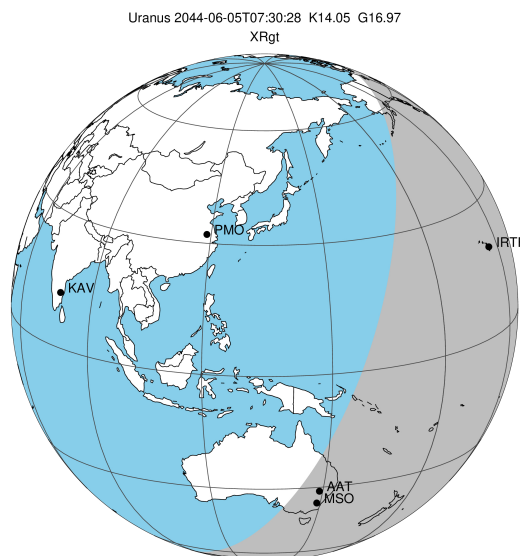


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2044-06-05T07:30:28.750
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 630941587819615872
 2Mass ID (if available) : 09231512+1603016

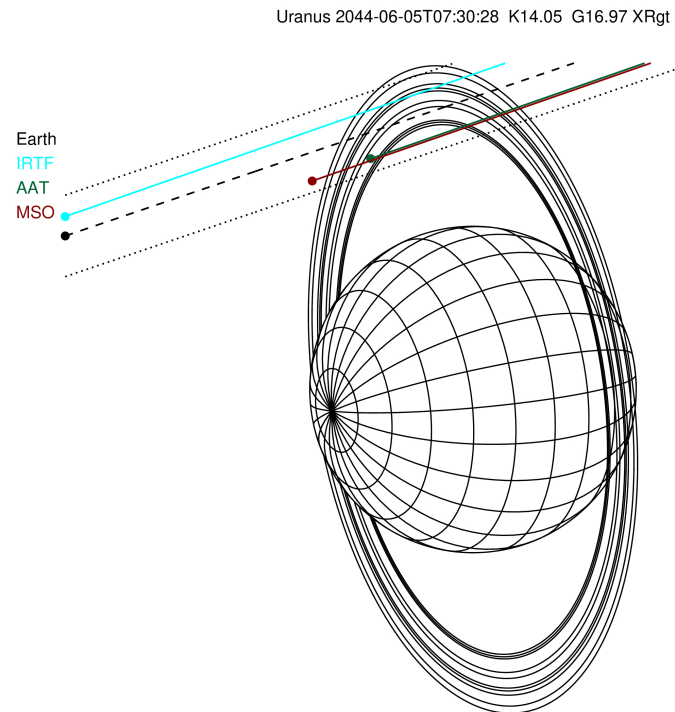
ICRS Star Coord at Epoch: 09h 23m 15.07787s +16:03:01.00968s

RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.052
 G magnitude : 16.974
 RP magnitude : 16.033
 BP magnitude : 17.883
 DUPflag : 0
 Distance (au) : 18.819
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 19.97
 Sun-Target sep (deg) : 63.47
 Sun-Moon sep (deg) : 56.97
 B (ring opening deg) : 29.09
 PA of pole (deg) : 98.72

#	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

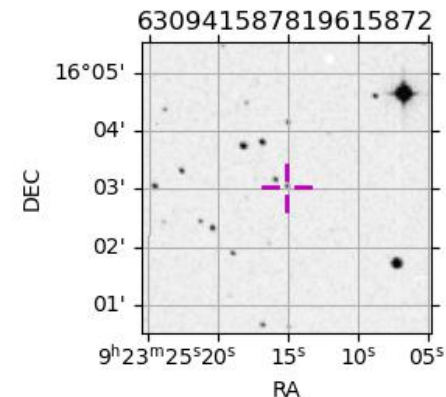


2044-06-05T07:30:28.7500 ex: 09 23 15.0779 s: +16 03 01.010 C/A 3.184° PA 198.76 deg v_sky +19.97 km/s D 18.82 AU
 Credit: Styled after SORA/Lucky Star

