

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-12-04T23:08:10.540
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3415603189170103936
 2Mass ID (if available) : 05194342+2312232

Uranus 2030-12-04T23:08:10 K13.49 G16.44 PgtRgt

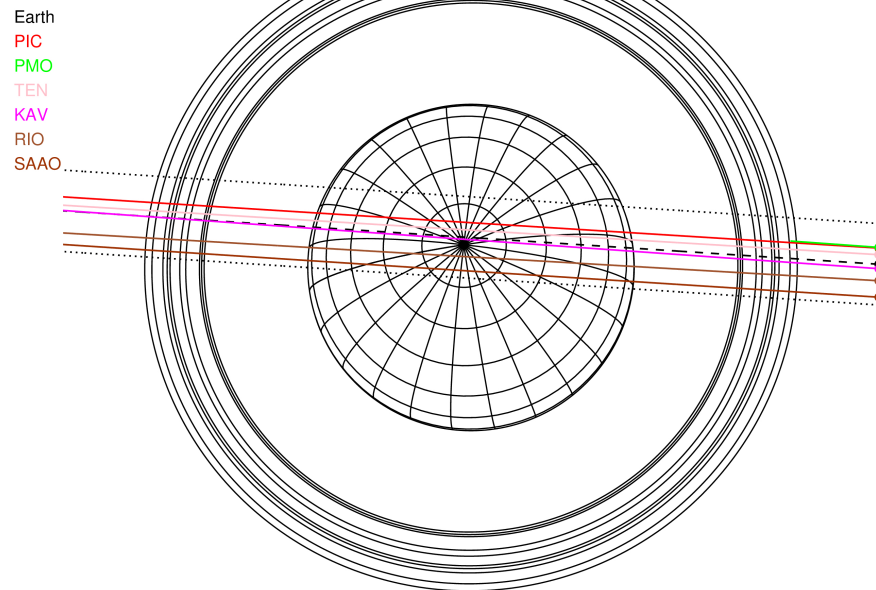
ICRS Star Coord at Epoch: 05h 19m 43.43161s +23:12:22.96421s

RUWE (>1.4 is poor) : 1.10
 K magnitude : 13.495
 G magnitude : 16.439
 RP magnitude : 15.530
 BP magnitude : 17.263
 DUPflag : 0
 Distance (au) : 18.181
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.13
 Sun-Target sep (deg) : 171.66
 Sun-Moon sep (deg) : 63.04
 B (ring opening deg) : 81.60
 PA of pole (deg) : 17.57

Uranus 2030-12-04T23:08:10 K13.49 G16.44
 PgtRgt



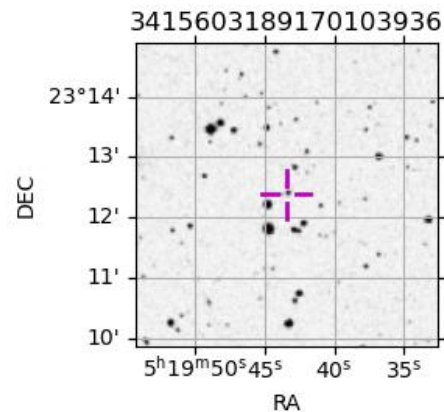
2030-12-04T23:08:10.5400 ra: 05 19 43.4316 s: +23 12 22.964 C/A 0.3611 PA 176.26 deg v_sky -23.13 km/s D 18.18 AU
 Credit: Styled after SORA/Lucky Star



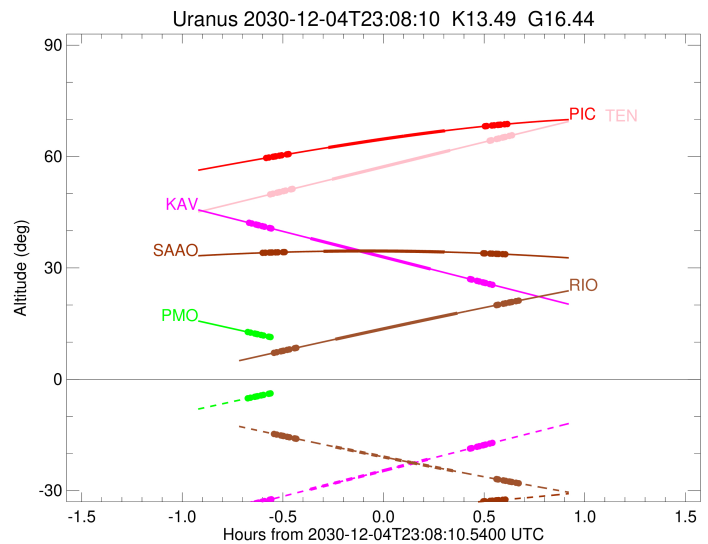
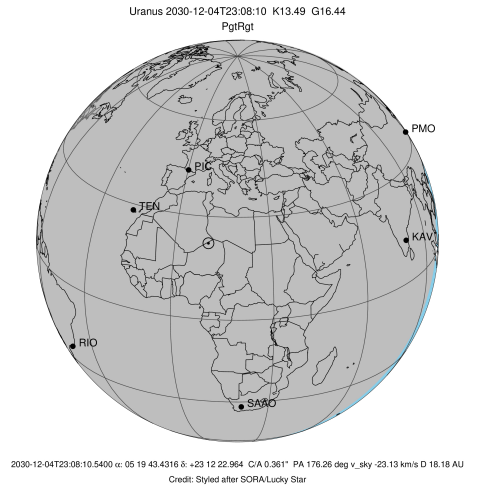
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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	+++++	+ +	+++++	DEC 04 22:33 - DEC 04 23:45	PieRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+			DEC 04 22:27 - DEC 04 22:27	PnnRin
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	+++++	+ +	+++++	DEC 04 22:34 - DEC 04 23:46	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++	+ +	+++++	DEC 04 22:28 - DEC 04 23:40	PieRie
RIO	Rio de Janeiro	-22.9	316.8	+++++	+ +	+++++	DEC 04 22:35 - DEC 04 23:48	PieRie
ESO	European Southern Obs	-29.3	289.3					PnnRnn
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++	+ +	+++++	DEC 04 22:32 - DEC 04 23:44	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

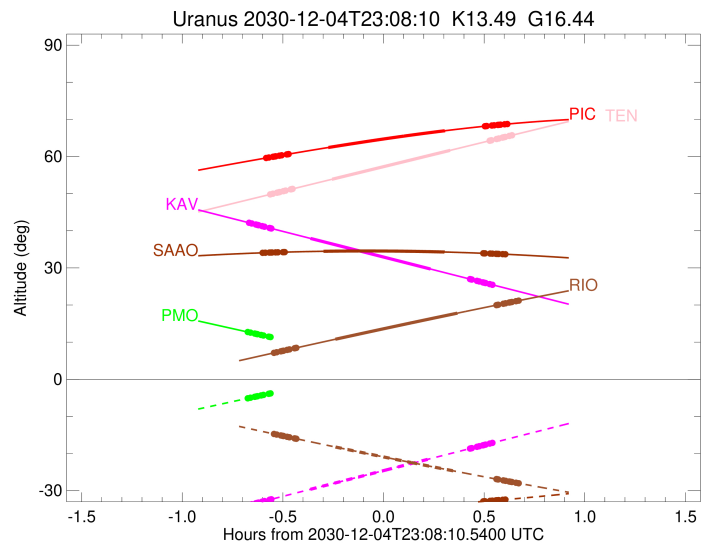
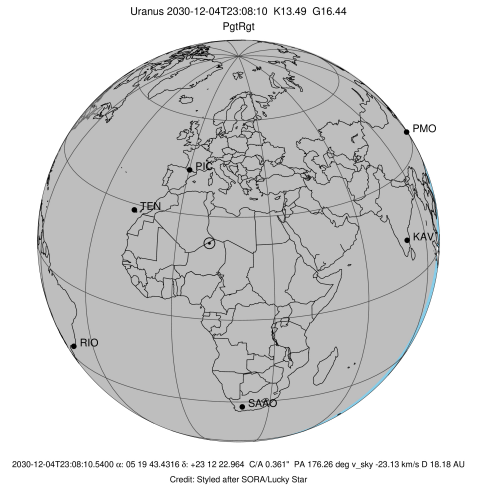


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-12-04T23:09:11.610
