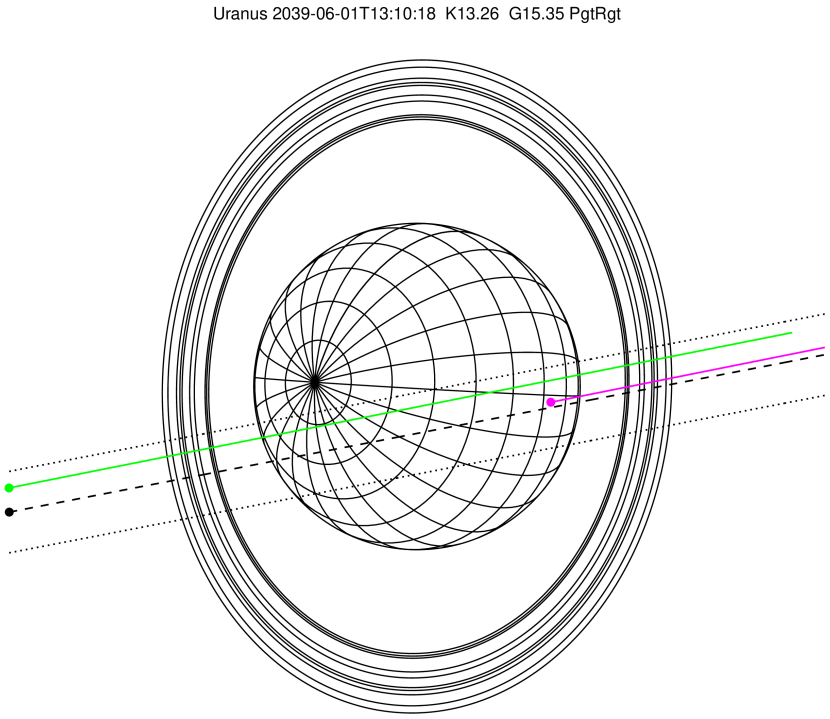
Stellar occultation prediction by rfrench@wellesley.edu Sun Jun 25 02:21:53 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2039-06-01T13:10:18.830
Event type : PgtRgt
: Uranus occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Gaia source ID : 673809145302137088
2Mass ID (if available) : 07510030+2130559

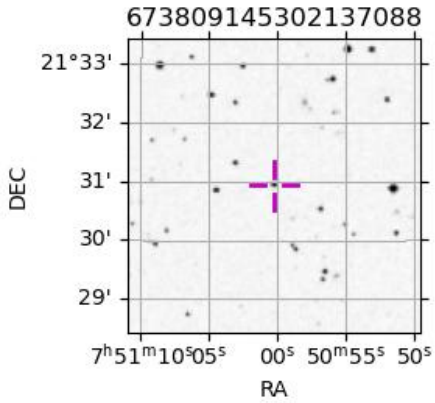
ICRS Star Coord at Epoch: 07h 51m 00.30255s +21:30:55.84078s
RUWE (>1.4 is poor) : 1.03
K magnitude : 13.261
G magnitude : 15.351
RP magnitude : 14.698
BP magnitude : 15.842
DUPflag : 0
Distance (au) : 19.323
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 27.48
Sun-Target sep (deg) : 45.29
Sun-Moon sep (deg) : 62.85
B (ring opening deg) : 51.20
PA of pole (deg) : 87.63

#	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



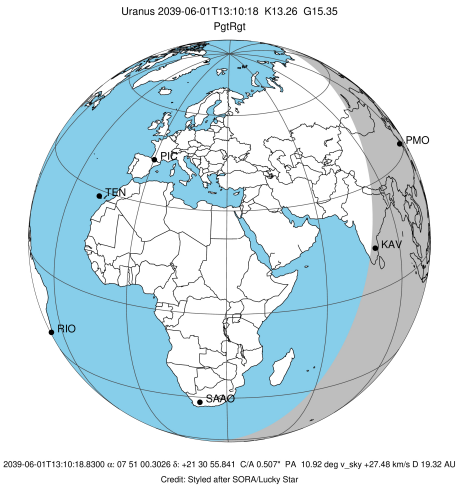
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

