

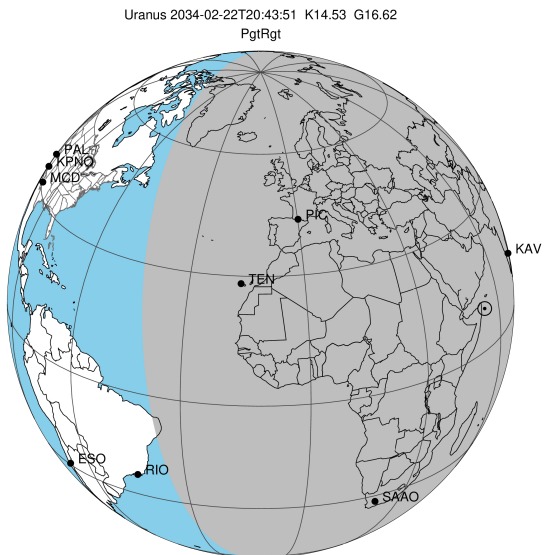
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-22T20:43:51.740
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3426149223669044992
 2Mass ID (if available) : 06071194+2342137

Uranus 2034-02-22T20:43:51 K14.53 G16.62 PgtRgt

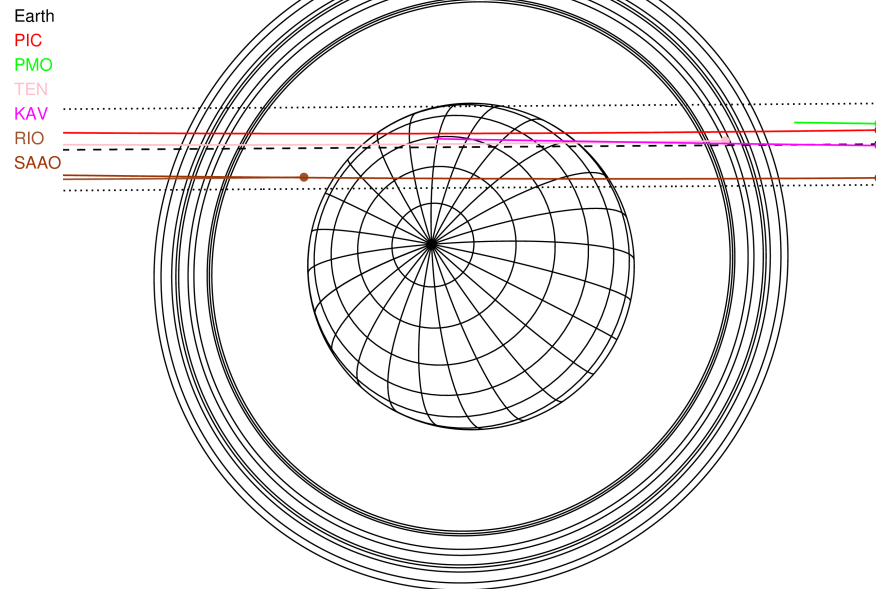
ICRS Star Coord at Epoch: 06h 07m 11.95177s +23:42:13.74250s

RUWE (>1.4 is poor) : 2.00
 K magnitude : 14.525
 G magnitude : 16.622
 RP magnitude : 15.731
 BP magnitude : 16.856
 DUPflag : 0
 Distance (au) : 18.461
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -7.52
 Sun-Target sep (deg) : 117.82
 Sun-Moon sep (deg) : 65.30
 B (ring opening deg) : 73.91
 PA of pole (deg) : 60.62

#	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

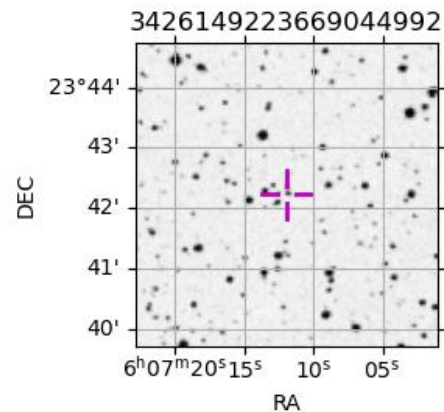


2034-02-22T20:43:51.7400 α: 06 07 11.9518 δ: +23 42 13.742 C/A 1.403° PA 180.40 deg v_sky - 7.53 km/s D 18.46 AU
 Credit: Styled after SORA/Lucky Star

