

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2035-02-19T12:40:45.460  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 3383351833069707136  
 2Mass ID (if available) : 06271371+2337261

ICRS Star Coord at Epoch: 06h 27m 13.70791s +23:37:25.98871s

RUWE (>1.4 is poor) : 1.03  
 K magnitude : 13.639  
 G magnitude : 16.500  
 RP magnitude : 15.644  
 BP magnitude : 17.243  
 DUPflag : 0  
 Distance (au) : 18.282  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -11.11  
 Sun-Target sep (deg) : 126.03  
 Sun-Moon sep (deg) : 17.38  
 B (ring opening deg) : 69.79  
 PA of pole (deg) : 68.83

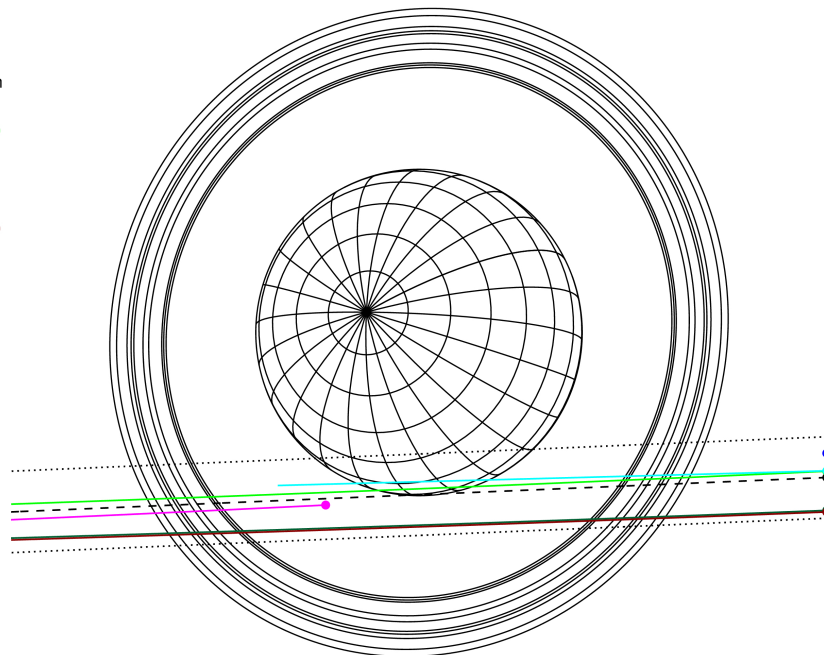
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2035-02-19T12:40:45.4600 α: 06 27 13.7079 s δ: +23 37 25.989 C/A 1.908° PA 2.42 deg v\_sky -11.11 km/s D 18.28 AU  
 Credit: Styled after SORA/Lucky Star

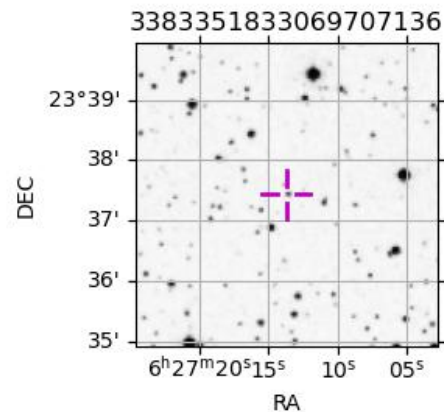
Uranus 2035-02-19T12:40:45 K13.64 G16.50 PgtRgt

