

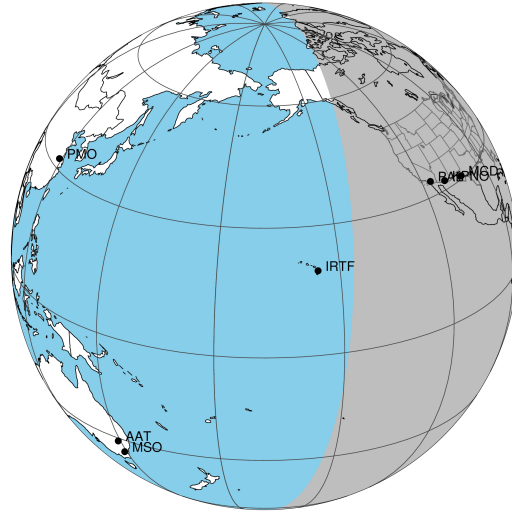
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-08T03:58:21.790
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3427673726601606144
 2Mass ID (if available) : 05493741+2337537

Uranus 2033-04-08T03:58:21 K14.48 G18.75 XRgt

ICRS Star Coord at Epoch: 05h 49m 37.41853s +23:37:53.61968s

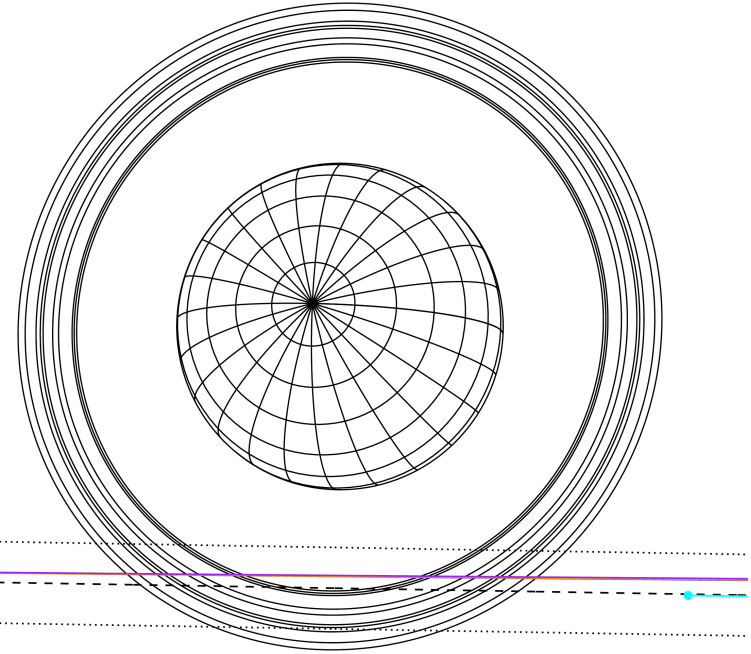
RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.480
 G magnitude : 18.749
 RP magnitude : 17.596
 BP magnitude : 20.173
 DUPflag : 0
 Distance (au) : 19.328
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 16.82
 Sun-Target sep (deg) : 69.44
 Sun-Moon sep (deg) : 38.40
 B (ring opening deg) : 77.28
 PA of pole (deg) : 50.18

Uranus 2033-04-08T03:58:21 K14.48 G18.75 XRgt



2033-04-08T03:58:21.7900 ex: 05 49 37.4185 s: +23 37 53.620 C/A 2.918° PA 359.02 deg v_sky +16.82 km/s D 19.33 AU
 Credit: Styled after SORA/Lucky Star

