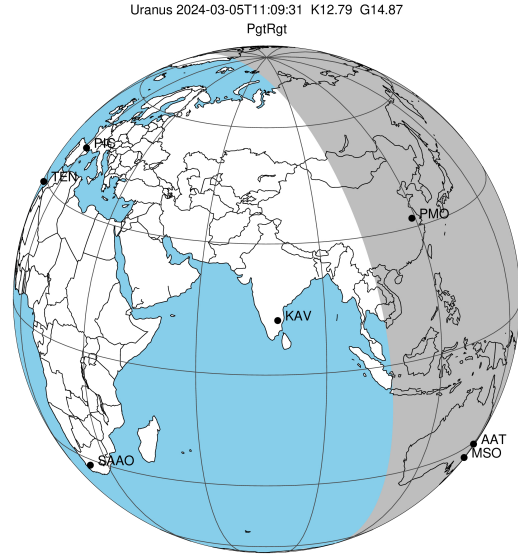


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2024-03-05T11:09:31.480
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 34607957413769216
 2Mass ID (if available) : 03080209+1718021

ICRS Star Coord at Epoch: 03h 08m 02.10372s +17:18:02.14502s

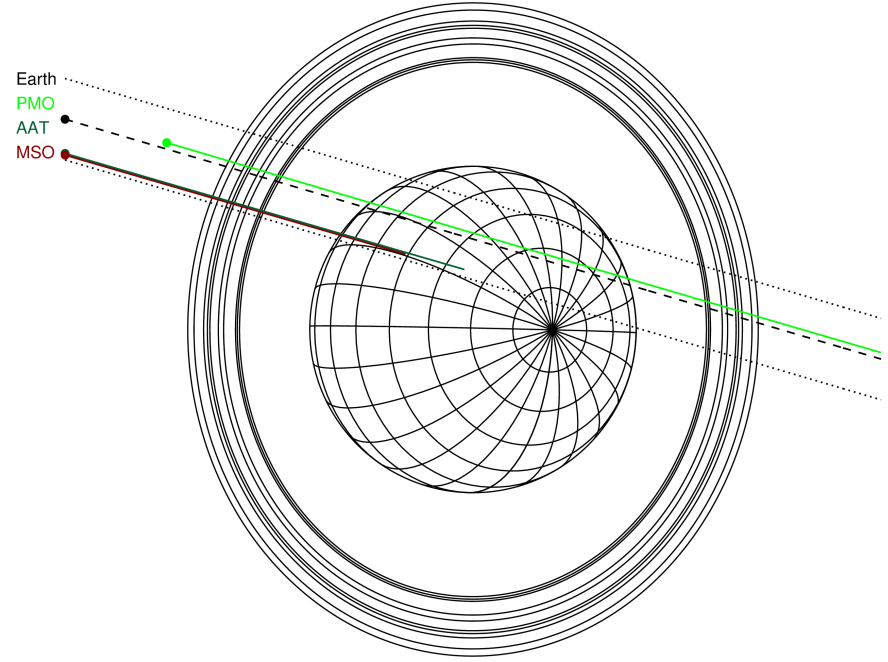
RUWE (>1.4 is poor) : 0.95
 K magnitude : 12.789
 G magnitude : 14.868
 RP magnitude : 14.205
 BP magnitude : 15.378
 DUPflag : 0
 Distance (au) : 20.012
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 19.25
 Sun-Target sep (deg) : 64.34
 Sun-Moon sep (deg) : 131.56
 B (ring opening deg) : 60.86
 PA of pole (deg) : -90.25