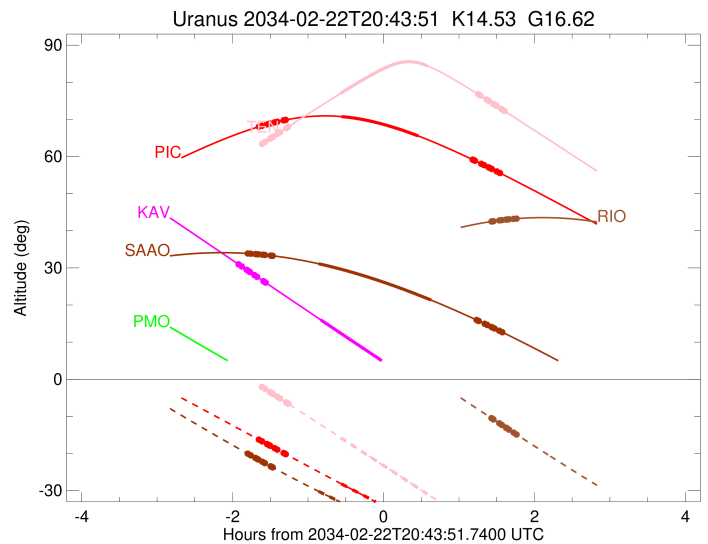
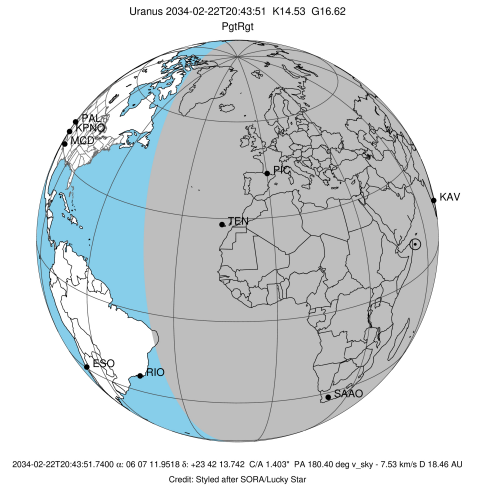


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	FEB 22 19:04 - FEB 22 22:15	PieRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
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	++++	+ +	+++++	FEB 22 19:21 - FEB 22 22:19	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++	+		FEB 22 18:48 - FEB 22 19:53	PinRin
RIO	Rio de Janeiro	-22.9	316.8			+++++	FEB 22 22:09 - FEB 22 22:28	PnnRne
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	+++++	+ +	+++++	FEB 22 18:55 - FEB 22 22:17	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

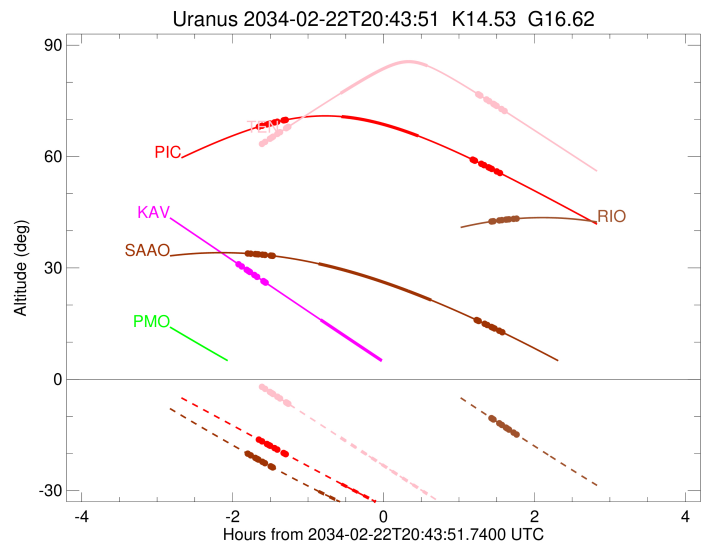
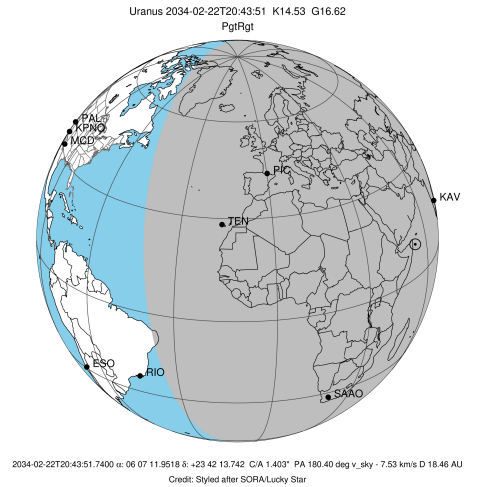