Earth  
 PAL  
 PMO  
 IRTF  
 KAV  
 AAT  
 MSO

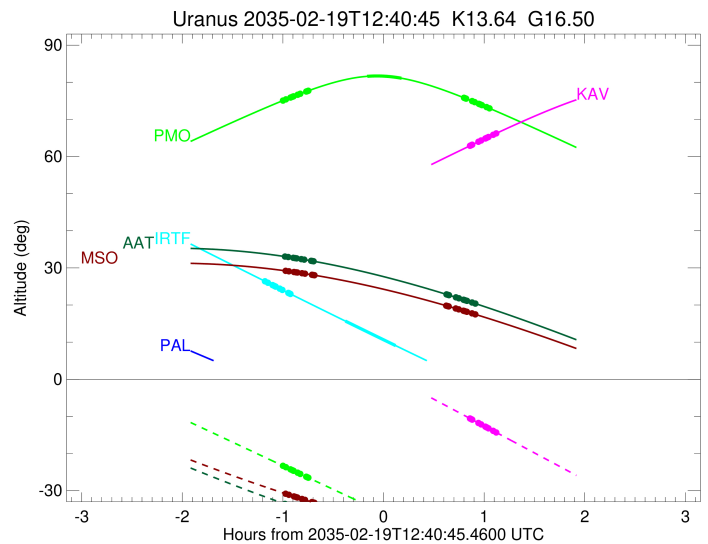
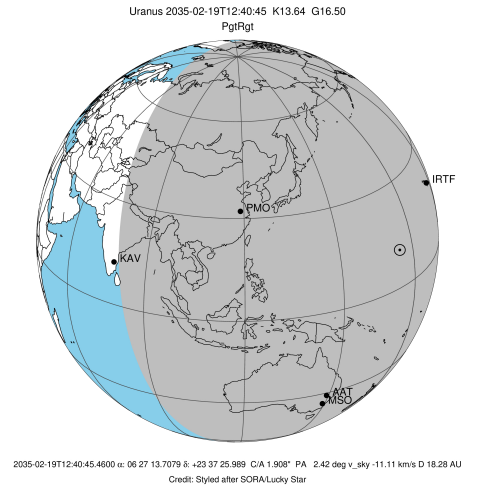


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++++	+ +	+++++	FEB 19 11:41 - FEB 19 13:43	PieRie
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	+++++	+ +		FEB 19 11:30 - FEB 19 12:47	PieRin
KAV	Kavalur Observatory	12.6	78.8			+++++	FEB 19 13:32 - FEB 19 13:47	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	+++++		+++++	FEB 19 11:42 - FEB 19 13:35	PnnRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++		+++++	FEB 19 11:42 - FEB 19 13:35	PnnRie

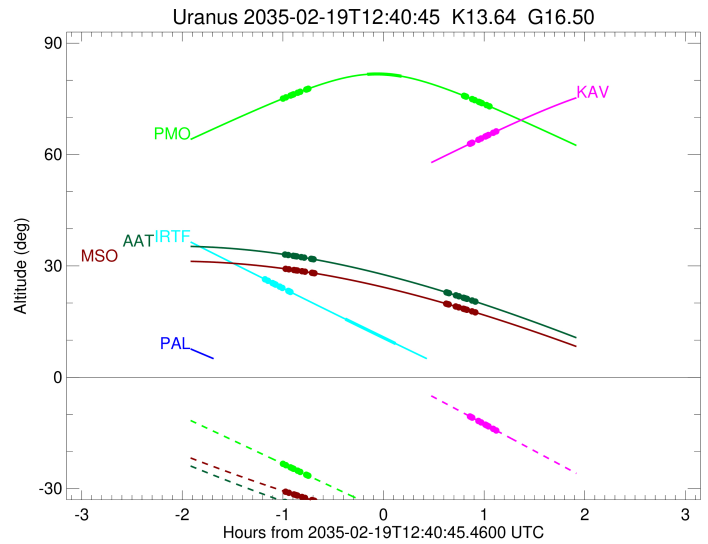
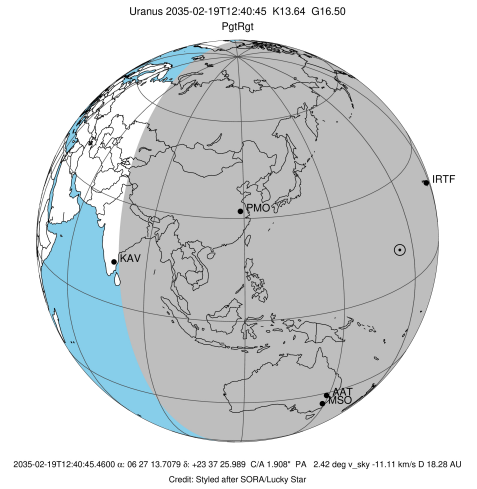


