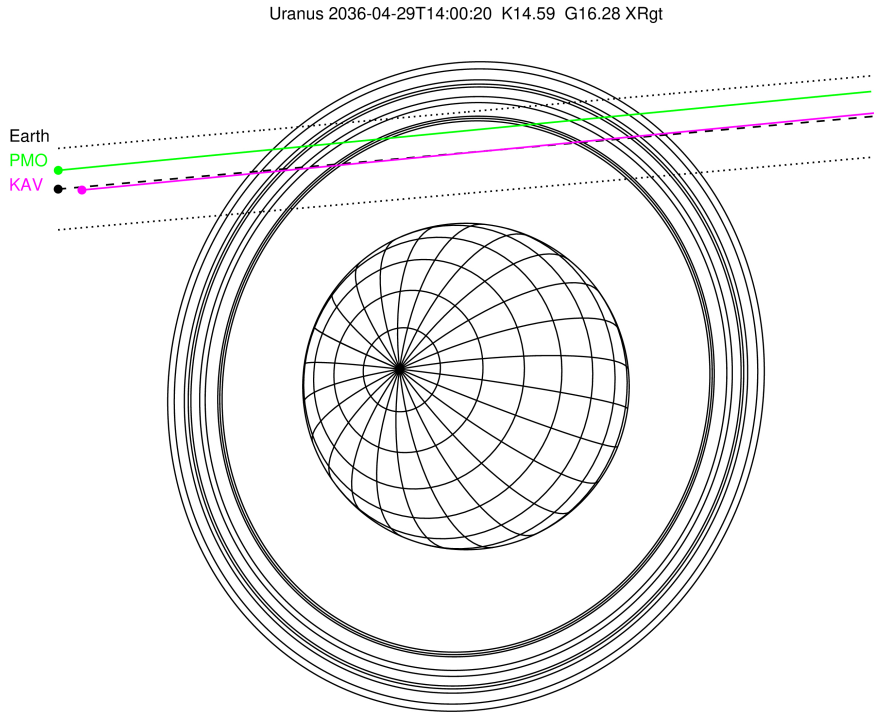
Stellar occultation prediction by rfrench@wellesley.edu Sun Jun 25 01:52:53 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2036-04-29T14:00:20.920
Event type : XRgt
: No Uranus occs
: Ring occs: geocentric, topocentric
Gaia source ID : 3379585284187919360
2Mass ID (if available) : 06490365+2320178

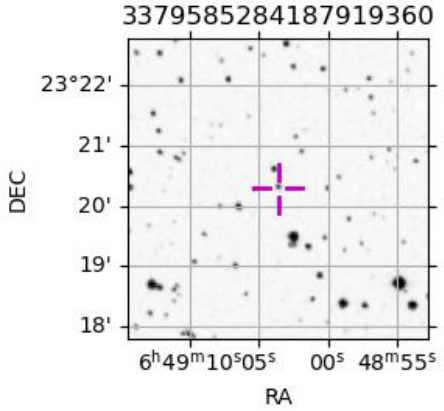
ICRS Star Coord at Epoch: 06h 49m 03.66483s +23:20:17.64112s
RUWE (>1.4 is poor) : 0.98
K magnitude : 14.585
G magnitude : 16.279
RP magnitude : 15.750
BP magnitude : 16.654
DUPflag : 0
Distance (au) : 19.259
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 20.46
Sun-Target sep (deg) : 61.92
Sun-Moon sep (deg) : 20.93
B (ring opening deg) : 65.11
PA of pole (deg) : 75.37

#	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



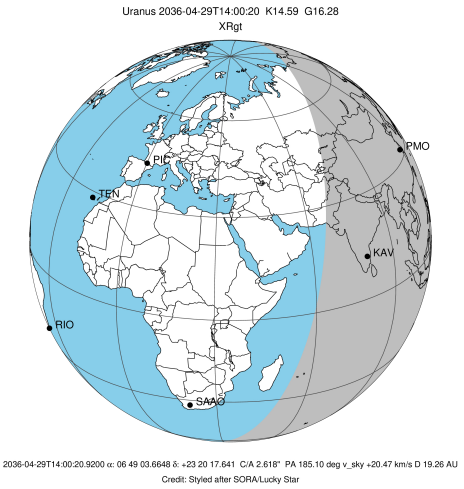
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