#	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



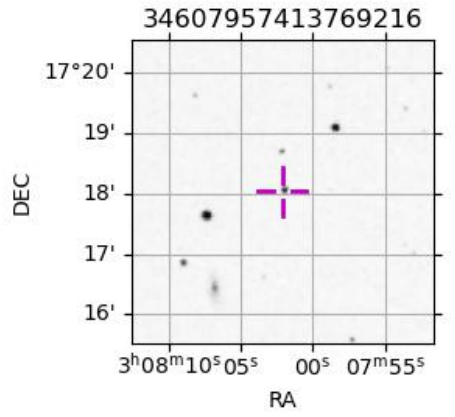
2024-03-05T11:09:31.4800 ex: 03 08 02.10372 s +17 18 02.145 C/A 0.9377 PA 163.62 deg v_sky +19.25 km/s D 20.01 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2024-03-05T11:09:31 K12.79 G14.87 PgtRgt

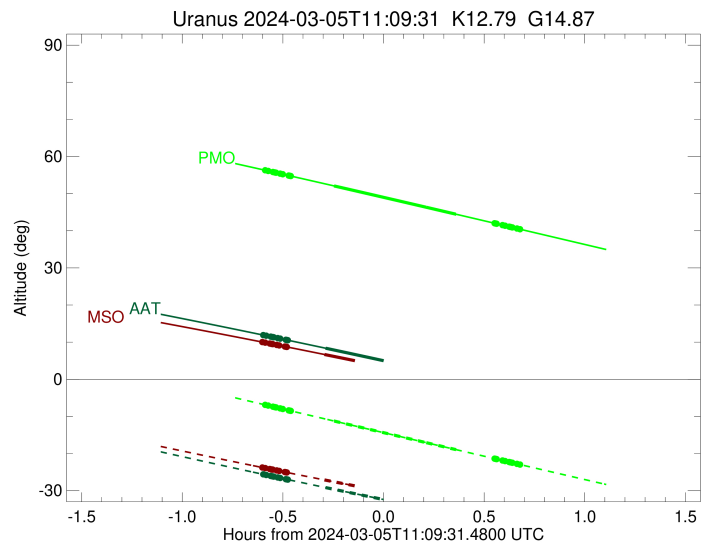
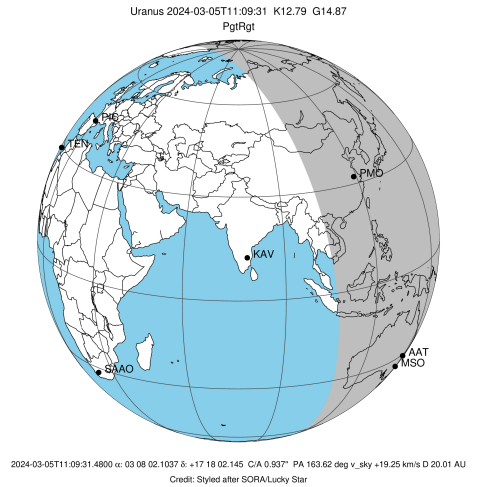


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++++	+ +	+++++	MAR 05 10:34 - MAR 05 11:50	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					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	+++++	+		MAR 05 10:33 - MAR 05 10:52	PinRin
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++	+		MAR 05 10:33 - MAR 05 10:51	PinRin