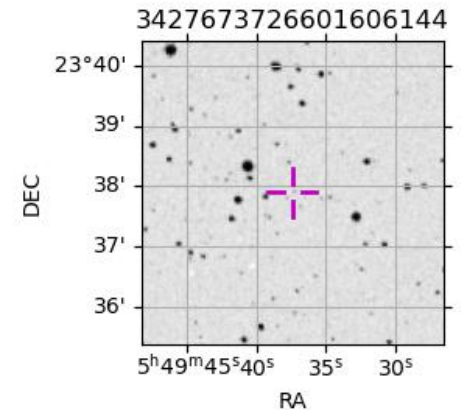
Earth
 PAL
 KPNO
 MCD
 IRTF



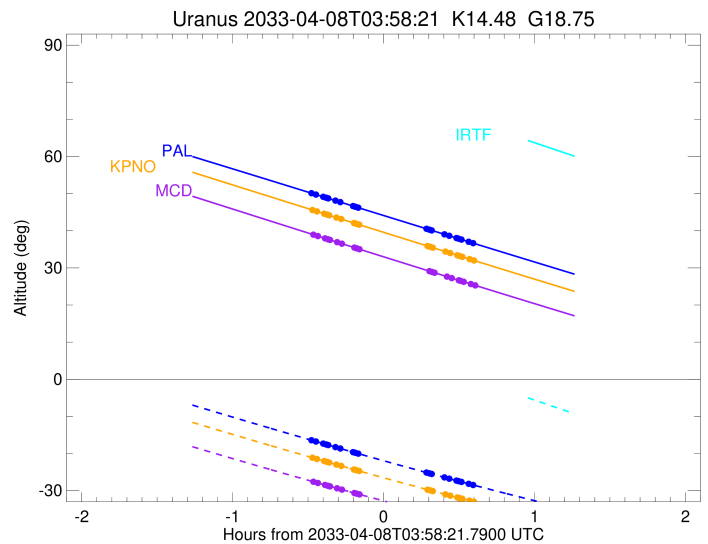
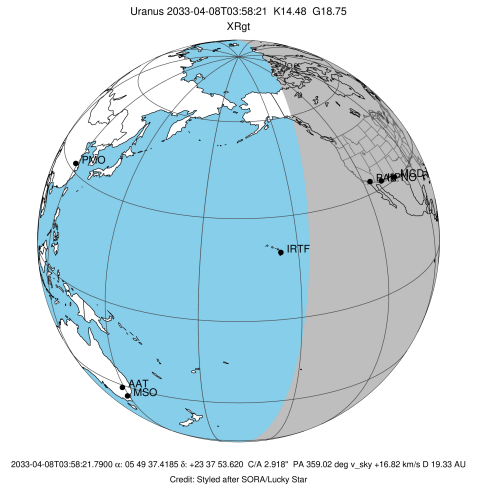
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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	+++++		+++++	APR 08 03:29 - APR 08 04:34	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	APR 08 03:29 - APR 08 04:34	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	APR 08 03:29 - APR 08 04:35	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 : 2033-04-08T04:02:52.400
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3427673726601606144
 2Mass ID (if available) : 05493741+2337537
 ICRS Star Coord at Epoch: 05h 49m 37.41853s +23:37:53.61968s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.480
 G magnitude : 18.749
 RP magnitude : 17.596
 BP magnitude : 20.173
 DUPflag : 0
 Distance (au) : 19.328
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 16.82
 Sun-Target sep (deg) : 69.44
 Sun-Moon sep (deg) : 38.35
 B (ring opening deg) : 77.28
 PA of pole (deg) : 50.18
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.793
 C/A sky separation (km) : 39148.7
 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

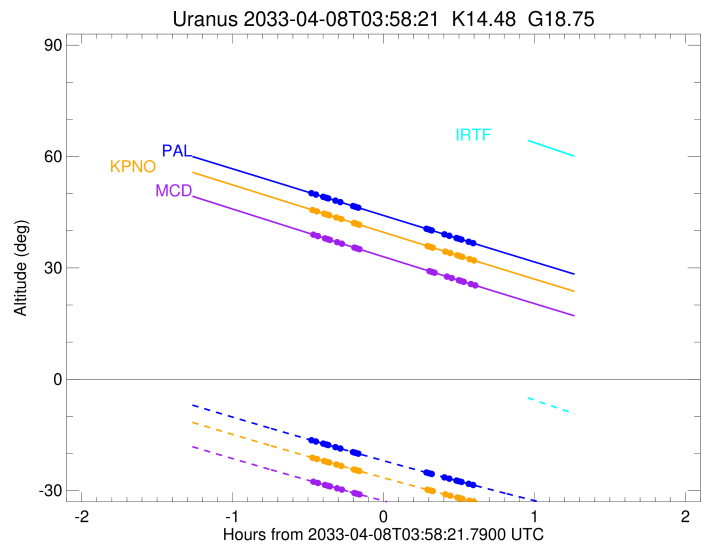
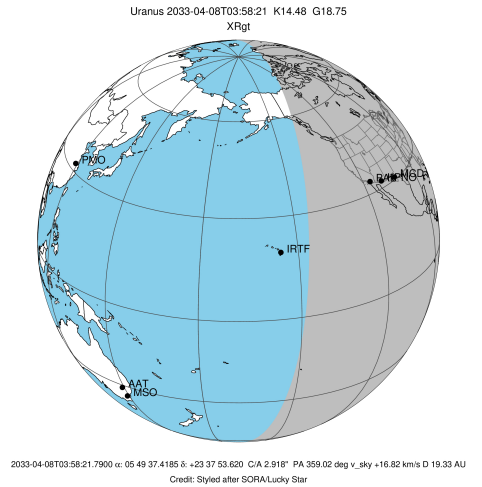


