

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-02-22T00:51:28.170
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3416207675751592448
 2Mass ID (if available) : 05282944+2324012

ICRS Star Coord at Epoch: 05h 28m 29.45218s +23:24:01.09893s

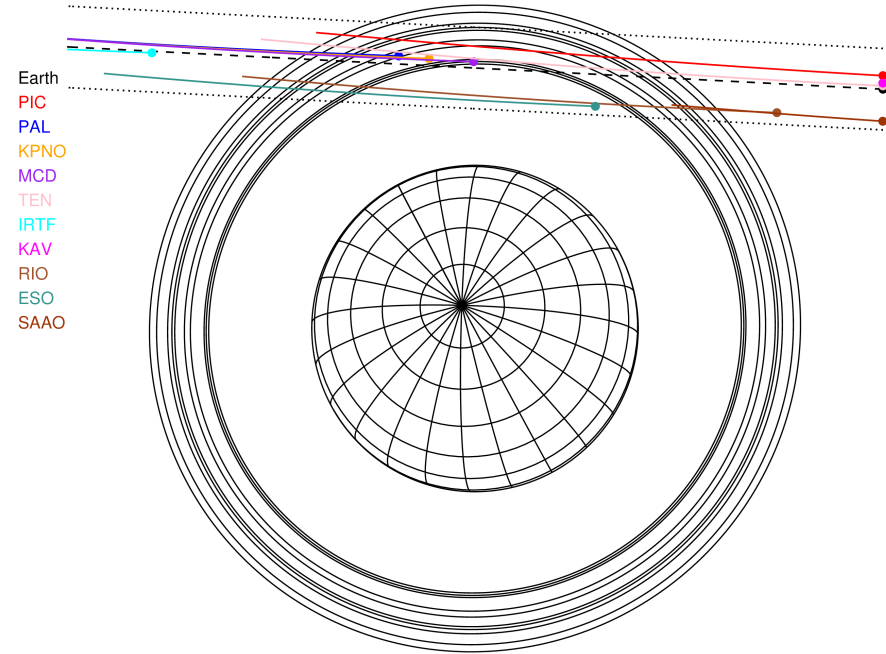
RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.682
 G magnitude : 17.563
 RP magnitude : 16.626
 BP magnitude : 18.481
 DUPflag : 0
 Distance (au) : 18.709
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -3.97
 Sun-Target sep (deg) : 110.27
 Sun-Moon sep (deg) : 23.49
 B (ring opening deg) : 80.61
 PA of pole (deg) : 29.74

#	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



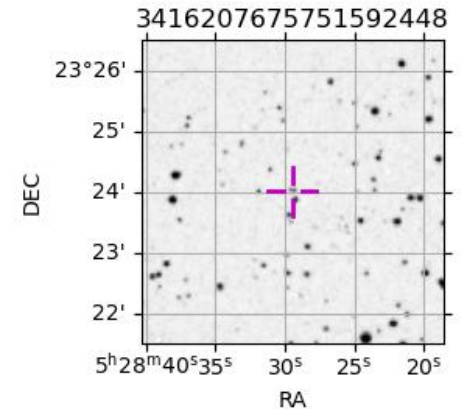
2032-02-22T00:51:28.1700 α: 05 28 29.4522 δ: +23 24 01.099 C/A 3.009° PA 177.03 deg v_sky - 3.98 km/s D 18.71 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2032-02-22T00:51:28 K14.68 G17.56 XRgt

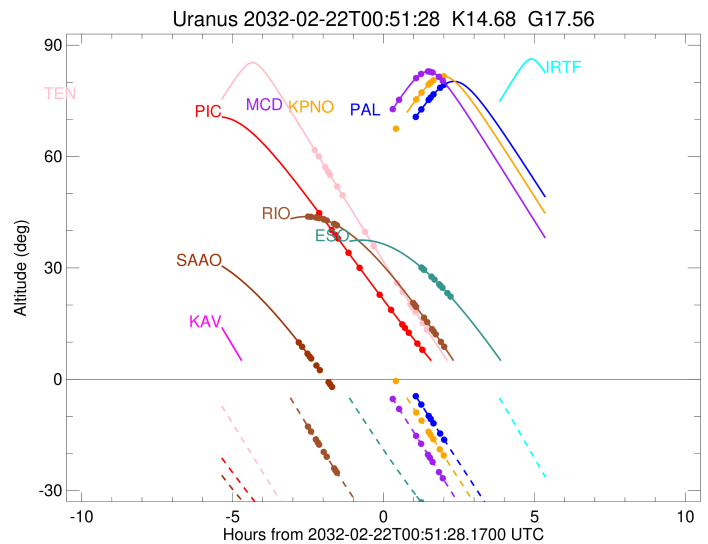
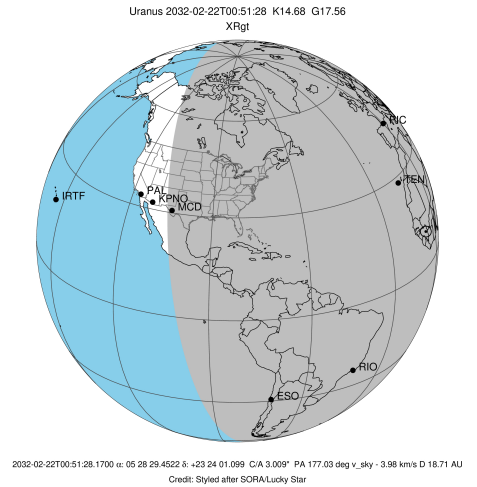