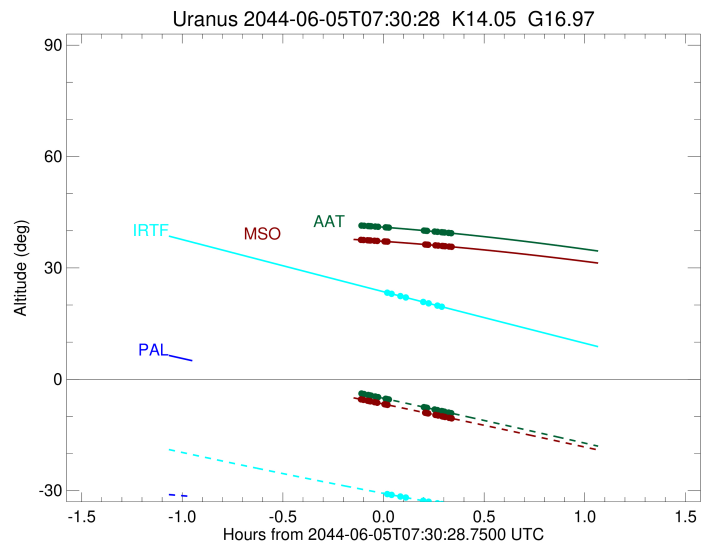
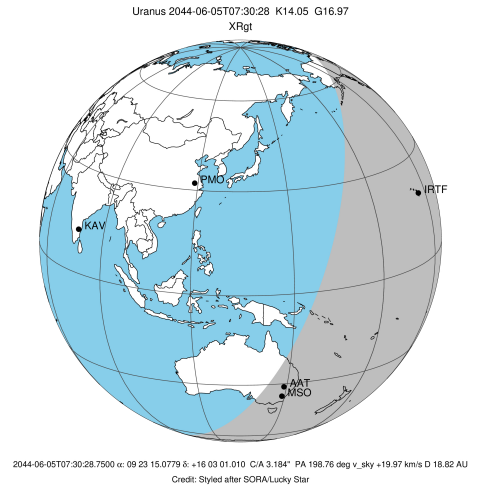


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
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					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	++++		++++	JUN 05 07:31 - JUN 05 07:48	PnnRie
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
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	+++		+++++	JUN 05 07:31 - JUN 05 07:50	PnnRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++		+++++	JUN 05 07:23 - JUN 05 07:51	PnnRie



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2044-06-05T07:34:14.940
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 630941587819615872
 2Mass ID (if available) : 09231512+1603016
 ICRS Star Coord at Epoch: 09h 23m 15.07787s +16:03:01.00967s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.052
 G magnitude : 16.974
 RP magnitude : 16.033
 BP magnitude : 17.883
 DUPflag : 0
 Distance (au) : 18.819
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 19.97
 Sun-Target sep (deg) : 63.47
 Sun-Moon sep (deg) : 56.91
 B (ring opening deg) : 29.09
 PA of pole (deg) : 98.72
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.415
 C/A sky separation (km) : 46609.1
 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



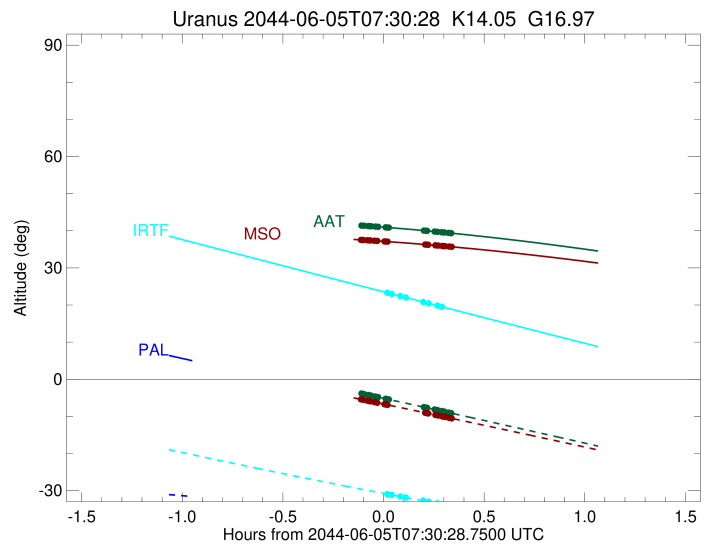
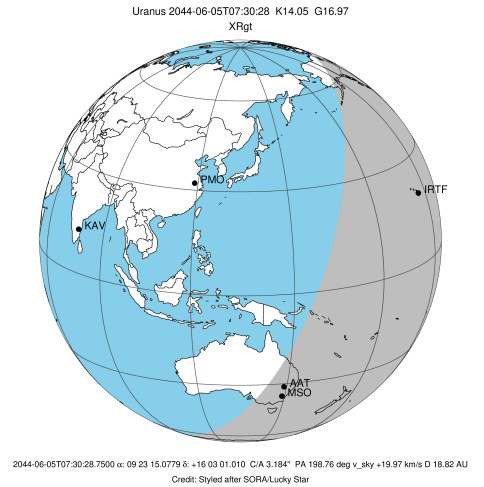
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2044-06-05T07:31:28.295		23.35	-30.90	51283.33	-16.01		
lambda	I	2044-06-05T07:32:54.728		23.01	-31.15	50026.71	-13.31		
delta	I	2044-06-05T07:35:32.579		22.40	-31.59	48300.35	-8.47		
gamma	I	2044-06-05T07:37:09.997		22.02	-31.86	47630.41	-5.25		

