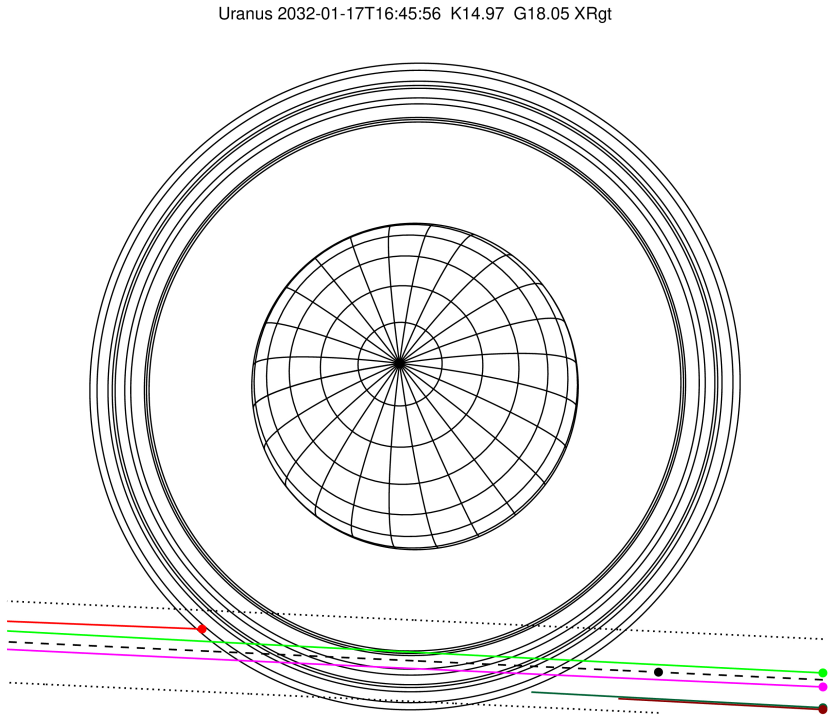
Stellar occultation prediction by rfrench@wellesley.edu Sun Jun 25 00:25:07 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2032-01-17T16:45:56.430
Event type : XRgt
: No Uranus occs
: Ring occs: geocentric, topocentric
Gaia source ID : 3416545191459378944
2Mass ID (if available) : 05314640+2326094

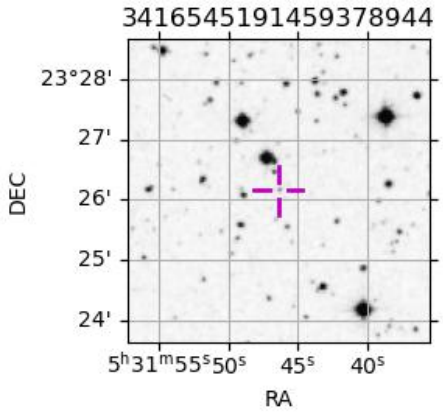
ICRS Star Coord at Epoch: 05h 31m 46.40077s +23:26:09.28726s
RUWE (>1.4 is poor) : 0.95
K magnitude : 14.972
G magnitude : 18.047
RP magnitude : 17.104
BP magnitude : 18.916
DUPflag : 0
Distance (au) : 18.250
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : -18.60
Sun-Target sep (deg) : 146.85
Sun-Moon sep (deg) : 79.52
B (ring opening deg) : 80.18
PA of pole (deg) : 33.74

#	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



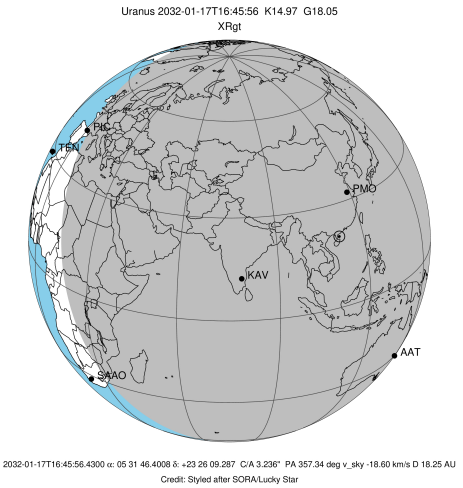
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

