

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-01-03T00:15:31.300
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 865677837062752896
 2Mass ID (if available) : 07352830+2207449

Uranus 2038-01-03T00:15:31 K14.75 G16.56 PgtRgt

ICRS Star Coord at Epoch: 07h 35m 28.30568s +22:07:44.80181s

RUWE (>1.4 is poor) : 0.00
 K magnitude : 14.750
 G magnitude : 16.559
 RP magnitude : 15.598
 BP magnitude : 16.381
 DUPflag : 0
 Distance (au) : 17.735
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.86
 Sun-Target sep (deg) : 170.15
 Sun-Moon sep (deg) : 137.86
 B (ring opening deg) : 54.76
 PA of pole (deg) : 85.07

a(km) ring

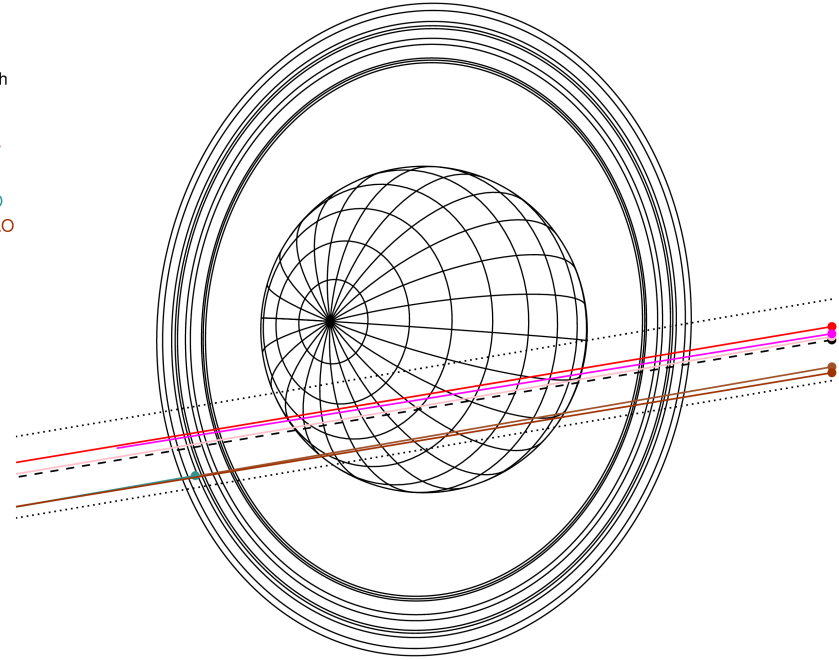
 1 41837.2 6
 2 42235.0 5
 3 42571.2 4
 4 44718.5 alpha
 5 45661.1 beta
 6 47176.1 eta
 7 47626.3 gamma
 8 48300.3 delta
 9 50026.7 lambda
 10 51149.4 epsilon

Uranus 2038-01-03T00:15:31 K14.75 G16.56 PgtRgt



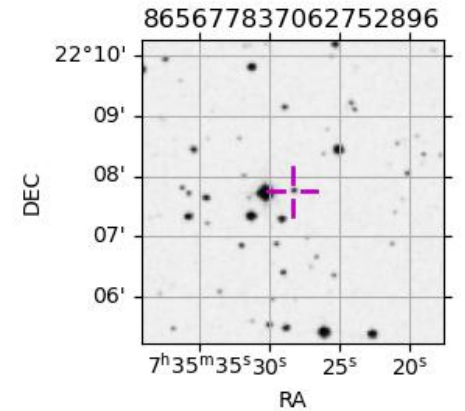
2038-01-03T00:15:31.3000 a: 07 35 28.3057 & +22 07 44.802 C/A 0.940° PA 9.56 deg v_sky -22.86 km/s D 17.74 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 TEN
 KAV
 RIO
 ESO
 SAAO