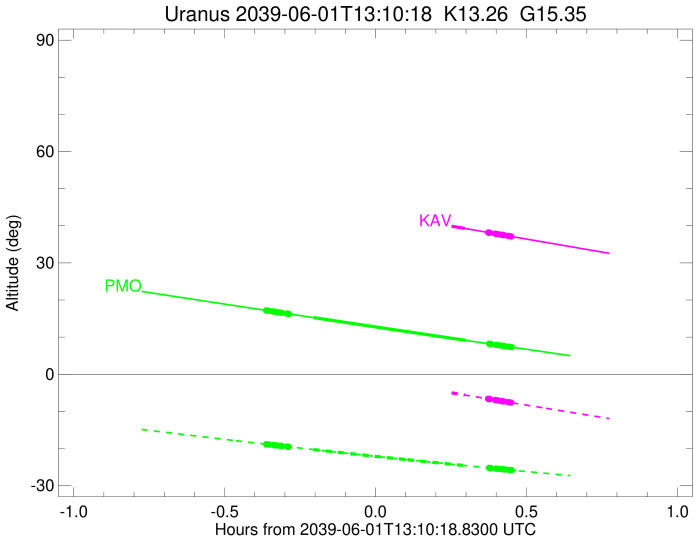
Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	++++++++++	+ +	++++++++++	JUN 01 12:48 - JUN 01 13:37	PieRie
KPNO	Kitt Peak Natl Obs	32.0	248.4					PnnRnn
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		+	++++++++++	JUN 01 13:28 - JUN 01 13:37	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



Uranus_2039-06-01T13_10_18.8300_PMO.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:21:15 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2039-06-01T13:13:10.860
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 : 673809145302137088
2Mass ID (if available) : 07510030+2130559
ICRS Star Coord at Epoch: 07h 51m 00.30255s +21:30:55.84078s
RUWE (>1.4 is poor) : 1.03
K magnitude : 13.261
G magnitude : 15.351
RP magnitude : 14.698
BP magnitude : 15.842
DUPflag : 0
Distance (au) : 19.323
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 27.48
Sun-Target sep (deg) : 45.29
Sun-Moon sep (deg) : 62.69
B (ring opening deg) : 51.20
PA of pole (deg) : 87.63
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.224
C/A sky separation (km) : 3140.7
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



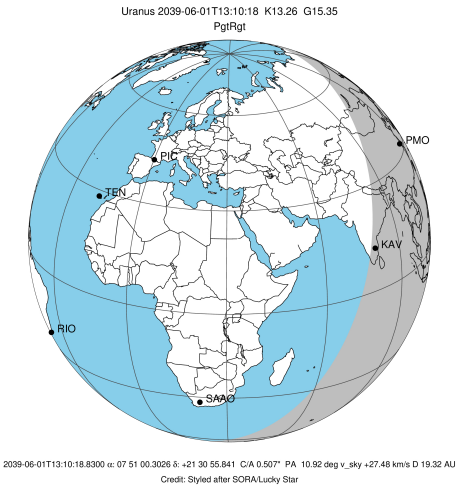


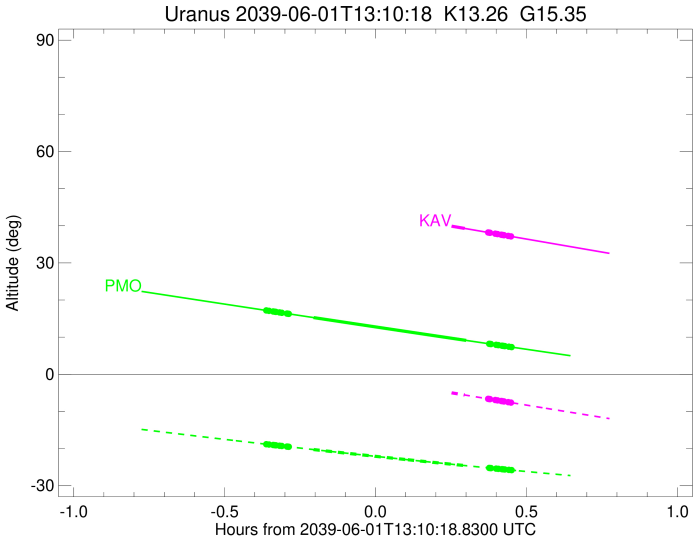
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2039-06-01T12:48:42.407		17.17	-18.86	50961.44	-34.74		
lambda	I	2039-06-01T12:49:09.302		17.08	-18.93	50026.71	-34.75		
delta	I	2039-06-01T12:49:58.979		16.91	-19.06	48300.35	-34.75		
gamma	I	2039-06-01T12:50:18.230		16.85	-19.11	47631.42	-34.75		
eta	I	2039-06-01T12:50:31.333		16.80	-19.14	47176.12	-34.75		
beta	I	2039-06-01T12:51:14.703		16.65	-19.25	45671.50	-34.74		
alpha	I	2039-06-01T12:51:41.254		16.56	-19.32	44744.59	-34.74		
4	I	2039-06-01T12:52:44.951		16.34	-19.48	42538.80	-34.74		
5	I	2039-06-01T12:52:51.842		16.32	-19.50	42287.55	-34.73		
6	I	2039-06-01T12:53:03.802		16.28	-19.53	41878.07	-34.72		
Uranus	I	2039-06-01T12:57:59.356		15.27	-20.28	25248.30		35.87	37.13
Uranus	E	2039-06-01T13:28:19.957		9.12	-24.63	25209.03		-38.51	-39.80
6	E	2039-06-01T13:32:53.133		8.21	-25.23	41798.70	34.82		
5	E	2039-06-01T13:33:04.312		8.18	-25.26	42192.11	34.83		
4	E	2039-06-01T13:33:15.965		8.14	-25.28	42608.05	34.84		
alpha	E	2039-06-01T13:34:15.951		7.94	-25.42	44689.61	34.84		
beta	E	2039-06-01T13:34:43.383		7.85	-25.48	45648.47	34.85		
eta	E	2039-06-01T13:35:27.271		7.70	-25.57	47176.12	34.86		
gamma	E	2039-06-01T13:35:40.034		7.66	-25.60	47620.99	34.86		
delta	E	2039-06-01T13:35:59.521		7.59	-25.64	48300.35	34.86		
lambda	E	2039-06-01T13:36:49.033		7.43	-25.75	50026.71	34.87		
epsilon	E	2039-06-01T13:37:25.124		7.31	-25.83	51285.36	34.86		

