

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2023-02-27T09:16:55.230
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 33482091866588672
 2Mass ID (if available) : 02511170+1603508

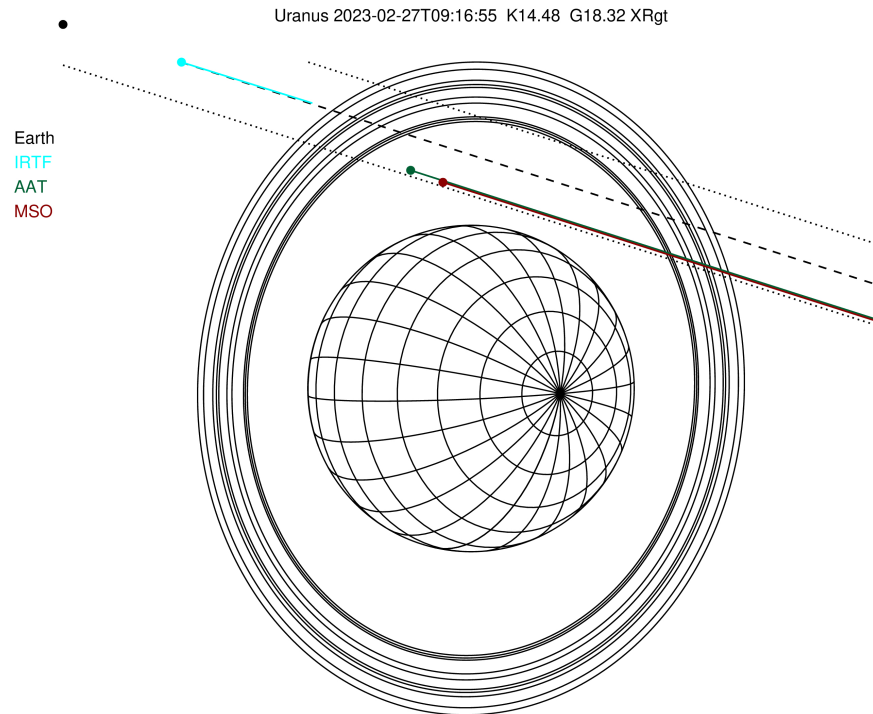
ICRS Star Coord at Epoch: 02h 51m 11.72488s +16:03:50.34008s

RUWE (>1.4 is poor) : 1.07
 K magnitude : 14.481
 G magnitude : 18.319
 RP magnitude : 17.125
 BP magnitude : 19.775
 DUPflag : 0
 Distance (au) : 20.028
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 18.03
 Sun-Target sep (deg) : 66.97
 Sun-Moon sep (deg) : 23.78
 B (ring opening deg) : 56.79
 PA of pole (deg) : -93.30

#	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

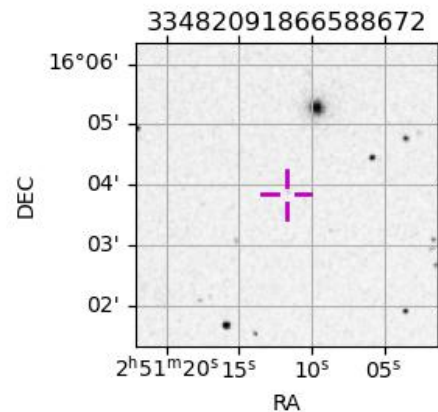


2023-02-27T09:16:55.2300 ex: 02 51 11.72488 s +16 03 50.34008 C/A 2.400" PA 162.27 deg v_sky +18.03 km/s D 20.03 AU
 Credit: Styled after SORA/Lucky Star