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2035-02-19T12:40:44.940  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PMO  
 Location : Purple Mtn Obs. Nanking  
 Latitude (deg) : 32.06667  
 E. Longitude (deg) : 118.82089  
 Altitude (km) : 0.364  
 Gaia source ID : 3383351833069707136  
 2Mass ID (if available) : 06271371+2337261  
 ICRS Star Coord at Epoch: 06h 27m 13.70791s +23:37:25.98871s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 13.639  
 G magnitude : 16.500  
 RP magnitude : 15.644  
 BP magnitude : 17.243  
 DUPflag : 0  
 Distance (au) : 18.282  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -11.11  
 Sun-Target sep (deg) : 126.03  
 Sun-Moon sep (deg) : 17.71  
 B (ring opening deg) : 69.79  
 PA of pole (deg) : 68.83  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.845  
 C/A sky separation (km) : 24459.4  
 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



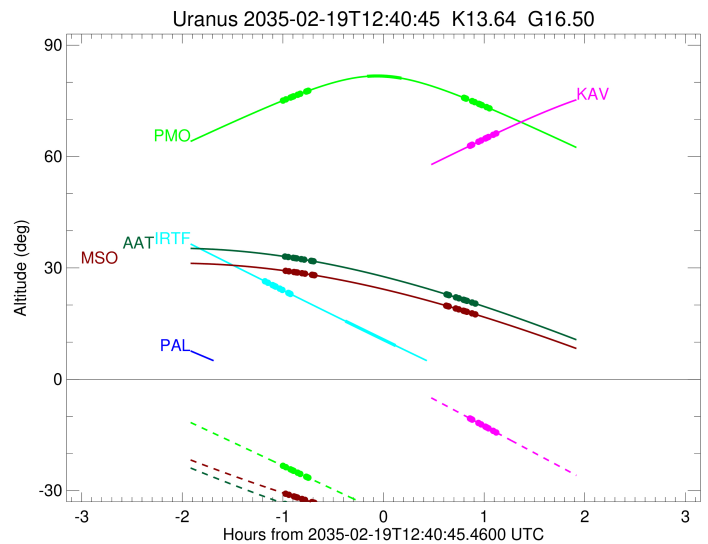
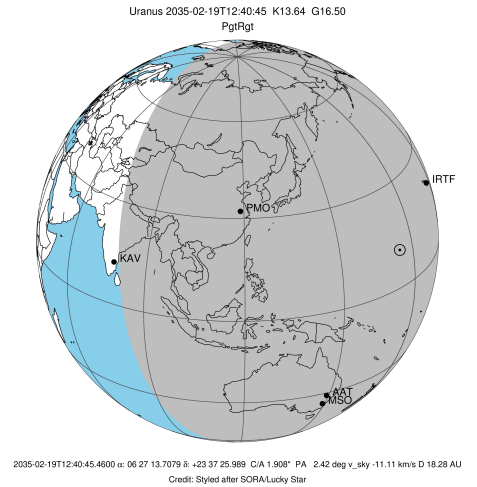
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-02-19T11:41:11.649		75.15	-23.39	50915.45	-10.57		
lambda	I	2035-02-19T11:42:35.659		75.40	-23.69	50026.71	-10.55		
delta	I	2035-02-19T11:45:20.260		75.90	-24.27	48300.35	-10.42		
gamma	I	2035-02-19T11:46:24.593		76.09	-24.50	47631.37	-10.37		
eta	I	2035-02-19T11:47:08.562		76.22	-24.66	47176.12	-10.34		
beta	I	2035-02-19T11:49:37.631		76.65	-25.18	45646.71	-10.20		
alpha	I	2035-02-19T11:51:05.422		76.90	-25.49	44752.39	-10.12		
4	I	2035-02-19T11:54:45.279		77.52	-26.27	42559.53	-9.89		
5	I	2035-02-19T11:55:11.724		77.59	-26.36	42282.27	-9.83		
6	I	2035-02-19T11:55:59.559		77.72	-26.53	41816.04	-9.79		
Uranus	I	2035-02-19T12:31:04.330		81.61	-33.94	25353.21		-12.49	-13.06
Uranus	E	2035-02-19T12:51:28.323		81.09	-38.20	25551.87		-2.29	-2.40
6	E	2035-02-19T13:28:48.616		75.82	-45.86	41878.83	9.77		
5	E	2035-02-19T13:29:17.524		75.73	-45.95	42158.50	9.81		
4	E	2035-02-19T13:30:03.884		75.59	-46.11	42616.43	9.86		
alpha	E	2035-02-19T13:33:33.443		74.95	-46.81	44703.66	10.09		
beta	E	2035-02-19T13:35:09.983		74.65	-47.13	45679.89	10.17		
eta	E	2035-02-19T13:37:36.154		74.20	-47.62	47176.12	10.30		
gamma	E	2035-02-19T13:38:19.663		74.06	-47.76	47625.18	10.34		
delta	E	2035-02-19T13:39:24.801		73.86	-47.98	48300.35	10.39		
lambda	E	2035-02-19T13:42:09.950		73.33	-48.52	50026.71	10.51		
epsilon	E	2035-02-19T13:43:41.207		73.04	-48.83	50989.02	10.53		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2035-02-19T12:32:28.260  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : IRTF  
 Location : Mauna Kea/IRTF  
 Latitude (deg) : 19.82622  
 E. Longitude (deg) : 204.52800  
 Altitude (km) : 4.168  
 Gaia source ID : 3383351833069707136  
 2Mass ID (if available) : 06271371+2337261  