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3415603189170103936
 2Mass ID (if available) : 05194342+2312232
 ICRS Star Coord at Epoch: 05h 19m 43.43161s +23:12:22.96421s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 13.495
 G magnitude : 16.439
 RP magnitude : 15.530
 BP magnitude : 17.263
 DUPflag : 0
 Distance (au) : 18.181
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.13
 Sun-Target sep (deg) : 171.66
 Sun-Moon sep (deg) : 63.68
 B (ring opening deg) : 81.60
 PA of pole (deg) : 17.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.531
 C/A sky separation (km) : 7001.8
 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



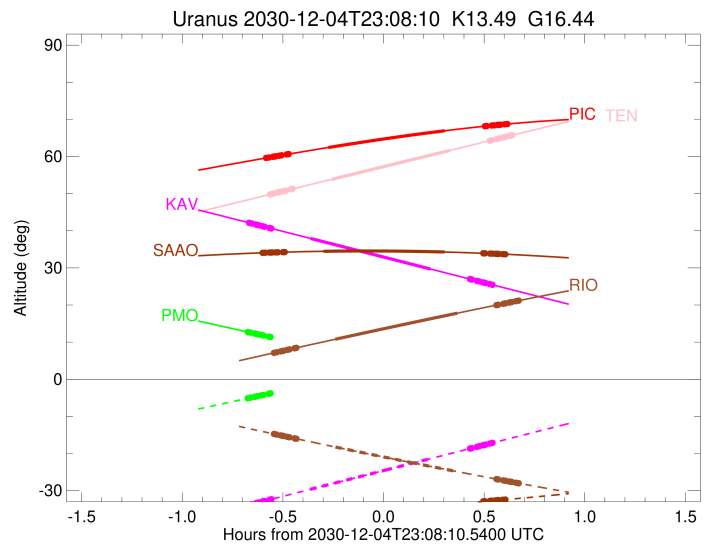
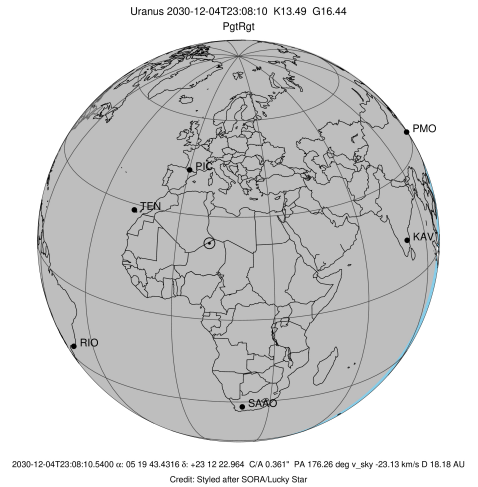
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-12-04T22:33:27.030		59.65	-64.14	50794.77	-23.24		
lambda	I	2030-12-04T22:34:00.105		59.74	-64.21	50026.71	-23.22		
delta	I	2030-12-04T22:35:14.487		59.93	-64.37	48300.35	-23.20		
gamma	I	2030-12-04T22:35:43.694		60.01	-64.43	47622.81	-23.19		
eta	I	2030-12-04T22:36:02.955		60.06	-64.47	47176.12	-23.19		
beta	I	2030-12-04T22:37:07.884		60.23	-64.60	45670.92	-23.17		
alpha	I	2030-12-04T22:37:50.368		60.34	-64.69	44686.51	-23.16		
4	I	2030-12-04T22:39:23.752		60.58	-64.88	42526.14	-23.13		
5	I	2030-12-04T22:39:38.951		60.62	-64.91	42173.46	-23.12		
6	I	2030-12-04T22:39:53.688		60.66	-64.94	41834.72	-23.11		
Uranus	I	2030-12-04T22:51:43.375		62.43	-66.28	25554.04		-0.77	-0.80
Uranus	E	2030-12-04T23:26:30.119		66.95	-69.02	25344.77		5.07	5.31
6	E	2030-12-04T23:38:23.393		68.16	-69.45	41825.30	23.15		
5	E	2030-12-04T23:38:43.025		68.19	-69.46	42275.81	23.15		
4	E	2030-12-04T23:38:57.610		68.22	-69.47	42615.26	23.16		
alpha	E	2030-12-04T23:40:29.584		68.36	-69.50	44745.38	23.19		
beta	E	2030-12-04T23:41:08.390		68.41	-69.51	45646.43	23.21		
eta	E	2030-12-04T23:42:14.266		68.51	-69.53	47176.12	23.23		