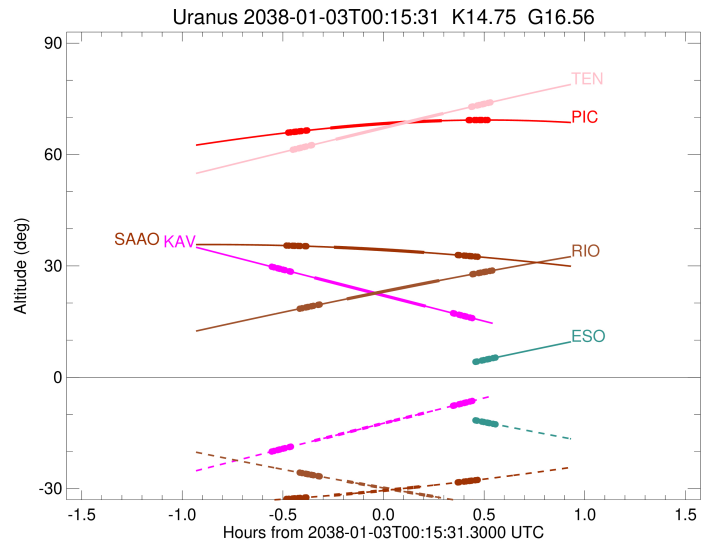
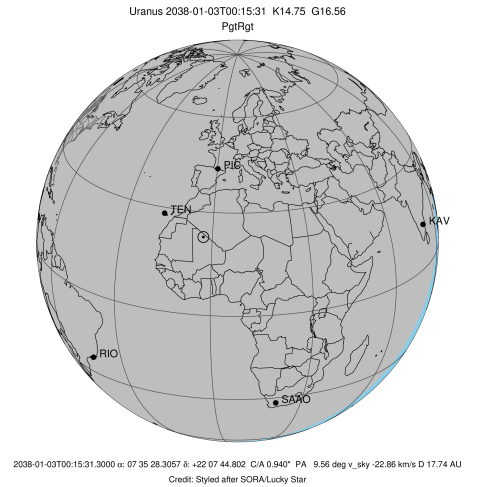


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events	Interval	OEncode
PIC	Pic du Midi	42.9	0.1	+++++++	+ +	+++++++	JAN 02 23:47 - JAN 03 00:46	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	+++++++	+ +	+++++++	JAN 02 23:48 - JAN 03 00:47	PieRie	
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn	
KAV	Kavalur Observatory	12.6	78.8	+++++++	+ +	+++++++	JAN 02 23:42 - JAN 03 00:41	PieRie	
RIO	Rio de Janeiro	-22.9	316.8	+++++++	+ +	+++++++	JAN 02 23:50 - JAN 03 00:47	PieRie	
ESO	European Southern Obs	-29.3	289.3			++	JAN 03 00:48 - JAN 03 00:48	PnnRne	
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn	
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++++	+ +	+++++++	JAN 02 23:46 - JAN 03 00:43	PieRie	
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn	

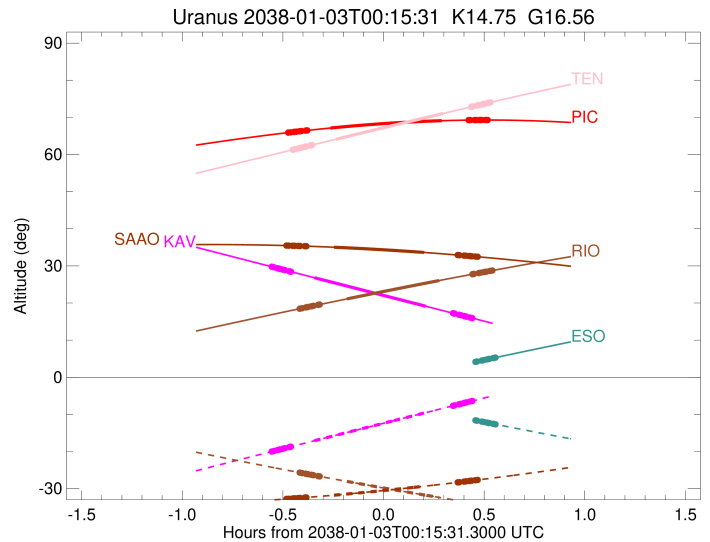
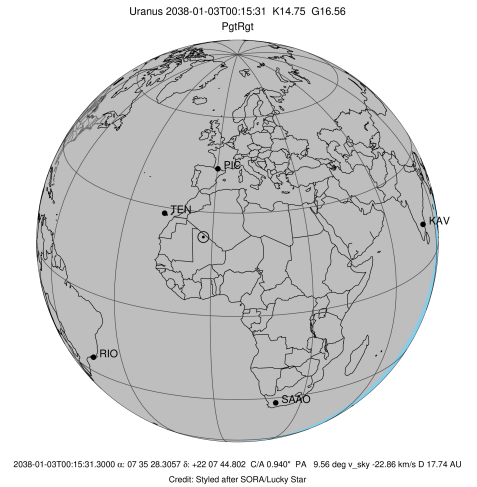


