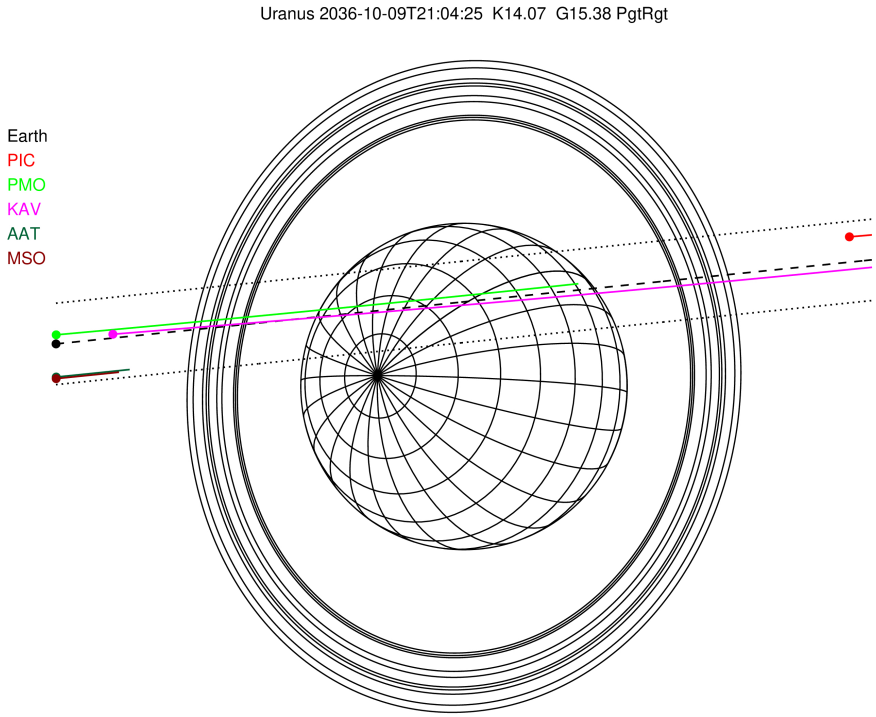
Stellar occultation prediction by rfrench@wellesley.edu Sun Jun 25 01:56:52 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2036-10-09T21:04:25.580
Event type : PgtRgt
: Uranus occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Gaia source ID : 866315248865447168
2Mass ID (if available) : 07223235+2229480

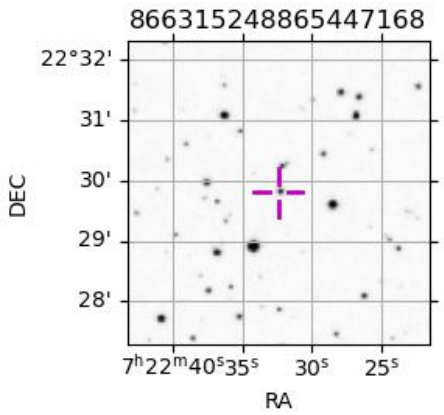
ICRS Star Coord at Epoch: 07h 22m 32.35562s +22:29:47.98242s
RUWE (>1.4 is poor) : 1.06
K magnitude : 14.066
G magnitude : 15.378
RP magnitude : 14.951
BP magnitude : 15.642
DUPflag : 0
Distance (au) : 18.794
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 7.71
Sun-Target sep (deg) : 87.64
Sun-Moon sep (deg) : 39.23
B (ring opening deg) : 57.70
PA of pole (deg) : 82.83

#	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



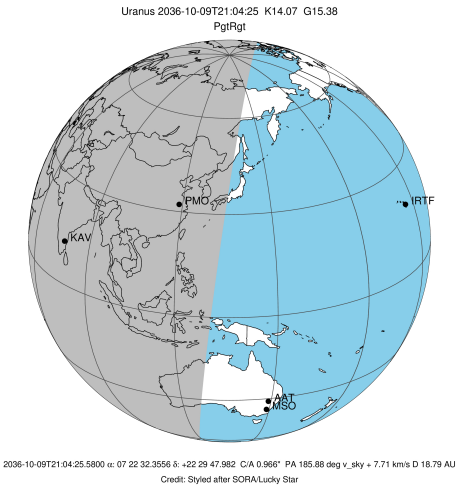
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

