

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-04-30T13:15:41.940
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3368245848972447232
 2Mass ID (if available) : 07080569+2256490

Uranus 2037-04-30T13:15:41 K10.05 G12.13 PgtRgt

ICRS Star Coord at Epoch: 07h 08m 05.69924s +22:56:48.96585s

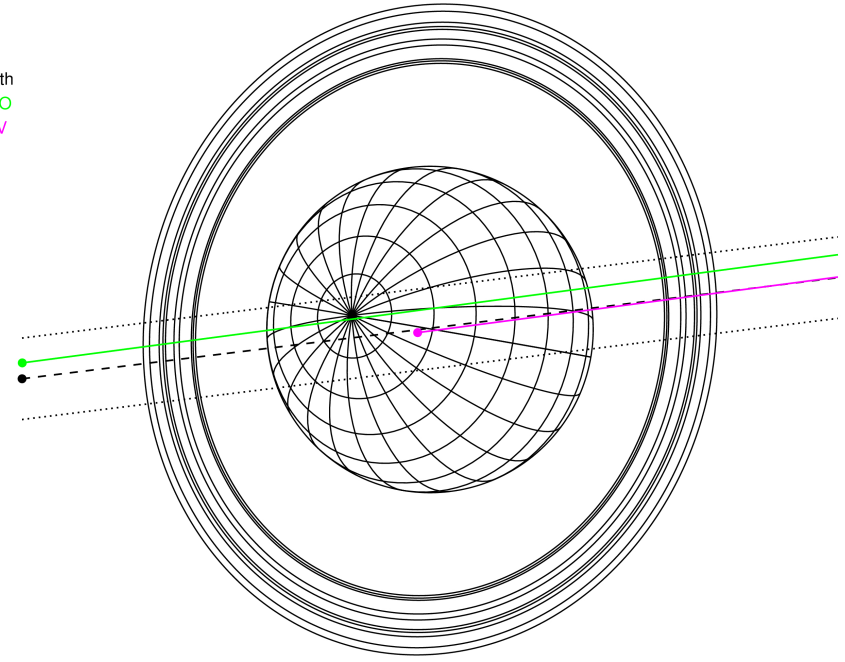
RUWE (>1.4 is poor) : 1.01
 K magnitude : 10.050
 G magnitude : 12.132
 RP magnitude : 11.466
 BP magnitude : 12.643
 DUPflag : 0
 Distance (au) : 19.139
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 18.74
 Sun-Target sep (deg) : 65.62
 Sun-Moon sep (deg) : 124.45
 B (ring opening deg) : 60.92
 PA of pole (deg) : 79.84

#	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



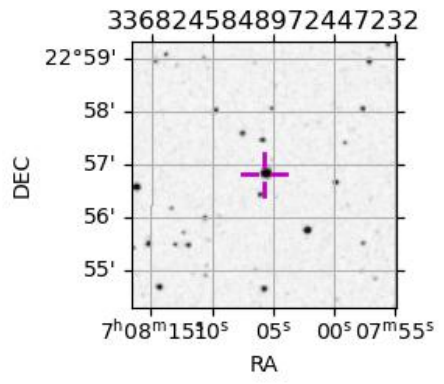
2037-04-30T13:15:41.9400 ex: 07 08 05.6992 s: +22 56 48.966 C/A 0.023° PA 187.02 deg v_sky +18.75 km/s D 19.14 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PMO
 KAV

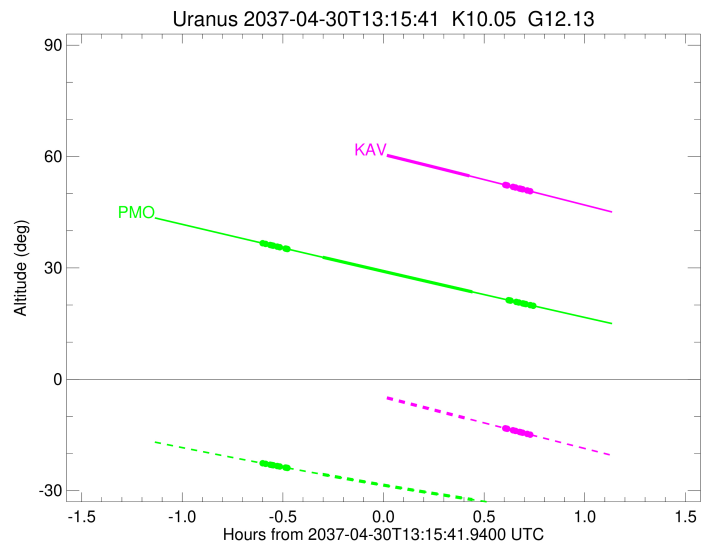
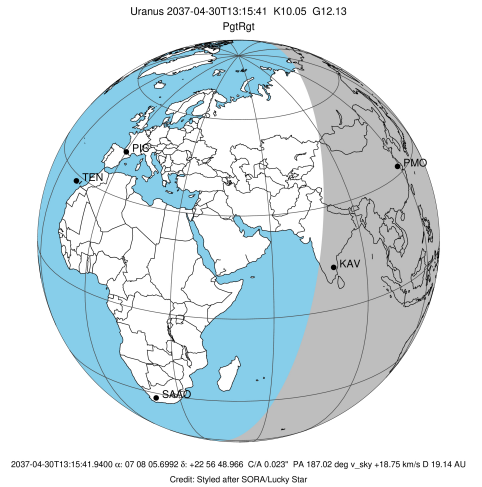