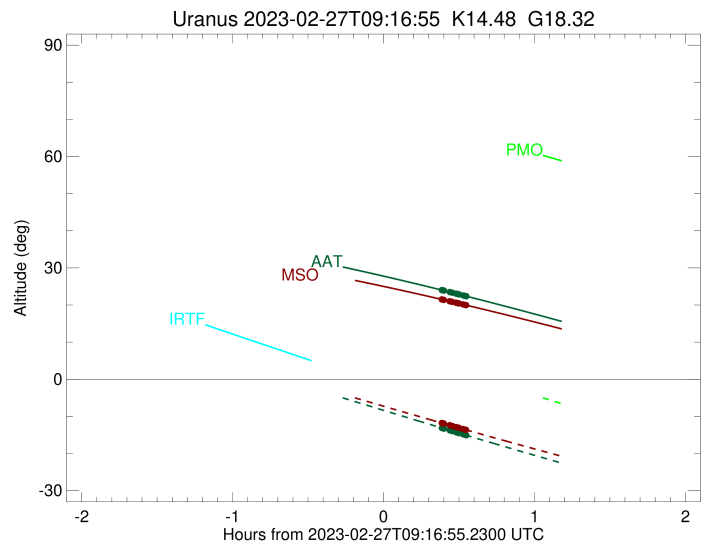
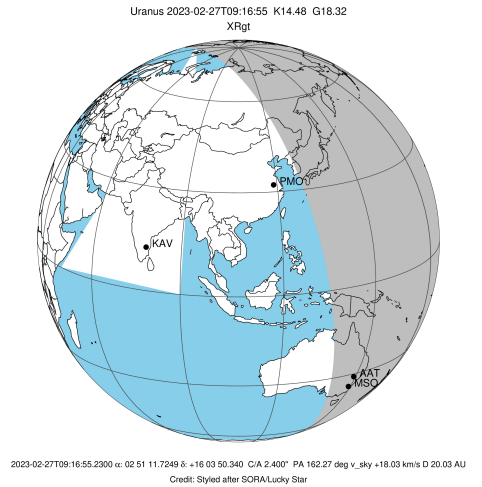


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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					PnnRnn
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					PnnRne
SAAO	So. Afr. Astro. Obs.	-32.4	20.8				FEB 27 09:40 - FEB 27 09:49	PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0				FEB 27 09:40 - FEB 27 09:49	PnnRne



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2023-02-27T09:19:00.300
 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 : 33482091866588672
 2Mass ID (if available) : 02511170+1603508
 ICRS Star Coord at Epoch: 02h 51m 11.72488s +16:03:50.34008s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 14.481
 G magnitude : 18.319
 RP magnitude : 17.125
 BP magnitude : 19.775
 DUPflag : 0
 Distance (au) : 20.028
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 18.03
 Sun-Target sep (deg) : 66.97
 Sun-Moon sep (deg) : 23.77
 B (ring opening deg) : 56.79
 PA of pole (deg) : -93.30
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.041
 C/A sky separation (km) : 29643.3
 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

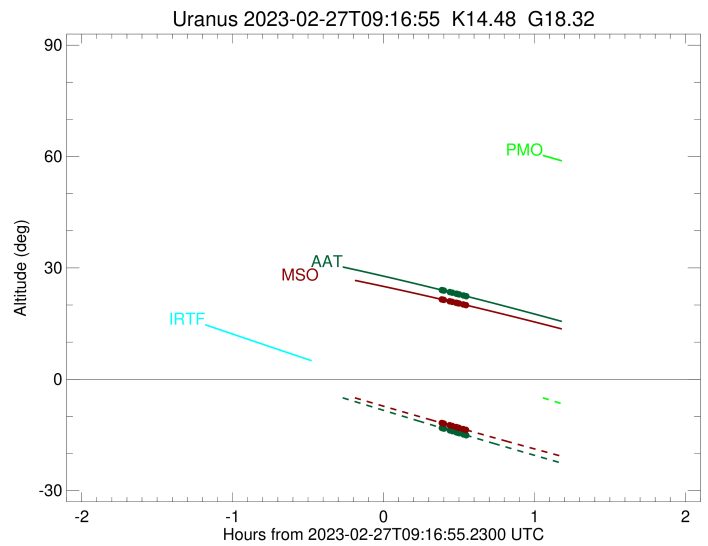
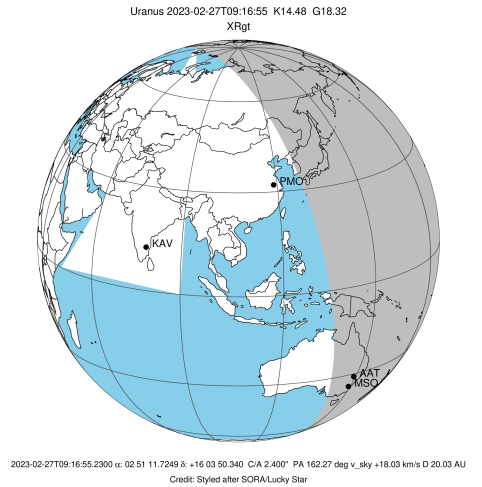