Uranus_2039-06-01T13_10_18.8300_KAV.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:31:59 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2039-06-01T13:13:08.940
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 : 673809145302137088
2Mass ID (if available) : 07510030+2130559
ICRS Star Coord at Epoch: 07h 51m 00.30255s +21:30:55.84078s
RUWE (>1.4 is poor) : 1.03
K magnitude : 13.261
G magnitude : 15.351
RP magnitude : 14.698
BP magnitude : 15.842
DUPflag : 0
Distance (au) : 19.323
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 27.48
Sun-Target sep (deg) : 45.29
Sun-Moon sep (deg) : 63.13
B (ring opening deg) : 51.20
PA of pole (deg) : 87.63
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.466
C/A sky separation (km) : 6525.3
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	2039-06-01T12:48:23.528	48.52	3.32x	50937.34	-34.14			
lambda	I	2039-06-01T12:48:50.183	48.42	3.22x	50026.71	-34.16			
delta	I	2039-06-01T12:49:40.737	48.22	3.03x	48300.35	-34.14			
gamma	I	2039-06-01T12:50:00.338	48.15	2.96x	47631.31	-34.13			
eta	I	2039-06-01T12:50:13.677	48.10	2.91x	47176.12	-34.12			
beta	I	2039-06-01T12:50:57.894	47.93	2.74x	45670.15	-34.10			
alpha	I	2039-06-01T12:51:24.940	47.82	2.64x	44742.82	-34.08			
4	I	2039-06-01T12:52:29.729	47.57	2.40x	42541.50	-34.05			
5	I	2039-06-01T12:52:36.675	47.54	2.37x	42292.37	-34.04			
6	I	2039-06-01T12:52:49.146	47.49	2.32x	41878.91	-34.03			
Uranus	I	2039-06-01T12:58:10.724	46.25	1.11x	25284.68			33.37	34.59
Uranus	E	2039-06-01T13:28:03.228	39.29	-5.59	25204.87			-38.79	-40.08
6	E	2039-06-01T13:32:40.919	38.21	-6.62	41800.27	34.12			
5	E	2039-06-01T13:32:52.285	38.16	-6.66	42197.70	34.13			
4	E	2039-06-01T13:33:04.107	38.12	-6.70	42610.04	34.14			
alpha	E	2039-06-01T13:34:05.212	37.88	-6.93	44688.35	34.17			
beta	E	2039-06-01T13:34:33.205	37.77	-7.03	45647.35	34.19			
eta	E	2039-06-01T13:35:17.947	37.59	-7.20	47176.12	34.22			
gamma	E	2039-06-01T13:35:30.945	37.54	-7.25	47620.96	34.23			
delta	E	2039-06-01T13:35:50.790	37.47	-7.32	48300.35	34.24			
lambda	E	2039-06-01T13:36:41.192	37.27	-7.51	50026.71	34.26			
epsilon	E	2039-06-01T13:37:17.171	37.13	-7.64	51259.84	34.25			