

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-01-03T18:00:07.280
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 865680830656659712
 2Mass ID (if available) : 07352023+2208019

ICRS Star Coord at Epoch: 07h 35m 20.21653s +22:08:02.02286s

RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.808
 G magnitude : 16.760
 RP magnitude : 16.127
 BP magnitude : 17.239
 DUPflag : 0
 Distance (au) : 17.733
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.93
 Sun-Target sep (deg) : 170.93
 Sun-Moon sep (deg) : 148.10
 B (ring opening deg) : 54.79
 PA of pole (deg) : 85.05

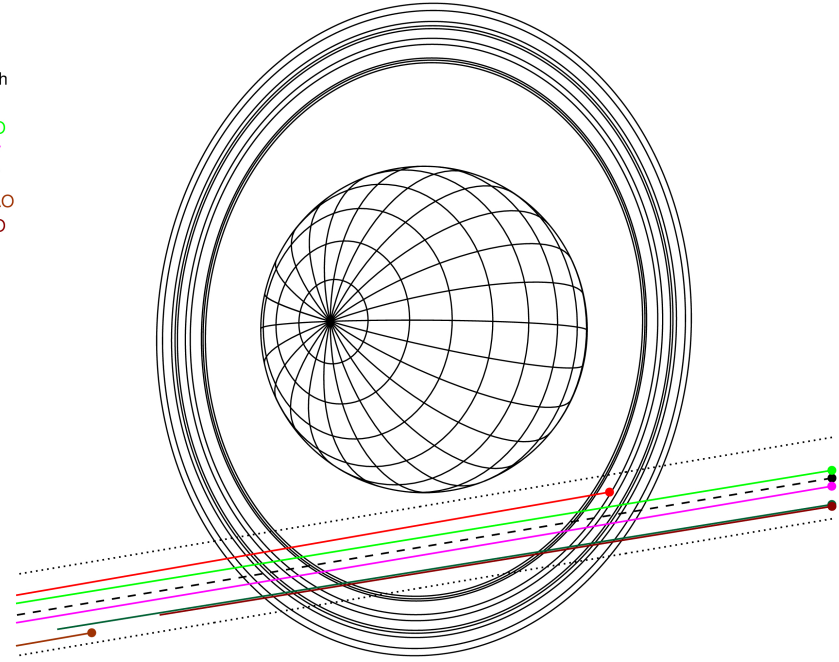
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2038-01-03T18:00:07.2800 α: 07:35 20.2165 s: +22:08 02.023 C/A 2.598° PA 9.53 deg v_sky -22.93 km/s D 17.73 AU
 Credit: Styled after SORA/Lucky Star

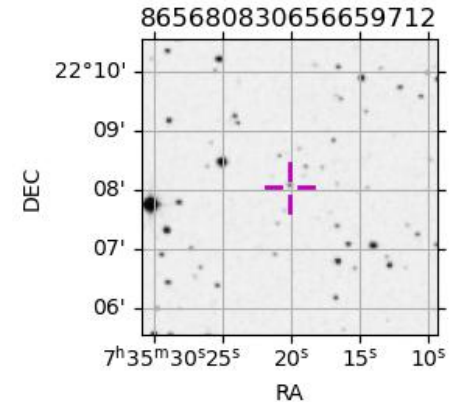
Uranus 2038-01-03T18:00:07 K14.81 G16.76 XRgt

