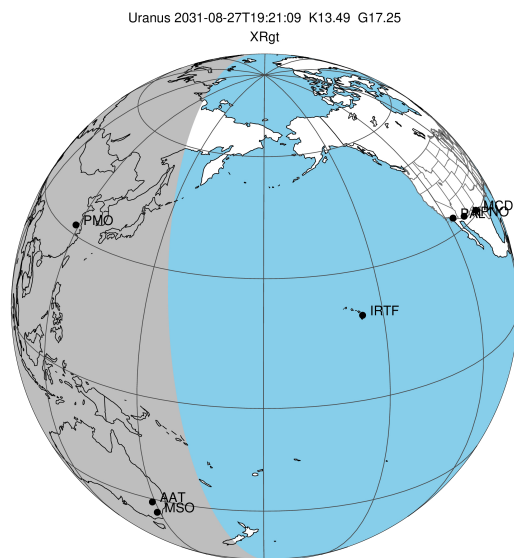


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-08-27T19:21:09.620
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3428368484809955584
 2Mass ID (if available) : 05434046+2330355

ICRS Star Coord at Epoch: 05h 43m 40.46561s +23:30:34.74712s

RUWE (>1.4 is poor) : 1.03
 K magnitude : 13.489
 G magnitude : 17.247
 RP magnitude : 16.056
 BP magnitude : 18.761
 DUPflag : 0
 Distance (au) : 19.469
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.67
 Sun-Target sep (deg) : 67.64
 Sun-Moon sep (deg) : 174.65
 B (ring opening deg) : 78.37
 PA of pole (deg) : 45.77

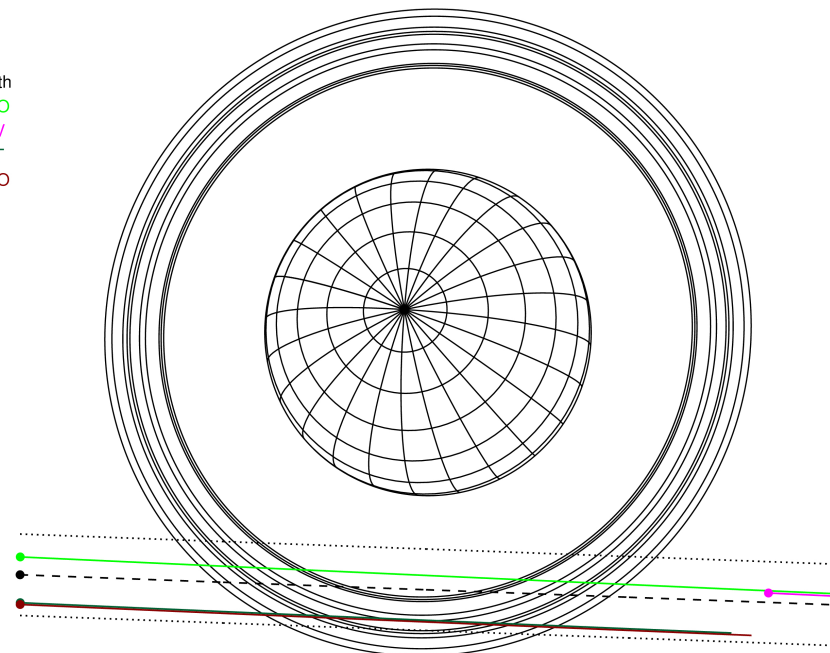
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2031-08-27T19:21:09.6200 ex: 05 43 40.4656 s: +23 30 34.747 C/A 2.848° PA 357.88 deg v_sky +17.67 km/s D 19.47 AU
 Credit: Styled after SORA/Lucky Star

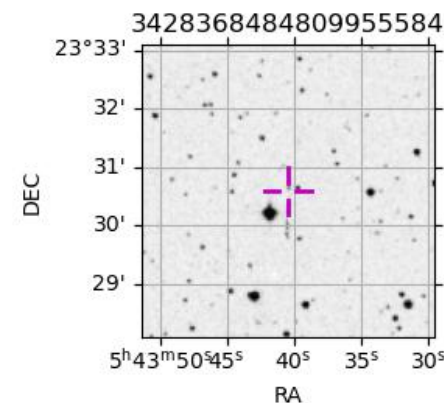
Uranus 2031-08-27T19:21:09 K13.49 G17.25 XRgt