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-22T20:41:44.580
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3426149223669044992
 2Mass ID (if available) : 06071194+2342137
 ICRS Star Coord at Epoch: 06h 07m 11.95177s +23:42:13.74250s
 RUWE (>1.4 is poor) : 2.00
 K magnitude : 14.525
 G magnitude : 16.622
 RP magnitude : 15.731
 BP magnitude : 16.856
 DUPflag : 0
 Distance (au) : 18.461
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -7.52
 Sun-Target sep (deg) : 117.82
 Sun-Moon sep (deg) : 66.22
 B (ring opening deg) : 73.91
 PA of pole (deg) : 60.62
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.556
 C/A sky separation (km) : 20833.4
 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



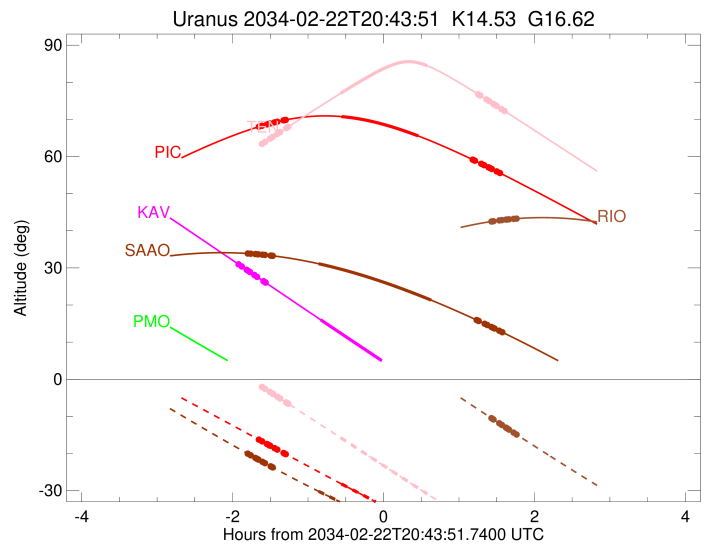
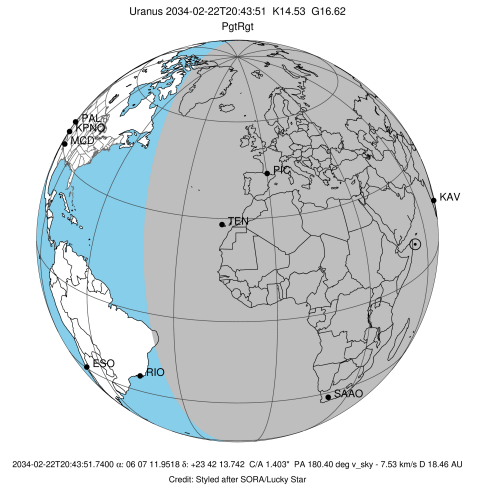
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-02-22T19:04:21.573		67.99	-16.19	51340.40	-7.40		
lambda	I	2034-02-22T19:07:18.905		68.29	-16.73	50026.71	-7.39		
delta	I	2034-02-22T19:11:13.489		68.67	-17.45	48300.35	-7.33		
gamma	I	2034-02-22T19:12:44.901		68.81	-17.72	47631.44	-7.31		
eta	I	2034-02-22T19:13:47.302		68.90	-17.91	47176.12	-7.29		
beta	I	2034-02-22T19:17:18.505		69.21	-18.56	45643.86	-7.23		
alpha	I	2034-02-22T19:19:29.751		69.38	-18.96	44697.04	-7.18		
4	I	2034-02-22T19:24:21.924		69.75	-19.85	42610.61	-7.08		
5	I	2034-02-22T19:25:18.556		69.81	-20.02	42218.29	-7.07		
6	I	2034-02-22T19:26:14.364		69.88	-20.19	41826.03	-7.03		
Uranus	I	2034-02-22T20:10:27.262		70.76	-28.19	25553.40		-1.59	-1.67
Uranus	E	2034-02-22T21:11:30.328		65.54	-38.73	25123.52		14.36	15.01
6	E	2034-02-22T21:54:38.531		59.18	-45.46	41806.77	6.96		
5	E	2034-02-22T21:55:50.918		58.99	-45.64	42311.42	6.99		
4	E	2034-02-22T21:56:24.053		58.90	-45.72	42532.05	7.00		
alpha	E	2034-02-22T22:01:33.329		58.06	-46.46	44708.33	7.09		
beta	E	2034-02-22T22:03:49.126		57.68	-46.78	45679.37	7.14		
eta	E	2034-02-22T22:07:18.146		57.10	-47.27	47176.12	7.19		
gamma	E	2034-02-22T22:08:20.355		56.93	-47.41	47624.12	7.21		
delta	E	2034-02-22T22:09:54.005		56.67	-47.62	48300.35	7.23		
lambda	E	2034-02-22T22:13:51.824		56.00	-48.16	50026.71	7.29		
epsilon	E	2034-02-22T22:15:31.328		55.72	-48.38	50752.65	7.30		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-22T20:44:57.210
 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 : 3426149223669044992
 2Mass ID (if available) : 06071194+2342137
 ICRS Star Coord at Epoch: 06h 07m 11.95177s +23:42:13.74250s
 RUWE (>1.4 is poor) : 2.00
 K magnitude : 14.525
 G magnitude : 16.622
 RP magnitude : 15.731
 BP magnitude : 16.856
 DUPflag : 0
 Distance (au) : 18.461
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -7.52
 Sun-Target sep (deg) : 117.82
 Sun-Moon sep (deg) : 66.18
 B (ring opening deg) : 73.91
 PA of pole (deg) : 60.62
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.434
 C/A sky separation (km) : 19205.2
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