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-01-03T00:16:15.150
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 865677837062752896
 2Mass ID (if available) : 07352830+2207449
 ICRS Star Coord at Epoch: 07h 35m 28.30568s +22:07:44.80181s
 RUWE (>1.4 is poor) : 0.00
 K magnitude : 14.750
 G magnitude : 16.559
 RP magnitude : 15.598
 BP magnitude : 16.381
 DUPflag : 0
 Distance (au) : 17.735
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.86
 Sun-Target sep (deg) : 170.15
 Sun-Moon sep (deg) : 138.37
 B (ring opening deg) : 54.76
 PA of pole (deg) : 85.07
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.784
 C/A sky separation (km) : 10083.1
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



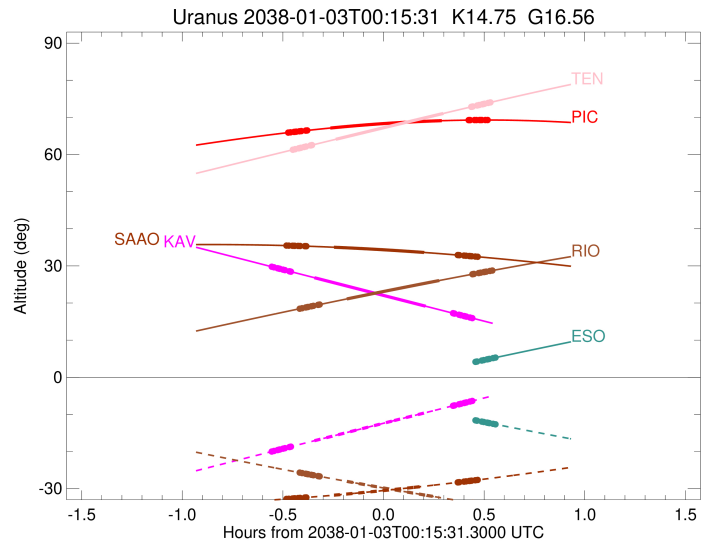
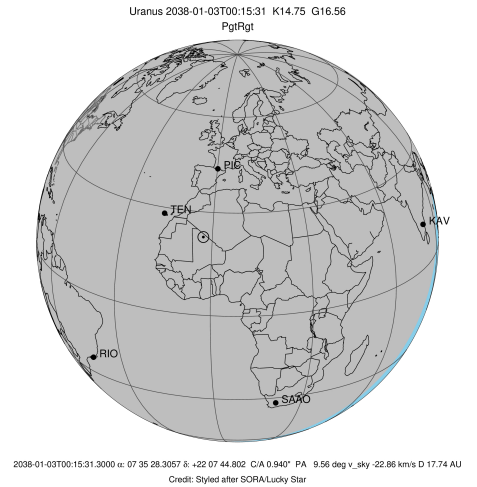
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2038-01-02T23:47:09.503		65.91	-69.79	51099.63	-27.47		
lambda	I	2038-01-02T23:47:48.508		65.98	-69.81	50026.71	-27.49		
delta	I	2038-01-02T23:48:51.347		66.09	-69.85	48300.35	-27.45		
gamma	I	2038-01-02T23:49:15.717		66.14	-69.86	47631.58	-27.43		
eta	I	2038-01-02T23:49:32.324		66.16	-69.87	47176.12	-27.42		
beta	I	2038-01-02T23:50:28.444		66.26	-69.90	45641.19	-27.37		
alpha	I	2038-01-02T23:51:02.792		66.32	-69.91	44705.07	-27.34		
4	I	2038-01-02T23:52:19.769		66.45	-69.95	42581.21	-27.25		
5	I	2038-01-02T23:52:30.103		66.46	-69.95	42289.55	-27.24		
6	I	2038-01-02T23:52:48.583		66.49	-69.96	41812.04	-27.24		
Uranus	I	2038-01-02T23:59:40.316		67.14	-70.07	25179.36		-34.72	-35.96
Uranus	E	2038-01-03T00:32:56.209		69.12	-69.17	25314.07		27.11	28.19
6	E	2038-01-03T00:40:54.438		69.27	-68.63	41875.56	27.26		
5	E	2038-01-03T00:41:08.307		69.27	-68.61	42214.02	27.26		
4	E	2038-01-03T00:41:19.912		69.27	-68.60	42541.88	27.26		
alpha	E	2038-01-03T00:42:38.893		69.29	-68.50	44716.78	27.36		
beta	E	2038-01-03T00:43:14.012		69.29	-68.45	45678.09	27.39		
eta	E	2038-01-03T00:44:08.753		69.29	-68.38	47176.12	27.43		
gamma	E	2038-01-03T00:44:24.980		69.30	-68.36	47621.39	27.45		
delta	E	2038-01-03T00:44:49.708		69.30	-68.32	48300.35	27.47		
lambda	E	2038-01-03T00:45:52.511		69.30	-68.24	50026.71	27.51		
epsilon	E	2038-01-03T00:46:29.046		69.30	-68.19	51032.25	27.49		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-01-03T00:17:15.770
 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 : 865677837062752896
 2Mass ID (if available) : 07352830+2207449
 ICRS Star Coord at Epoch: 07h 35m 28.30568s +22:07:44.80181s
 RUWE (>1.4 is poor) : 0.00
 K magnitude : 14.750
 G magnitude : 16.559
 RP magnitude : 15.598
 BP magnitude : 16.381
 DUPflag : 0
 Distance (au) : 17.735
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.86
 Sun-Target sep (deg) : 170.15
 Sun-Moon sep (deg) : 138.19
 B (ring opening deg) : 54.76
 PA of pole (deg) : 85.07
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.914
 C/A sky separation (km) : 11755.6
 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



