

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2023-02-25T12:50:24.340
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 33481713909396224
 2Mass ID (if available) : 02505890+1602512

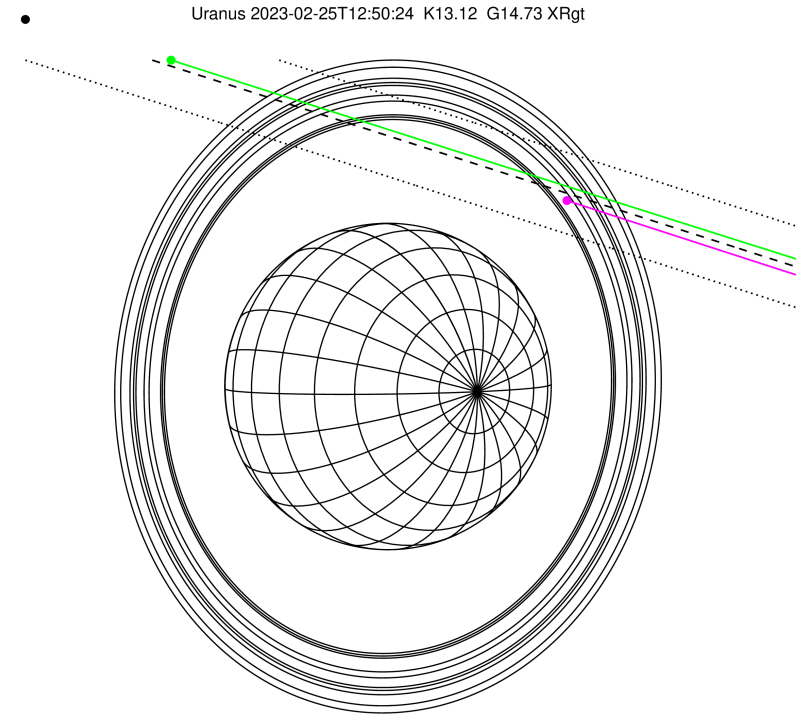
ICRS Star Coord at Epoch: 02h 50m 58.90753s +16:02:51.33387s

RUWE (>1.4 is poor) : 1.15
 K magnitude : 13.120
 G magnitude : 14.729
 RP magnitude : 14.179
 BP magnitude : 15.102
 DUPflag : 0
 Distance (au) : 19.998
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.16
 Sun-Target sep (deg) : 68.78
 Sun-Moon sep (deg) : 1.22
 B (ring opening deg) : 56.74
 PA of pole (deg) : -93.33

#	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

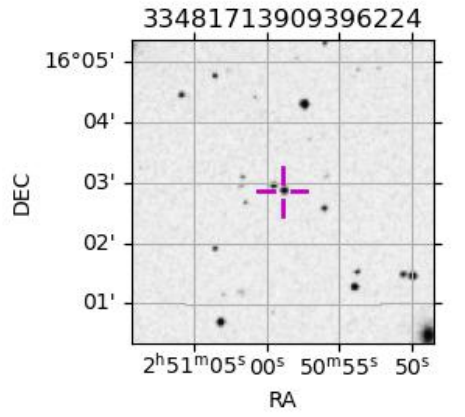


2023-02-25T12:50:24.3400 ex: 02 50 58.9075 s: +16 02 51.334 C/A 2.578° PA 162.20 deg v_sky +17.16 km/s D 20.00 AU
 Credit: Styled after SORA/Lucky Star