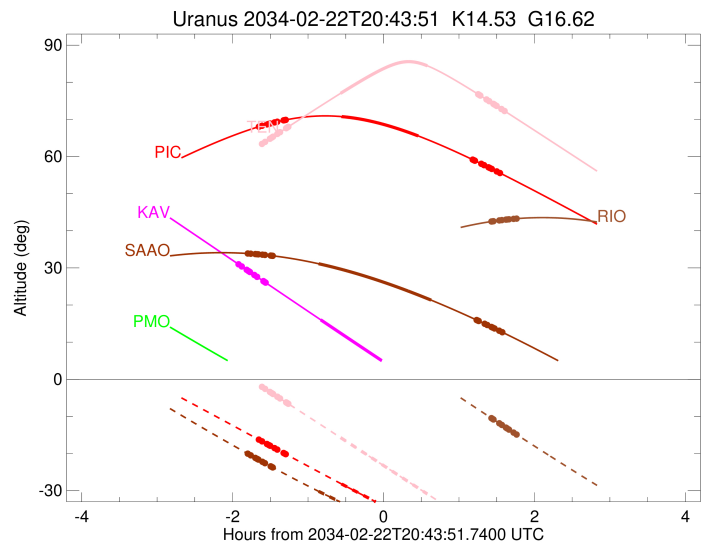
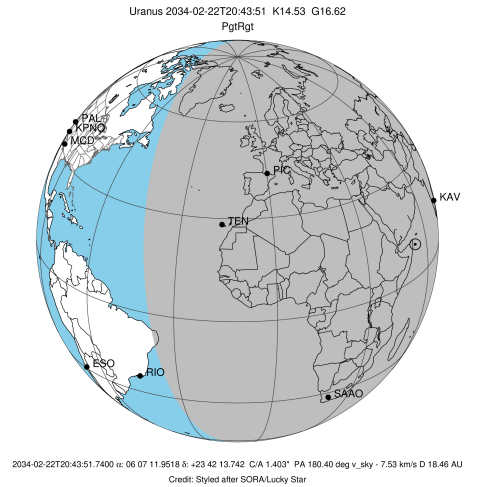
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-02-22T19:06:50.070		63.31	-1.96x	51350.86	-7.54		
lambda	I	2034-02-22T19:09:45.532		63.95	-2.59x	50026.71	-7.53		
delta	I	2034-02-22T19:13:35.492		64.80	-3.42x	48300.35	-7.48		
gamma	I	2034-02-22T19:15:05.000		65.13	-3.75x	47631.40	-7.46		
eta	I	2034-02-22T19:16:06.056		65.35	-3.97x	47176.12	-7.45		
beta	I	2034-02-22T19:19:32.545		66.11	-4.72x	45643.51	-7.40		
alpha	I	2034-02-22T19:21:40.442		66.58	-5.18	44697.99	-7.36		
4	I	2034-02-22T19:26:25.010		67.62	-6.22	42611.44	-7.28		
5	I	2034-02-22T19:27:20.673		67.83	-6.42	42215.25	-7.27		
6	I	2034-02-22T19:28:14.253		68.02	-6.62	41827.66	-7.24		
Uranus	I	2034-02-22T20:09:39.785		77.01	-15.70	25537.62		-3.11	-3.26
Uranus	E	2034-02-22T21:18:48.048		84.43	-30.92	25081.21		15.07	15.75
6	E	2034-02-22T21:59:00.350		76.81	-39.69	41808.26	7.22		
5	E	2034-02-22T22:00:09.729		76.56	-39.94	42310.15	7.25		
4	E	2034-02-22T22:00:41.775		76.45	-40.05	42531.01	7.26		
alpha	E	2034-02-22T22:05:40.639		75.39	-41.13	44709.80	7.34		
beta	E	2034-02-22T22:07:51.819		74.92	-41.60	45679.73	7.38		
eta	E	2034-02-22T22:11:14.154		74.19	-42.33	47176.12	7.42		
gamma	E	2034-02-22T22:12:14.411		73.97	-42.54	47623.92	7.44		
delta	E	2034-02-22T22:13:45.233		73.65	-42.87	48300.35	7.46		
lambda	E	2034-02-22T22:17:36.007		72.81	-43.69	50026.71	7.50		
epsilon	E	2034-02-22T22:19:13.128		72.46	-44.04	50756.28	7.51		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-22T20:29:03.790
 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 : 3426149223669044992
 2Mass ID (if available) : 06071194+2342137
 ICRS Star Coord at Epoch: 06h 07m 11.95177s +23:42:13.74250s
 RUWE (>1.4 is poor) : 2.00
 K magnitude : 14.525
 G magnitude : 16.622
 RP magnitude : 15.731
 BP magnitude : 16.856
 DUPflag : 0
 Distance (au) : 18.461
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -7.52
 Sun-Target sep (deg) : 117.82
 Sun-Moon sep (deg) : 65.78
 B (ring opening deg) : 73.91
 PA of pole (deg) : 60.62
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.486
 C/A sky separation (km) : 19895.8
 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