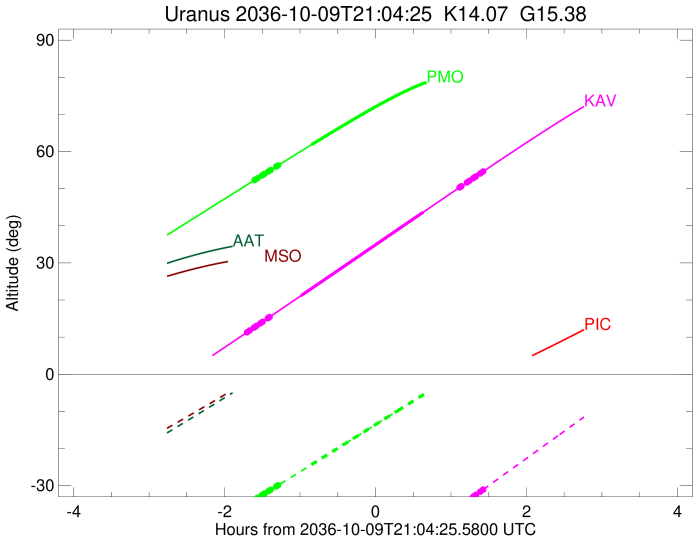
Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	++++++++++	+		OCT 09 19:27 - OCT 09 20:13	PinRin
KPNO	Kitt Peak Natl Obs	32.0	248.4					PnnRnn
MCD	McDonald 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	++++++++++	+ +	++++++++++	OCT 09 19:21 - OCT 09 22:29	PieRie
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



Uranus_2036-10-09T21_04_25.5800_PMO.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:21:01 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2036-10-09T21:00:34.150
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 : 866315248865447168
2Mass ID (if available) : 07223235+2229480
ICRS Star Coord at Epoch: 07h 22m 32.35562s +22:29:47.98242s
RUWE (>1.4 is poor) : 1.06
K magnitude : 14.066
G magnitude : 15.378
RP magnitude : 14.951
BP magnitude : 15.642
DUPflag : 0
Distance (au) : 18.794
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 7.71
Sun-Target sep (deg) : 87.64
Sun-Moon sep (deg) : 39.62
B (ring opening deg) : 57.70
PA of pole (deg) : 82.83
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.039
C/A sky separation (km) : 14156.2
NAIF SPICE kernels : RAJobs_U111+rgf15.spk
URKALLv1.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



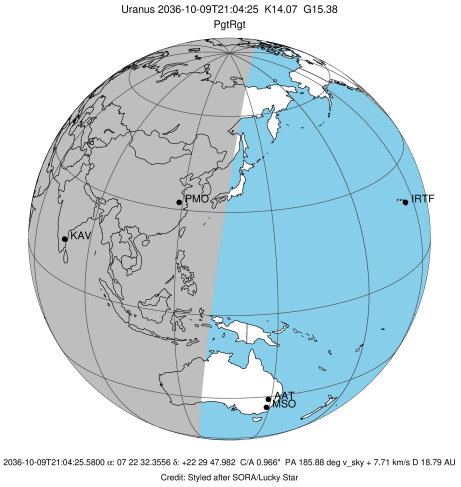


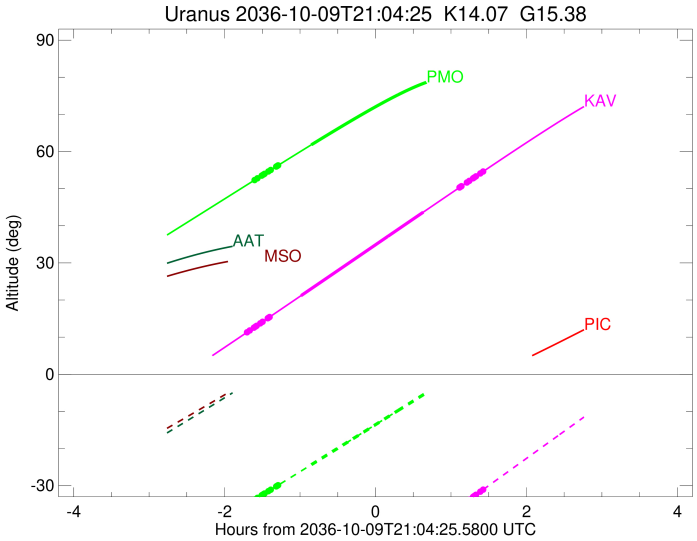
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-10-09T19:27:38.372		52.17	-33.89	51501.55	-8.40		
lambda	I	2036-10-09T19:30:34.071		52.79	-33.29	50026.71	-8.38		
delta	I	2036-10-09T19:34:00.455		53.52	-32.58	48300.35	-8.35		
gamma	I	2036-10-09T19:35:21.586		53.81	-32.30	47623.61	-8.33		
eta	I	2036-10-09T19:36:15.308		54.00	-32.11	47176.12	-8.33		
beta	I	2036-10-09T19:39:19.785		54.65	-31.48	45641.61	-8.29		
alpha	I	2036-10-09T19:41:07.570		55.03	-31.11	44745.53	-8.27		
4	I	2036-10-09T19:45:38.162		55.99	-30.17	42526.07	-8.21		
5	I	2036-10-09T19:46:06.497		56.08	-30.07	42311.24	-8.21		
6	I	2036-10-09T19:47:01.861		56.28	-29.88	41828.59	-8.19		
Uranus	I	2036-10-09T20:13:24.983		61.82	-24.36	25195.65		29.86	31.01
Uranus	E	2036-10-09T21:48:25.837		79.07	-4.25x	25362.76		-21.35	-22.26
6	E	2036-10-09T22:18:58.002		80.43	2.18x	41870.54	8.05		
5	E	2036-10-09T22:19:30.448		80.42	2.29x	42160.33	8.07		
4	E	2036-10-09T22:20:27.096		80.38	2.49x	42604.02	8.07		
alpha	E	2036-10-09T22:24:44.437		80.17	3.38x	44684.61	8.12		
beta	E	2036-10-09T22:26:45.642		80.04	3.81x	45674.04	8.14		
eta	E	2036-10-09T22:29:49.672		79.81	4.45x	47176.12	8.16		
gamma	E	2036-10-09T22:30:44.731		79.74	4.64x	47625.80	8.17		
delta	E	2036-10-09T22:32:07.228		79.61	4.92x	48300.35	8.18		
lambda	E	2036-10-09T22:35:37.881		79.27	5.65x	50026.71	8.21		
epsilon	E	2036-10-09T22:37:05.225		79.11	5.96x	50744.08	8.22		

