

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-13T12:40:07.940
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3427508804154723072
 2Mass ID (if available) : 05502070+2338051

Uranus 2033-04-13T12:40:07 K12.69 G14.29 PgtRgt

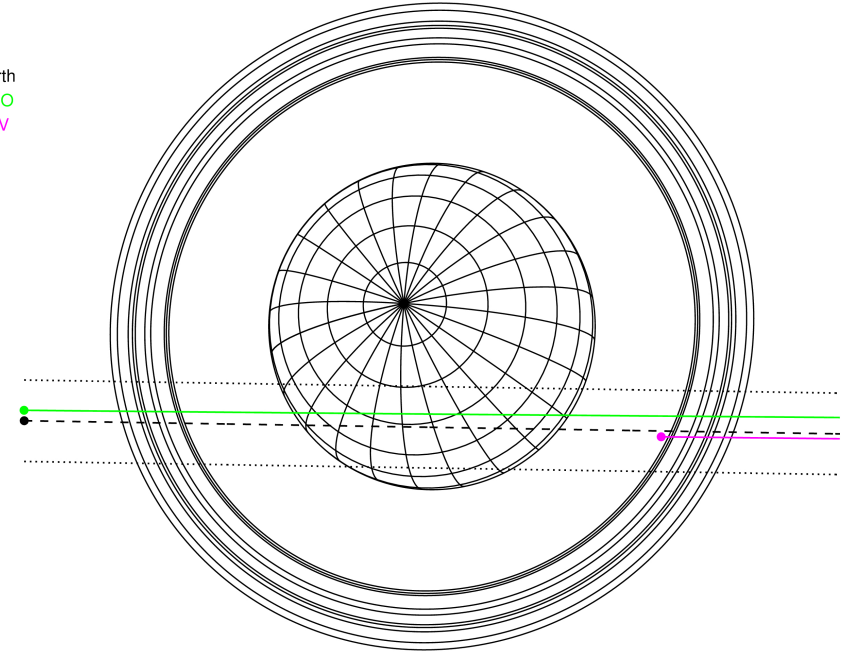
ICRS Star Coord at Epoch: 05h 50m 20.71574s +23:38:05.28587s

RUWE (>1.4 is poor) : 1.02
 K magnitude : 12.691
 G magnitude : 14.295
 RP magnitude : 13.743
 BP magnitude : 14.669
 DUPflag : 0
 Distance (au) : 19.412
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 19.25
 Sun-Target sep (deg) : 64.34
 Sun-Moon sep (deg) : 101.71
 B (ring opening deg) : 77.15
 PA of pole (deg) : 50.70
 # a(km) ring



2033-04-13T12:40:07.9400 ex: 05 50 20.7157 8: +23 38 05.286 C/A 1.115° PA 359.08 deg v_sky +19.25 km/s D 19.41 AU
 Credit: Styled after SORA/Lucky Star