gamma	E	2030-12-04T23:42:33.838		68.54	-69.54	47630.76	23.23		
delta	E	2030-12-04T23:43:02.655		68.58	-69.54	48300.35	23.24		
lambda	E	2030-12-04T23:44:16.910		68.69	-69.56	50026.71	23.26		
epsilon	E	2030-12-04T23:45:22.135		68.78	-69.57	51544.19	23.28		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-12-04T23:04:08.090
 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 : 3415603189170103936
 2Mass ID (if available) : 05194342+2312232
 ICRS Star Coord at Epoch: 05h 19m 43.43161s +23:12:22.96421s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 13.495
 G magnitude : 16.439
 RP magnitude : 15.530
 BP magnitude : 17.263
 DUPflag : 0
 Distance (au) : 18.181
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.13
 Sun-Target sep (deg) : 171.66
 Sun-Moon sep (deg) : 63.45
 B (ring opening deg) : 81.60
 PA of pole (deg) : 17.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.587
 C/A sky separation (km) : 7742.4
 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



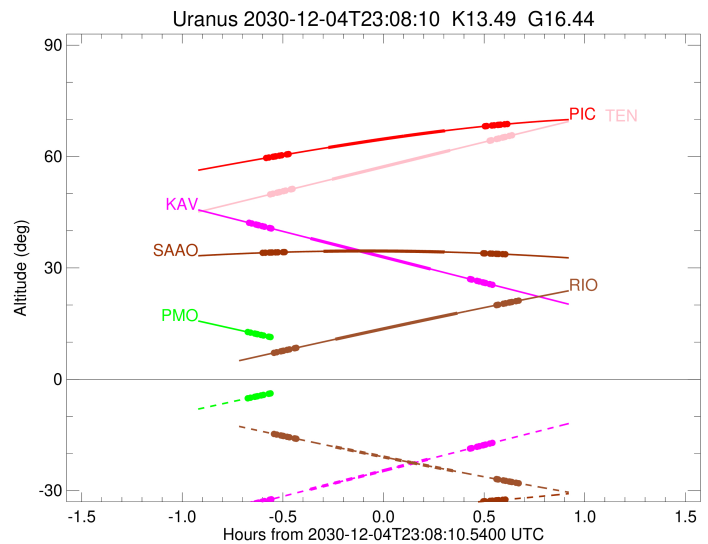
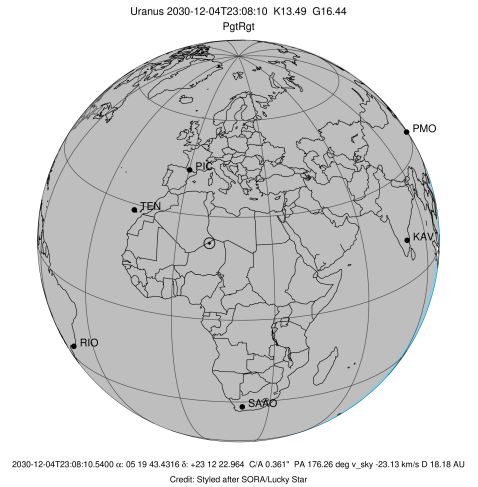
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-12-04T22:27:57.941		12.68	-5.08	50795.75	-22.91		
lambda	I	2030-12-04T22:28:31.536		12.56	-4.97x	50026.71	-22.89		
delta	I	2030-12-04T22:29:47.005		12.31	-4.72x	48300.35	-22.86		
gamma	I	2030-12-04T22:30:16.645		12.21	-4.63x	47622.84	-22.85		
eta	I	2030-12-04T22:30:36.195		12.15	-4.56x	47176.12	-22.85		
beta	I	2030-12-04T22:31:42.112		11.93	-4.35x	45670.80	-22.82		
alpha	I	2030-12-04T22:32:25.249		11.78	-4.21x	44686.43	-22.80		
4	I	2030-12-04T22:34:00.096		11.47	-3.90x	42526.18	-22.77		
5	I	2030-12-04T22:34:15.559		11.42	-3.85x	42173.04	-22.75		
6	I	2030-12-04T22:34:30.528		11.37	-3.81x	41834.36	-22.75		
Uranus	I	2030-12-04T22:46:33.675		8.97	-1.49x	25556.01		-0.59	-0.62
Uranus	E	2030-12-04T23:21:33.188		2.17x	5.07x	25322.18		5.33	5.59