Earth
 PIC
 PMO
 KAV
 AAT
 SAAO
 MSO

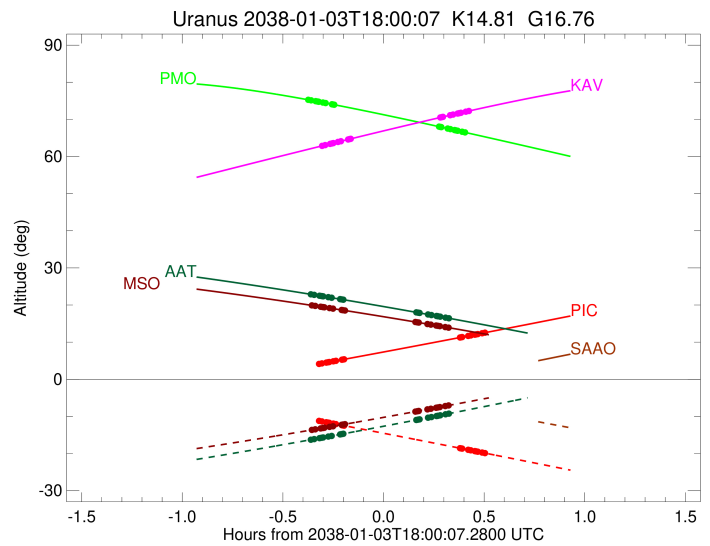
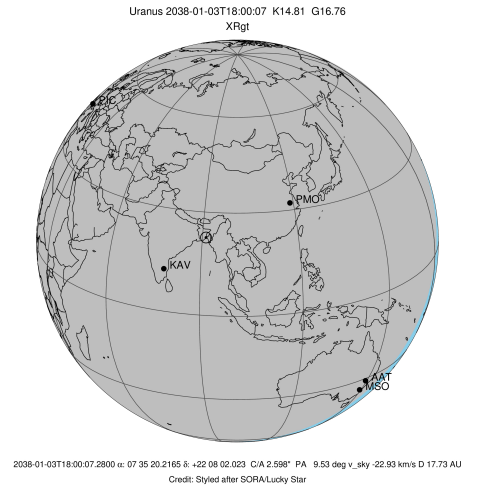


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++		+++++	JAN 03 17:47 - JAN 03 18:30	PnnRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++		+++++	JAN 03 17:37 - JAN 03 18:24	PnnRie
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					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++		+++++	JAN 03 17:42 - JAN 03 18:25	PnnRie
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 03 17:38 - JAN 03 18:19	PnnRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++		+++++	JAN 03 17:39 - JAN 03 18:19	PnnRie



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-01-03T18:03:49.560
 Event type : XRgt
 : No Uranus occs
 : 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 : 865680830656659712
 2Mass ID (if available) : 07352023+2208019
 ICRS Star Coord at Epoch: 07h 35m 20.21653s +22:08:02.02286s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.808
 G magnitude : 16.760
 RP magnitude : 16.127
 BP magnitude : 17.239
 DUPflag : 0
 Distance (au) : 17.733
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.93
 Sun-Target sep (deg) : 170.93
 Sun-Moon sep (deg) : 147.54
 B (ring opening deg) : 54.79
 PA of pole (deg) : 85.05
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.338
 C/A sky separation (km) : 30070.6
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

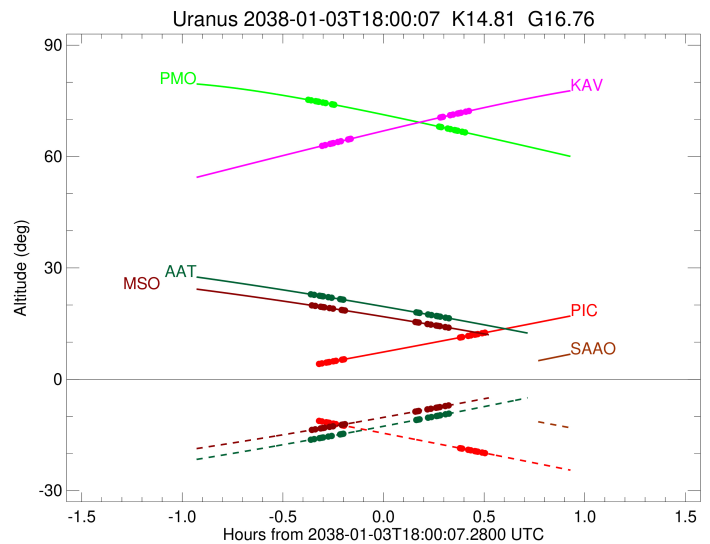
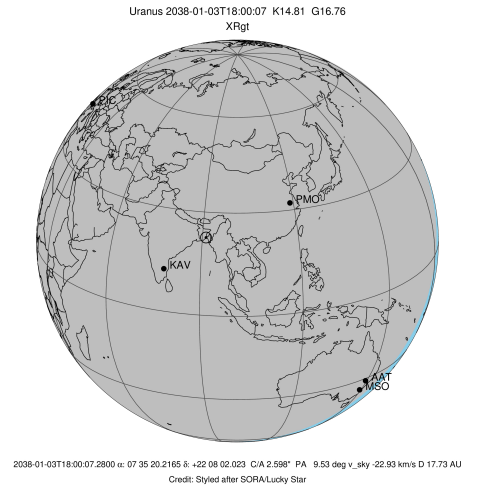


