

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2042-11-12T23:43:38.960
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 631695887156285056
 2Mass ID (if available) : 09175286+1626188

ICRS Star Coord at Epoch: 09h 17m 52.89876s +16:26:18.02215s

RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.592
 G magnitude : 17.505
 RP magnitude : 16.747
 BP magnitude : 18.147
 DUPflag : 0
 Distance (au) : 18.366
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 4.94
 Sun-Target sep (deg) : 93.32
 Sun-Moon sep (deg) : 94.83
 B (ring opening deg) : 30.42
 PA of pole (deg) : 98.24

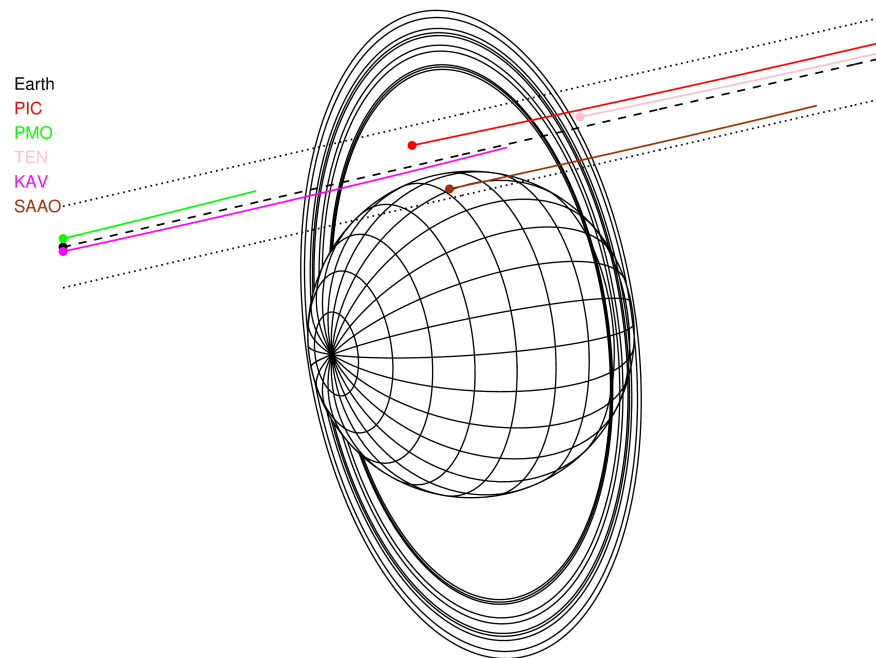
a(km) ring

- 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



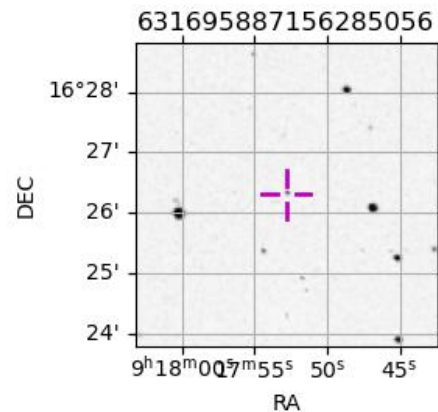
2042-11-12T23:43:38.9600 ra: 09 17 52.89888 s: +16 26 18.022 C/A 2.0688° PA 196.32 deg v_sky + 4.94 km/s D 18.37 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2042-11-12T23:43:38 K14.59 G17.50 PtRgt

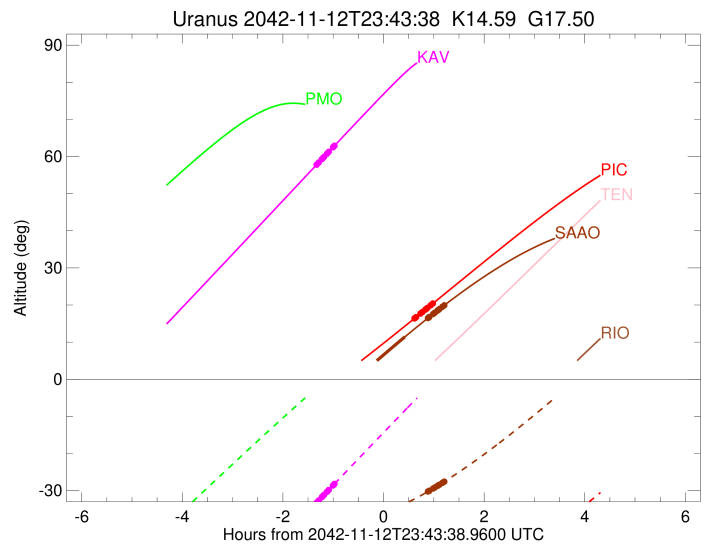
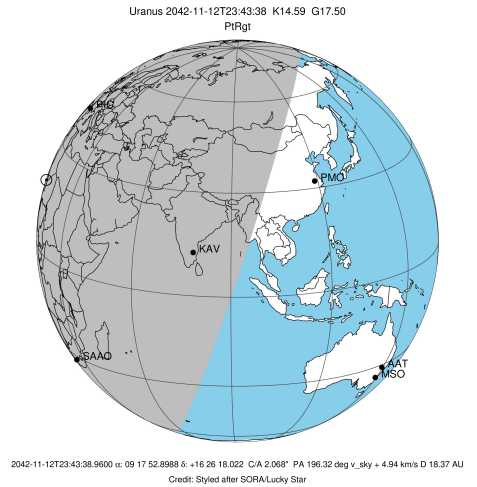