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OCode
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 30 12:39 - APR 30 14:00	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 30 13:41 - APR 30 13:59	PneRne
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

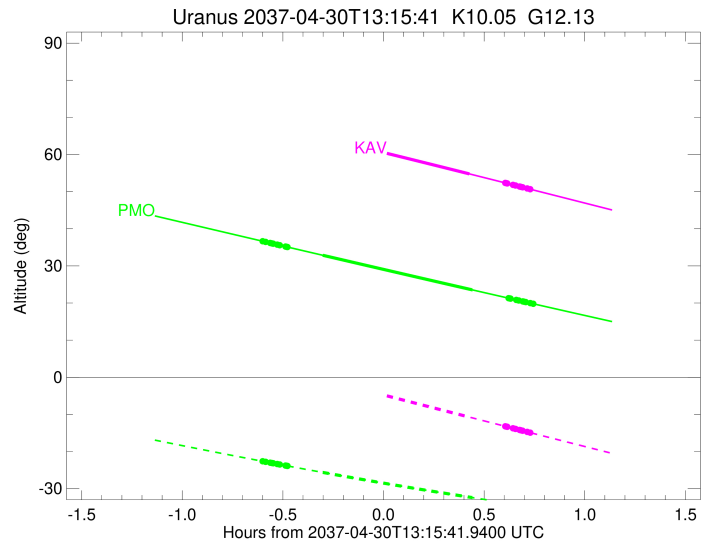
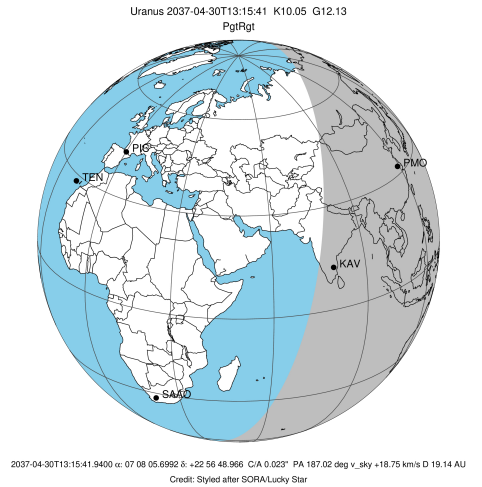