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2038-01-03T17:41:05.269		4.17x	-11.24	50929.46	-22.08		
lambda	I	2038-01-03T17:41:46.161		4.28x	-11.36	50026.71	-21.96		
delta	I	2038-01-03T17:43:05.602		4.50x	-11.59	48300.35	-21.49		
gamma	I	2038-01-03T17:43:36.898		4.58x	-11.68	47630.89	-21.29		
eta	I	2038-01-03T17:43:58.329		4.64x	-11.74	47176.12	-21.15		
beta	I	2038-01-03T17:45:11.796		4.85x	-11.95	45642.69	-20.63		
alpha	I	2038-01-03T17:45:58.602		4.98x	-12.09	44690.96	-20.27		
4	I	2038-01-03T17:47:45.492		5.27	-12.39	42555.25	-19.33		
5	I	2038-01-03T17:47:57.849		5.31	-12.43	42313.05	-19.23		
6	I	2038-01-03T17:48:22.828		5.37	-12.50	41835.66	-19.03		

No planet occultations

6	E	2038-01-03T18:22:56.882		11.25	-18.57	41879.57	19.07		
5	E	2038-01-03T18:23:17.945		11.32	-18.63	42256.17	19.28		
4	E	2038-01-03T18:23:31.718		11.36	-18.67	42528.50	19.37		
alpha	E	2038-01-03T18:25:20.769		11.67	-19.00	44700.86	20.32		
beta	E	2038-01-03T18:26:07.943		11.81	-19.14	45671.13	20.69		
eta	E	2038-01-03T18:27:19.817		12.02	-19.35	47176.12	21.21		
gamma	E	2038-01-03T18:27:40.807		12.08	-19.41	47622.84	21.35		
delta	E	2038-01-03T18:28:12.384		12.17	-19.51	48300.35	21.56		
lambda	E	2038-01-03T18:29:31.573		12.40	-19.74	50026.71	22.04		
epsilon	E	2038-01-03T18:30:10.192		12.51	-19.86	50881.88	22.15		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-01-03T17:59:11.810
 Event type : XRgt
 : No Uranus occs
 : 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 : 865680830656659712
 2Mass ID (if available) : 07352023+2208019
 ICRS Star Coord at Epoch: 07h 35m 20.21653s +22:08:02.02286s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.808
 G magnitude : 16.760
 RP magnitude : 16.127
 BP magnitude : 17.239
 DUPflag : 0
 Distance (au) : 17.733
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.93
 Sun-Target sep (deg) : 170.93
 Sun-Moon sep (deg) : 148.78
 B (ring opening deg) : 54.79
 PA of pole (deg) : 85.05
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.495
 C/A sky separation (km) : 32088.7
 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

