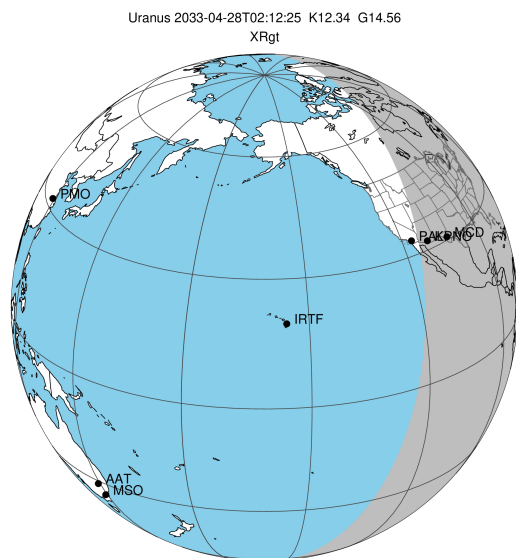


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-28T02:12:25.590
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3427497465441099264
 2Mass ID (if available) : 05524503+2338325

ICRS Star Coord at Epoch: 05h 52m 45.06852s +23:38:32.35329s

RUWE (>1.4 is poor) : 1.11
 K magnitude : 12.335
 G magnitude : 14.565
 RP magnitude : 13.856
 BP magnitude : 15.114
 DUPflag : 0
 Distance (au) : 19.618
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 25.24
 Sun-Target sep (deg) : 50.68
 Sun-Moon sep (deg) : 64.90
 B (ring opening deg) : 76.71
 PA of pole (deg) : 52.39

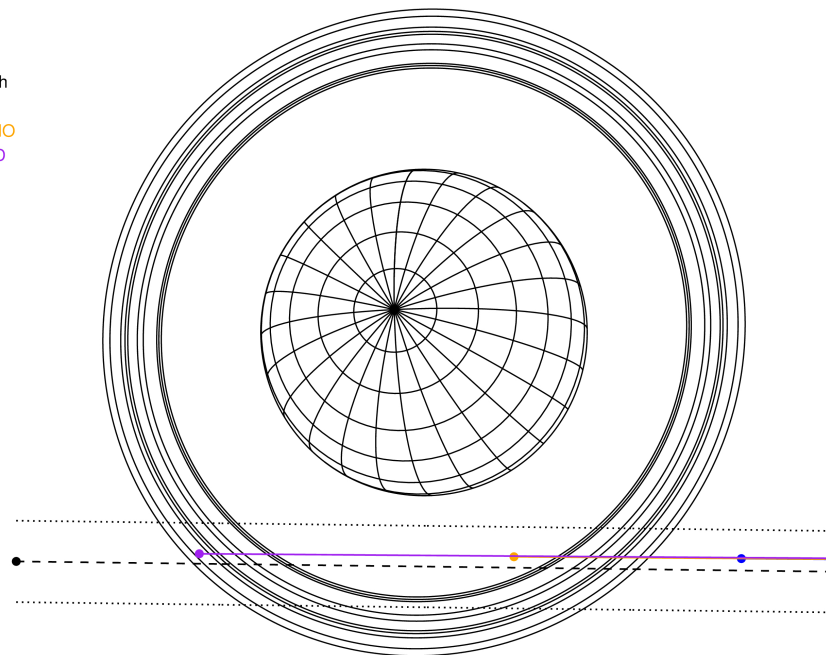
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2033-04-28T02:12:25.5900 ex: 05 52 45.0685 s: +23 38 32.353 C/A 2.570° PA 359.28 deg v_sky +25.24 km/s D 19.62 AU
 Credit: Styled after SORA/Lucky Star

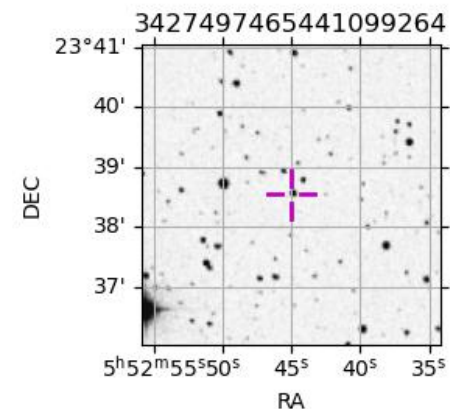
Uranus 2033-04-28T02:12:25 K12.34 G14.56 XRgt