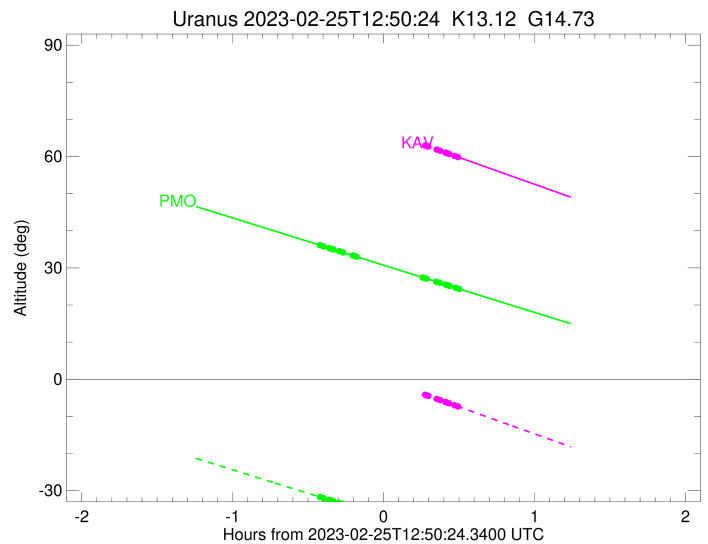
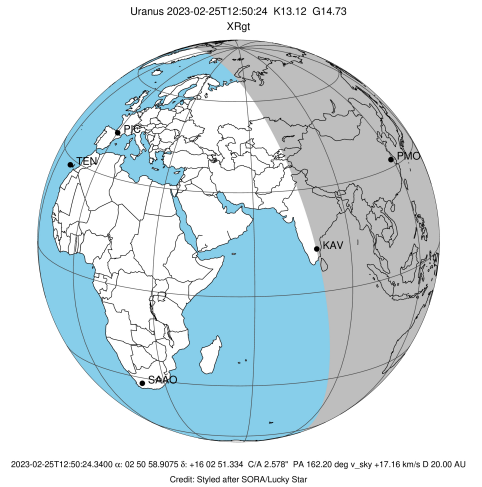


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++++		+++++	FEB 25 12:25 - FEB 25 13:19	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			+++++	FEB 25 13:11 - FEB 25 13:19	PnnRne
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					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2023-02-25T12:55:36.300
 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 : 33481713909396224
 2Mass ID (if available) : 02505890+1602512
 ICRS Star Coord at Epoch: 02h 50m 58.90753s +16:02:51.33387s
 RUWE (>1.4 is poor) : 1.15
 K magnitude : 13.120
 G magnitude : 14.729
 RP magnitude : 14.179
 BP magnitude : 15.102
 DUPflag : 0
 Distance (au) : 19.998
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.16
 Sun-Target sep (deg) : 68.78
 Sun-Moon sep (deg) : 1.20
 B (ring opening deg) : 56.74
 PA of pole (deg) : -93.33
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.645
 C/A sky separation (km) : 38362.5
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

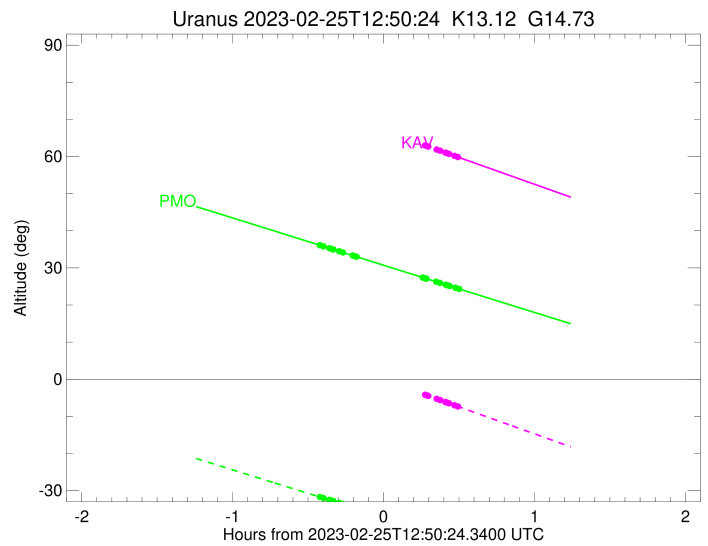
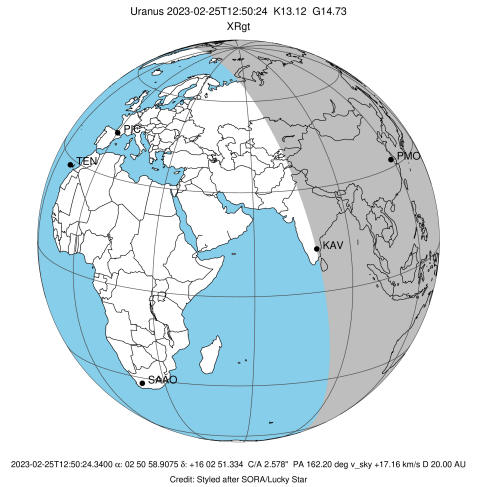