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-04-08T03:29:08.292		50.25	-16.31	51542.03	-10.78		
lambda	I	2033-04-08T03:31:32.354		49.75	-16.78	50026.71	-10.27		
delta	I	2033-04-08T03:34:25.704		49.14	-17.34	48300.35	-9.63		
gamma	I	2033-04-08T03:35:36.277		48.89	-17.57	47630.38	-9.35		
eta	I	2033-04-08T03:36:25.381		48.72	-17.73	47176.12	-9.15		
beta	I	2033-04-08T03:39:15.642		48.13	-18.28	45681.16	-8.40		
alpha	I	2033-04-08T03:41:10.596		47.73	-18.65	44746.25	-7.86		
4	I	2033-04-08T03:46:11.662		46.67	-19.62	42616.53	-6.25		
5	I	2033-04-08T03:47:17.767		46.44	-19.83	42214.41	-5.90		
6	I	2033-04-08T03:48:29.821		46.19	-20.06	41808.43	-5.43		

No planet occultations

6	E	2033-04-08T04:15:17.686		40.57	-25.10	41795.34	5.45		
5	E	2033-04-08T04:16:41.535		40.28	-25.35	42270.48	5.92		
4	E	2033-04-08T04:17:34.315		40.10	-25.52	42602.82	6.27		
alpha	E	2033-04-08T04:22:37.685		39.04	-26.44	44750.25	7.89		
beta	E	2033-04-08T04:24:30.249		38.65	-26.78	45672.61	8.44		
eta	E	2033-04-08T04:27:20.774		38.05	-27.29	47176.12	9.20		
gamma	E	2033-04-08T04:28:09.019		37.89	-27.44	47624.72	9.40		
delta	E	2033-04-08T04:29:19.809		37.64	-27.65	48300.35	9.69		
lambda	E	2033-04-08T04:32:12.143		37.04	-28.16	50026.71	10.34		
epsilon	E	2033-04-08T04:34:14.620		36.61	-28.53	51318.98	10.85		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-08T04:03:14.950
 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 : 3427673726601606144
 2Mass ID (if available) : 05493741+2337537
 ICRS Star Coord at Epoch: 05h 49m 37.41853s +23:37:53.61968s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.480
 G magnitude : 18.749
 RP magnitude : 17.596
 BP magnitude : 20.173
 DUPflag : 0
 Distance (au) : 19.328
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 16.82
 Sun-Target sep (deg) : 69.44
 Sun-Moon sep (deg) : 38.28
 B (ring opening deg) : 77.28
 PA of pole (deg) : 50.18
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.791
 C/A sky separation (km) : 39125.9
 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

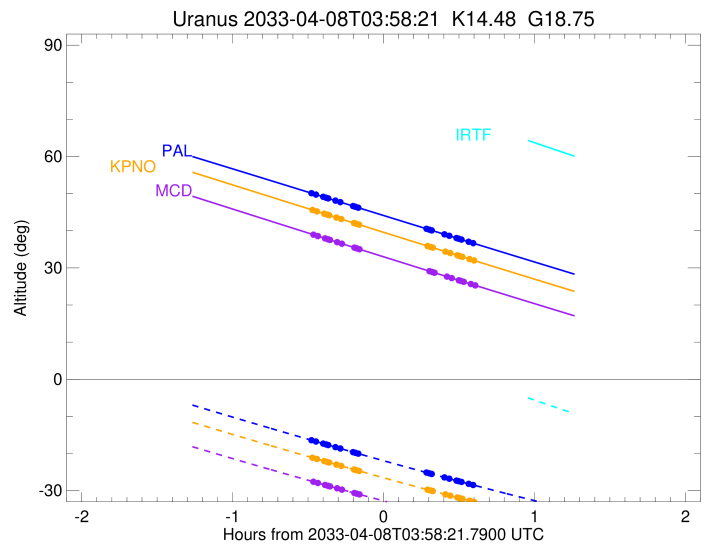
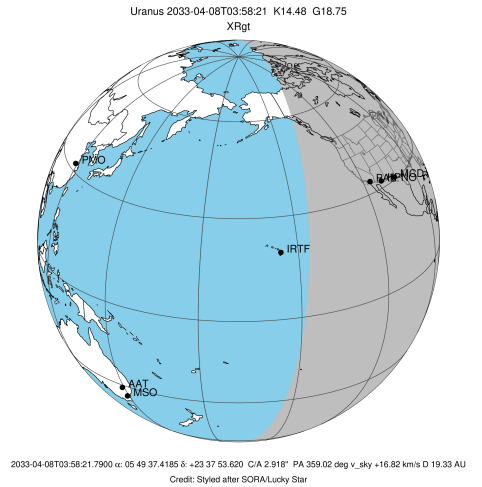