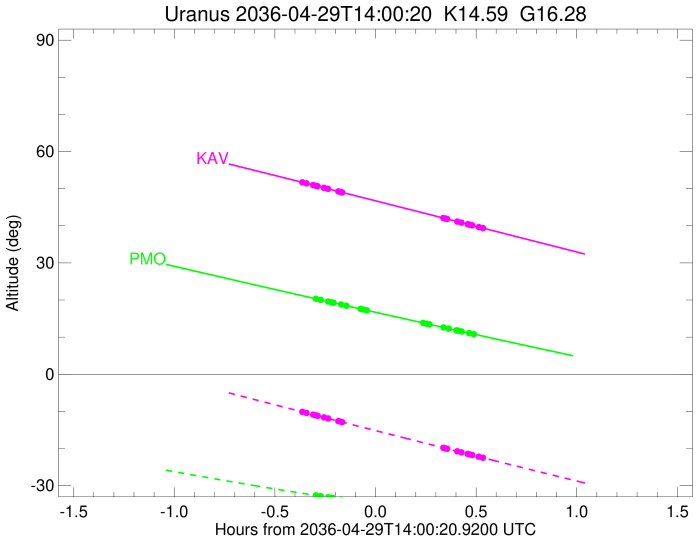
Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	++++++++++		++++++++++	APR 29 13:43 - APR 29 14:29	PnnRie
KPNO	Kitt Peak Natl Obs	32.0	248.4					PnnRnn
MCD	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 29 13:38 - APR 29 14:32	PnnRie
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_2036-04-29T14_00_20.9200_PMO.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:20:59 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2036-04-29T14:04:15.000
Event type : XRgt
: No Uranus occs
: 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 : 3379585284187919360
2Mass ID (if available) : 06490365+2320178
ICRS Star Coord at Epoch: 06h 49m 03.66483s +23:20:17.64112s
RUWE (>1.4 is poor) : 0.98
K magnitude : 14.585
G magnitude : 16.279
RP magnitude : 15.750
BP magnitude : 16.654
DUPflag : 0
Distance (au) : 19.259
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 20.46
Sun-Target sep (deg) : 61.92
Sun-Moon sep (deg) : 21.86
B (ring opening deg) : 65.11
PA of pole (deg) : 75.37
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.854
C/A sky separation (km) : 39867.3
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

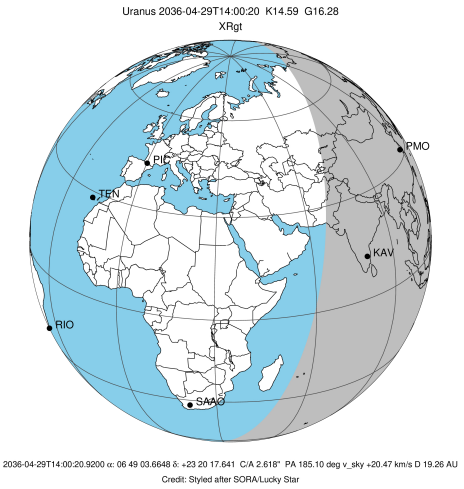
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-04-29T13:43:04.185		20.23	-32.70	50769.26	-13.58		
lambda	I	2036-04-29T13:43:59.787		20.04	-32.83	50026.71	-13.18		
delta	I	2036-04-29T13:46:15.412		19.58	-33.14	48300.35	-12.26		
gamma	I	2036-04-29T13:47:11.584		19.39	-33.27	47622.98	-11.85		
eta	I	2036-04-29T13:47:49.745		19.26	-33.36	47176.12	-11.56		
beta	I	2036-04-29T13:50:08.212		18.79	-33.67	45649.90	-10.46		
alpha	I	2036-04-29T13:51:40.524		18.47	-33.87	44722.40	-9.63		
4	I	2036-04-29T13:56:02.275		17.58	-34.44	42528.53	-7.09		
5	I	2036-04-29T13:56:32.187		17.48	-34.51	42314.44	-6.79		
6	I	2036-04-29T13:57:54.421		17.20	-34.69	41804.37	-5.91		