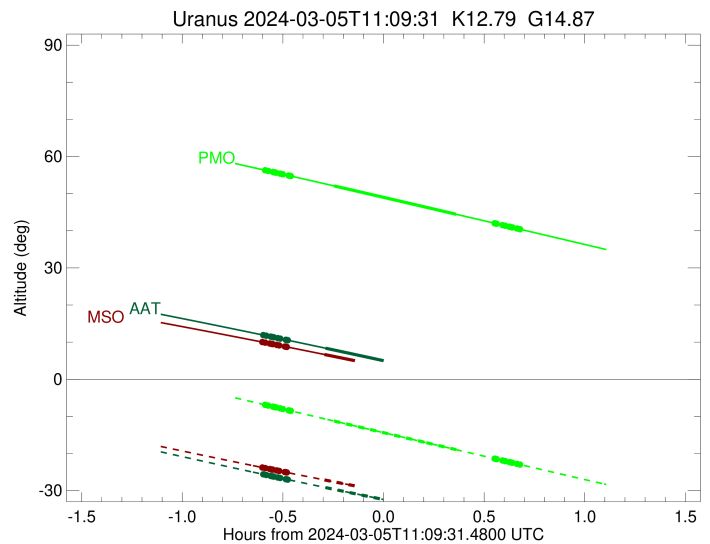
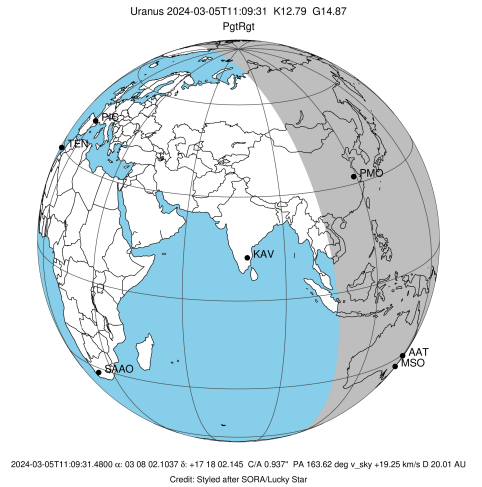


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2024-03-05T11:13:06.830
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 34607957413769216
 2Mass ID (if available) : 03080209+1718021
 ICRS Star Coord at Epoch: 03h 08m 02.10372s +17:18:02.14502s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 12.789
 G magnitude : 14.868
 RP magnitude : 14.205
 BP magnitude : 15.378
 DUPflag : 0
 Distance (au) : 20.012
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 19.25
 Sun-Target sep (deg) : 64.34
 Sun-Moon sep (deg) : 131.69
 B (ring opening deg) : 60.86
 PA of pole (deg) : -90.25
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.998
 C/A sky separation (km) : 14492.3
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