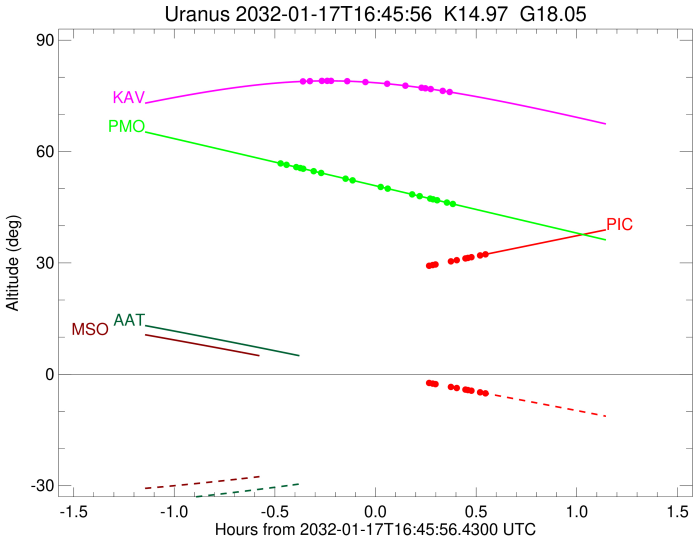
Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	|	|	+	JAN 17 17:18 - JAN 17 17:18	PnnRne
PAL	Palomar Mt (200")	33.4	243.1	|	|	|		PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++++++	|	+++++++++	JAN 17 16:17 - JAN 17 17:08	PnnRie
KPNO	Kitt Peak Natl 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	+++++++	|	+++++++	JAN 17 16:23 - JAN 17 17:07	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_2032-01-17T16_45_56.4300_PIC.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:15:55 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2032-01-17T16:49:35.080
Event type : XRgt
: No Uranus occs
: Ring occs: geocentric, topocentric
Observer code : PIC
Location : Pic du Midi
Latitude (deg) : 42.93656
E. Longitude (deg) : 0.14231
Altitude (km) : 2.890
Gaia source ID : 3416545191459378944
2Mass ID (if available) : 05314640+2326094
ICRS Star Coord at Epoch: 05h 31m 46.40077s +23:26:09.28726s
RUWE (>1.4 is poor) : 0.95
K magnitude : 14.972
G magnitude : 18.047
RP magnitude : 17.104
BP magnitude : 18.916
DUPflag : 0
Distance (au) : 18.250
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : -18.60
Sun-Target sep (deg) : 146.85
Sun-Moon sep (deg) : 79.83
B (ring opening deg) : 80.18
PA of pole (deg) : 33.74
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.967
C/A sky separation (km) : 39267.5
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

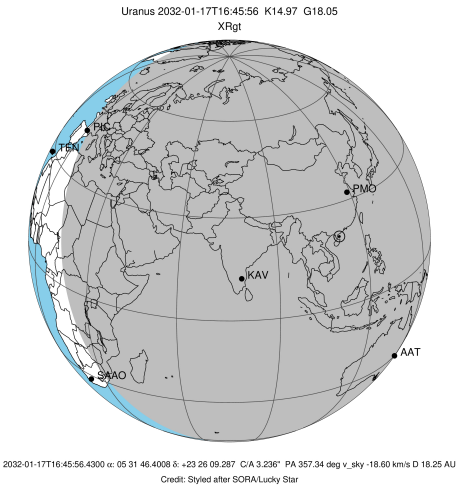
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-01-17T16:20:59.904		21.79	4.17x	51428.16	-11.85		
lambda	I	2032-01-17T16:22:59.891		22.15	3.86x	50026.71	-11.42		
delta	I	2032-01-17T16:25:35.883		22.62	3.46x	48300.35	-10.70		
gamma	I	2032-01-17T16:26:40.342		22.81	3.29x	47621.06	-10.38		
eta	I	2032-01-17T16:27:23.692		22.94	3.18x	47176.12	-10.15		
beta	I	2032-01-17T16:30:00.386		23.41	2.77x	45651.60	-9.28		
alpha	I	2032-01-17T16:31:44.065		23.72	2.50x	44722.07	-8.65		
4	I	2032-01-17T16:36:24.547		24.57	1.77x	42545.02	-6.80		
5	I	2032-01-17T16:37:04.316		24.69	1.67x	42287.76	-6.52		
6	I	2032-01-17T16:38:11.289		24.89	1.49x	41871.37	-5.99		