Earth
 PMO
 KAV
 AAT
 MSO

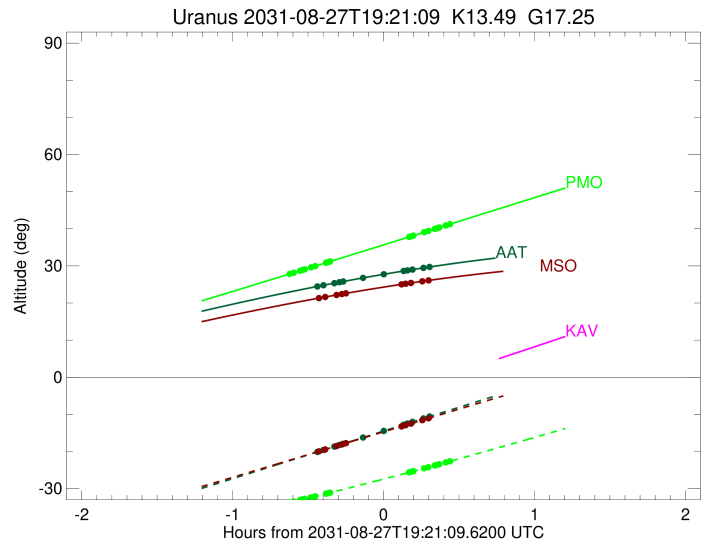
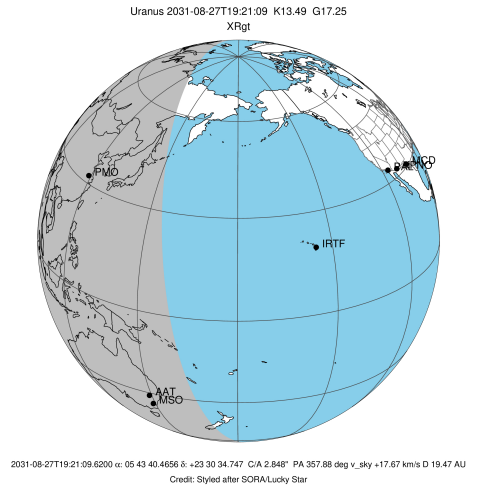


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++++		+++++	AUG 27 18:43 - AUG 27 19:47	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					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	+++++		+++++	AUG 27 18:54 - AUG 27 19:38	PnnRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++		+++++	AUG 27 18:55 - AUG 27 19:38	PnnRie



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-08-27T19:16:23.790
 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 : 3428368484809955584
 2Mass ID (if available) : 05434046+2330355
 ICRS Star Coord at Epoch: 05h 43m 40.46561s +23:30:34.74712s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 13.489
 G magnitude : 17.247
 RP magnitude : 16.056
 BP magnitude : 18.761
 DUPflag : 0
 Distance (au) : 19.469
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.67
 Sun-Target sep (deg) : 67.64
 Sun-Moon sep (deg) : 175.48
 B (ring opening deg) : 78.37
 PA of pole (deg) : 45.77
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.693
 C/A sky separation (km) : 38020.4
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