 ICRS Star Coord at Epoch: 06h 27m 13.70791s +23:37:25.98871s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 13.639  
 G magnitude : 16.500  
 RP magnitude : 15.644  
 BP magnitude : 17.243  
 DUPflag : 0  
 Distance (au) : 18.282  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -11.11  
 Sun-Target sep (deg) : 126.03  
 Sun-Moon sep (deg) : 16.68  
 B (ring opening deg) : 69.79  
 PA of pole (deg) : 68.83  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.762  
 C/A sky separation (km) : 23367.6  
 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\_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	2035-02-19T11:30:28.333		26.31	-74.33	50918.86	-10.52		
lambda	I	2035-02-19T11:31:53.103		25.99	-74.04	50026.71	-10.50		
delta	I	2035-02-19T11:34:38.460		25.37	-73.48	48300.35	-10.38		
gamma	I	2035-02-19T11:35:43.050		25.13	-73.25	47631.35	-10.33		
eta	I	2035-02-19T11:36:27.177		24.96	-73.10	47176.12	-10.30		
beta	I	2035-02-19T11:38:56.708		24.40	-72.58	45646.51	-10.18		
alpha	I	2035-02-19T11:40:24.662		24.07	-72.27	44752.41	-10.10		
4	I	2035-02-19T11:44:04.732		23.25	-71.49	42558.76	-9.89		
5	I	2035-02-19T11:44:30.956		23.15	-71.39	42283.44	-9.84		
6	I	2035-02-19T11:45:18.929		22.97	-71.22	41815.36	-9.81		
Uranus	I	2035-02-19T12:18:00.404		15.67	-63.96	25295.58		-14.19	-14.83
Uranus	E	2035-02-19T12:47:58.660		9.07	-57.07	25558.76		0.42	0.44
6	E	2035-02-19T13:23:12.018		1.43x	-48.86	41879.18	9.63		
5	E	2035-02-19T13:23:41.255		1.32x	-48.74	42157.52	9.66		
4	E	2035-02-19T13:24:28.372		1.16x	-48.56	42616.23	9.70		
alpha	E	2035-02-19T13:28:01.623		0.39x	-47.73	44702.42	9.89		
beta	E	2035-02-19T13:29:40.276		0.04x	-47.34	45680.16	9.96		
eta	E	2035-02-19T13:32:09.633		-0.49x	-46.76	47176.12	10.07		
gamma	E	2035-02-19T13:32:54.128		-0.65x	-46.58	47624.97	10.10		
delta	E	2035-02-19T13:34:00.835		-0.88x	-46.32	48300.35	10.15		
lambda	E	2035-02-19T13:36:50.122		-1.48x	-45.66	50026.71	10.25		
epsilon	E	2035-02-19T13:38:25.108		-1.82x	-45.29	51002.63	10.26		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2035-02-19T12:46:05.300  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : 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 : 3383351833069707136  
 2Mass ID (if available) : 06271371+2337261  
 ICRS Star Coord at Epoch: 06h 27m 13.70791s +23:37:25.98871s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 13.639  
 G magnitude : 16.500  
 RP magnitude : 15.644  
 BP magnitude : 17.243  
 DUPflag : 0  
 Distance (au) : 18.282  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -11.11  
 Sun-Target sep (deg) : 126.03  
 Sun-Moon sep (deg) : 18.15  
 B (ring opening deg) : 69.79  
 PA of pole (deg) : 68.83  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.981  
 C/A sky separation (km) : 26265.8  
 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



