T19:37:54.446		-1.25x	5.56x	44686.23	26.67		
beta	E	2037-01-02T19:38:31.699		-1.37x	5.69x	45675.21	26.67		
eta	E	2037-01-02T19:39:28.042		-1.55x	5.87x	47176.12	26.68		
gamma	E	2037-01-02T19:39:44.833		-1.61x	5.93x	47624.04	26.68		
delta	E	2037-01-02T19:40:10.183		-1.69x	6.01x	48300.35	26.68		
lambda	E	2037-01-02T19:41:14.888		-1.90x	6.22x	50026.71	26.68		
epsilon	E	2037-01-02T19:41:48.505		-2.01x	6.33x	50923.73	26.70		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-01-02T19:16:48.650
 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 : 3367478011898324608
 2Mass ID (if available) : 07150524+2245537
 ICRS Star Coord at Epoch: 07h 15m 05.24469s +22:45:53.68262s
 RUWE (>1.4 is poor) : 1.20
 K magnitude : 14.718
 G magnitude : 15.836
 RP magnitude : 15.414
 BP magnitude : 16.103
 DUPflag : 0
 Distance (au) : 17.785
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.19
 Sun-Target sep (deg) : 174.95
 Sun-Moon sep (deg) : 5.23
 B (ring opening deg) : 59.36
 PA of pole (deg) : 81.29
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.418
 C/A sky separation (km) : 5390.9
 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	2037-01-02T18:45:25.527		7.57	-11.31	51424.03	-26.73		
lambda	I	2037-01-02T18:46:17.833		7.72	-11.46	50026.71	-26.71		
delta	I	2037-01-02T18:47:22.479		7.91	-11.64	48300.35	-26.70		
gamma	I	2037-01-02T18:47:47.678		7.99	-11.72	47627.60	-26.69		
eta	I	2037-01-02T18:48:04.591		8.04	-11.76	47176.12	-26.69		
beta	I	2037-01-02T18:49:02.048		8.21	-11.92	45644.64	-26.68		
alpha	I	2037-01-02T18:49:35.820		8.31	-12.02	44748.24	-26.68		
4	I	2037-01-02T18:50:59.092		8.55	-12.25	42529.10	-26.66		
5	I	2037-01-02T18:51:07.867		8.58	-12.28	42286.14	-26.65		
6	I	2037-01-02T18:51:24.996		8.63	-12.33	41857.18	-26.67		
Uranus	I	2037-01-02T18:59:20.153		10.01	-13.65	25128.72		-30.55	-31.72
Uranus	E	2037-01-02T19:34:20.274		15.87	-19.18	25225.38		26.50	27.57
6	E	2037-01-02T19:42:42.199		17.20	-20.41	41827.51	26.75		
5	E	2037-01-02T19:42:55.755		17.24	-20.45	42169.80	26.73		
4	E	2037-01-02T19:43:12.256		17.28	-20.49	42616.23	26.75		
alpha	E	2037-01-02T19:44:29.730		17.48	-20.68	44685.75	26.77		
beta	E	2037-01-02T19:45:06.835		17.58	-20.76	45674.48	26.77		
eta	E	2037-01-02T19:46:02.981		17.72	-20.90	47176.12	26.79		
gamma	E	2037-01-02T19:46:19.691		17.77	-20.94	47623.81	26.79		
delta	E	2037-01-02T19:46:44.940		17.83	-21.00	48300.35	26.80		
lambda	E	2037-01-02T19:47:49.345		18.00	-21.16	50026.71	26.81		
epsilon	E	2037-01-02T19:48:23.377		18.09	-21.24	50939.30	26.84		