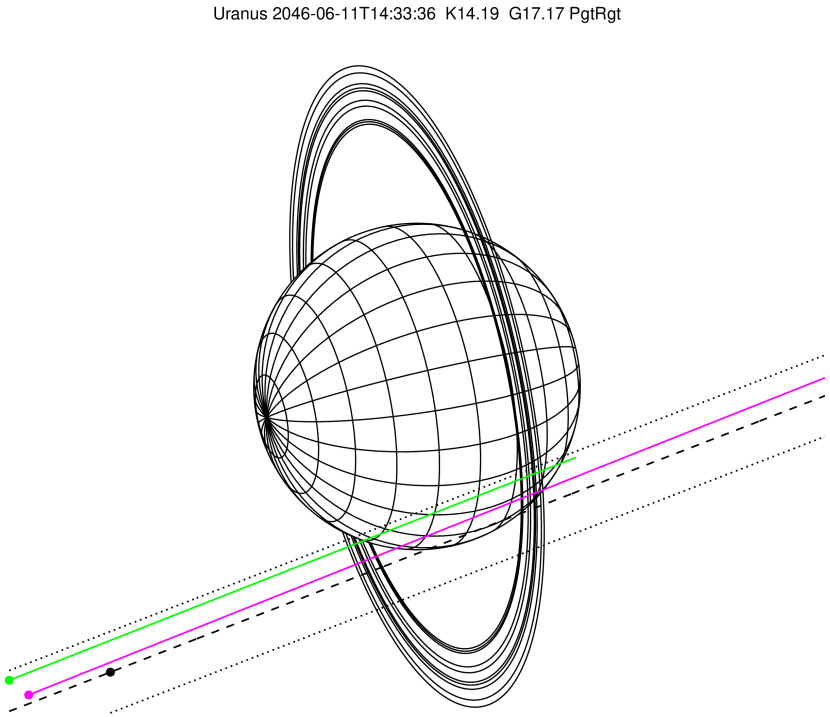
Stellar occultation prediction by rfrench@wellesley.edu Sun Jun 25 02:44:28 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2046-06-11T14:33:36.890
Event type : PgtRgt
: Uranus occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Gaia source ID : 6148994039932861696
2Mass ID (if available) : 09594068+1302325

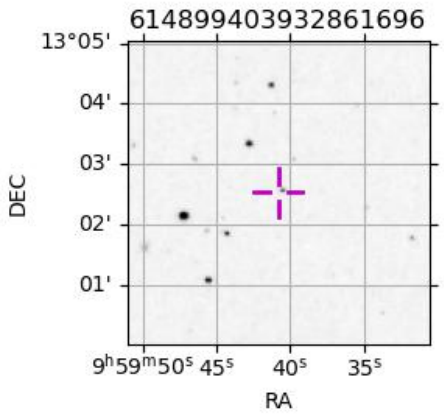
ICRS Star Coord at Epoch: 09h 59m 40.76132s +13:02:31.35310s
RUWE (>1.4 is poor) : 1.01
K magnitude : 14.193
G magnitude : 17.173
RP magnitude : 16.247
BP magnitude : 18.058
DUPflag : 0
Distance (au) : 18.698
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 18.26
Sun-Target sep (deg) : 67.25
Sun-Moon sep (deg) : 22.66
B (ring opening deg) : 19.88
PA of pole (deg) : 101.65

#	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



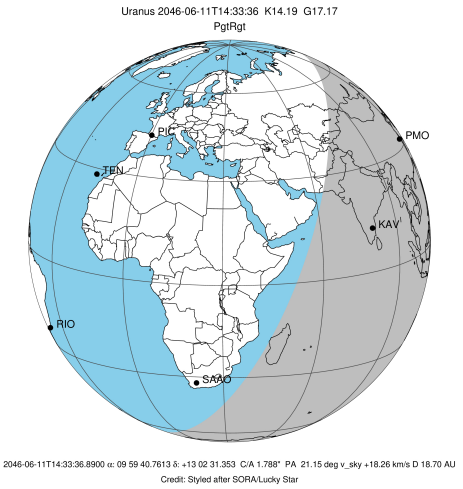
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