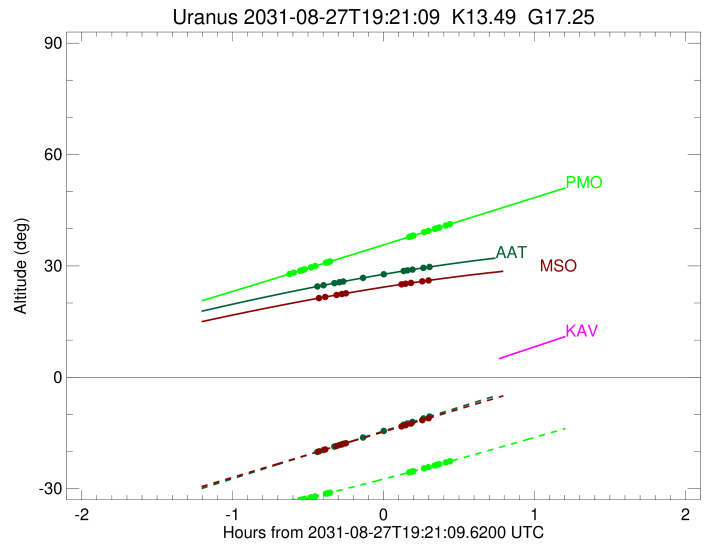
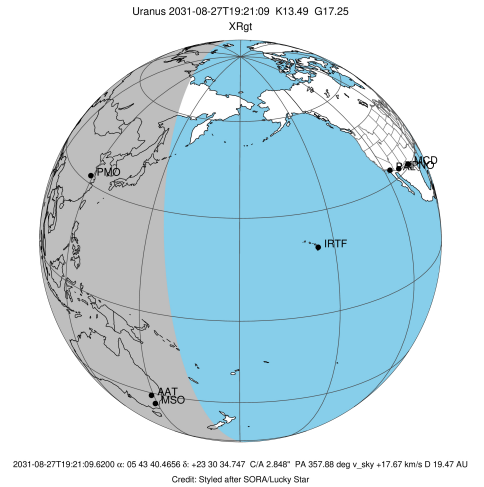
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-08-27T18:43:38.120	27.78	-33.76	51312.59	-11.69		
lambda	I	2031-08-27T18:45:29.091	28.17	-33.46	50026.71	-11.39		
delta	I	2031-08-27T18:48:04.835	28.71	-33.04	48300.35	-10.77		
gamma	I	2031-08-27T18:49:07.694	28.93	-32.87	47631.45	-10.51		
eta	I	2031-08-27T18:49:51.426	29.08	-32.75	47176.12	-10.32		
beta	I	2031-08-27T18:52:24.050	29.61	-32.34	45654.97	-9.60		
alpha	I	2031-08-27T18:54:07.829	29.97	-32.06	44685.30	-9.08		
4	I	2031-08-27T18:58:19.463	30.85	-31.36	42572.62	-7.65		
5	I	2031-08-27T18:58:54.886	30.98	-31.26	42308.33	-7.44		
6	I	2031-08-27T18:59:55.211	31.19	-31.09	41866.97	-7.09		

No planet occultations

6	E	2031-08-27T19:31:25.636	37.82	-25.59	41879.73	7.06		
5	E	2031-08-27T19:32:17.707	38.01	-25.44	42257.72	7.41		
4	E	2031-08-27T19:32:56.267	38.14	-25.32	42536.85	7.62		
alpha	E	2031-08-27T19:37:14.387	39.05	-24.54	44696.74	9.04		
beta	E	2031-08-27T19:38:56.197	39.41	-24.23	45641.19	9.55		
eta	E	2031-08-27T19:41:31.094	39.96	-23.75	47176.12	10.26		
gamma	E	2031-08-27T19:42:14.834	40.11	-23.62	47628.91	10.45		
delta	E	2031-08-27T19:43:18.310	40.34	-23.42	48300.35	10.71		
lambda	E	2031-08-27T19:45:55.042	40.89	-22.94	50026.71	11.31		
epsilon	E	2031-08-27T19:47:02.938	41.13	-22.73	50802.92	11.61		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-08-27T19:18:02.810
 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 : 3428368484809955584
 2Mass ID (if available) : 05434046+2330355
 ICRS Star Coord at Epoch: 05h 43m 40.46561s +23:30:34.74712s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 13.489
 G magnitude : 17.247
 RP magnitude : 16.056
 BP magnitude : 18.761
 DUPflag : 0
 Distance (au) : 19.469
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.67
 Sun-Target sep (deg) : 67.64
 Sun-Moon sep (deg) : 174.53
 B (ring opening deg) : 78.37
 PA of pole (deg) : 45.77
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.190
 C/A sky separation (km) : 45041.5
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