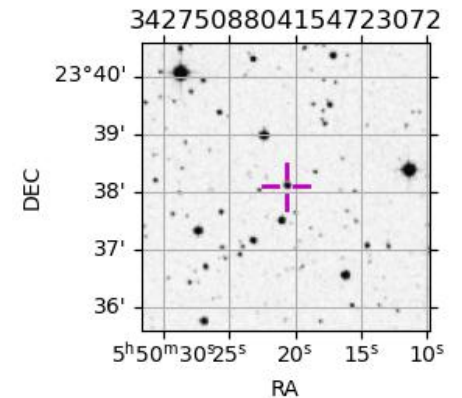
Earth
 PMO
 KAV



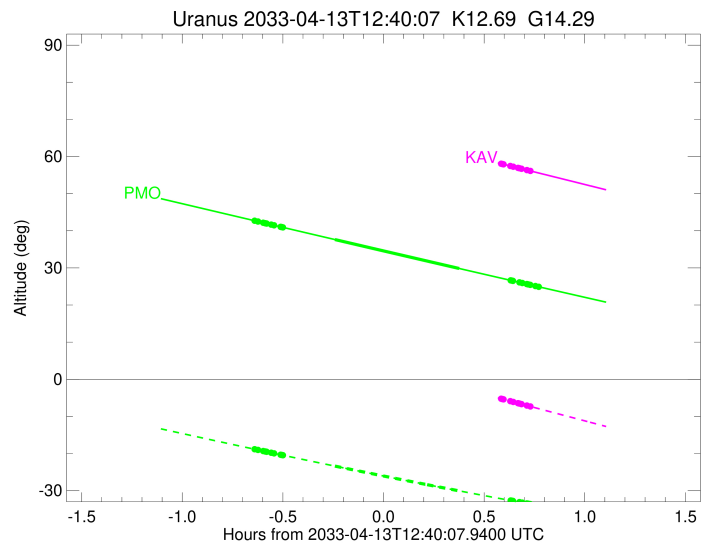
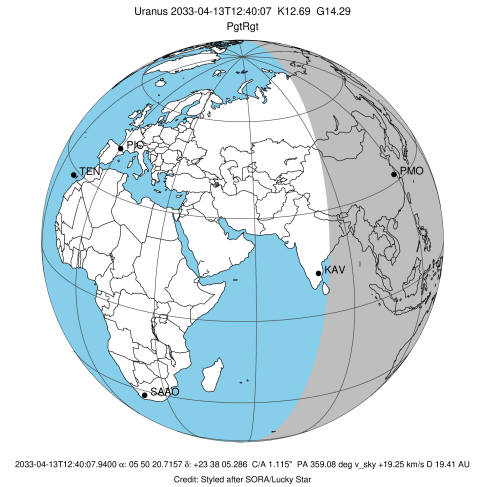
- 1 41837.2 6
- 2 42235.0 5
- 3 42571.2 4
- 4 44718.5 alpha
- 5 45661.1 beta
- 6 47176.1 eta
- 7 47626.3 gamma
- 8 48300.3 delta
- 9 50026.7 lambda
- 10 51149.4 epsilon

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					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	APR 13 12:01 - APR 13 13:26	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					PnnRnn
KAV	Kavalur Observatory	12.6	78.8			+++++	APR 13 13:15 - APR 13 13:23	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					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