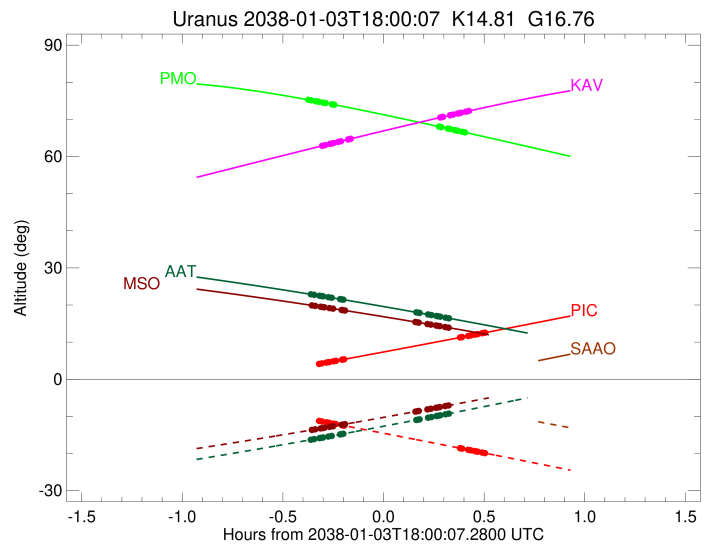
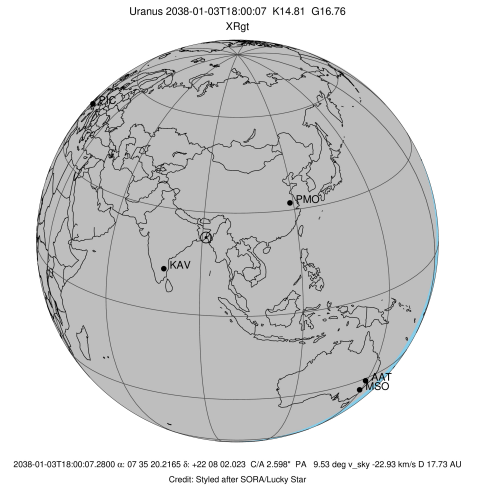


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2038-01-03T17:37:52.865		75.25	-68.36	50909.77	-21.64		
lambda	I	2038-01-03T17:38:33.706		75.14	-68.23	50026.71	-21.49		
delta	I	2038-01-03T17:39:55.121		74.91	-67.95	48300.35	-20.91		
gamma	I	2038-01-03T17:40:27.330		74.82	-67.85	47630.71	-20.67		
eta	I	2038-01-03T17:40:49.419		74.76	-67.77	47176.12	-20.49		
beta	I	2038-01-03T17:42:05.445		74.54	-67.52	45643.29	-19.86		
alpha	I	2038-01-03T17:42:54.296		74.40	-67.35	44689.61	-19.41		
4	I	2038-01-03T17:44:46.867		74.07	-66.97	42551.96	-18.24		
5	I	2038-01-03T17:44:59.776		74.04	-66.93	42314.29	-18.12		
6	I	2038-01-03T17:45:26.039		73.96	-66.84	41839.12	-17.86		

No planet occultations

6	E	2038-01-03T18:16:41.443		68.05	-60.39	41879.23	17.85		
5	E	2038-01-03T18:17:04.037		67.98	-60.31	42260.96	18.11		
4	E	2038-01-03T18:17:18.425		67.93	-60.26	42527.65	18.23		
alpha	E	2038-01-03T18:19:13.488		67.55	-59.86	44699.30	19.39		
beta	E	2038-01-03T18:20:02.822		67.38	-59.69	45670.20	19.85		
eta	E	2038-01-03T18:21:17.548		67.14	-59.43	47176.12	20.48		
gamma	E	2038-01-03T18:21:39.284		67.06	-59.35	47623.04	20.65		
delta	E	2038-01-03T18:22:11.892		66.95	-59.24	48300.35	20.89		
lambda	E	2038-01-03T18:23:33.380		66.68	-58.95	50026.71	21.47		
epsilon	E	2038-01-03T18:24:12.404		66.55	-58.82	50869.45	21.62		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-01-03T18:01:40.140
 Event type : XRgt
 : No Uranus occs
 : 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 : 865680830656659712
 2Mass ID (if available) : 07352023+2208019
 ICRS Star Coord at Epoch: 07h 35m 20.21653s +22:08:02.02286s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.808
 G magnitude : 16.760
 RP magnitude : 16.127
 BP magnitude : 17.239
 DUPflag : 0
 Distance (au) : 17.733
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.93
 Sun-Target sep (deg) : 170.93
 Sun-Moon sep (deg) : 148.28
 B (ring opening deg) : 54.79
 PA of pole (deg) : 85.05
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.706
 C/A sky separation (km) : 34805.0
 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