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-04-30T13:19:53.480
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 3368245848972447232
 2Mass ID (if available) : 07080569+2256490
 ICRS Star Coord at Epoch: 07h 08m 05.69924s +22:56:48.96585s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 10.050
 G magnitude : 12.132
 RP magnitude : 11.466
 BP magnitude : 12.643
 DUPflag : 0
 Distance (au) : 19.139
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 18.74
 Sun-Target sep (deg) : 65.62
 Sun-Moon sep (deg) : 125.29
 B (ring opening deg) : 60.92
 PA of pole (deg) : 79.84
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.231
 C/A sky separation (km) : 3210.3
 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	2037-04-30T12:39:33.286		36.67	-22.61	51289.68	-20.96		
lambda	I	2037-04-30T12:40:33.578		36.46	-22.78	50026.71	-20.95		
delta	I	2037-04-30T12:41:55.996		36.17	-23.02	48300.35	-20.95		
gamma	I	2037-04-30T12:42:28.216		36.06	-23.11	47625.47	-20.95		
eta	I	2037-04-30T12:42:49.670		35.98	-23.17	47176.12	-20.95		
beta	I	2037-04-30T12:44:02.802		35.72	-23.37	45642.41	-20.94		
alpha	I	2037-04-30T12:44:47.187		35.57	-23.50	44710.95	-20.94		
4	I	2037-04-30T12:46:27.607		35.21	-23.78	42607.96	-20.94		
5	I	2037-04-30T12:46:48.667		35.14	-23.84	42154.85	-20.93		
6	I	2037-04-30T12:47:05.122		35.08	-23.89	41844.70	-20.95		
Uranus	I	2037-04-30T12:57:34.363		32.87	-25.63	25126.77		28.56	29.68
Uranus	E	2037-04-30T13:42:12.929		23.54	-32.41	25190.91		-26.12	-27.18
6	E	2037-04-30T13:52:57.259		21.32	-33.86	41823.40	21.09		
5	E	2037-04-30T13:53:22.108		21.23	-33.92	42314.62	21.08		
4	E	2037-04-30T13:53:32.221		21.20	-33.94	42538.91	21.09		
alpha	E	2037-04-30T13:55:15.732		20.84	-34.17	44721.22	21.10		
beta	E	2037-04-30T13:56:01.149		20.69	-34.26	45680.71	21.10		
eta	E	2037-04-30T13:57:11.919		20.44	-34.42	47176.12	21.11		
gamma	E	2037-04-30T13:57:33.247		20.37	-34.46	47626.35	21.11		
delta	E	2037-04-30T13:58:05.171		20.26	-34.53	48300.35	21.11		
lambda	E	2037-04-30T13:59:26.923		19.98	-34.70	50026.71	21.12		
epsilon	E	2037-04-30T14:00:15.471		19.81	-34.81	51052.17	21.14		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-04-30T13:18:31.010
 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 : 3368245848972447232
 2Mass ID (if available) : 07080569+2256490
 ICRS Star Coord at Epoch: 07h 08m 05.69924s +22:56:48.96585s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 10.050
 G magnitude : 12.132
 RP magnitude : 11.466
 BP magnitude : 12.643
 DUPflag : 0
 Distance (au) : 19.139
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 18.74
 Sun-Target sep (deg) : 65.62
 Sun-Moon sep (deg) : 125.42
 B (ring opening deg) : 60.92
 PA of pole (deg) : 79.84
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.017
 C/A sky separation (km) : 233.1
 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_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	2037-04-30T12:37:20.826		68.83	4.26x	51264.02	-20.72		
lambda	I	2037-04-30T12:38:20.534		68.63	4.02x	50026.71	-20.72		
delta	I	2037-04-30T12:39:43.838		68.34	3.69x	48300.35	-20.72		
gamma	I	2037-04-30T12:40:16.384		68.22	3.56x	47625.85	-20.72		
eta	I	2037-04-30T12:40:38.084		68.15	3.48x	47176.12	-20.72		
beta	I	2037-04-30T12:41:52.018		67.89	3.19x	45641.92	-20.72		
alpha	I	2037-04-30T12:42:36.740		67.73	3.01x	44713.50	-20.72		
4	I	2037-04-30T12:44:18.457		67.37	2.61x	42605.71	-20.73		
5	I	2037-04-30T12:44:39.645		67.30	2.53x	42154.94	-20.72		
6	I	2037-04-30T12:44:56.073		67.24	2.46x	41848.10	-20.74		
Uranus	I	2037-04-30T12:55:40.287		64.94	-0.07x	25155.02		27.50	28.60
Uranus	E	2037-04-30T13:41:19.128		54.78	-10.74	25150.50		-27.67	-28.77
6	E	2037-04-30T13:51:57.372		52.37	-13.20	41826.81	20.84		
5	E	2037-04-30T13:52:22.442		52.27	-13.29	42315.18	20.82		
4	E	2037-04-30T13:52:32.499		52.23	-13.33	42536.40	20.83		
alpha	E	2037-04-30T13:54:17.520		51.83	-13.74	44723.87	20.83		
beta	E	2037-04-30T13:55:03.348		51.66	-13.91	45680.30	20.84		
eta	E	2037-04-30T13:56:15.040		51.39	-14.19	47176.12	20.84		
gamma	E	2037-04-30T13:56:36.662		51.31	-14.27	47626.74	20.84		
delta	E	2037-04-30T13:57:08.984		51.18	-14.39	48300.35	20.84		
lambda	E	2037-04-30T13:58:31.810		50.87	-14.71	50026.71	20.84		
epsilon	E	2037-04-30T13:59:19.718		50.68	-14.90	51025.39	20.85		