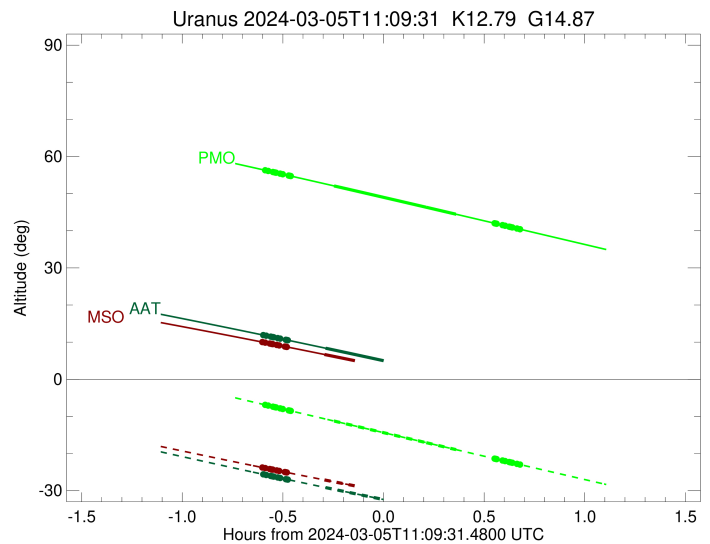
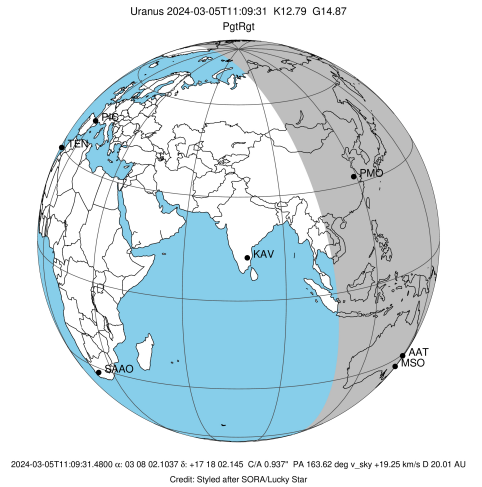
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2024-03-05T10:34:26.877		56.26	-6.94	50914.43	-20.57		
lambda	I	2024-03-05T10:35:10.149		56.11	-7.09	50026.71	-20.50		
delta	I	2024-03-05T10:36:34.507		55.83	-7.39	48300.35	-20.43		
gamma	I	2024-03-05T10:37:07.280		55.72	-7.50	47631.26	-20.40		
eta	I	2024-03-05T10:37:29.601		55.64	-7.58	47176.12	-20.38		
beta	I	2024-03-05T10:38:45.143		55.38	-7.85	45641.06	-20.31		
alpha	I	2024-03-05T10:39:29.996		55.23	-8.01	44735.06	-20.26		
4	I	2024-03-05T10:41:16.711		54.87	-8.39	42563.55	-20.12		
5	I	2024-03-05T10:41:29.383		54.82	-8.43	42300.03	-20.12		
6	I	2024-03-05T10:41:54.172		54.74	-8.52	41801.07	-20.07		
Uranus	I	2024-03-05T10:54:46.840		52.08	-11.25	25379.43		-17.86	-18.64
Uranus	E	2024-03-05T11:31:11.233		44.45	-18.96	25159.61		27.41	28.50
6	E	2024-03-05T11:42:38.773		42.03	-21.38	41849.91	20.16		
5	E	2024-03-05T11:42:57.166		41.96	-21.45	42215.89	20.21		
4	E	2024-03-05T11:43:13.064		41.91	-21.50	42548.24	20.21		
alpha	E	2024-03-05T11:44:57.868		41.54	-21.87	44687.21	20.36		
beta	E	2024-03-05T11:45:46.616		41.36	-22.04	45677.31	20.41		
eta	E	2024-03-05T11:47:00.016		41.10	-22.30	47176.12	20.48		
gamma	E	2024-03-05T11:47:21.834		41.03	-22.37	47623.27	20.51		
delta	E	2024-03-05T11:47:54.829		40.91	-22.49	48300.35	20.54		
lambda	E	2024-03-05T11:49:18.740		40.61	-22.78	50026.71	20.61		
epsilon	E	2024-03-05T11:50:31.376		40.36	-23.04	51525.82	20.69		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2024-03-05T11:12:58.380
 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 : 34607957413769216
 2Mass ID (if available) : 03080209+1718021
 ICRS Star Coord at Epoch: 03h 08m 02.10372s +17:18:02.14502s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 12.789
 G magnitude : 14.868
 RP magnitude : 14.205
 BP magnitude : 15.378
 DUPflag : 0
 Distance (au) : 20.012
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 19.25
 Sun-Target sep (deg) : 64.34
 Sun-Moon sep (deg) : 131.28
 B (ring opening deg) : 60.86
 PA of pole (deg) : -90.25
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.596
 C/A sky separation (km) : 8653.5
 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_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	2024-03-05T10:33:54.356		11.86	-25.66	50875.85	-21.29		
lambda	I	2024-03-05T10:34:34.284		11.73	-25.79	50026.71	-21.26		
delta	I	2024-03-05T10:35:55.523		11.48	-26.05	48300.35	-21.24		
gamma	I	2024-03-05T10:36:27.046		11.38	-26.15	47630.98	-21.23		
eta	I	2024-03-05T10:36:48.475		11.31	-26.22	47176.12	-21.22		
beta	I	2024-03-05T10:38:00.933		11.08	-26.45	45641.20	-21.20		
alpha	I	2024-03-05T10:38:43.696		10.95	-26.59	44739.05	-21.18		
4	I	2024-03-05T10:40:25.385		10.63	-26.92	42570.23	-21.13		
5	I	2024-03-05T10:40:38.067		10.59	-26.96	42292.31	-21.13		
6	I	2024-03-05T10:41:01.160		10.52	-27.03	41804.84	-21.11		