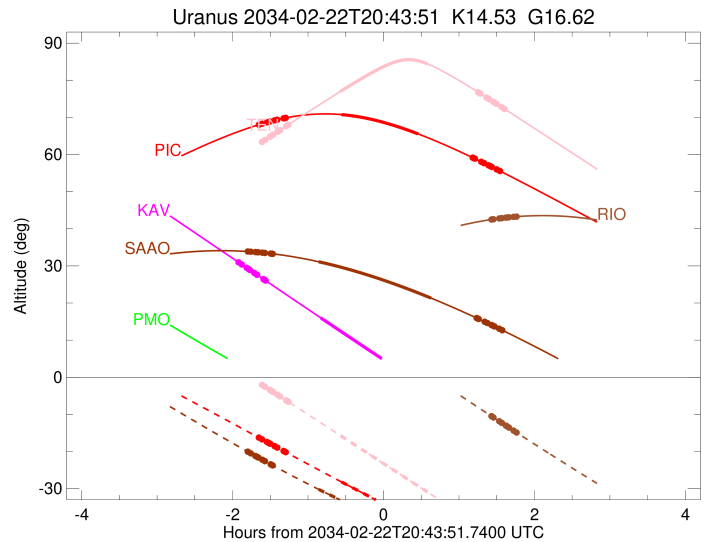
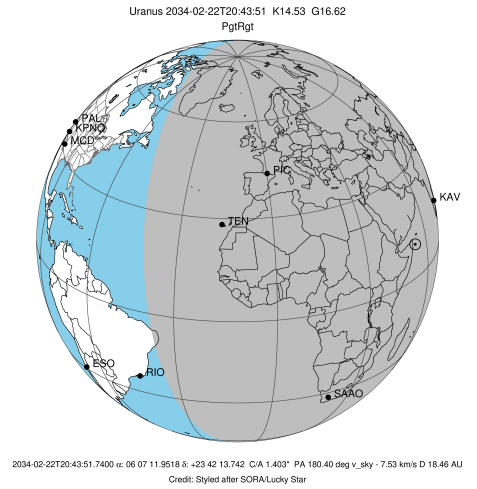
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-02-22T18:48:10.696		31.07	-86.50	51355.52	-7.37		
lambda	I	2034-02-22T18:51:10.982		30.38	-86.96	50026.71	-7.35		
delta	I	2034-02-22T18:55:06.824		29.48	-87.36	48300.35	-7.29		
gamma	I	2034-02-22T18:56:38.746		29.13	-87.44	47631.38	-7.27		
eta	I	2034-02-22T18:57:41.485		28.89	-87.46	47176.12	-7.25		
beta	I	2034-02-22T19:01:13.934		28.08	-87.34	45643.41	-7.19		
alpha	I	2034-02-22T19:03:25.649		27.57	-87.14	44698.26	-7.14		
4	I	2034-02-22T19:08:19.421		26.45	-86.42	42611.62	-7.04		
5	I	2034-02-22T19:09:17.116		26.23	-86.25	42214.59	-7.03		
6	I	2034-02-22T19:10:12.406		26.02	-86.08	41828.00	-7.00		
Uranus	I	2034-02-22T19:53:56.517		16.01	-76.06	25540.77		-2.87	-3.01
Uranus	E	2034-02-22T21:03:00.280		0.42x	-59.26	25105.73		14.66	15.32
6	E	2034-02-22T21:46:52.804		-9.27x	-48.55	41807.05	6.67		
5	E	2034-02-22T21:48:08.233		-9.55x	-48.25	42311.20	6.70		
4	E	2034-02-22T21:48:42.829		-9.67x	-48.10	42531.85	6.70		
alpha	E	2034-02-22T21:54:06.113		-10.85x	-46.79	44708.57	6.78		
beta	E	2034-02-22T21:56:28.272		-11.36x	-46.21	45679.43	6.81		
eta	E	2034-02-22T22:00:07.406		-12.15x	-45.32	47176.12	6.86		
gamma	E	2034-02-22T22:01:12.686		-12.39x	-45.05	47624.09	6.87		
delta	E	2034-02-22T22:02:51.024		-12.74x	-44.65	48300.35	6.89		
lambda	E	2034-02-22T22:07:01.010		-13.64x	-43.64	50026.71	6.93		
epsilon	E	2034-02-22T22:08:45.771		-14.01x	-43.21	50753.02	6.94		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-22T20:50:36.850
 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 : 3426149223669044992
 2Mass ID (if available) : 06071194+2342137
 ICRS Star Coord at Epoch: 06h 07m 11.95177s +23:42:13.74250s
 RUWE (>1.4 is poor) : 2.00
 K magnitude : 14.525
 G magnitude : 16.622
 RP magnitude : 15.731
 BP magnitude : 16.856
 DUPflag : 0