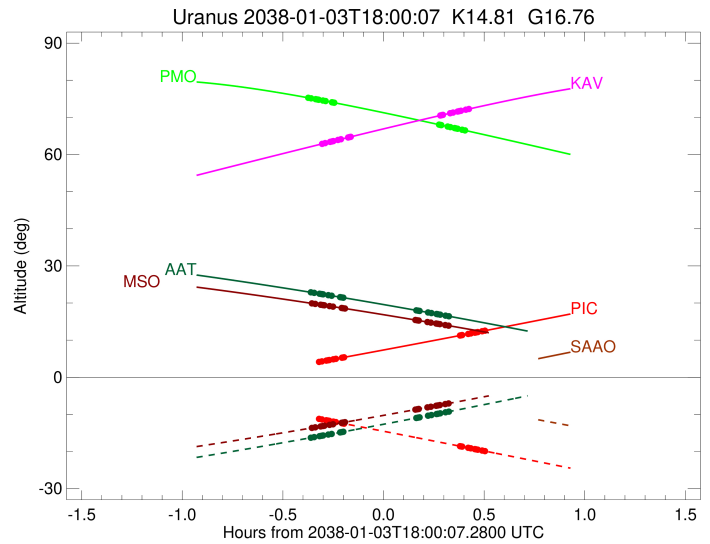
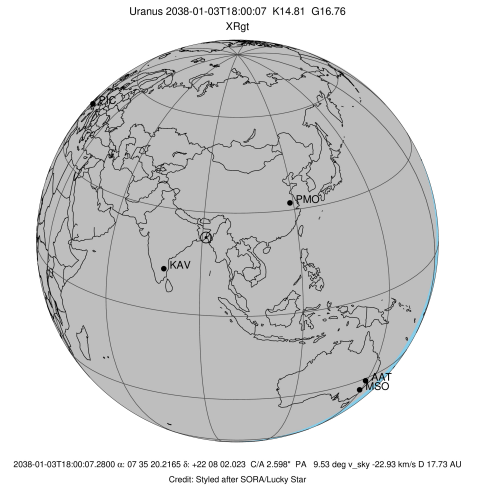


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2038-01-03T17:42:02.470		62.92	-71.01	50887.75	-20.29		
lambda	I	2038-01-03T17:42:44.991		63.08	-71.15	50026.71	-20.08		
delta	I	2038-01-03T17:44:12.502		63.41	-71.44	48300.35	-19.36		
gamma	I	2038-01-03T17:44:47.388		63.54	-71.56	47630.47	-19.04		
eta	I	2038-01-03T17:45:11.384		63.63	-71.64	47176.12	-18.82		
beta	I	2038-01-03T17:46:34.624		63.93	-71.91	45644.15	-18.01		
alpha	I	2038-01-03T17:47:28.908		64.13	-72.09	44688.12	-17.41		
4	I	2038-01-03T17:49:36.488		64.61	-72.50	42547.82	-15.86		
5	I	2038-01-03T17:49:51.120		64.66	-72.55	42315.15	-15.69		
6	I	2038-01-03T17:50:21.111		64.77	-72.64	41843.71	-15.33		