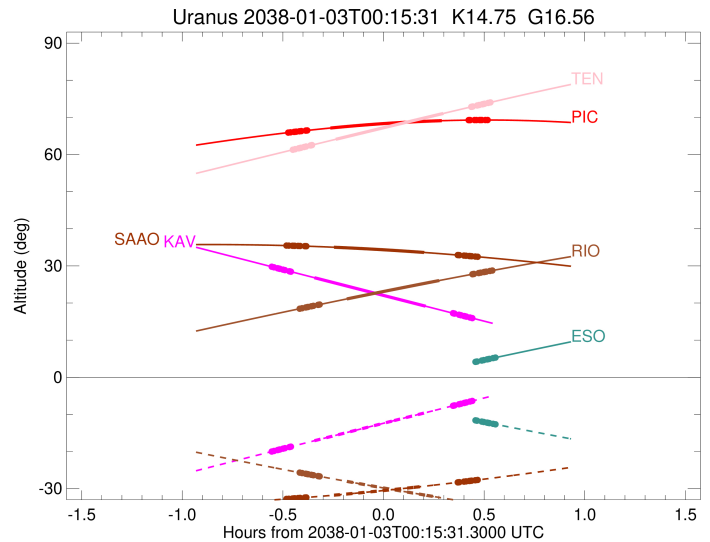
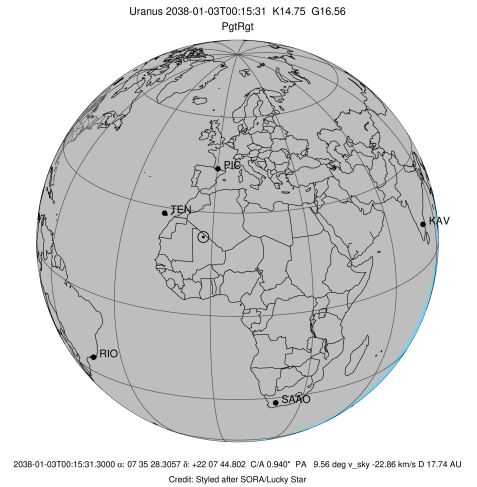
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2038-01-02T23:48:32.530		61.30	-70.85	51086.57	-27.29		
lambda	I	2038-01-02T23:49:11.315		61.44	-70.99	50026.71	-27.31		
delta	I	2038-01-02T23:50:14.597		61.67	-71.22	48300.35	-27.25		
gamma	I	2038-01-02T23:50:39.151		61.76	-71.31	47631.57	-27.23		
eta	I	2038-01-02T23:50:55.885		61.83	-71.37	47176.12	-27.21		
beta	I	2038-01-02T23:51:52.460		62.03	-71.57	45641.12	-27.15		
alpha	I	2038-01-02T23:52:27.154		62.16	-71.69	44703.90	-27.10		
4	I	2038-01-02T23:53:44.873		62.45	-71.97	42579.44	-26.98		
5	I	2038-01-02T23:53:55.173		62.48	-72.01	42291.86	-26.97		
6	I	2038-01-02T23:54:13.805		62.55	-72.08	41813.45	-26.97		
Uranus	I	2038-01-03T00:01:16.769		64.10	-73.58	25189.84		-34.16	-35.39
Uranus	E	2038-01-03T00:33:21.747		71.07	-80.14	25342.42		25.35	26.39
6	E	2038-01-03T00:41:41.906		72.84	-81.66	41876.32	27.01		
5	E	2038-01-03T00:41:56.001		72.89	-81.70	42217.35	27.02		
4	E	2038-01-03T00:42:07.539		72.94	-81.73	42540.44	27.02		
alpha	E	2038-01-03T00:43:27.201		73.22	-81.96	44715.42	27.15		
beta	E	2038-01-03T00:44:02.605		73.34	-82.06	45677.65	27.19		
eta	E	2038-01-03T00:44:57.737		73.53	-82.21	47176.12	27.26		
gamma	E	2038-01-03T00:45:14.071		73.59	-82.26	47621.48	27.27		
delta	E	2038-01-03T00:45:38.951		73.68	-82.33	48300.35	27.30		
lambda	E	2038-01-03T00:46:42.117		73.90	-82.50	50026.71	27.36		
epsilon	E	2038-01-03T00:47:18.349		74.03	-82.59	51018.64	27.34		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-01-03T00:11:26.360
 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 : 865677837062752896
 2Mass ID (if available) : 07352830+2207449
 ICRS Star Coord at Epoch: 07h 35m 28.30568s +22:07:44.80181s
 RUWE (>1.4 is poor) : 0.00
 K magnitude : 14.750
 G magnitude : 16.559
 RP magnitude : 15.598
 BP magnitude : 16.381
 DUPflag : 0
 Distance (au) : 17.735
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.86
 Sun-Target sep (deg) : 170.15
 Sun-Moon sep (deg) : 138.77
 B (ring opening deg) : 54.76
 PA of pole (deg) : 85.07
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.836
 C/A sky separation (km) : 10749.3
 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