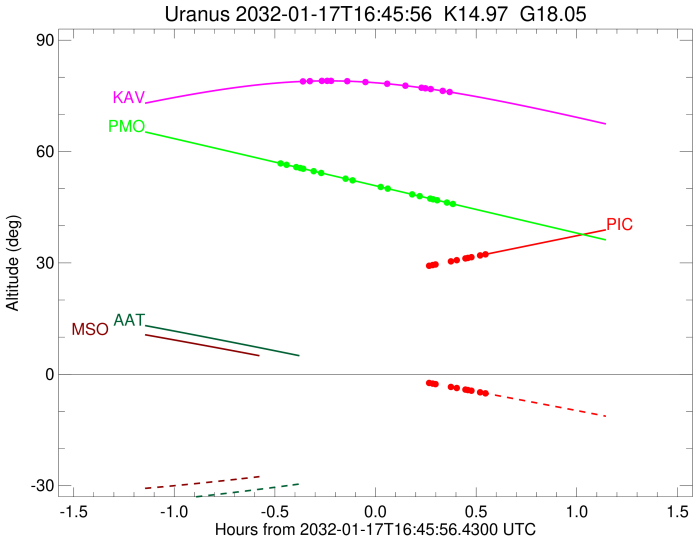
No planet occultations

6	E	2032-01-17T17:01:54.719		29.22	-2.34x	41849.02	6.00		
5	E	2032-01-17T17:03:08.667		29.45	-2.54x	42314.45	6.54		
4	E	2032-01-17T17:03:48.812		29.57	-2.65x	42576.96	6.82		
alpha	E	2032-01-17T17:08:20.899		30.40	-3.40x	44692.93	8.67		
beta	E	2032-01-17T17:10:06.365		30.72	-3.69x	45641.07	9.30		
eta	E	2032-01-17T17:12:43.806		31.20	-4.13x	47176.12	10.18		
gamma	E	2032-01-17T17:13:27.426		31.34	-4.25x	47625.22	10.41		
delta	E	2032-01-17T17:14:31.287		31.53	-4.43x	48300.35	10.73		
lambda	E	2032-01-17T17:17:06.758		32.01	-4.86x	50026.71	11.46		
epsilon	E	2032-01-17T17:18:23.211		32.24	-5.08	50915.91	11.89		

Uranus_2032-01-17T16_45_56.4300_PMO.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:20:07 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2032-01-17T16:42:46.720
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 : 3416545191459378944
2Mass ID (if available) : 05314640+2326094
ICRS Star Coord at Epoch: 05h 31m 46.40077s +23:26:09.28726s
RUWE (>1.4 is poor) : 0.95
K magnitude : 14.972
G magnitude : 18.047
RP magnitude : 17.104
BP magnitude : 18.916
DUPflag : 0
Distance (au) : 18.250
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : -18.60
Sun-Target sep (deg) : 146.85
Sun-Moon sep (deg) : 80.37
B (ring opening deg) : 80.18
PA of pole (deg) : 33.74
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.141
C/A sky separation (km) : 41570.2
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

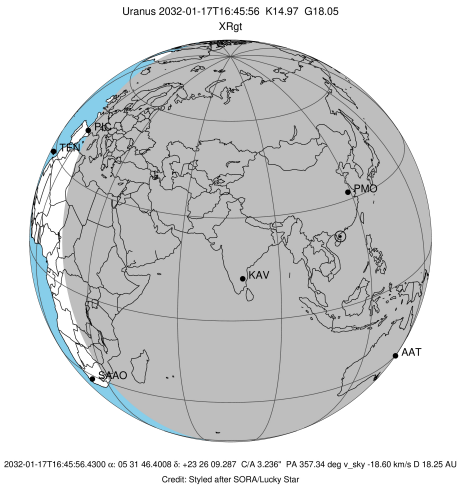
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-01-17T16:17:16.866		56.87	-78.82	51401.39	-10.87		
lambda	I	2032-01-17T16:19:25.830		56.42	-78.79	50026.71	-10.34		
delta	I	2032-01-17T16:22:20.608		55.80	-78.71	48300.35	-9.40		
gamma	I	2032-01-17T16:23:34.532		55.54	-78.66	47621.20	-8.97		
eta	I	2032-01-17T16:24:24.986		55.36	-78.63	47176.12	-8.67		
beta	I	2032-01-17T16:27:33.936		54.69	-78.47	45649.45	-7.46		
alpha	I	2032-01-17T16:29:47.085		54.22	-78.34	44717.31	-6.53		
4	I	2032-01-17T16:37:10.764		52.65	-77.76	42553.63	-3.13		
5	I	2032-01-17T16:38:46.883		52.31	-77.61	42300.83	-2.33		