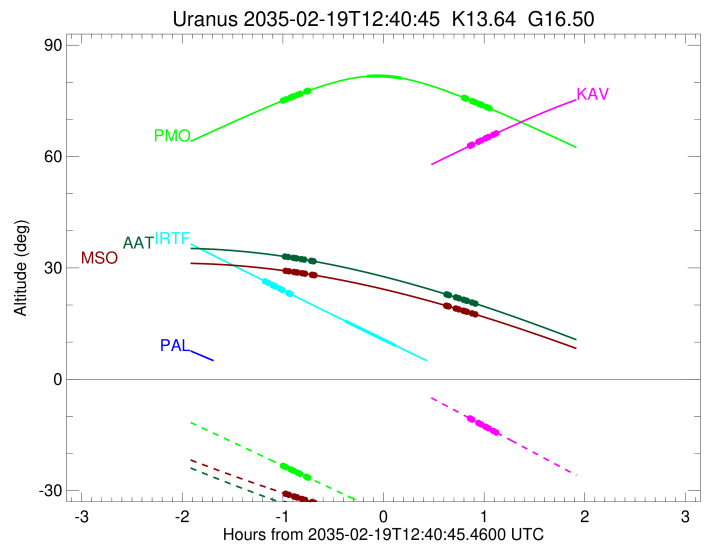
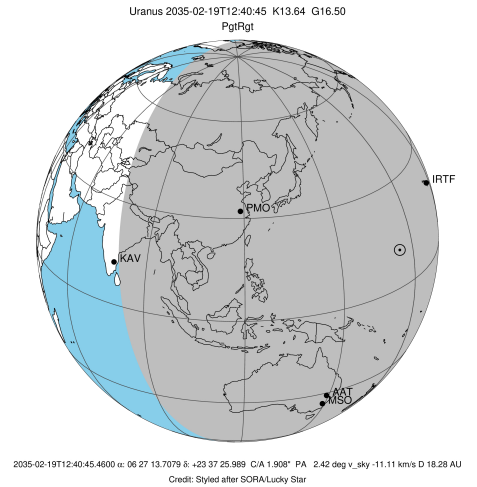
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-02-19T11:47:48.170		39.34	14.38x	50904.85	-10.22		
lambda	I	2035-02-19T11:49:14.059		39.67	14.04x	50026.71	-10.19		
delta	I	2035-02-19T11:52:04.648		40.32	13.37x	48300.35	-10.05		
gamma	I	2035-02-19T11:53:11.427		40.57	13.11x	47631.42	-9.99		
eta	I	2035-02-19T11:53:57.117		40.75	12.93x	47176.12	-9.94		
beta	I	2035-02-19T11:56:32.207		41.34	12.32x	45647.27	-9.79		
alpha	I	2035-02-19T11:58:03.842		41.69	11.96x	44752.30	-9.69		
4	I	2035-02-19T12:01:53.766		42.57	11.05x	42561.50	-9.42		
5	I	2035-02-19T12:02:22.083		42.68	10.94x	42279.28	-9.36		
6	I	2035-02-19T12:03:11.842		42.87	10.74x	41817.77	-9.31		