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1			+++++++	NOV 13 00:20 - NOV 13 00:43	PnnRne
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	+++++++			NOV 12 22:24 - NOV 12 22:45	PnnRin
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		+	+++++++	NOV 13 00:09 - NOV 13 00:56	PneRne
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2042-11-12T23:27:10.410
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 631695887156285056
 2Mass ID (if available) : 09175286+1626188
 ICRS Star Coord at Epoch: 09h 17m 52.89876s +16:26:18.02215s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.592
 G magnitude : 17.505
 RP magnitude : 16.747
 BP magnitude : 18.147
 DUPflag : 0
 Distance (au) : 18.366
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 4.94
 Sun-Target sep (deg) : 93.32
 Sun-Moon sep (deg) : 94.91
 B (ring opening deg) : 30.42
 PA of pole (deg) : 98.24
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.317
 C/A sky separation (km) : 30869.3
 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

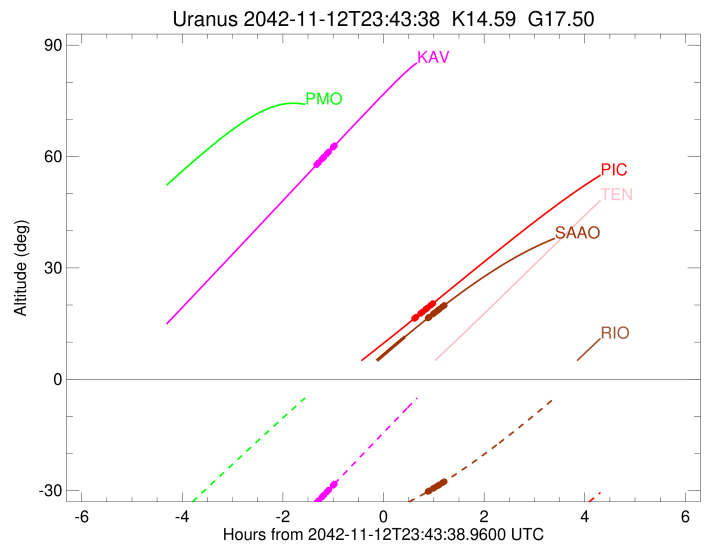
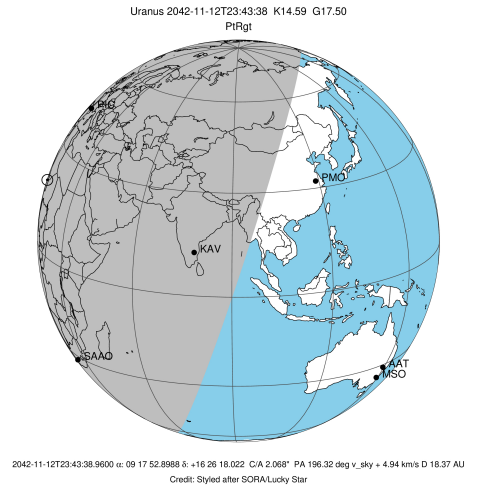


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2042-11-12T22:24:10.729	-4.03x	-60.01	50784.16	-7.96			
lambda	I	2042-11-12T22:25:46.631	-3.77x	-60.20	50026.71	-7.86			
delta	I	2042-11-12T22:29:28.898	-3.16x	-60.62	48300.35	-7.67			
gamma	I	2042-11-12T22:30:57.123	-2.91x	-60.79	47627.07	-7.59			
eta	I	2042-11-12T22:31:56.747	-2.75x	-60.90	47176.12	-7.54			
beta	I	2042-11-12T22:35:18.518	-2.19x	-61.27	45678.37	-7.33			
alpha	I	2042-11-12T22:37:32.631	-1.81x	-61.50	44704.79	-7.20			
4	I	2042-11-12T22:42:43.684	-0.94x	-62.02	42539.16	-6.83			
5	I	2042-11-12T22:43:26.049	-0.82x	-62.09	42184.97	-6.76			
6	I	2042-11-12T22:44:21.096	-0.66x	-62.18	41866.23	-6.69			