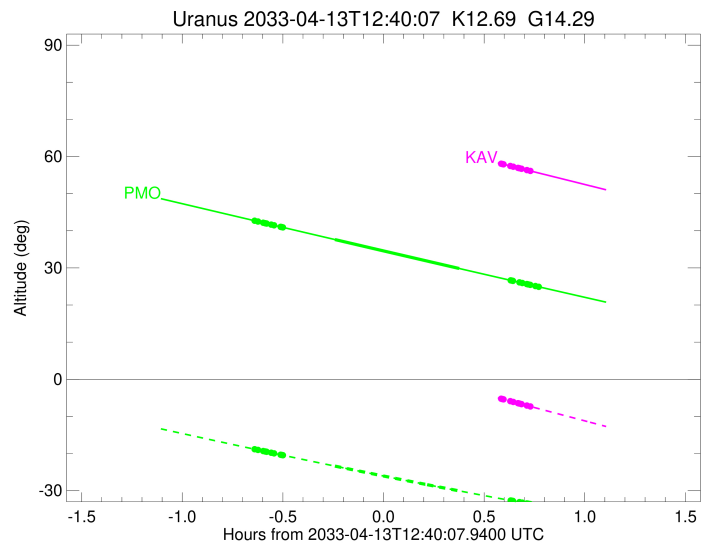
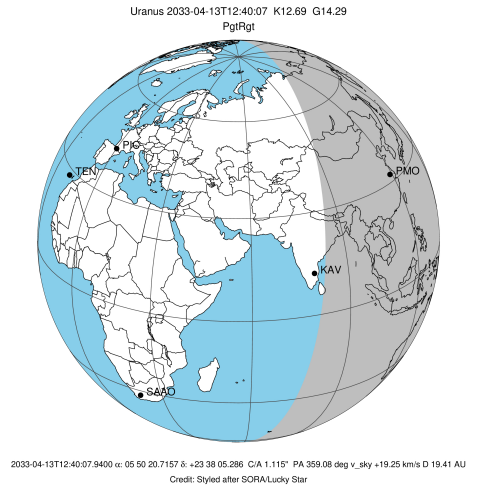
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-13T12:44:26.860
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 3427508804154723072
 2Mass ID (if available) : 05502070+2338051
 ICRS Star Coord at Epoch: 05h 50m 20.71574s +23:38:05.28587s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 12.691
 G magnitude : 14.295
 RP magnitude : 13.743
 BP magnitude : 14.669
 DUPflag : 0
 Distance (au) : 19.412
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 19.25
 Sun-Target sep (deg) : 64.34
 Sun-Moon sep (deg) : 102.36
 B (ring opening deg) : 77.15
 PA of pole (deg) : 50.70
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.974
 C/A sky separation (km) : 13718.2
 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_itrf93_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	2033-04-13T12:01:31.206		42.75	-18.81	51372.08	-18.61		
lambda	I	2033-04-13T12:02:43.708		42.49	-19.04	50026.71	-18.54		
delta	I	2033-04-13T12:04:16.973		42.16	-19.34	48300.35	-18.48		
gamma	I	2033-04-13T12:04:53.183		42.03	-19.45	47631.51	-18.46		
eta	I	2033-04-13T12:05:17.862		41.95	-19.53	47176.12	-18.44		
beta	I	2033-04-13T12:06:39.539		41.66	-19.80	45671.77	-18.39		
alpha	I	2033-04-13T12:07:31.477		41.47	-19.96	44717.97	-18.35		
4	I	2033-04-13T12:09:27.692		41.06	-20.33	42593.25	-18.26		
5	I	2033-04-13T12:09:51.517		40.98	-20.41	42156.18	-18.23		
6	I	2033-04-13T12:10:07.894		40.92	-20.46	41854.43	-18.20		
Uranus	I	2033-04-13T12:25:38.848		37.64	-23.39	25500.26		4.08	4.28
Uranus	E	2033-04-13T13:02:42.067		29.84	-30.06	25007.35		-12.79	-13.38
6	E	2033-04-13T13:18:00.887		26.65	-32.66	41799.47	18.32		
5	E	2033-04-13T13:18:28.299		26.56	-32.73	42305.93	18.35		
4	E	2033-04-13T13:18:42.530		26.51	-32.77	42578.28	18.38		
alpha	E	2033-04-13T13:20:40.133		26.10	-33.09	44738.95	18.48		
beta	E	2033-04-13T13:21:29.950		25.93	-33.23	45662.34	18.52		
eta	E	2033-04-13T13:22:51.555		25.65	-33.45	47176.12	18.58		
gamma	E	2033-04-13T13:23:15.559		25.56	-33.52	47622.40	18.60		
delta	E	2033-04-13T13:23:51.980		25.44	-33.62	48300.35	18.63		
lambda	E	2033-04-13T13:25:24.512		25.12	-33.87	50026.71	18.69		
epsilon	E	2033-04-13T13:26:23.518		24.91	-34.02	51130.36	18.76		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-13T12:42:18.520
 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 : 3427508804154723072
 2Mass ID (if available) : 05502070+2338051
 ICRS Star Coord at Epoch: 05h 50m 20.71574s +23:38:05.28587s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 12.691
 G magnitude : 14.295
 RP magnitude : 13.743
 BP magnitude : 14.669
 DUPflag : 0
 Distance (au) : 19.412
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 19.25
 Sun-Target sep (deg) : 64.34
 Sun-Moon sep (deg) : 102.59
 B (ring opening deg) : 77.15
 PA of pole (deg) : 50.70
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.196
 C/A sky separation (km) : 16845.0
 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_itrf93_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	2033-04-13T11:59:38.699		73.62	12.99x	51392.15	-18.04		
lambda	I	2033-04-13T12:00:54.668		73.40	12.68x	50026.71	-17.94		
delta	I	2033-04-13T12:02:31.108		73.12	12.29x	48300.35	-17.86		
gamma	I	2033-04-13T12:03:08.596		73.01	12.14x	47631.55	-17.82		
eta	I	2033-04-13T12:03:34.168		72.93	12.04x	47176.12	-17.80		
beta	I	2033-04-13T12:04:58.828		72.67	11.69x	45672.93	-17.71		
alpha	I	2033-04-13T12:05:52.729		72.51	11.48x	44720.38	-17.65		
4	I	2033-04-13T12:07:53.702		72.14	10.99x	42596.17	-17.50		
5	I	2033-04-13T12:08:18.702		72.06	10.89x	42157.52	-17.46		
6	I	2033-04-13T12:08:36.077		72.01	10.82x	41851.38	-17.42		
Uranus	I	2033-04-13T12:25:18.286		68.75	6.78x	25541.07		2.25	2.36
Uranus	E	2033-04-13T12:58:39.563		61.70	-1.27x	25004.64		-12.83	-13.41
6	E	2033-04-13T13:15:10.410		58.07	-5.23	41797.96	17.49		
5	E	2033-04-13T13:15:39.027		57.96	-5.35	42302.54	17.53		
4	E	2033-04-13T13:15:54.276		57.91	-5.41	42581.96	17.57		
alpha	E	2033-04-13T13:17:57.039		57.45	-5.90	44741.01	17.73		
beta	E	2033-04-13T13:18:48.913		57.26	-6.10	45663.87	17.79		
eta	E	2033-04-13T13:20:13.747		56.94	-6.44	47176.12	17.88		
gamma	E	2033-04-13T13:20:38.712		56.85	-6.54	47622.68	17.90		
delta	E	2033-04-13T13:21:16.529		56.71	-6.69	48300.35	17.94		
lambda	E	2033-04-13T13:22:52.527		56.35	-7.08	50026.71	18.03		
epsilon	E	2033-04-13T13:23:55.183		56.12	-7.33	51157.88	18.13		