No planet occultations

6	E	2035-02-19T13:32:22.636		62.91	-10.57	41878.17	9.37		
5	E	2035-02-19T13:32:52.951		63.02	-10.69	42160.20	9.42		
4	E	2035-02-19T13:33:41.086		63.19	-10.88	42616.56	9.49		
alpha	E	2035-02-19T13:37:18.377		63.97	-11.76	44705.50	9.76		
beta	E	2035-02-19T13:38:57.778		64.32	-12.16	45679.44	9.87		
eta	E	2035-02-19T13:41:28.260		64.86	-12.76	47176.12	10.03		
gamma	E	2035-02-19T13:42:12.979		65.02	-12.94	47625.46	10.07		
delta	E	2035-02-19T13:43:19.788		65.25	-13.21	48300.35	10.13		
lambda	E	2035-02-19T13:46:08.890		65.85	-13.89	50026.71	10.28		
epsilon	E	2035-02-19T13:47:40.312		66.17	-14.26	50970.16	10.31		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2035-02-19T12:36:41.070  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : 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 : 3383351833069707136  
 2Mass ID (if available) : 06271371+2337261  
 ICRS Star Coord at Epoch: 06h 27m 13.70791s +23:37:25.98871s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 13.639  
 G magnitude : 16.500  
 RP magnitude : 15.644  
 BP magnitude : 17.243  
 DUPflag : 0  
 Distance (au) : 18.282  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -11.11  
 Sun-Target sep (deg) : 126.03  
 Sun-Moon sep (deg) : 16.91  
 B (ring opening deg) : 69.79  
 PA of pole (deg) : 68.83  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 2.274  
 C/A sky separation (km) : 30157.8  
 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

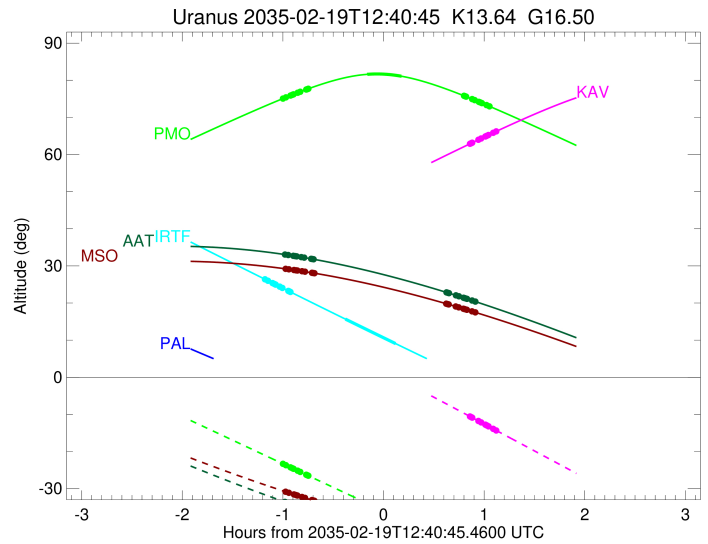
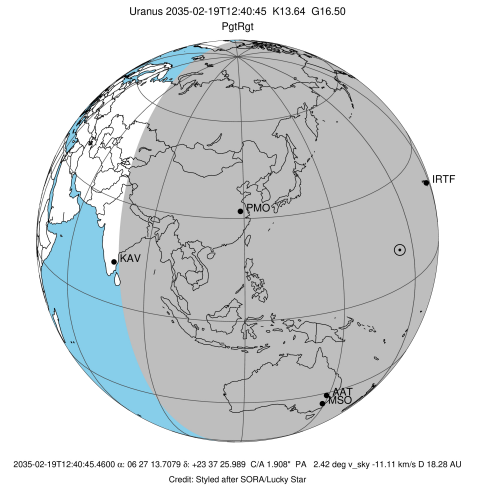
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-02-19T11:42:31.277		33.02	-33.66	50871.13	-9.67		
lambda	I	2035-02-19T11:43:58.608		32.93	-33.89	50026.71	-9.62		
delta	I	2035-02-19T11:46:59.977		32.71	-34.37	48300.35	-9.41		
gamma	I	2035-02-19T11:48:11.377		32.63	-34.55	47631.54	-9.32		
eta	I	2035-02-19T11:49:00.395		32.57	-34.68	47176.12	-9.26		
beta	I	2035-02-19T11:51:47.488		32.36	-35.10	45649.20	-9.03		
alpha	I	2035-02-19T11:53:27.383		32.23	-35.36	44751.63	-8.88		
4	I	2035-02-19T11:57:39.598		31.90	-35.99	42567.77	-8.48		
5	I	2035-02-19T11:58:13.147		31.86	-36.07	42269.38	-8.39		
6	I	2035-02-19T11:59:06.800		31.78	-36.20	41823.38	-8.31		