No planet occultations

6	E	2042-11-13T00:20:43.445	16.41	-63.97	41870.77	6.46			
5	E	2042-11-13T00:21:41.643	16.59	-63.91	42294.03	6.52			
4	E	2042-11-13T00:22:30.935	16.74	-63.85	42601.46	6.59			
alpha	E	2042-11-13T00:27:43.614	17.69	-63.49	44750.12	6.92			
beta	E	2042-11-13T00:29:54.016	18.09	-63.32	45649.40	7.03			
eta	E	2042-11-13T00:33:29.006	18.75	-63.03	47176.12	7.21			
gamma	E	2042-11-13T00:34:30.507	18.94	-62.94	47620.96	7.26			
delta	E	2042-11-13T00:36:03.681	19.22	-62.81	48300.35	7.33			
lambda	E	2042-11-13T00:39:56.731	19.93	-62.47	50026.71	7.49			
epsilon	E	2042-11-13T00:43:01.024	20.50	-62.18	51417.02	7.57			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2042-11-12T23:37:21.720
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 631695887156285056
 2Mass ID (if available) : 09175286+1626188
 ICRS Star Coord at Epoch: 09h 17m 52.89876s +16:26:18.02215s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.592
 G magnitude : 17.505
 RP magnitude : 16.747
 BP magnitude : 18.147
 DUPflag : 0
 Distance (au) : 18.366
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 4.94
 Sun-Target sep (deg) : 93.32
 Sun-Moon sep (deg) : 95.69
 B (ring opening deg) : 30.42
 PA of pole (deg) : 98.24
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.030
 C/A sky separation (km) : 27042.5
 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

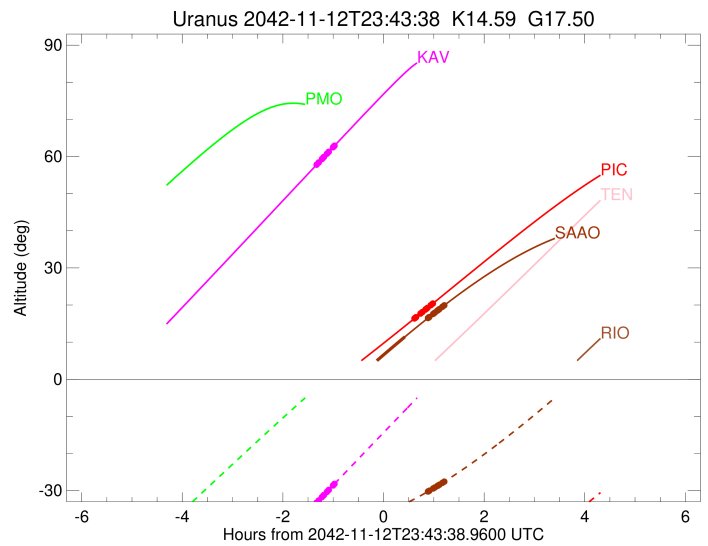
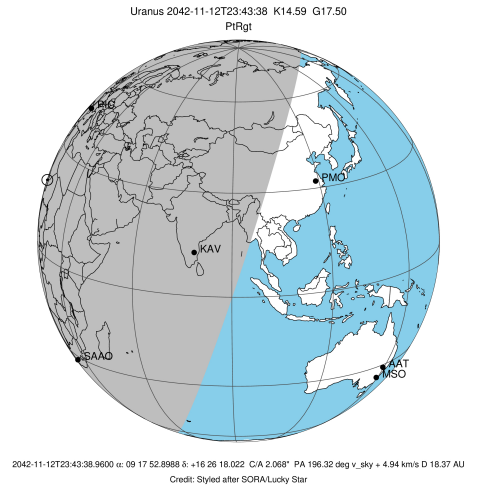