Uranus_2036-10-09T21_04_25.5800_KAV.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:31:45 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2036-10-09T20:53:16.940
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 : 866315248865447168
2Mass ID (if available) : 07223235+2229480
ICRS Star Coord at Epoch: 07h 22m 32.35562s +22:29:47.98242s
RUWE (>1.4 is poor) : 1.06
K magnitude : 14.066
G magnitude : 15.378
RP magnitude : 14.951
BP magnitude : 15.642
DUPflag : 0
Distance (au) : 18.794
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 7.71
Sun-Target sep (deg) : 87.64
Sun-Moon sep (deg) : 38.96
B (ring opening deg) : 57.70
PA of pole (deg) : 82.83
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.932
C/A sky separation (km) : 12706.2
NAIF SPICE kernels : RAJobs_U111+rgf15.spk
URKALLv1.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	2036-10-09T19:21:38.537	11.16	-76.40	51505.05	-8.74			
lambda	I	2036-10-09T19:24:27.843	11.80	-75.76	50026.71	-8.72			
delta	I	2036-10-09T19:27:46.189	12.56	-75.02	48300.35	-8.69			
gamma	I	2036-10-09T19:29:04.128	12.86	-74.72	47623.70	-8.67			
eta	I	2036-10-09T19:29:55.747	13.06	-74.52	47176.12	-8.67			
beta	I	2036-10-09T19:32:52.904	13.73	-73.85	45641.71	-8.63			
alpha	I	2036-10-09T19:34:36.334	14.13	-73.45	44745.98	-8.61			
4	I	2036-10-09T19:38:55.993	15.12	-72.45	42526.16	-8.56			
5	I	2036-10-09T19:39:23.125	15.23	-72.34	42311.83	-8.56			
6	I	2036-10-09T19:40:16.344	15.43	-72.14	41827.56	-8.54			
Uranus	I	2036-10-09T20:05:10.093	21.16	-66.25	25181.94		30.49	31.66	
Uranus	E	2036-10-09T21:42:24.335	43.67	-42.69	25328.28		-23.28	-24.25	
6	E	2036-10-09T22:11:17.933	50.33	-35.64	41869.15	8.21			
5	E	2036-10-09T22:11:49.647	50.45	-35.51	42158.95	8.22			
4	E	2036-10-09T22:12:45.715	50.67	-35.28	42605.55	8.22			
alpha	E	2036-10-09T22:16:58.577	51.63	-34.26	44684.65	8.25			
beta	E	2036-10-09T22:18:57.963	52.09	-33.77	45674.76	8.26			
eta	E	2036-10-09T22:21:59.222	52.78	-33.03	47176.12	8.28			
gamma	E	2036-10-09T22:22:53.553	52.99	-32.81	47626.05	8.28			
delta	E	2036-10-09T22:24:14.923	53.30	-32.48	48300.35	8.29			
lambda	E	2036-10-09T22:27:42.965	54.09	-31.63	50026.71	8.31			
epsilon	E	2036-10-09T22:29:09.239	54.42	-31.28	50743.53	8.31			