6	E	2030-12-04T23:33:43.870		-0.14x	7.28x	41824.19	22.65		
5	E	2030-12-04T23:34:03.900		-0.20x	7.34x	42273.93	22.65		
4	E	2030-12-04T23:34:18.876		-0.25x	7.39x	42614.95	22.67		
alpha	E	2030-12-04T23:35:52.845		-0.54x	7.67x	44744.83	22.70		
beta	E	2030-12-04T23:36:32.500		-0.67x	7.79x	45646.08	22.71		
eta	E	2030-12-04T23:37:39.815		-0.88x	7.99x	47176.12	22.74		
gamma	E	2030-12-04T23:37:59.811		-0.94x	8.05x	47630.83	22.74		
delta	E	2030-12-04T23:38:29.245		-1.03x	8.13x	48300.35	22.75		
lambda	E	2030-12-04T23:39:45.095		-1.27x	8.36x	50026.71	22.77		
epsilon	E	2030-12-04T23:40:51.812		-1.48x	8.56x	51546.33	22.79		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-12-04T23:10:29.960
 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 : 3415603189170103936
 2Mass ID (if available) : 05194342+2312232
 ICRS Star Coord at Epoch: 05h 19m 43.43161s +23:12:22.96421s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 13.495
 G magnitude : 16.439
 RP magnitude : 15.530
 BP magnitude : 17.263
 DUPflag : 0
 Distance (au) : 18.181
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.13
 Sun-Target sep (deg) : 171.66
 Sun-Moon sep (deg) : 63.52
 B (ring opening deg) : 81.60
 PA of pole (deg) : 17.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.443
 C/A sky separation (km) : 5837.4
 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



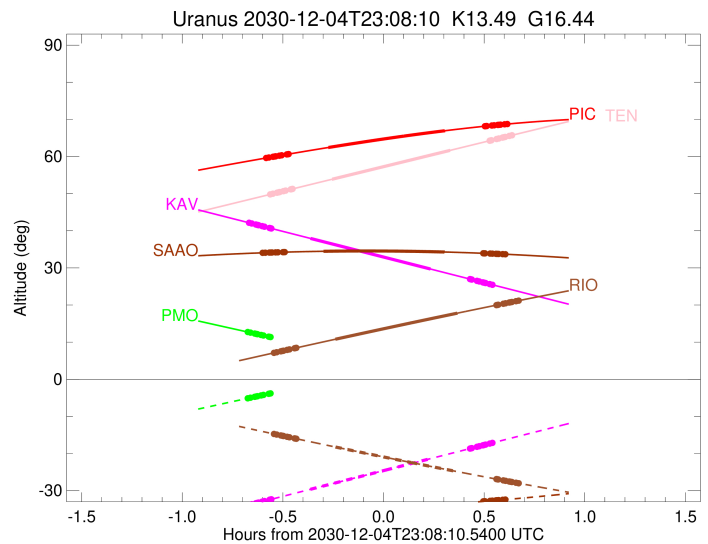
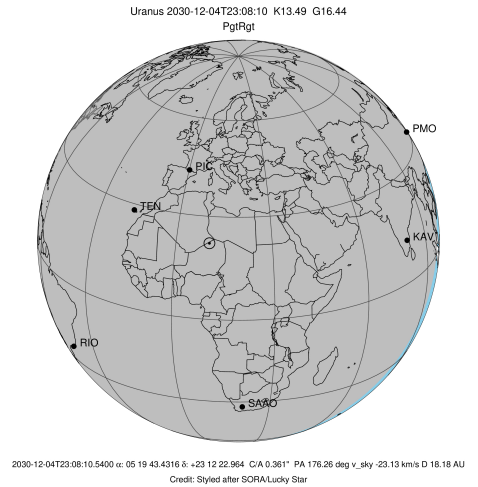
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-12-04T22:34:39.356		49.86	-57.55	50790.70	-23.29		
lambda	I	2030-12-04T22:35:12.172		49.98	-57.67	50026.71	-23.28		
delta	I	2030-12-04T22:36:26.351		50.26	-57.94	48300.35	-23.27		
gamma	I	2030-12-04T22:36:55.477		50.36	-58.05	47622.72	-23.26		
eta	I	2030-12-04T22:37:14.676		50.43	-58.12	47176.12	-23.26		
beta	I	2030-12-04T22:38:19.381		50.67	-58.36	45671.34	-23.25		
alpha	I	2030-12-04T22:39:01.725		50.83	-58.51	44686.79	-23.24		