 Distance (au) : 18.461
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -7.52
 Sun-Target sep (deg) : 117.82
 Sun-Moon sep (deg) : 65.61
 B (ring opening deg) : 73.91
 PA of pole (deg) : 60.62
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.074
 C/A sky separation (km) : 14376.0
 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	2034-02-22T19:08:11.562		18.67	30.95x	51382.57	-7.70		
lambda	I	2034-02-22T19:11:07.499		19.21	30.27x	50026.71	-7.70		
delta	I	2034-02-22T19:14:52.040		19.89	29.41x	48300.35	-7.68		
gamma	I	2034-02-22T19:16:19.246		20.16	29.08x	47631.23	-7.67		
eta	I	2034-02-22T19:17:18.621		20.34	28.85x	47176.12	-7.66		
beta	I	2034-02-22T19:20:39.166		20.94	28.08x	45642.59	-7.64		
alpha	I	2034-02-22T19:22:42.326		21.31	27.60x	44701.05	-7.62		
4	I	2034-02-22T19:27:16.606		22.13	26.55x	42613.60	-7.58		
5	I	2034-02-22T19:28:11.704		22.29	26.34x	42206.30	-7.58		
6	I	2034-02-22T19:29:01.228		22.43	26.15x	41832.63	-7.56		
Uranus	I	2034-02-22T20:06:13.579		28.69	17.57x	25458.87		-6.76	-7.08
Uranus	E	2034-02-22T21:33:43.925		39.93	-2.41x	25022.15		16.03	16.75
6	E	2034-02-22T22:09:33.875		42.49	-10.45	41812.74	7.66		
5	E	2034-02-22T22:10:38.214		42.55	-10.68	42305.69	7.68		
4	E	2034-02-22T22:11:08.904		42.57	-10.80	42528.59	7.68		
alpha	E	2034-02-22T22:15:52.830		42.79	-11.85	44714.01	7.73		
beta	E	2034-02-22T22:17:57.193		42.88	-12.31	45680.53	7.75		
eta	E	2034-02-22T22:21:10.057		43.00	-13.02	47176.12	7.77		
gamma	E	2034-02-22T22:22:07.562		43.04	-13.23	47623.37	7.78		
delta	E	2034-02-22T22:23:34.499		43.09	-13.55	48300.35	7.79		
lambda	E	2034-02-22T22:27:15.664		43.21	-14.36	50026.71	7.82		
epsilon	E	2034-02-22T22:28:50.634		43.25	-14.71	50769.73	7.82		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-22T20:37:19.850
 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 : 3426149223669044992
 2Mass ID (if available) : 06071194+2342137