Uranus	I	2024-03-05T10:52:15.002		8.37	-29.18	25264.15		-23.22	-24.19
Uranus	E	2024-03-05T11:33:30.958		0.24x	-36.65	25115.62		29.05	30.19
6	E	2024-03-05T11:43:54.164		-1.86x	-38.41	41855.58	21.25		
5	E	2024-03-05T11:44:10.799		-1.91x	-38.46	42205.07	21.27		
4	E	2024-03-05T11:44:26.665		-1.96x	-38.50	42553.94	21.27		
alpha	E	2024-03-05T11:46:06.225		-2.30x	-38.78	44689.22	21.33		
beta	E	2024-03-05T11:46:52.782		-2.46x	-38.91	45678.72	21.35		
eta	E	2024-03-05T11:48:02.982		-2.70x	-39.10	47176.12	21.37		
gamma	E	2024-03-05T11:48:23.873		-2.77x	-39.16	47622.74	21.38		
delta	E	2024-03-05T11:48:55.554		-2.87x	-39.25	48300.35	21.39		
lambda	E	2024-03-05T11:50:16.191		-3.15x	-39.46	50026.71	21.42		
epsilon	E	2024-03-05T11:51:25.206		-3.38x	-39.65	51505.97	21.46		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2024-03-05T11:12:41.610
 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 : 34607957413769216
 2Mass ID (if available) : 03080209+1718021
 ICRS Star Coord at Epoch: 03h 08m 02.10372s +17:18:02.14502s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 12.789
 G magnitude : 14.868
 RP magnitude : 14.205
 BP magnitude : 15.378
 DUPflag : 0
 Distance (au) : 20.012
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 19.25
 Sun-Target sep (deg) : 64.34
 Sun-Moon sep (deg) : 131.30
 B (ring opening deg) : 60.86
 PA of pole (deg) : -90.25
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.578
 C/A sky separation (km) : 8394.4
 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_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	2024-03-05T10:33:37.225		9.98	-23.81	50874.34	-21.32		
lambda	I	2024-03-05T10:34:17.030		9.86	-23.94	50026.71	-21.29		
delta	I	2024-03-05T10:35:38.158		9.62	-24.18	48300.35	-21.27		
gamma	I	2024-03-05T10:36:09.637		9.53	-24.28	47630.97	-21.26		
eta	I	2024-03-05T10:36:31.035		9.46	-24.34	47176.12	-21.25		
beta	I	2024-03-05T10:37:43.385		9.25	-24.56	45641.22	-21.23		
alpha	I	2024-03-05T10:38:26.076		9.12	-24.69	44739.20	-21.22		
4	I	2024-03-05T10:40:07.595		8.82	-25.00	42570.50	-21.17		
5	I	2024-03-05T10:40:20.282		8.78	-25.04	42291.96	-21.17		
6	I	2024-03-05T10:40:43.313		8.71	-25.11	41805.01	-21.15		
Uranus	I	2024-03-05T10:51:54.002		6.68	-27.11	25259.70		-23.41	-24.39
Uranus	E	2024-03-05T11:33:18.743	-1.09x	-34.12	25114.95			29.08	30.21
6	E	2024-03-05T11:43:40.399	-3.09x	-35.75	41855.83		21.28		
5	E	2024-03-05T11:43:56.972	-3.14x	-35.79	42204.59		21.30		
4	E	2024-03-05T11:44:12.850	-3.20x	-35.83	42554.21		21.30		
alpha	E	2024-03-05T11:45:52.263	-3.52x	-36.08	44689.32		21.36		
beta	E	2024-03-05T11:46:38.758	-3.67x	-36.20	45678.78		21.37		
eta	E	2024-03-05T11:47:48.870	-3.89x	-36.38	47176.12		21.40		
gamma	E	2024-03-05T11:48:09.736	-3.96x	-36.43	47622.72		21.41		
delta	E	2024-03-05T11:48:41.381	-4.06x	-36.51	48300.35		21.42		
lambda	E	2024-03-05T11:50:01.932	-4.33x	-36.72	50026.71		21.45		
epsilon	E	2024-03-05T11:51:10.828	-4.55x	-36.89	51504.93		21.48		