No planet occultations

gamma	E	2044-06-05T07:42:17.113		20.83	-32.71	47629.41	5.26		
delta	E	2044-06-05T07:43:54.653		20.46	-32.98	48300.35	8.48		
lambda	E	2044-06-05T07:46:32.320		19.85	-33.41	50026.71	13.34		
epsilon	E	2044-06-05T07:48:13.468		19.46	-33.68	51520.34	16.04		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2044-06-05T07:32:36.080
 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 : 630941587819615872
 2Mass ID (if available) : 09231512+1603016
 ICRS Star Coord at Epoch: 09h 23m 15.07787s +16:03:01.00967s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.052
 G magnitude : 16.974
 RP magnitude : 16.033
 BP magnitude : 17.883
 DUPflag : 0
 Distance (au) : 18.819
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 19.97
 Sun-Target sep (deg) : 63.47
 Sun-Moon sep (deg) : 57.25
 B (ring opening deg) : 29.09
 PA of pole (deg) : 98.72
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.888
 C/A sky separation (km) : 39419.0
 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

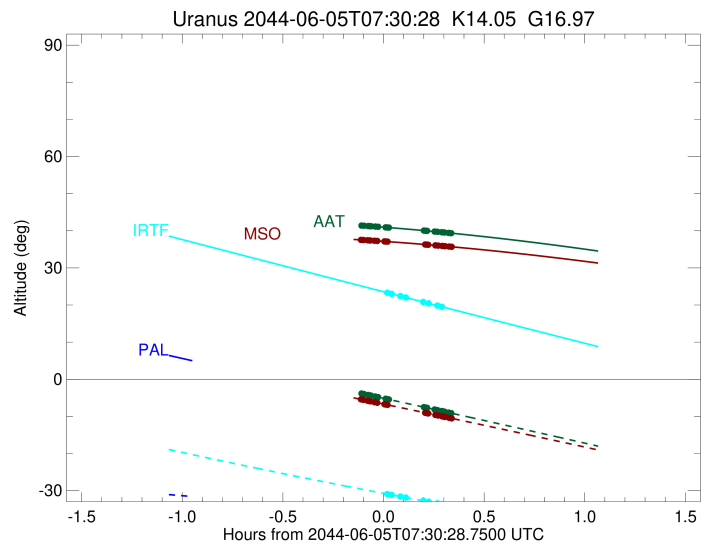
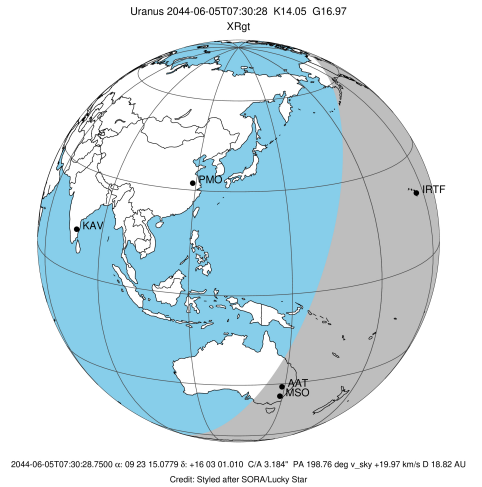