4	I	2030-12-04T22:40:34.784		51.17	-58.86	42526.04	-23.22		
5	I	2030-12-04T22:40:49.855		51.23	-58.91	42174.82	-23.21		
6	I	2030-12-04T22:41:04.552		51.28	-58.96	41835.84	-23.21		
Uranus	I	2030-12-04T22:52:49.257		53.88	-61.55	25548.02		-1.14	-1.19
Uranus	E	2030-12-04T23:28:02.071		61.66	-69.23	25372.18		4.73	4.95
6	E	2030-12-04T23:39:48.841		64.26	-71.77	41826.55	23.28		
5	E	2030-12-04T23:40:08.397		64.33	-71.84	42277.89	23.28		
4	E	2030-12-04T23:40:22.826		64.38	-71.89	42615.56	23.29		
alpha	E	2030-12-04T23:41:54.338		64.72	-72.21	44745.96	23.31		
beta	E	2030-12-04T23:42:32.948		64.86	-72.35	45646.81	23.32		
eta	E	2030-12-04T23:43:38.498		65.10	-72.58	47176.12	23.33		
gamma	E	2030-12-04T23:43:57.977		65.17	-72.65	47630.68	23.34		
delta	E	2030-12-04T23:44:26.668		65.28	-72.75	48300.35	23.34		
lambda	E	2030-12-04T23:45:40.600		65.55	-73.02	50026.71	23.36		
epsilon	E	2030-12-04T23:46:45.446		65.79	-73.24	51541.68	23.37		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-12-04T23:04:20.840
 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 : 3415603189170103936
 2Mass ID (if available) : 05194342+2312232
 ICRS Star Coord at Epoch: 05h 19m 43.43161s +23:12:22.96421s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 13.495
 G magnitude : 16.439
 RP magnitude : 15.530
 BP magnitude : 17.263
 DUPflag : 0
 Distance (au) : 18.181
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.13
 Sun-Target sep (deg) : 171.66
 Sun-Moon sep (deg) : 63.83
 B (ring opening deg) : 81.60
 PA of pole (deg) : 17.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.328
 C/A sky separation (km) : 4329.8
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-12-04T22:28:21.669		42.09	-33.81	50783.29	-23.38		
lambda	I	2030-12-04T22:28:54.039		41.97	-33.68	50026.71	-23.37		
delta	I	2030-12-04T22:30:07.921		41.69	-33.40	48300.35	-23.36		