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2042-11-12T22:24:49.088		58.02	-33.02	50767.50	-7.65		
lambda	I	2042-11-12T22:26:26.431		58.41	-32.64	50026.71	-7.59		
delta	I	2042-11-12T22:30:15.881		59.33	-31.73	48300.35	-7.46		
gamma	I	2042-11-12T22:31:46.358		59.69	-31.37	47627.67	-7.41		
eta	I	2042-11-12T22:32:47.459		59.93	-31.13	47176.12	-7.37		
beta	I	2042-11-12T22:36:12.730		60.76	-30.32	45679.51	-7.24		
alpha	I	2042-11-12T22:38:29.006		61.30	-29.78	44700.96	-7.16		
4	I	2042-11-12T22:43:38.473		62.54	-28.56	42535.06	-6.92		
5	I	2042-11-12T22:44:19.931		62.71	-28.39	42176.71	-6.88		
6	I	2042-11-12T22:45:13.300		62.92	-28.18	41861.53	-6.83		

No planet occultations

6	E	2042-11-13T00:44:50.223		85.64	-0.10x	41867.80	6.71		
5	E	2042-11-13T00:45:47.658		85.52	0.12x	42299.37	6.75		
4	E	2042-11-13T00:46:34.335		85.41	0.30x	42604.76	6.79		
alpha	E	2042-11-13T00:51:39.819		84.61	1.48x	44751.12	7.01		
beta	E	2042-11-13T00:53:48.647		84.22	1.97x	45648.01	7.09		
eta	E	2042-11-13T00:57:23.127		83.54	2.80x	47176.12	7.21		
gamma	E	2042-11-13T00:58:24.707		83.33	3.04x	47620.98	7.24		
delta	E	2042-11-13T00:59:58.222		83.02	3.39x	48300.35	7.29		
lambda	E	2042-11-13T01:03:53.218		82.20	4.30x	50026.71	7.40		
epsilon	E	2042-11-13T01:07:02.770		81.52	5.02x	51437.72	7.46		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2042-11-12T23:30:40.810
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Observer code : SAAO
 Location : So. Afr. Astro. Obs. (Sutherland)
 Latitude (deg) : -32.37953
 E. Longitude (deg) : 20.81070
 Altitude (km) : 1.768
 Gaia source ID : 631695887156285056
 2Mass ID (if available) : 09175286+1626188
 ICRS Star Coord at Epoch: 09h 17m 52.89876s +16:26:18.02215s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.592
 G magnitude : 17.505
 RP magnitude : 16.747
 BP magnitude : 18.147
 DUPflag : 0
 Distance (au) : 18.366
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 4.94
 Sun-Target sep (deg) : 93.32
 Sun-Moon sep (deg) : 94.89
 B (ring opening deg) : 30.42
 PA of pole (deg) : 98.24
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.727
 C/A sky separation (km) : 22998.2
 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	2042-11-12T22:16:32.704	-10.98x	-39.87	50758.01	-8.74			
lambda	I	2042-11-12T22:17:56.653	-10.70x	-39.88	50026.71	-8.69			
delta	I	2042-11-12T22:21:16.372	-10.01x	-39.88	48300.35	-8.59			
gamma	I	2042-11-12T22:22:34.773	-9.74x	-39.88	47628.11	-8.55			
eta	I	2042-11-12T22:23:27.701	-9.55x	-39.88	47176.12	-8.53			
beta	I	2042-11-12T22:26:24.672	-8.95x	-39.86	45680.18	-8.43			
alpha	I	2042-11-12T22:28:22.110	-8.54x	-39.85	44698.26	-8.36			
4	I	2042-11-12T22:32:44.955	-7.64x	-39.80	42532.41	-8.18			
5	I	2042-11-12T22:33:20.059	-7.52x	-39.79	42171.22	-8.14			
6	I	2042-11-12T22:34:04.469	-7.37x	-39.78	41857.65	-8.12			
Uranus	I	2042-11-12T22:52:48.654	-3.55x	-39.29	25522.79			25.07	26.11
Uranus	E	2042-11-13T00:09:14.848	11.44	-33.55	25538.25			-18.70	-19.52
6	E	2042-11-13T00:36:50.349	16.52	-30.22	41863.41	7.72			
5	E	2042-11-13T00:37:42.075	16.67	-30.11	42305.33	7.75			
4	E	2042-11-13T00:38:21.268	16.79	-30.02	42608.59	7.78			
alpha	E	2042-11-13T00:42:49.286	17.58	-29.43	44752.04	7.92			
beta	E	2042-11-13T00:44:43.310	17.92	-29.17	45646.23	7.97			
eta	E	2042-11-13T00:47:55.016	18.48	-28.74	47176.12	8.05			
gamma	E	2042-11-13T00:48:50.236	18.65	-28.61	47621.07	8.07			
delta	E	2042-11-13T00:50:14.270	18.89	-28.42	48300.35	8.10			
lambda	E	2042-11-13T00:53:46.505	19.51	-27.92	50026.71	8.17			
epsilon	E	2042-11-13T00:56:42.274	20.01	-27.50	51467.13	8.20			