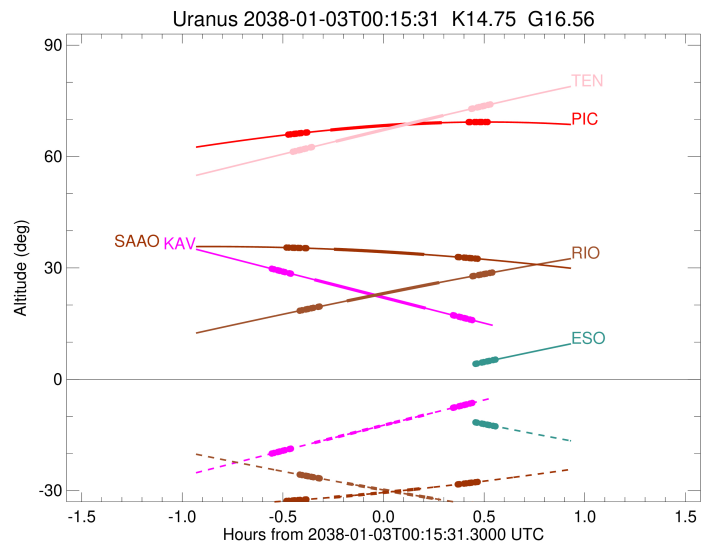
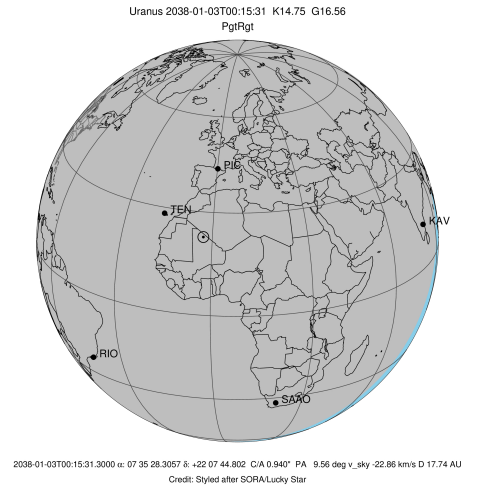
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2038-01-02T23:42:14.864		29.76	-20.00	51092.06	-27.23		
lambda	I	2038-01-02T23:42:53.936		29.61	-19.85	50026.71	-27.25		
delta	I	2038-01-02T23:43:57.345		29.37	-19.61	48300.35	-27.20		
gamma	I	2038-01-02T23:44:21.943		29.27	-19.51	47631.57	-27.18		
eta	I	2038-01-02T23:44:38.706		29.21	-19.45	47176.12	-27.16		
beta	I	2038-01-02T23:45:35.367		28.99	-19.23	45641.15	-27.11		
alpha	I	2038-01-02T23:46:10.084		28.85	-19.10	44704.42	-27.07		
4	I	2038-01-02T23:47:27.863		28.55	-18.80	42580.26	-26.96		
5	I	2038-01-02T23:47:38.232		28.51	-18.76	42290.81	-26.96		
6	I	2038-01-02T23:47:56.891		28.44	-18.69	41812.80	-26.95		
Uranus	I	2038-01-02T23:54:56.190		26.82	-17.09	25184.08		-34.47	-35.71
Uranus	E	2038-01-03T00:28:04.489		19.14	-9.54	25322.64		26.58	27.66
6	E	2038-01-03T00:36:15.156		17.26	-7.68	41875.78	26.86		
5	E	2038-01-03T00:36:29.260		17.20	-7.63	42214.91	26.86		
4	E	2038-01-03T00:36:40.993		17.16	-7.58	42541.49	26.86		
alpha	E	2038-01-03T00:38:01.149		16.85	-7.28	44716.42	26.96		
beta	E	2038-01-03T00:38:36.787		16.71	-7.15	45677.98	27.00		
eta	E	2038-01-03T00:39:32.322		16.50	-6.94	47176.12	27.05		
gamma	E	2038-01-03T00:39:48.782		16.43	-6.87	47621.41	27.06		
delta	E	2038-01-03T00:40:13.862		16.34	-6.78	48300.35	27.08		
lambda	E	2038-01-03T00:41:17.555		16.09	-6.54	50026.71	27.13		
epsilon	E	2038-01-03T00:41:54.481		15.95	-6.40	51028.91	27.11		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-01-03T00:18:16.620
 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 : 865677837062752896
 2Mass ID (if available) : 07352830+2207449
 ICRS Star Coord at Epoch: 07h 35m 28.30568s +22:07:44.80181s
 RUWE (>1.4 is poor) : 0.00
 K magnitude : 14.750
 G magnitude : 16.559
 RP magnitude : 15.598
 BP magnitude : 16.381
 DUPflag : 0
 Distance (au) : 17.735
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.86
 Sun-Target sep (deg) : 170.15
 Sun-Moon sep (deg) : 137.63
 B (ring opening deg) : 54.76
 PA of pole (deg) : 85.07
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.292
 C/A sky separation (km) : 16622.2
 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