gamma	I	2030-12-04T22:30:36.936		41.57	-33.29	47622.55	-23.36		
eta	I	2030-12-04T22:30:56.050		41.50	-33.21	47176.12	-23.36		
beta	I	2030-12-04T22:32:00.451		41.25	-32.96	45672.09	-23.35		
alpha	I	2030-12-04T22:32:42.620		41.09	-32.80	44687.36	-23.34		
4	I	2030-12-04T22:34:15.302		40.74	-32.44	42525.94	-23.33		
5	I	2030-12-04T22:34:30.184		40.68	-32.39	42177.37	-23.32		
6	I	2030-12-04T22:34:44.853		40.62	-32.33	41837.85	-23.32		
Uranus	I	2030-12-04T22:46:25.112		37.94	-29.63	25533.89		-1.72	-1.81
Uranus	E	2030-12-04T23:22:12.013		29.70	-21.38	25398.73		4.38	4.58
6	E	2030-12-04T23:33:57.165		26.99	-18.68	41827.63	23.23		
5	E	2030-12-04T23:34:16.790		26.92	-18.60	42279.62	23.22		
4	E	2030-12-04T23:34:31.188		26.86	-18.55	42615.79	23.23		
alpha	E	2030-12-04T23:36:02.961		26.51	-18.19	44746.42	23.24		
beta	E	2030-12-04T23:36:41.689		26.36	-18.05	45647.14	23.24		
eta	E	2030-12-04T23:37:47.452		26.11	-17.79	47176.12	23.25		
gamma	E	2030-12-04T23:38:07.001		26.03	-17.72	47630.62	23.25		
delta	E	2030-12-04T23:38:35.804		25.92	-17.61	48300.35	23.25		
lambda	E	2030-12-04T23:39:50.040		25.64	-17.33	50026.71	23.26		
epsilon	E	2030-12-04T23:40:55.084		25.39	-17.08	51539.61	23.27		

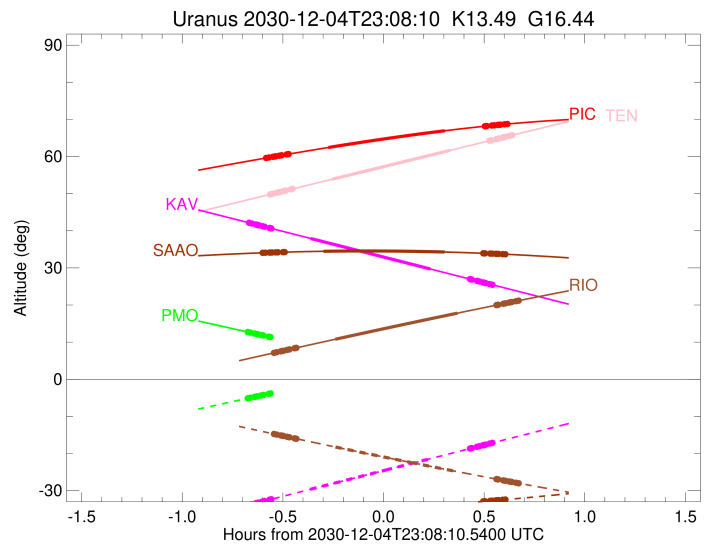
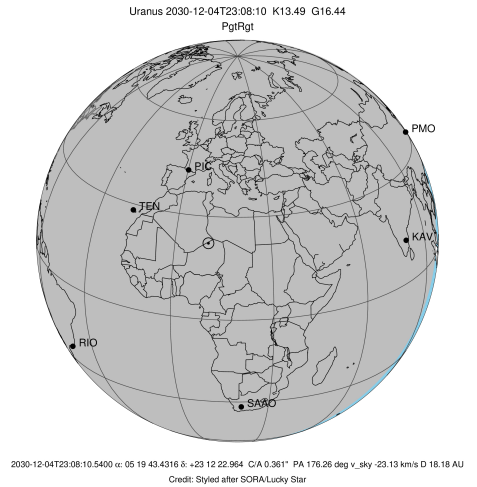
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-12-04T23:12:03.610
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 3415603189170103936
 2Mass ID (if available) : 05194342+2312232
 ICRS Star Coord at Epoch: 05h 19m 43.43161s +23:12:22.96421s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 13.495
 G magnitude : 16.439
 RP magnitude : 15.530
 BP magnitude : 17.263
 DUPflag : 0
 Distance (au) : 18.181
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.13
 Sun-Target sep (deg) : 171.66
 Sun-Moon sep (deg) : 62.89
 B (ring opening deg) : 81.60
 PA of pole (deg) : 17.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.125