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2023-02-25T12:25:22.473		36.06	-31.76	50956.44	-12.92		
lambda	I	2023-02-25T12:26:34.753		35.80	-32.01	50026.71	-12.69		
delta	I	2023-02-25T12:28:54.604		35.30	-32.50	48300.35	-11.98		
gamma	I	2023-02-25T12:29:51.524		35.10	-32.70	47627.02	-11.67		
eta	I	2023-02-25T12:30:30.518		34.96	-32.83	47176.12	-11.45		
beta	I	2023-02-25T12:32:49.566		34.47	-33.32	45641.06	-10.61		
alpha	I	2023-02-25T12:34:15.375		34.17	-33.62	44752.32	-10.05		
4	I	2023-02-25T12:38:13.839		33.32	-34.44	42558.48	-8.33		
5	I	2023-02-25T12:38:53.277		33.18	-34.58	42232.73	-7.96		
6	I	2023-02-25T12:39:46.504		32.99	-34.76	41817.89	-7.57		

No planet occultations

6	E	2023-02-25T13:05:54.693		27.43	-40.14	41849.84	7.59		
5	E	2023-02-25T13:06:36.520		27.28	-40.28	42175.09	7.98		
4	E	2023-02-25T13:07:28.985		27.10	-40.46	42595.73	8.36		
alpha	E	2023-02-25T13:11:20.548		26.28	-41.24	44733.05	10.09		
beta	E	2023-02-25T13:12:49.539		25.96	-41.54	45652.62	10.66		
eta	E	2023-02-25T13:15:07.043		25.48	-42.00	47176.12	11.51		
gamma	E	2023-02-25T13:15:45.386		25.34	-42.13	47621.53	11.73		
delta	E	2023-02-25T13:16:42.495		25.14	-42.32	48300.35	12.04		
lambda	E	2023-02-25T13:19:01.616		24.65	-42.79	50026.71	12.76		
epsilon	E	2023-02-25T13:19:58.829		24.44	-42.98	50764.79	13.00		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2023-02-25T12:52:50.730
 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 : 33481713909396224
 2Mass ID (if available) : 02505890+1602512
 ICRS Star Coord at Epoch: 02h 50m 58.90753s +16:02:51.33387s
 RUWE (>1.4 is poor) : 1.15
 K magnitude : 13.120
 G magnitude : 14.729
 RP magnitude : 14.179
 BP magnitude : 15.102
 DUPflag : 0
 Distance (au) : 19.998
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.16
 Sun-Target sep (deg) : 68.78
 Sun-Moon sep (deg) : 1.37
 B (ring opening deg) : 56.74
 PA of pole (deg) : -93.33
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.507
 C/A sky separation (km) : 36364.6
 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



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	2023-02-25T12:20:25.368	74.10	7.02x	50975.44	-13.63		
lambda	I	2023-02-25T12:21:35.170	73.82	6.74x	50026.71	-13.45		
delta	I	2023-02-25T12:23:46.352	73.31	6.21x	48300.35	-12.86		
gamma	I	2023-02-25T12:24:39.192	73.10	6.00x	47627.35	-12.61		
eta	I	2023-02-25T12:25:15.232	72.96	5.86x	47176.12	-12.43		
beta	I	2023-02-25T12:27:22.107	72.45	5.35x	45641.08	-11.76		
alpha	I	2023-02-25T12:28:38.926	72.15	5.04x	44752.43	-11.31		
4	I	2023-02-25T12:32:05.009	71.33	4.22x	42554.38	-10.02		
5	I	2023-02-25T12:32:36.109	71.21	4.09x	42240.78	-9.74		
6	I	2023-02-25T12:33:20.318	71.04	3.92x	41814.01	-9.47		

No planet occultations

6	E	2023-02-25T13:06:54.468	63.00	-4.17x	41854.52	9.49		
5	E	2023-02-25T13:07:27.186	62.87	-4.30x	42169.49	9.76		
4	E	2023-02-25T13:08:11.436	62.69	-4.48x	42599.69	10.04		
alpha	E	2023-02-25T13:11:30.867	61.89	-5.28	44730.25	11.34		
beta	E	2023-02-25T13:12:51.063	61.57	-5.60	45654.17	11.79		
eta	E	2023-02-25T13:14:56.626	61.07	-6.11	47176.12	12.47		
gamma	E	2023-02-25T13:15:32.088	60.93	-6.25	47621.37	12.65		
delta	E	2023-02-25T13:16:25.240	60.72	-6.47	48300.35	12.90		
lambda	E	2023-02-25T13:18:36.003	60.19	-6.99	50026.71	13.49		
epsilon	E	2023-02-25T13:19:30.916	59.97	-7.21	50773.95	13.68		