Earth
 PAL
 KPNO
 MCD

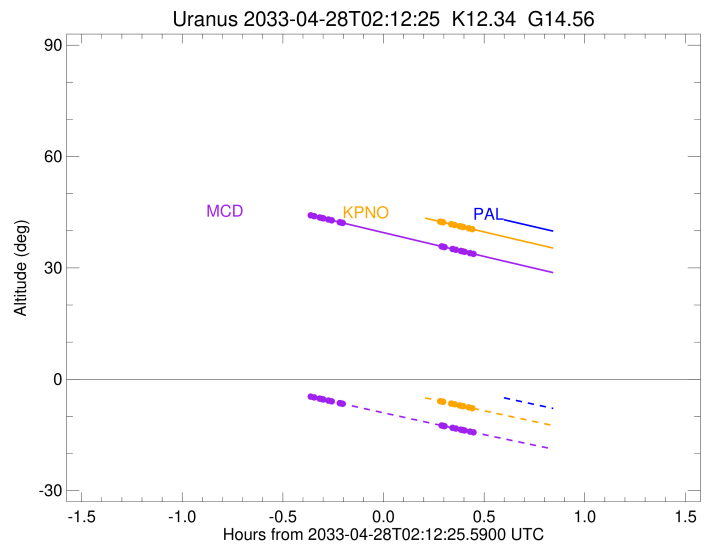
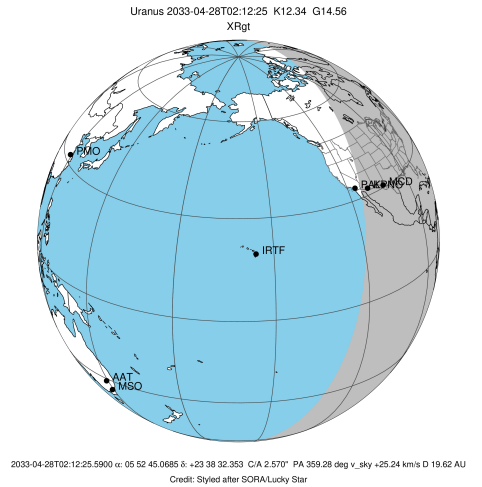


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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			+++++	APR 28 02:29 - APR 28 02:39	PnnRne
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	APR 28 01:53 - APR 28 02:39	PnnRie
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					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 : 2033-04-28T02:15:16.990
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 3427497465441099264
 2Mass ID (if available) : 05524503+2338325
 ICRS Star Coord at Epoch: 05h 52m 45.06852s +23:38:32.35329s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 12.335
 G magnitude : 14.565
 RP magnitude : 13.856
 BP magnitude : 15.114
 DUPflag : 0
 Distance (au) : 19.618
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 25.24
 Sun-Target sep (deg) : 50.68
 Sun-Moon sep (deg) : 65.83
 B (ring opening deg) : 76.71
 PA of pole (deg) : 52.39
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.461
 C/A sky separation (km) : 35012.9
 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



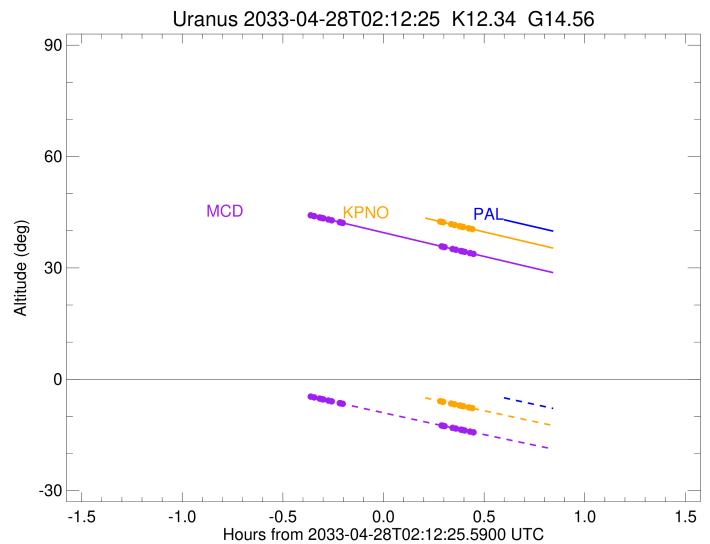
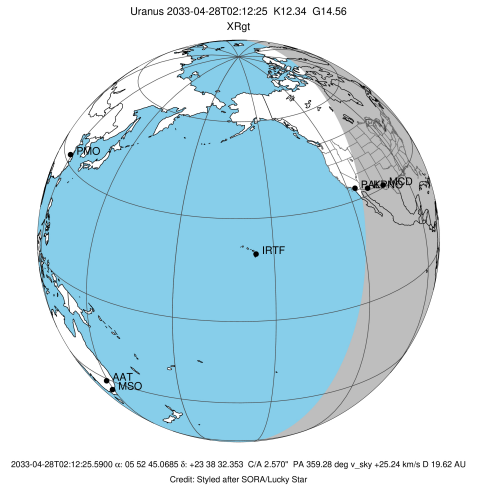
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-04-28T01:50:11.652	50.80	2.00x	51416.07	-18.52		
lambda	I	2033-04-28T01:51:28.050	50.53	1.74x	50026.71	-17.95		
delta	I	2033-04-28T01:53:06.023	50.18	1.41x	48300.35	-17.28		
gamma	I	2033-04-28T01:53:45.038	50.05	1.28x	47631.56	-17.00		
eta	I	2033-04-28T01:54:11.992	49.95	1.19x	47176.12	-16.79		
beta	I	2033-04-28T01:55:43.477	49.62	0.87x	45672.74	-16.06		
alpha	I	2033-04-28T01:56:43.839	49.41	0.67x	44719.26	-15.55		
4	I	2033-04-28T01:59:07.016	48.90	0.18x	42592.63	-14.16		
5	I	2033-04-28T01:59:38.218	48.79	0.08x	42155.87	-13.82		
6	I	2033-04-28T02:00:00.137	48.71	0.00x	41855.85	-13.56		