 C/A sky separation (km) : 1647.2
 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	2030-12-04T22:35:47.885		7.17	-14.79	50776.48	-23.28		
lambda	I	2030-12-04T22:36:20.101		7.28	-14.89	50026.71	-23.27		
delta	I	2030-12-04T22:37:34.278		7.53	-15.13	48300.35	-23.27		
gamma	I	2030-12-04T22:38:03.407		7.63	-15.23	47622.39	-23.27		
eta	I	2030-12-04T22:38:22.581		7.69	-15.29	47176.12	-23.27		
beta	I	2030-12-04T22:39:27.161		7.91	-15.50	45672.87	-23.27		
alpha	I	2030-12-04T22:40:09.456		8.05	-15.63	44688.04	-23.27		
4	I	2030-12-04T22:41:42.406		8.36	-15.93	42525.95	-23.28		
5	I	2030-12-04T22:41:57.186		8.41	-15.98	42180.34	-23.27		
6	I	2030-12-04T22:42:11.932		8.46	-16.03	41840.08	-23.28		
Uranus	I	2030-12-04T22:53:51.543		10.79	-18.25	25507.20		-2.48	-2.60
Uranus	E	2030-12-04T23:30:12.035		17.81	-24.88	25456.51		3.49	3.66
6	E	2030-12-04T23:41:49.906		19.97	-26.89	41830.87	23.38		
5	E	2030-12-04T23:42:09.463		20.03	-26.95	42284.62	23.38		
4	E	2030-12-04T23:42:23.576		20.07	-26.99	42616.30	23.38		
alpha	E	2030-12-04T23:43:54.800		20.35	-27.24	44747.77	23.38		
beta	E	2030-12-04T23:44:33.282		20.47	-27.35	45648.22	23.39		
eta	E	2030-12-04T23:45:38.601		20.66	-27.54	47176.12	23.39		
gamma	E	2030-12-04T23:45:58.022		20.72	-27.59	47630.40	23.39		
delta	E	2030-12-04T23:46:26.663		20.81	-27.67	48300.35	23.39		
lambda	E	2030-12-04T23:47:40.458		21.03	-27.88	50026.71	23.40		
epsilon	E	2030-12-04T23:48:44.768		21.23	-28.06	51531.38	23.40		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2030-12-04T23:08:19.330
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      : 3415603189170103936
2Mass ID (if available) : 05194342+2312232
ICRS Star Coord at Epoch: 05h 19m 43.43161s +23:12:22.96421s
RUWE (>1.4 is poor) : 1.10
K magnitude          : 13.495
G magnitude          : 16.439
RP magnitude         : 15.530
BP magnitude         : 17.263
DUPflag             : 0