No planet occultations

6	E	2035-02-19T13:18:21.290		22.86	-45.36	41876.62	8.25		
5	E	2035-02-19T13:18:56.237		22.78	-45.41	42163.85	8.32		
4	E	2035-02-19T13:19:50.323		22.65	-45.48	42616.37	8.41		
alpha	E	2035-02-19T13:23:53.680		22.08	-45.77	44708.65	8.80		
beta	E	2035-02-19T13:25:43.165		21.82	-45.90	45678.57	8.95		
eta	E	2035-02-19T13:28:28.487		21.42	-46.08	47176.12	9.17		
gamma	E	2035-02-19T13:29:17.392		21.30	-46.13	47625.93	9.23		
delta	E	2035-02-19T13:30:30.135		21.13	-46.21	48300.35	9.31		
lambda	E	2035-02-19T13:33:33.449		20.68	-46.39	50026.71	9.52		
epsilon	E	2035-02-19T13:35:09.178		20.45	-46.48	50942.47	9.57		



target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2035-02-19T12:36:50.460  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : 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 : 3383351833069707136  
 2Mass ID (if available) : 06271371+2337261  
 ICRS Star Coord at Epoch: 06h 27m 13.70791s +23:37:25.98871s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 13.639  
 G magnitude : 16.500  
 RP magnitude : 15.644  
 BP magnitude : 17.243  
 DUPflag : 0  
 Distance (au) : 18.282  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -11.11  
 Sun-Target sep (deg) : 126.03  
 Sun-Moon sep (deg) : 16.90  
 B (ring opening deg) : 69.79  
 PA of pole (deg) : 68.83  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 2.294  
 C/A sky separation (km) : 30421.5  
 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



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	2035-02-19T11:42:53.967		29.18	-30.91	50869.29	-9.61		
lambda	I	2035-02-19T11:44:21.680		29.09	-31.13	50026.71	-9.56		
delta	I	2035-02-19T11:47:24.320		28.89	-31.57	48300.35	-9.34		
gamma	I	2035-02-19T11:48:36.253		28.81	-31.74	47631.54	-9.25		
eta	I	2035-02-19T11:49:25.650		28.76	-31.86	47176.12	-9.19		
beta	I	2035-02-19T11:52:14.100		28.56	-32.26	45649.33	-8.96		
alpha	I	2035-02-19T11:53:54.899		28.45	-32.49	44751.58	-8.80		
4	I	2035-02-19T11:58:09.562		28.14	-33.08	42568.16	-8.38		
5	I	2035-02-19T11:58:43.612		28.09	-33.16	42268.73	-8.29		
6	I	2035-02-19T11:59:37.744		28.03	-33.28	41823.75	-8.22		

No planet occultations

6	E	2035-02-19T13:18:11.160		19.82	-41.55	41876.46	8.16		
5	E	2035-02-19T13:18:46.547		19.74	-41.59	42164.21	8.23		
4	E	2035-02-19T13:19:41.169		19.62	-41.66	42616.33	8.32		
alpha	E	2035-02-19T13:23:46.891		19.08	-41.92	44708.92	8.72		
beta	E	2035-02-19T13:25:37.265		18.83	-42.04	45678.48	8.87		
eta	E	2035-02-19T13:28:23.889		18.46	-42.20	47176.12	9.10		
gamma	E	2035-02-19T13:29:13.157		18.35	-42.25	47625.97	9.16		
delta	E	2035-02-19T13:30:26.411		18.18	-42.32	48300.35	9.25		
lambda	E	2035-02-19T13:33:30.937		17.76	-42.49	50026.71	9.46		
epsilon	E	2035-02-19T13:35:07.001		17.54	-42.57	50940.04	9.51		