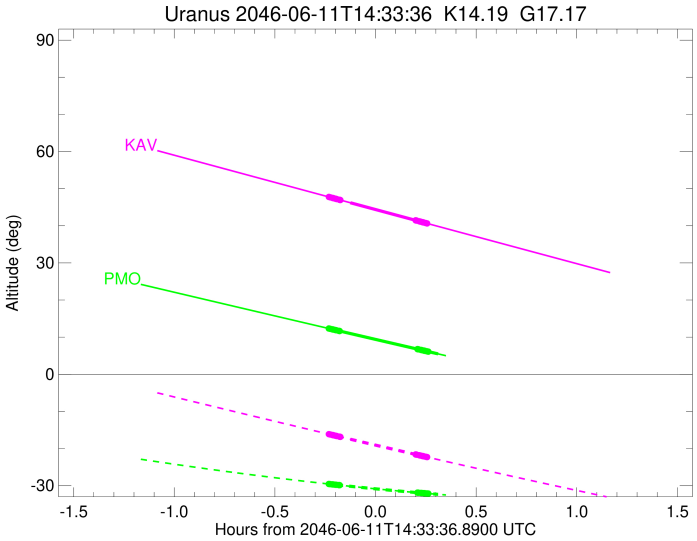
Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++++	+ +		JUN 11 14:19 - JUN 11 14:52	PieRin
KPNO	Kitt Peak Natl Obs	32.0	248.4					PnnRnn
MCD	McDonald 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 11 14:19 - JUN 11 14:49	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_2046-06-11T14_33_36.8900_PMO.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:21:29 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2046-06-11T14:37:13.500
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 : 614899403932861696
2Mass ID (if available) : 09594068+1302325
ICRS Star Coord at Epoch: 09h 59m 40.76132s +13:02:31.35310s
RUWE (>1.4 is poor) : 1.01
K magnitude : 14.193
G magnitude : 17.173
RP magnitude : 16.247
BP magnitude : 18.058
DUPflag : 0
Distance (au) : 18.698
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 18.26
Sun-Target sep (deg) : 67.25
Sun-Moon sep (deg) : 22.32
B (ring opening deg) : 19.88
PA of pole (deg) : 101.65
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.433
C/A sky separation (km) : 19430.1
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



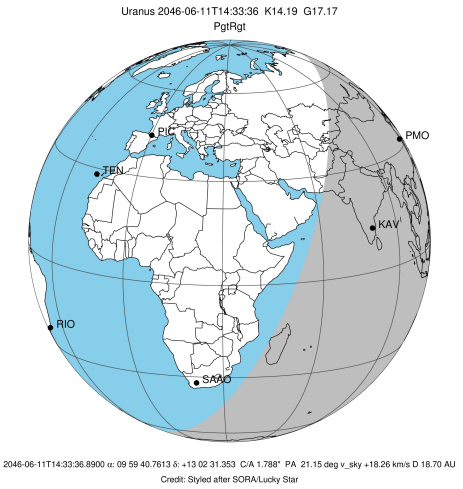


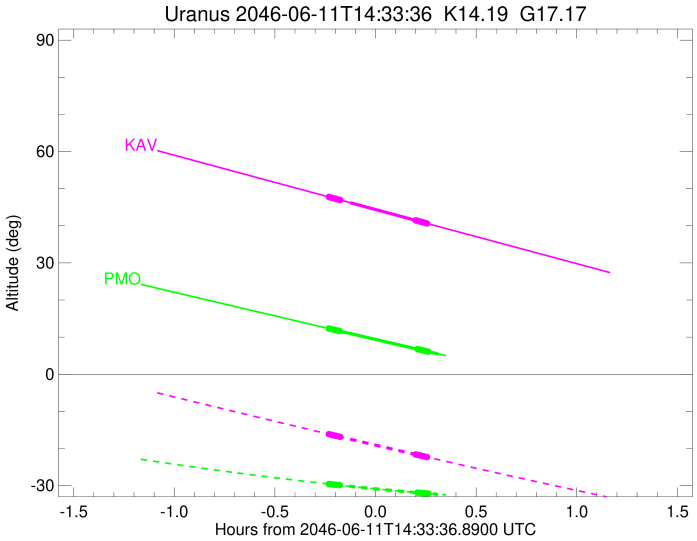
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2046-06-11T14:19:47.340		12.31	-29.57	50920.23	-48.98		
lambda	I	2046-06-11T14:20:05.662		12.24	-29.60	50026.71	-48.69		
delta	I	2046-06-11T14:20:41.235		12.12	-29.66	48300.35	-48.37		
gamma	I	2046-06-11T14:20:55.277		12.07	-29.68	47622.11	-48.23		
eta	I	2046-06-11T14:21:04.533		12.04	-29.69	47176.12	-48.14		
beta	I	2046-06-11T14:21:35.979		11.93	-29.74	45660.08	-47.80		
alpha	I	2046-06-11T14:21:56.997		11.85	-29.78	44689.66	-47.58		
4	I	2046-06-11T14:22:40.908	b	11.70	-29.85	42595.40	-46.93		
5	I	2046-06-11T14:22:45.865	b	11.68	-29.86	42292.62	-46.89		
6	I	2046-06-11T14:22:55.184	b	11.65	-29.87	41817.88	-46.61		
Uranus	I	2046-06-11T14:22:06.210		11.82	-29.79	25541.47		28.68	29.81
Uranus	E	2046-06-11T14:52:17.469		5.49	-32.35	25519.38		-46.23	-47.54
6	E	2046-06-11T14:46:06.707	b	6.78	-31.89	41816.45	46.74		
5	E	2046-06-11T14:46:14.537	b	6.75	-31.90	42248.39	47.02		
4	E	2046-06-11T14:46:21.916	b	6.73	-31.91	42525.97	47.07		
alpha	E	2046-06-11T14:47:07.840	b	6.57	-31.97	44750.25	47.72		
beta	E	2046-06-11T14:47:27.268	b	6.50	-31.99	45677.44	47.94		
eta	E	2046-06-11T14:47:58.412	b	6.39	-32.03	47176.12	48.28		
gamma	E	2046-06-11T14:48:07.834	b	6.36	-32.04	47631.49	48.38		
delta	E	2046-06-11T14:48:21.638	b	6.31	-32.06	48300.35	48.52		
lambda	E	2046-06-11T14:48:57.098	b	6.19	-32.10	50026.71	48.85		
epsilon	E	2046-06-11T14:49:28.159	b	6.08	-32.14	51548.09	49.14		