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-04-08T03:29:32.372		45.72	-21.02	51542.03	-10.81		
lambda	I	2033-04-08T03:31:56.106		45.21	-21.49	50026.71	-10.30		
delta	I	2033-04-08T03:34:49.026		44.60	-22.05	48300.35	-9.66		
gamma	I	2033-04-08T03:35:59.412		44.35	-22.27	47630.38	-9.38		
eta	I	2033-04-08T03:36:48.381		44.18	-22.43	47176.12	-9.17		
beta	I	2033-04-08T03:39:38.136		43.57	-22.98	45681.16	-8.43		
alpha	I	2033-04-08T03:41:32.709		43.17	-23.34	44746.24	-7.89		
4	I	2033-04-08T03:46:32.519		42.11	-24.30	42616.54	-6.29		
5	I	2033-04-08T03:47:38.287		41.87	-24.51	42214.34	-5.94		
6	I	2033-04-08T03:48:49.896		41.62	-24.73	41808.46	-5.47		

No planet occultations

6	E	2033-04-08T04:15:42.872		35.93	-29.71	41795.33	5.48		
5	E	2033-04-08T04:17:06.236		35.63	-29.96	42270.64	5.96		
4	E	2033-04-08T04:17:58.688		35.45	-30.12	42602.75	6.31		
alpha	E	2033-04-08T04:23:00.724		34.39	-31.02	44750.23	7.92		
beta	E	2033-04-08T04:24:52.879		33.99	-31.35	45672.59	8.47		
eta	E	2033-04-08T04:27:42.844		33.40	-31.85	47176.12	9.23		
gamma	E	2033-04-08T04:28:30.938		33.23	-31.99	47624.72	9.43		
delta	E	2033-04-08T04:29:41.515		32.98	-32.20	48300.35	9.72		
lambda	E	2033-04-08T04:32:33.355		32.38	-32.70	50026.71	10.37		
epsilon	E	2033-04-08T04:34:35.456		31.95	-33.05	51318.51	10.88		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-08T04:03:41.070
 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 : 3427673726601606144
 2Mass ID (if available) : 05493741+2337537
 ICRS Star Coord at Epoch: 05h 49m 37.41853s +23:37:53.61968s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.480
 G magnitude : 18.749
 RP magnitude : 17.596
 BP magnitude : 20.173
 DUPflag : 0
 Distance (au) : 19.328
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 16.82
 Sun-Target sep (deg) : 69.44
 Sun-Moon sep (deg) : 38.18
 B (ring opening deg) : 77.28
 PA of pole (deg) : 50.18
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.782
 C/A sky separation (km) : 38999.2
 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	2033-04-08T03:29:54.998		39.07	-27.49	51541.71	-10.88		
lambda	I	2033-04-08T03:32:17.644		38.57	-27.94	50026.71	-10.38		
delta	I	2033-04-08T03:35:09.126		37.95	-28.48	48300.35	-9.74		
gamma	I	2033-04-08T03:36:18.861		37.70	-28.70	47630.40	-9.47		
eta	I	2033-04-08T03:37:07.355		37.53	-28.85	47176.12	-9.27		
beta	I	2033-04-08T03:39:55.258		36.93	-29.37	45681.15	-8.53		
alpha	I	2033-04-08T03:41:48.376		36.53	-29.72	44746.14	-8.00		
4	I	2033-04-08T03:46:43.005		35.48	-30.63	42616.55	-6.43		
5	I	2033-04-08T03:47:47.359		35.25	-30.83	42213.75	-6.09		
6	I	2033-04-08T03:48:56.916		35.00	-31.04	41808.73	-5.63		

No planet occultations

6	E	2033-04-08T04:16:28.620		29.16	-35.92	41795.26	5.65		
5	E	2033-04-08T04:17:49.878		28.87	-36.15	42271.29	6.11		
4	E	2033-04-08T04:18:40.941		28.69	-36.29	42602.47	6.45		
alpha	E	2033-04-08T04:23:37.705		27.65	-37.12	44750.15	8.04		
beta	E	2033-04-08T04:25:28.378		27.26	-37.43	45672.48	8.58		
eta	E	2033-04-08T04:28:16.430		26.67	-37.89	47176.12	9.32		
gamma	E	2033-04-08T04:29:04.031		26.50	-38.02	47624.69	9.52		
delta	E	2033-04-08T04:30:13.929		26.26	-38.21	48300.35	9.81		
lambda	E	2033-04-08T04:33:04.258		25.66	-38.67	50026.71	10.45		
epsilon	E	2033-04-08T04:35:05.238		25.24	-39.00	51316.85	10.96		