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2044-06-05T07:23:54.914		41.40	-3.84x	51174.13	-25.14		
lambda	I	2044-06-05T07:24:41.857		41.35	-4.00x	50026.71	-23.98		
delta	I	2044-06-05T07:25:56.268		41.27	-4.24x	48300.35	-22.39		
gamma	I	2044-06-05T07:26:26.607		41.24	-4.34x	47631.44	-21.70		
eta	I	2044-06-05T07:26:47.837		41.21	-4.41x	47176.12	-21.19		
beta	I	2044-06-05T07:28:03.398		41.13	-4.65x	45649.87	-19.27		
alpha	I	2044-06-05T07:28:52.774		41.08	-4.81x	44730.94	-17.89		
4	I	2044-06-05T07:31:07.884		40.92	-5.26	42583.96	-13.83		
5	I	2044-06-05T07:31:26.437		40.90	-5.32	42307.87	-13.18		
6	I	2044-06-05T07:32:04.344		40.86	-5.44	41822.72	-11.79		

No planet occultations

6	E	2044-06-05T07:42:25.519		40.06	-7.49	41802.68	11.80		
5	E	2044-06-05T07:43:06.505		40.01	-7.62	42312.92	13.19		
4	E	2044-06-05T07:43:30.476		39.98	-7.70	42609.24	13.84		
alpha	E	2044-06-05T07:45:41.465		39.79	-8.14	44700.57	17.91		
beta	E	2044-06-05T07:46:31.695		39.72	-8.30	45641.07	19.29		
eta	E	2044-06-05T07:47:47.356		39.61	-8.56	47176.12	21.21		
gamma	E	2044-06-05T07:48:08.374		39.58	-8.63	47627.26	21.72		
delta	E	2044-06-05T07:48:38.876		39.54	-8.73	48300.35	22.42		
lambda	E	2044-06-05T07:49:53.212		39.43	-8.97	50026.71	24.01		
epsilon	E	2044-06-05T07:50:55.144		39.33	-9.18	51551.15	25.17		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2044-06-05T07:32:38.430
 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 : 630941587819615872
 2Mass ID (if available) : 09231512+1603016
 ICRS Star Coord at Epoch: 09h 23m 15.07787s +16:03:01.00967s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.052
 G magnitude : 16.974
 RP magnitude : 16.033
 BP magnitude : 17.883
 DUPflag : 0
 Distance (au) : 18.819
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 19.97
 Sun-Target sep (deg) : 63.47
 Sun-Moon sep (deg) : 57.21
 B (ring opening deg) : 29.09
 PA of pole (deg) : 98.72
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.866
 C/A sky separation (km) : 39116.9
 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	2044-06-05T07:23:45.636		37.55	-5.41	51170.36	-25.45		
lambda	I	2044-06-05T07:24:31.804		37.51	-5.56	50026.71	-24.32		
delta	I	2044-06-05T07:25:45.063		37.44	-5.79	48300.35	-22.78		
gamma	I	2044-06-05T07:26:14.861		37.41	-5.88	47631.45	-22.11		
eta	I	2044-06-05T07:26:35.685		37.39	-5.94	47176.12	-21.62		
beta	I	2044-06-05T07:27:49.561		37.32	-6.18	45650.10	-19.77		
alpha	I	2044-06-05T07:28:37.567		37.27	-6.33	44731.40	-18.45		
4	I	2044-06-05T07:30:47.405		37.13	-6.73	42583.08	-14.59		
5	I	2044-06-05T07:31:04.901		37.12	-6.79	42307.14	-14.00		
6	I	2044-06-05T07:31:40.161		37.08	-6.90	41823.67	-12.71		

No planet occultations

6	E	2044-06-05T07:42:48.590		36.31	-9.01	41802.09	12.71		
5	E	2044-06-05T07:43:26.918		36.26	-9.13	42312.49	14.01		
4	E	2044-06-05T07:43:49.799		36.23	-9.20	42609.74	14.60		
alpha	E	2044-06-05T07:45:55.525		36.07	-9.60	44700.14	18.46		
beta	E	2044-06-05T07:46:44.389		36.01	-9.76	45641.08	19.78		
eta	E	2044-06-05T07:47:58.368		35.91	-9.99	47176.12	21.64		
gamma	E	2044-06-05T07:48:18.981		35.89	-10.06	47627.20	22.13		
delta	E	2044-06-05T07:48:48.945		35.85	-10.15	48300.35	22.80		
lambda	E	2044-06-05T07:50:02.130		35.75	-10.39	50026.71	24.35		
epsilon	E	2044-06-05T07:51:03.274		35.66	-10.58	51551.69	25.49		