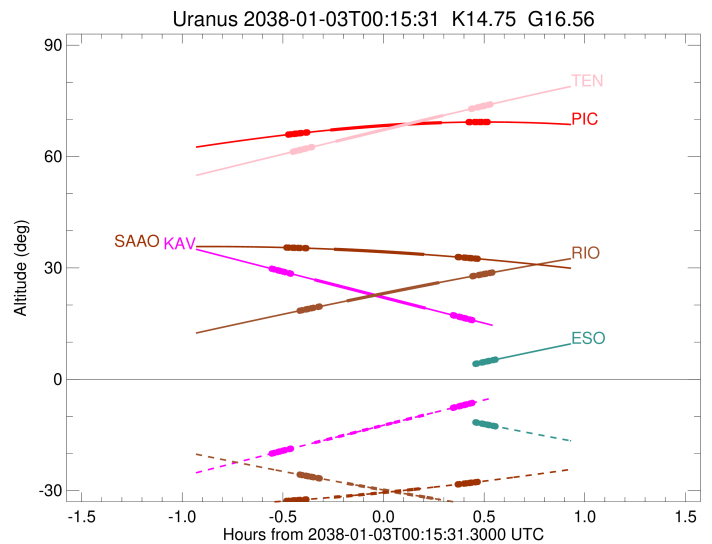
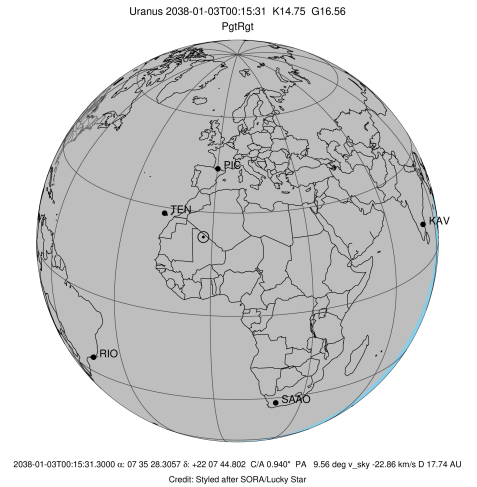
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2038-01-02T23:50:36.475		18.48	-25.70	51047.67	-26.34		
lambda	I	2038-01-02T23:51:15.173		18.60	-25.81	50026.71	-26.35		
delta	I	2038-01-02T23:52:20.839		18.81	-26.00	48300.35	-26.23		
gamma	I	2038-01-02T23:52:46.364		18.89	-26.07	47631.51	-26.18		
eta	I	2038-01-02T23:53:03.772		18.94	-26.12	47176.12	-26.14		
beta	I	2038-01-02T23:54:02.725		19.13	-26.29	45641.07	-26.01		
alpha	I	2038-01-02T23:54:39.116		19.24	-26.39	44700.52	-25.92		
4	I	2038-01-02T23:56:00.640		19.50	-26.62	42574.03	-25.69		
5	I	2038-01-02T23:56:11.048		19.53	-26.65	42298.30	-25.67		
6	I	2038-01-02T23:56:30.479		19.59	-26.70	41817.94	-25.64		
Uranus	I	2038-01-03T00:04:35.353		21.10	-28.05	25245.69		-31.09	-32.27
Uranus	E	2038-01-03T00:32:07.858		26.06	-32.37	25431.94		19.09	19.92
6	E	2038-01-03T00:42:02.173		27.76	-33.81	41878.14	25.71		
5	E	2038-01-03T00:42:17.265		27.80	-33.85	42227.39	25.75		
4	E	2038-01-03T00:42:28.856		27.83	-33.88	42536.51	25.76		
alpha	E	2038-01-03T00:43:52.294		28.07	-34.07	44711.42	26.01		
beta	E	2038-01-03T00:44:29.282		28.17	-34.16	45676.21	26.10		
eta	E	2038-01-03T00:45:26.691		28.33	-34.29	47176.12	26.23		
gamma	E	2038-01-03T00:45:43.669		28.38	-34.33	47621.76	26.27		
delta	E	2038-01-03T00:46:09.477		28.45	-34.39	48300.35	26.32		
lambda	E	2038-01-03T00:47:14.911		28.63	-34.54	50026.71	26.44		
epsilon	E	2038-01-03T00:47:50.903		28.73	-34.63	50979.66	26.44		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-01-03T00:18:57.180
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 865677837062752896
 2Mass ID (if available) : 07352830+2207449
 ICRS Star Coord at Epoch: 07h 35m 28.30568s +22:07:44.80181s
 RUWE (>1.4 is poor) : 0.00
 K magnitude : 14.750
 G magnitude : 16.559
 RP magnitude : 15.598
 BP magnitude : 16.381
 DUPflag : 0
 Distance (au) : 17.735