No planet occultations

6	E	2038-01-03T18:17:04.409		70.52	-77.20	41878.20	15.34		
5	E	2038-01-03T18:17:30.817		70.61	-77.26	42269.31	15.70		
4	E	2038-01-03T18:17:46.867		70.67	-77.30	42526.56	15.88		
alpha	E	2038-01-03T18:19:56.786		71.12	-77.60	44696.66	17.43		
beta	E	2038-01-03T18:20:51.429		71.30	-77.72	45668.49	18.03		
eta	E	2038-01-03T18:22:13.216		71.58	-77.89	47176.12	18.85		
gamma	E	2038-01-03T18:22:36.813		71.66	-77.94	47623.41	19.07		
delta	E	2038-01-03T18:23:12.025		71.78	-78.02	48300.35	19.38		
lambda	E	2038-01-03T18:24:39.422		72.08	-78.19	50026.71	20.11		
epsilon	E	2038-01-03T18:25:19.937		72.21	-78.27	50847.96	20.32		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-01-03T17:56:52.730
 Event type : XRgt
 : No Uranus occs
 : 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 : 865680830656659712
 2Mass ID (if available) : 07352023+2208019
 ICRS Star Coord at Epoch: 07h 35m 20.21653s +22:08:02.02286s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.808
 G magnitude : 16.760
 RP magnitude : 16.127
 BP magnitude : 17.239
 DUPflag : 0
 Distance (au) : 17.733
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.93
 Sun-Target sep (deg) : 170.93
 Sun-Moon sep (deg) : 148.83
 B (ring opening deg) : 54.79
 PA of pole (deg) : 85.05
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.895
 C/A sky separation (km) : 37232.5
 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

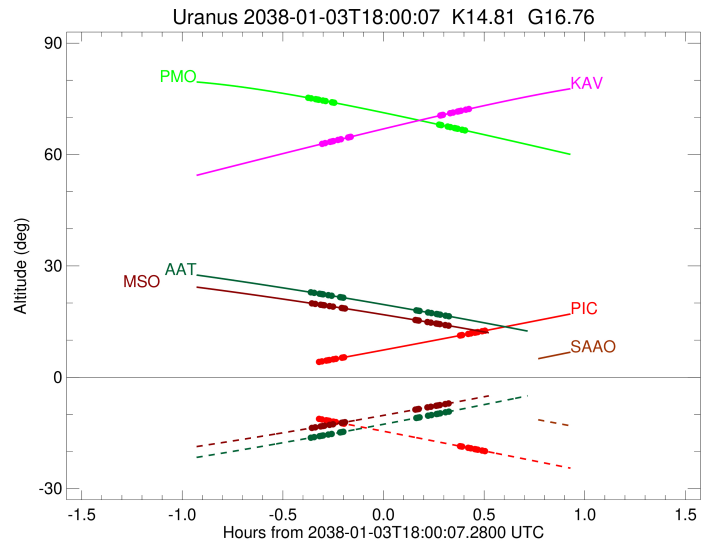
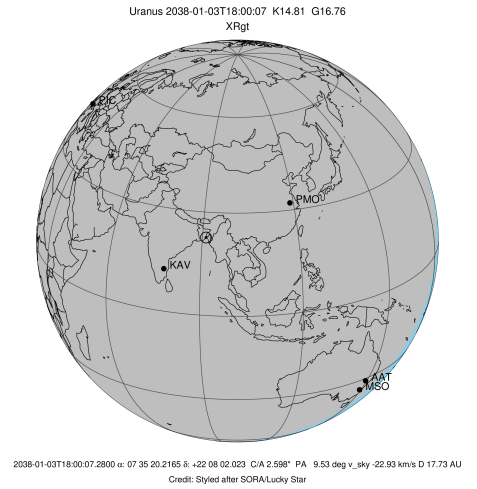


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2038-01-03T17:38:43.213		22.85	-16.24	50865.54	-18.80		
lambda	I	2038-01-03T17:39:28.019		22.74	-16.12	50026.71	-18.52		
delta	I	2038-01-03T17:41:03.496		22.50	-15.86	48300.35	-17.62		
gamma	I	2038-01-03T17:41:41.945		22.41	-15.76	47630.18	-17.23		
eta	I	2038-01-03T17:42:08.507		22.34	-15.68	47176.12	-16.95		
beta	I	2038-01-03T17:43:41.674		22.11	-15.43	45645.23	-15.92		
alpha	I	2038-01-03T17:44:43.690		21.95	-15.26	44686.78	-15.15		
4	I	2038-01-03T17:47:14.259		21.58	-14.84	42543.47	-13.09		
5	I	2038-01-03T17:47:31.815		21.53	-14.79	42315.06	-12.84		
6	I	2038-01-03T17:48:08.105		21.44	-14.69	41848.85	-12.34		