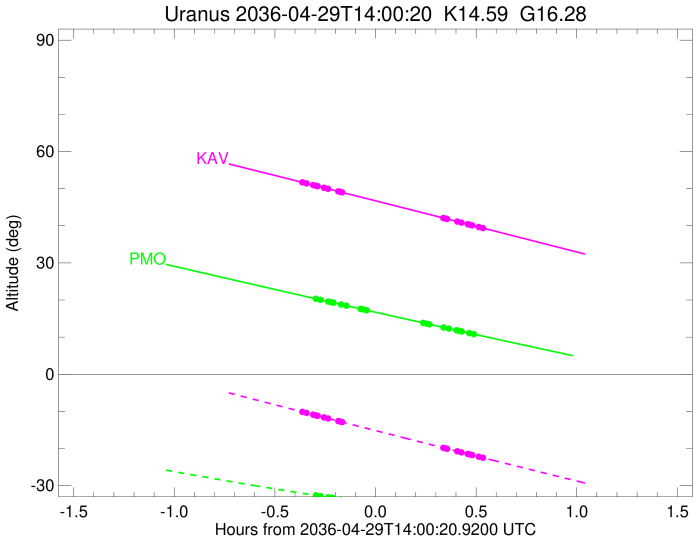
No planet occultations

6	E	2036-04-29T14:14:28.283		13.85	-36.71	41822.79	5.92		
5	E	2036-04-29T14:15:44.374		13.60	-36.85	42306.31	6.80		
4	E	2036-04-29T14:16:16.288		13.49	-36.92	42528.07	7.11		
alpha	E	2036-04-29T14:20:33.943		12.63	-37.40	44694.66	9.66		
beta	E	2036-04-29T14:22:10.562		12.31	-37.57	45668.69	10.49		
eta	E	2036-04-29T14:24:26.825		11.85	-37.82	47176.12	11.61		
gamma	E	2036-04-29T14:25:05.318		11.72	-37.89	47628.61	11.90		
delta	E	2036-04-29T14:26:00.800		11.54	-37.99	48300.35	12.31		
lambda	E	2036-04-29T14:28:15.861		11.09	-38.22	50026.71	13.24		
epsilon	E	2036-04-29T14:29:41.981		10.81	-38.37	51190.31	13.64		

Uranus_2036-04-29T14_00_20.9200_KAV.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:31:43 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2036-04-29T14:03:43.760
Event type : XRgt
: No Uranus occs
: 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 : 3379585284187919360
2Mass ID (if available) : 06490365+2320178
ICRS Star Coord at Epoch: 06h 49m 03.66483s +23:20:17.64112s
RUWE (>1.4 is poor) : 0.98
K magnitude : 14.585
G magnitude : 16.279
RP magnitude : 15.750
BP magnitude : 16.654
DUPflag : 0
Distance (au) : 19.259
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 20.46
Sun-Target sep (deg) : 61.92
Sun-Moon sep (deg) : 21.80
B (ring opening deg) : 65.11
PA of pole (deg) : 75.37
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.606
C/A sky separation (km) : 36406.0
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	2036-04-29T13:38:59.448		51.60	-10.23	50756.45	-15.14		
lambda	I	2036-04-29T13:39:48.143		51.41	-10.42	50026.71	-14.86		
delta	I	2036-04-29T13:41:46.863		50.96	-10.88	48300.35	-14.21		
gamma	I	2036-04-29T13:42:35.044		50.78	-11.07	47622.48	-13.93		
eta	I	2036-04-29T13:43:07.324		50.66	-11.19	47176.12	-13.73		
beta	I	2036-04-29T13:45:01.643		50.23	-11.63	45647.63	-12.99		
alpha	I	2036-04-29T13:46:13.910		49.95	-11.91	44727.59	-12.46		
4	I	2036-04-29T13:49:21.387		49.24	-12.64	42532.39	-10.99		
5	I	2036-04-29T13:49:41.145		49.16	-12.71	42310.40	-10.84		
6	I	2036-04-29T13:50:30.550		48.98	-12.90	41799.18	-10.41		

No planet occultations

6	E	2036-04-29T14:20:31.888		42.10	-19.80	41832.09	10.44		
5	E	2036-04-29T14:21:15.234		41.94	-19.96	42297.23	10.87		
4	E	2036-04-29T14:21:36.943		41.85	-20.05	42531.66	11.02		
alpha	E	2036-04-29T14:24:40.398		41.15	-20.74	44691.21	12.50		
beta	E	2036-04-29T14:25:57.072		40.86	-21.03	45671.28	13.03		
eta	E	2036-04-29T14:27:49.206		40.43	-21.46	47176.12	13.78		
gamma	E	2036-04-29T14:28:21.839		40.30	-21.58	47629.18	13.98		
delta	E	2036-04-29T14:29:09.347		40.12	-21.76	48300.35	14.27		
lambda	E	2036-04-29T14:31:07.560		39.67	-22.21	50026.71	14.93		
epsilon	E	2036-04-29T14:32:27.227		39.36	-22.51	51232.32	15.21		