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.86
 Sun-Target sep (deg) : 170.15
 Sun-Moon sep (deg) : 137.26
 B (ring opening deg) : 54.76
 PA of pole (deg) : 85.07
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.276
 C/A sky separation (km) : 16409.3
 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	2038-01-02T23:51:00.490	-6.17x	-1.88x	51050.17	-26.17			
lambda	I	2038-01-02T23:51:39.546	-6.03x	-2.01x	50026.71	-26.17			
delta	I	2038-01-02T23:52:45.649	-5.81x	-2.22x	48300.35	-26.06			
gamma	I	2038-01-02T23:53:11.341	-5.72x	-2.31x	47631.51	-26.01			
eta	I	2038-01-02T23:53:28.863	-5.66x	-2.36x	47176.12	-25.97			
beta	I	2038-01-02T23:54:28.195	-5.46x	-2.55x	45641.06	-25.85			
alpha	I	2038-01-02T23:55:04.806	-5.34x	-2.67x	44700.73	-25.76			
4	I	2038-01-02T23:56:26.820	-5.06x	-2.93x	42574.37	-25.53			
5	I	2038-01-02T23:56:37.314	-5.03x	-2.97x	42297.93	-25.52			
6	I	2038-01-02T23:56:56.871	-4.96x	-3.03x	41817.66	-25.49			
Uranus	I	2038-01-03T00:05:01.667	-3.33x	-4.58x	25241.62			-31.32	-32.50
Uranus	E	2038-01-03T00:33:02.501	2.22x	-9.81	25428.87			19.33	20.17
6	E	2038-01-03T00:42:56.910	4.15x	-11.61	41878.10	25.58			
5	E	2038-01-03T00:43:12.073	4.20x	-11.65	42227.12	25.62			
4	E	2038-01-03T00:43:23.738	4.24x	-11.69	42536.61	25.63			
alpha	E	2038-01-03T00:44:47.622	4.51x	-11.94	44711.52	25.86			
beta	E	2038-01-03T00:45:24.813	4.63x	-12.05	45676.25	25.96			
eta	E	2038-01-03T00:46:22.544	4.81x	-12.22	47176.12	26.08			
gamma	E	2038-01-03T00:46:39.618	4.87x	-12.27	47621.76	26.12			
delta	E	2038-01-03T00:47:05.575	4.95x	-12.35	48300.35	26.17			
lambda	E	2038-01-03T00:48:11.391	5.16	-12.54	50026.71	26.29			
epsilon	E	2038-01-03T00:48:47.627	5.28	-12.65	50980.48	26.29			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-01-03T00:14:05.490
 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 : 865677837062752896
 2Mass ID (if available) : 07352830+2207449