Uranus_2046-06-11T14_33_36.8900_KAV.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:32:11 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2046-06-11T14:37:36.240
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 : 614899403932861696
2Mass ID (if available) : 09594068+1302325
ICRS Star Coord at Epoch: 09h 59m 40.76132s +13:02:31.35310s
RUWE (>1.4 is poor) : 1.01
K magnitude : 14.193
G magnitude : 17.173
RP magnitude : 16.247
BP magnitude : 18.058
DUPflag : 0
Distance (au) : 18.698
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 18.26
Sun-Target sep (deg) : 67.25
Sun-Moon sep (deg) : 22.41
B (ring opening deg) : 19.88
PA of pole (deg) : 101.65
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.648
C/A sky separation (km) : 22343.6
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	2046-06-11T14:19:48.535		47.74	-16.16	50942.62	-46.86		
lambda	I	2046-06-11T14:20:08.193		47.66	-16.23	50026.71	-46.49		
delta	I	2046-06-11T14:20:45.502		47.51	-16.36	48300.35	-46.05		
gamma	I	2046-06-11T14:21:00.254		47.45	-16.41	47622.36	-45.87		
eta	I	2046-06-11T14:21:09.997		47.41	-16.45	47176.12	-45.74		
beta	I	2046-06-11T14:21:43.106		47.28	-16.56	45661.59	-45.28		
alpha	I	2046-06-11T14:22:05.322		47.19	-16.64	44691.12	-44.98		
4	I	2046-06-11T14:22:52.101		47.00	-16.81	42592.17	-44.11		
5	I	2046-06-11T14:22:57.065		46.98	-16.83	42297.05	-44.04		
6	I	2046-06-11T14:23:07.303		46.94	-16.86	41814.77	-43.71		
Uranus	I	2046-06-11T14:26:07.595		46.20	-17.50	25551.90		17.78	18.57
Uranus	E	2046-06-11T14:49:01.857		40.63	-22.32	25532.36		-36.29	-37.55
6	E	2046-06-11T14:45:34.325	b	41.47	-21.60	41813.54	43.82		
5	E	2046-06-11T14:45:42.953	b	41.43	-21.63	42254.62	44.15		
4	E	2046-06-11T14:45:50.841	b	41.40	-21.65	42525.96	44.23		
alpha	E	2046-06-11T14:46:39.572	b	41.21	-21.82	44749.28	45.10		
beta	E	2046-06-11T14:47:00.081	b	41.12	-21.89	45678.23	45.41		
eta	E	2046-06-11T14:47:32.913	b	40.99	-22.01	47176.12	45.87		
gamma	E	2046-06-11T14:47:42.825	b	40.95	-22.04	47631.41	46.00		
delta	E	2046-06-11T14:47:57.338	b	40.89	-22.09	48300.34	46.18		
lambda	E	2046-06-11T14:48:34.538	b	40.74	-22.22	50026.71	46.63		
epsilon	E	2046-06-11T14:49:07.127		40.61	-22.33	51552.03	47.00		