No planet occultations

6	E	2033-04-28T02:29:17.564	42.48	-5.89	41810.75	13.58		
5	E	2033-04-28T02:29:46.709	42.38	-5.98	42214.54	13.85		
4	E	2033-04-28T02:30:14.538	42.28	-6.07	42616.32	14.19		
alpha	E	2033-04-28T02:32:38.285	41.77	-6.55	44751.53	15.58		
beta	E	2033-04-28T02:33:36.725	41.56	-6.74	45679.53	16.10		
eta	E	2033-04-28T02:35:07.584	41.24	-7.04	47176.12	16.84		
gamma	E	2033-04-28T02:35:34.211	41.15	-7.13	47627.19	17.04		
delta	E	2033-04-28T02:36:13.379	41.01	-7.26	48300.35	17.33		
lambda	E	2033-04-28T02:37:51.075	40.66	-7.58	50026.71	18.00		
epsilon	E	2033-04-28T02:39:08.395	40.39	-7.83	51437.34	18.58		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-28T02:15:37.260
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 3427497465441099264
 2Mass ID (if available) : 05524503+2338325
 ICRS Star Coord at Epoch: 05h 52m 45.06852s +23:38:32.35329s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 12.335
 G magnitude : 14.565
 RP magnitude : 13.856
 BP magnitude : 15.114
 DUPflag : 0
 Distance (au) : 19.618
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 25.24
 Sun-Target sep (deg) : 50.68
 Sun-Moon sep (deg) : 65.79
 B (ring opening deg) : 76.71
 PA of pole (deg) : 52.39
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.454
 C/A sky separation (km) : 34911.4
 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_itrff93_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	2033-04-28T01:50:30.562		44.21	-4.63x	51415.42	-18.60		
lambda	I	2033-04-28T01:51:46.609		43.94	-4.89x	50026.71	-18.02		
delta	I	2033-04-28T01:53:24.138		43.59	-5.22	48300.35	-17.37		
gamma	I	2033-04-28T01:54:02.963		43.45	-5.35	47631.56	-17.08		
eta	I	2033-04-28T01:54:29.781		43.35	-5.44	47176.12	-16.88		
beta	I	2033-04-28T01:56:00.772		43.03	-5.75	45672.69	-16.16		
alpha	I	2033-04-28T01:57:00.778		42.81	-5.95	44719.16	-15.64		
4	I	2033-04-28T01:59:22.957		42.30	-6.43	42592.49	-14.27		
5	I	2033-04-28T01:59:53.905		42.19	-6.53	42155.82	-13.94		
6	I	2033-04-28T02:00:15.624		42.11	-6.60	41856.00	-13.67		

No planet occultations

6	E	2033-04-28T02:29:42.849		35.80	-12.44	41810.58	13.70		
5	E	2033-04-28T02:30:11.780		35.70	-12.54	42214.92	13.97		
4	E	2033-04-28T02:30:39.354		35.60	-12.63	42616.30	14.30		
alpha	E	2033-04-28T02:33:02.072		35.09	-13.09	44751.56	15.68		
beta	E	2033-04-28T02:34:00.145		34.89	-13.28	45679.50	16.20		
eta	E	2033-04-28T02:35:30.490		34.57	-13.57	47176.12	16.93		
gamma	E	2033-04-28T02:35:56.974		34.47	-13.66	47627.17	17.13		
delta	E	2033-04-28T02:36:35.941		34.33	-13.78	48300.35	17.42		
lambda	E	2033-04-28T02:38:13.167		33.99	-14.10	50026.71	18.08		
epsilon	E	2033-04-28T02:39:30.093		33.71	-14.34	51436.40	18.66		