No planet occultations

6	E	2038-01-03T18:09:55.950		18.02	-10.96	41876.65	12.32		
5	E	2038-01-03T18:10:28.825		17.93	-10.87	42276.98	12.83		
4	E	2038-01-03T18:10:47.866		17.88	-10.81	42526.01	13.07		
alpha	E	2038-01-03T18:13:21.156		17.47	-10.36	44694.44	15.13		
beta	E	2038-01-03T18:14:23.648		17.30	-10.18	45666.91	15.89		
eta	E	2038-01-03T18:15:55.603		17.05	-9.91	47176.12	16.92		
gamma	E	2038-01-03T18:16:21.839		16.97	-9.83	47623.75	17.20		
delta	E	2038-01-03T18:17:00.733		16.87	-9.72	48300.35	17.59		
lambda	E	2038-01-03T18:18:36.397		16.60	-9.44	50026.71	18.49		
epsilon	E	2038-01-03T18:19:19.480		16.48	-9.31	50831.25	18.76		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-01-03T17:56:58.110
 Event type : XRgt
 : No Uranus occs
 : 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 : 865680830656659712
 2Mass ID (if available) : 07352023+2208019
 ICRS Star Coord at Epoch: 07h 35m 20.21653s +22:08:02.02286s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.808
 G magnitude : 16.760
 RP magnitude : 16.127
 BP magnitude : 17.239
 DUPflag : 0
 Distance (au) : 17.733
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.93
 Sun-Target sep (deg) : 170.93
 Sun-Moon sep (deg) : 148.78
 B (ring opening deg) : 54.79
 PA of pole (deg) : 85.05
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.919
 C/A sky separation (km) : 37544.8
 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	2038-01-03T17:39:01.882		19.86	-13.60	50862.92	-18.59		
lambda	I	2038-01-03T17:39:47.055		19.76	-13.49	50026.71	-18.31		
delta	I	2038-01-03T17:41:23.747		19.54	-13.24	48300.35	-17.38		
gamma	I	2038-01-03T17:42:02.750		19.45	-13.14	47630.14	-16.98		
eta	I	2038-01-03T17:42:29.714		19.39	-13.07	47176.12	-16.69		
beta	I	2038-01-03T17:44:04.471		19.17	-12.82	45645.38	-15.62		
alpha	I	2038-01-03T17:45:07.763		19.02	-12.66	44686.63	-14.83		
4	I	2038-01-03T17:47:42.378		18.65	-12.25	42542.91	-12.68		
5	I	2038-01-03T17:48:00.490		18.61	-12.20	42314.96	-12.42		
6	I	2038-01-03T17:48:37.995		18.52	-12.11	41849.55	-11.89		

No planet occultations

6	E	2038-01-03T18:09:39.354		15.42	-8.70	41876.36	11.87		
5	E	2038-01-03T18:10:13.454		15.34	-8.61	42278.13	12.41		
4	E	2038-01-03T18:10:33.048		15.29	-8.56	42525.97	12.67		
alpha	E	2038-01-03T18:13:10.381		14.89	-8.12	44694.12	14.81		
beta	E	2038-01-03T18:14:14.141		14.72	-7.94	45666.66	15.60		
eta	E	2038-01-03T18:15:47.679		14.48	-7.68	47176.12	16.67		
gamma	E	2038-01-03T18:16:14.315		14.41	-7.61	47623.80	16.95		
delta	E	2038-01-03T18:16:53.759		14.31	-7.50	48300.35	17.35		
lambda	E	2038-01-03T18:18:30.630		14.06	-7.22	50026.71	18.27		
epsilon	E	2038-01-03T18:19:14.067		13.95	-7.10	50828.86	18.56		