Distance (au)       : 18.181
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -23.13
Sun-Target sep (deg) : 171.66
Sun-Moon sep (deg)  : 63.52
B (ring opening deg) : 81.60
PA of pole (deg)    : 17.57
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.043
C/A sky separation (km) : 565.2
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl1.spk
ural11.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.ural11.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.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	2030-12-04T22:32:24.776		34.07	-35.45	50769.04	-23.54		
lambda	I	2030-12-04T22:32:56.308		34.09	-35.45	50026.71	-23.54		
delta	I	2030-12-04T22:34:09.641		34.13	-35.44	48300.35	-23.54		
gamma	I	2030-12-04T22:34:38.448		34.14	-35.44	47622.20	-23.54		
eta	I	2030-12-04T22:34:57.397		34.15	-35.43	47176.12	-23.54		
beta	I	2030-12-04T22:36:01.209		34.18	-35.42	45673.75	-23.54		
alpha	I	2030-12-04T22:36:43.024		34.20	-35.42	44688.92	-23.54		
4	I	2030-12-04T22:38:14.966		34.24	-35.40	42526.10	-23.54		
5	I	2030-12-04T22:38:29.432		34.25	-35.40	42183.87	-23.54		
6	I	2030-12-04T22:38:44.073		34.25	-35.39	41842.58	-23.54		
Uranus	I	2030-12-04T22:50:16.668		34.47	-35.18	25472.39		-3.21	-3.36
Uranus	E	2030-12-04T23:26:22.692		34.28	-33.65	25489.80		2.87	3.00
6	E	2030-12-04T23:37:54.408		33.94	-32.90	41832.86	23.54		
5	E	2030-12-04T23:38:13.855		33.93	-32.87	42287.51	23.54		
4	E	2030-12-04T23:38:27.757		33.92	-32.86	42616.48	23.54		
alpha	E	2030-12-04T23:39:58.374		33.86	-32.75	44748.49	23.54		
beta	E	2030-12-04T23:40:36.597		33.84	-32.70	45648.88	23.54		
eta	E	2030-12-04T23:41:41.454		33.79	-32.62	47176.12	23.54		
gamma	E	2030-12-04T23:42:00.742		33.78	-32.60	47630.26	23.55		
delta	E	2030-12-04T23:42:29.202		33.76	-32.56	48300.35	23.55		
lambda	E	2030-12-04T23:43:42.523		33.71	-32.47	50026.71	23.55		
epsilon	E	2030-12-04T23:44:46.198		33.67	-32.39	51525.99	23.54		