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2023-02-27T08:44:06.488		32.60	-1.52x	51027.22	-16.86		
lambda	I	2023-02-27T08:45:05.803		32.47	-1.73x	50026.71	-16.78		
delta	I	2023-02-27T08:46:49.746		32.23	-2.09x	48300.35	-16.43		
gamma	I	2023-02-27T08:47:30.831		32.13	-2.23x	47628.10	-16.29		
eta	I	2023-02-27T08:47:58.667		32.07	-2.33x	47176.12	-16.19		
beta	I	2023-02-27T08:49:34.607		31.84	-2.67x	45641.51	-15.81		
alpha	I	2023-02-27T08:50:31.126		31.71	-2.86x	44751.99	-15.57		
4	I	2023-02-27T08:52:56.151		31.37	-3.37x	42547.07	-14.90		
5	I	2023-02-27T08:53:15.149		31.32	-3.44x	42255.41	-14.76		
6	I	2023-02-27T08:53:45.369		31.25	-3.54x	41807.72	-14.63		

No planet occultations

6	E	2023-02-27T09:40:06.996		24.02	-13.13	41867.10	14.68		
5	E	2023-02-27T09:40:26.629		23.97	-13.19	42157.61	14.81		
4	E	2023-02-27T09:40:57.504		23.88	-13.30	42609.87	14.96		
alpha	E	2023-02-27T09:43:15.908		23.49	-13.76	44720.42	15.63		
beta	E	2023-02-27T09:44:15.759		23.32	-13.97	45659.69	15.88		
eta	E	2023-02-27T09:45:50.247		23.06	-14.29	47176.12	16.26		
gamma	E	2023-02-27T09:46:17.525		22.98	-14.38	47621.01	16.36		
delta	E	2023-02-27T09:46:58.857		22.86	-14.52	48300.35	16.51		
lambda	E	2023-02-27T09:48:42.307		22.57	-14.87	50026.71	16.86		
epsilon	E	2023-02-27T09:49:28.928		22.43	-15.02	50816.13	16.95		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2023-02-27T09:18:45.760
 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 : 33482091866588672
 2Mass ID (if available) : 02511170+1603508
 ICRS Star Coord at Epoch: 02h 51m 11.72488s +16:03:50.34008s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 14.481
 G magnitude : 18.319
 RP magnitude : 17.125
 BP magnitude : 19.775
 DUPflag : 0
 Distance (au) : 20.028
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 18.03
 Sun-Target sep (deg) : 66.97
 Sun-Moon sep (deg) : 23.79
 B (ring opening deg) : 56.79
 PA of pole (deg) : -93.30
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.024
 C/A sky separation (km) : 29399.7
 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	2023-02-27T08:43:46.001		29.53	-0.65x	51029.55	-16.95		
lambda	I	2023-02-27T08:44:45.144		29.40	-0.85x	50026.71	-16.87		
delta	I	2023-02-27T08:46:28.506		29.18	-1.19x	48300.35	-16.53		
gamma	I	2023-02-27T08:47:09.344		29.10	-1.33x	47628.14	-16.39		
eta	I	2023-02-27T08:47:37.009		29.04	-1.42x	47176.12	-16.29		
beta	I	2023-02-27T08:49:12.318		28.83	-1.74x	45641.54	-15.92		
alpha	I	2023-02-27T08:50:08.438		28.71	-1.93x	44751.95	-15.69		
4	I	2023-02-27T08:52:32.328		28.40	-2.41x	42546.76	-15.03		
5	I	2023-02-27T08:52:51.088		28.36	-2.47x	42256.05	-14.89		
6	I	2023-02-27T08:53:21.091		28.29	-2.57x	41807.47	-14.77		

No planet occultations

6	E	2023-02-27T09:40:04.502		21.51	-11.77	41867.36	14.82		
5	E	2023-02-27T09:40:23.927		21.46	-11.84	42157.43	14.94		
4	E	2023-02-27T09:40:54.551		21.38	-11.93	42610.06	15.09		
alpha	E	2023-02-27T09:43:11.844		21.02	-12.38	44720.17	15.75		
beta	E	2023-02-27T09:44:11.300		20.86	-12.57	45659.83	15.98		
eta	E	2023-02-27T09:45:45.172		20.61	-12.87	47176.12	16.36		
gamma	E	2023-02-27T09:46:12.285		20.54	-12.95	47621.00	16.46		
delta	E	2023-02-27T09:46:53.377		20.43	-13.09	48300.35	16.61		
lambda	E	2023-02-27T09:48:36.265		20.15	-13.41	50026.71	16.95		
epsilon	E	2023-02-27T09:49:22.731		20.03	-13.56	50817.52	17.03		