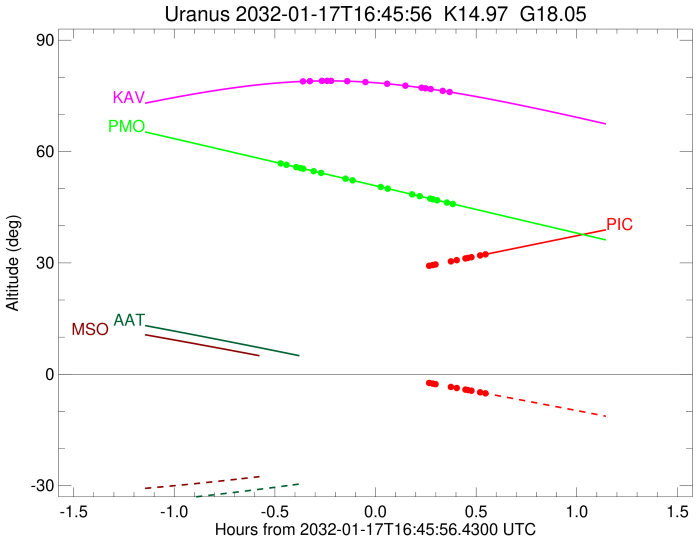
No planet occultations

5	E	2032-01-17T16:47:53.307		50.37	-76.60	42310.05	2.33		
4	E	2032-01-17T16:49:30.006		50.03	-76.39	42568.20	3.13		
alpha	E	2032-01-17T16:56:46.568		48.48	-75.41	44695.68	6.52		
beta	E	2032-01-17T16:59:02.017		48.00	-75.08	45641.26	7.44		
eta	E	2032-01-17T17:02:12.577		47.32	-74.60	47176.12	8.65		
gamma	E	2032-01-17T17:03:03.569		47.14	-74.46	47624.79	8.95		
delta	E	2032-01-17T17:04:17.302		46.88	-74.27	48300.35	9.37		
lambda	E	2032-01-17T17:07:12.627		46.26	-73.81	50026.71	10.31		
epsilon	E	2032-01-17T17:08:39.191		45.95	-73.57	50937.30	10.84		

Uranus_2032-01-17T16_45_56.4300_KAV.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:30:54 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2032-01-17T16:45:37.820
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 : 3416545191459378944
2Mass ID (if available) : 05314640+2326094
ICRS Star Coord at Epoch: 05h 31m 46.40077s +23:26:09.28726s
RUWE (>1.4 is poor) : 0.95
K magnitude : 14.972
G magnitude : 18.047
RP magnitude : 17.104
BP magnitude : 18.916
DUPflag : 0
Distance (au) : 18.250
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : -18.60
Sun-Target sep (deg) : 146.85
Sun-Moon sep (deg) : 80.48
B (ring opening deg) : 80.18
PA of pole (deg) : 33.74
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.335
C/A sky separation (km) : 44140.9
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	2032-01-17T16:23:56.656		78.88	-53.06	51371.77	-9.40		
lambda	I	2032-01-17T16:26:24.408		78.96	-53.63	50026.71	-8.68		
delta	I	2032-01-17T16:29:59.205		79.03	-54.46	48300.35	-7.37		
gamma	I	2032-01-17T16:31:35.494		79.04	-54.83	47621.44	-6.73		
eta	I	2032-01-17T16:32:44.032		79.03	-55.10	47176.12	-6.26		
beta	I	2032-01-17T16:37:37.663		78.95	-56.23	45646.69	-4.11		
alpha	I	2032-01-17T16:43:13.047		78.70	-57.52	44708.29	-1.44		

No planet occultations

alpha	E	2032-01-17T16:49:05.220		78.28	-58.87	44703.55	1.44		
beta	E	2032-01-17T16:54:42.655		77.75	-60.16	45642.17	4.11		
eta	E	2032-01-17T16:59:37.537		77.18	-61.29	47176.12	6.26		
gamma	E	2032-01-17T17:00:46.499		77.04	-61.55	47624.10	6.73		
delta	E	2032-01-17T17:02:22.435		76.83	-61.92	48300.35	7.36		
lambda	E	2032-01-17T17:05:57.346		76.34	-62.73	50026.71	8.68		
epsilon	E	2032-01-17T17:07:42.743		76.09	-63.13	50973.20	9.39		