 ICRS Star Coord at Epoch: 07h 35m 28.30568s +22:07:44.80181s
 RUWE (>1.4 is poor) : 0.00
 K magnitude : 14.750
 G magnitude : 16.559
 RP magnitude : 15.598
 BP magnitude : 16.381
 DUPflag : 0
 Distance (au) : 17.735
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.86
 Sun-Target sep (deg) : 170.15
 Sun-Moon sep (deg) : 138.40
 B (ring opening deg) : 54.76
 PA of pole (deg) : 85.07
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.327
 C/A sky separation (km) : 17063.4
 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	2038-01-02T23:46:39.640		35.47	-32.77	51041.69	-26.42		
lambda	I	2038-01-02T23:47:17.996		35.46	-32.73	50026.71	-26.43		
delta	I	2038-01-02T23:48:23.483		35.43	-32.66	48300.35	-26.30		
gamma	I	2038-01-02T23:48:48.945		35.42	-32.63	47631.49	-26.24		
eta	I	2038-01-02T23:49:06.312		35.41	-32.61	47176.12	-26.20		
beta	I	2038-01-02T23:50:05.139		35.38	-32.54	45641.08	-26.06		
alpha	I	2038-01-02T23:50:41.488		35.36	-32.50	44700.05	-25.96		
4	I	2038-01-02T23:52:02.919		35.33	-32.41	42573.25	-25.71		
5	I	2038-01-02T23:52:13.261		35.32	-32.39	42299.15	-25.70		
6	I	2038-01-02T23:52:32.647		35.31	-32.37	41818.61	-25.66		
Uranus	I	2038-01-03T00:00:44.032		35.03	-31.76	25255.29		-30.55	-31.72
Uranus	E	2038-01-03T00:27:37.760		33.62	-29.36	25437.61		18.64	19.46
6	E	2038-01-03T00:37:39.492		32.92	-28.31	41878.20	25.64		
5	E	2038-01-03T00:37:54.636		32.90	-28.29	42227.81	25.68		
4	E	2038-01-03T00:38:06.238		32.89	-28.26	42536.36	25.70		
alpha	E	2038-01-03T00:39:29.881		32.78	-28.11	44711.27	25.95		
beta	E	2038-01-03T00:40:06.951		32.74	-28.05	45676.16	26.05		
eta	E	2038-01-03T00:41:04.473		32.66	-27.94	47176.12	26.18		
gamma	E	2038-01-03T00:41:21.481		32.64	-27.91	47621.77	26.22		
delta	E	2038-01-03T00:41:47.334		32.61	-27.86	48300.35	26.28		
lambda	E	2038-01-03T00:42:52.871		32.52	-27.74	50026.71	26.41		
epsilon	E	2038-01-03T00:43:28.873		32.47	-27.67	50978.55	26.40		