 ICRS Star Coord at Epoch: 06h 07m 11.95177s +23:42:13.74250s
 RUWE (>1.4 is poor) : 2.00
 K magnitude : 14.525
 G magnitude : 16.622
 RP magnitude : 15.731
 BP magnitude : 16.856
 DUPflag : 0
 Distance (au) : 18.461
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -7.52
 Sun-Target sep (deg) : 117.82
 Sun-Moon sep (deg) : 65.88
 B (ring opening deg) : 73.91
 PA of pole (deg) : 60.62
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.028
 C/A sky separation (km) : 13764.2
 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	2034-02-22T18:55:27.250		33.89	-19.95	51393.48	-7.89		
lambda	I	2034-02-22T18:58:20.477		33.82	-20.50	50026.71	-7.88		
delta	I	2034-02-22T19:01:59.900		33.73	-21.19	48300.35	-7.85		
gamma	I	2034-02-22T19:03:25.155		33.69	-21.45	47631.17	-7.84		
eta	I	2034-02-22T19:04:23.198		33.66	-21.63	47176.12	-7.84		
beta	I	2034-02-22T19:07:39.360		33.56	-22.24	45642.33	-7.81		
alpha	I	2034-02-22T19:09:39.657		33.49	-22.62	44702.08	-7.79		
4	I	2034-02-22T19:14:08.140		33.32	-23.44	42614.15	-7.74		
5	I	2034-02-22T19:15:02.548		33.29	-23.61	42203.62	-7.74		
6	I	2034-02-22T19:15:50.486		33.25	-23.76	41834.16	-7.73		
Uranus	I	2034-02-22T19:52:11.687		31.13	-30.18	25437.09		-7.47	-7.82
Uranus	E	2034-02-22T21:21:43.476		21.32	-42.88	25021.43		16.04	16.76
6	E	2034-02-22T21:57:48.629		15.97	-46.07	41812.62	7.54		
5	E	2034-02-22T21:58:54.035		15.80	-46.14	42305.84	7.56		
4	E	2034-02-22T21:59:25.211		15.72	-46.18	42528.65	7.56		
alpha	E	2034-02-22T22:04:14.013		14.96	-46.48	44713.85	7.59		
beta	E	2034-02-22T22:06:20.685		14.62	-46.61	45680.50	7.60		
eta	E	2034-02-22T22:09:37.277		14.09	-46.79	47176.12	7.62		
gamma	E	2034-02-22T22:10:35.935		13.94	-46.84	47623.40	7.63		
delta	E	2034-02-22T22:12:04.639		13.70	-46.92	48300.35	7.64		
lambda	E	2034-02-22T22:15:50.484		13.08	-47.10	50026.71	7.65		
epsilon	E	2034-02-22T22:17:27.416		12.82	-47.17	50768.78	7.65		