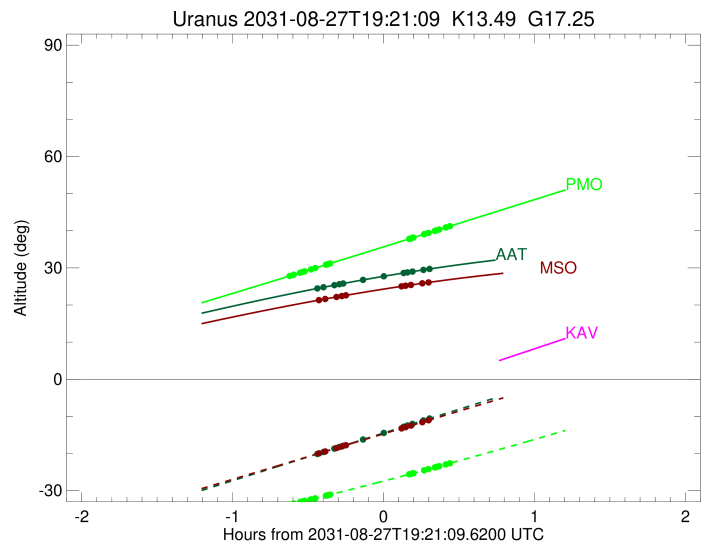
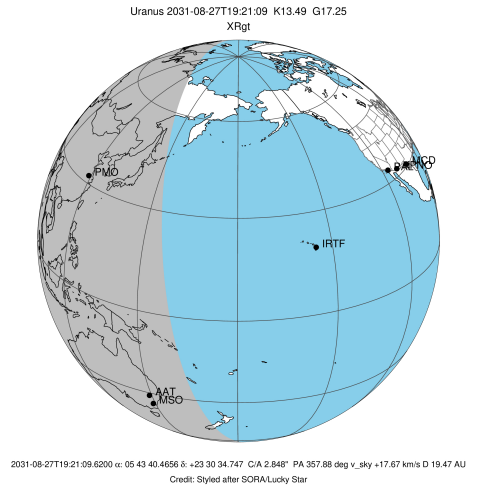


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-08-27T18:54:45.647		24.45	-20.14	51215.34	-7.96		
lambda	I	2031-08-27T18:57:19.945		24.79	-19.59	50026.71	-7.32		
delta	I	2031-08-27T19:01:40.310		25.35	-18.66	48300.35	-5.92		
gamma	I	2031-08-27T19:03:40.306		25.61	-18.23	47631.54	-5.22		
eta	I	2031-08-27T19:05:12.299		25.80	-17.91	47176.12	-4.67		
beta	I	2031-08-27T19:13:20.393		26.81	-16.16	45646.75	-1.53		

No planet occultations

beta	E	2031-08-27T19:20:56.733		27.70	-14.54	45644.53	1.53		
eta	E	2031-08-27T19:29:06.873		28.62	-12.79	47176.12	4.67		
gamma	E	2031-08-27T19:30:38.797		28.79	-12.46	47630.26	5.21		
delta	E	2031-08-27T19:32:39.306		29.00	-12.03	48300.35	5.90		
lambda	E	2031-08-27T19:37:00.372		29.46	-11.10	50026.71	7.30		
epsilon	E	2031-08-27T19:38:51.030		29.65	-10.71	50864.57	7.93		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-08-27T19:18:10.140
 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 : 3428368484809955584
 2Mass ID (if available) : 05434046+2330355
 ICRS Star Coord at Epoch: 05h 43m 40.46561s +23:30:34.74712s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 13.489
 G magnitude : 17.247
 RP magnitude : 16.056
 BP magnitude : 18.761
 DUPflag : 0
 Distance (au) : 19.469
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.67
 Sun-Target sep (deg) : 67.64
 Sun-Moon sep (deg) : 174.48
 B (ring opening deg) : 78.37
 PA of pole (deg) : 45.77
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.209
 C/A sky separation (km) : 45305.1
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-08-27T18:55:24.112		21.31	-19.98	51210.58	-7.78		
lambda	I	2031-08-27T18:58:01.639		21.63	-19.44	50026.71	-7.12		
delta	I	2031-08-27T19:02:31.632		22.17	-18.52	48300.35	-5.64		
gamma	I	2031-08-27T19:04:38.382		22.42	-18.09	47631.53	-4.90		
eta	I	2031-08-27T19:06:17.281		22.62	-17.75	47176.12	-4.30		

No planet occultations

eta	E	2031-08-27T19:28:15.908		25.02	-13.26	47176.12	4.30		
gamma	E	2031-08-27T19:29:54.733		25.19	-12.92	47630.32	4.89		
delta	E	2031-08-27T19:32:01.985		25.40	-12.49	48300.35	5.63		
lambda	E	2031-08-27T19:36:32.654		25.85	-11.57	50026.71	7.10		
epsilon	E	2031-08-27T19:38:26.570		26.03	-11.18	50867.89	7.76		