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++++		+++++++	FEB 21 22:40 - FEB 22 02:09	PnnRie
PAL	Palomar Mt (200")	33.4	243.1			+++++	FEB 22 02:06 - FEB 22 02:52	PnnRne
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4			+++++++	FEB 22 01:56 - FEB 22 02:51	PnnRne
MCD	McDonald Obs. 2.7m	30.7	256.0			+++++++	FEB 22 01:20 - FEB 22 02:49	PnnRne
TEN	Teide Obs./Tenerife	28.3	343.5	+++++++		+++++++	FEB 21 22:32 - FEB 22 02:18	PnnRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++++		+++++++	FEB 21 22:19 - FEB 22 02:52	PnnRie
ESO	European Southern Obs	-29.3	289.3			+++++++	FEB 22 02:06 - FEB 22 03:04	PnnRne
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++			FEB 21 22:00 - FEB 21 22:27	PnnRin
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-02-22T00:26:02.900
 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 : 3416207675751592448
 2Mass ID (if available) : 05282944+2324012
 ICRS Star Coord at Epoch: 05h 28m 29.45218s +23:24:01.09893s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.682
 G magnitude : 17.563
 RP magnitude : 16.626
 BP magnitude : 18.481
 DUPflag : 0
 Distance (au) : 18.709
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -3.97
 Sun-Target sep (deg) : 110.27
 Sun-Moon sep (deg) : 23.11
 B (ring opening deg) : 80.61
 PA of pole (deg) : 29.74
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.246
 C/A sky separation (km) : 44041.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.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



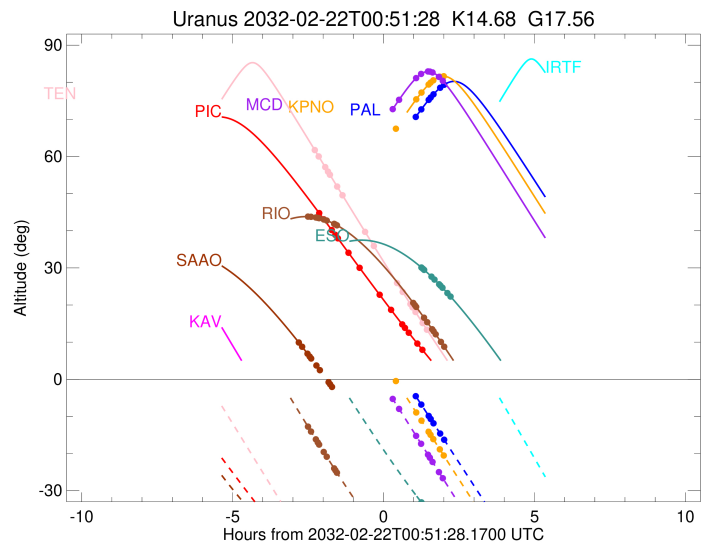
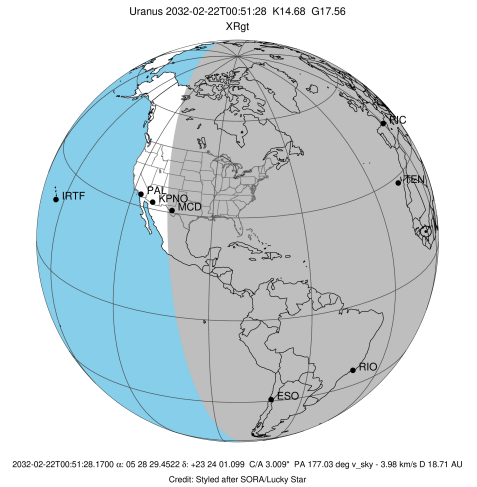
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-02-21T22:40:43.271		45.29	-51.96	51543.48	-2.17		
lambda	I	2032-02-21T22:52:55.584		43.07	-53.29	50026.71	-1.96		
delta	I	2032-02-21T23:08:46.525		40.17	-54.79	48300.35	-1.66		
gamma	I	2032-02-21T23:15:51.938		38.86	-55.38	47622.87	-1.52		
eta	I	2032-02-21T23:20:56.087		37.93	-55.76	47176.12	-1.42		
beta	I	2032-02-21T23:41:57.917		34.06	-56.99	45672.65	-0.96		
alpha	I	2032-02-22T00:03:25.436		30.12	-57.62	44750.90	-0.47		

No planet occultations

alpha	E	2032-02-22T00:44:23.968		22.66	-56.96	44752.33	0.46		
beta	E	2032-02-22T01:06:33.438		18.69	-55.62	45678.74	0.93		
eta	E	2032-02-22T01:28:31.716		14.82	-53.71	47176.12	1.34		
gamma	E	2032-02-22T01:33:57.425		13.87	-53.16	47626.44	1.43		
delta	E	2032-02-22T01:41:29.564		12.56	-52.35	48300.35	1.55		
lambda	E	2032-02-22T01:58:36.675		9.64	-50.31	50026.71	1.80		
epsilon	E	2032-02-22T02:09:34.704		7.79	-48.88	51262.30	1.97		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-02-22T01:06:46.040
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3416207675751592448
 2Mass ID (if available) : 05282944+2324012
 ICRS Star Coord at Epoch: 05h 28m 29.45218s +23:24:01.09893s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.682
 G magnitude : 17.563
 RP magnitude : 16.626
 BP magnitude : 18.481
 DUPflag : 0
 Distance (au) : 18.709
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -3.97
 Sun-Target sep (deg) : 110.27
 Sun-Moon sep (deg) : 24.23
 B (ring opening deg) : 80.61
 PA of pole (deg) : 29.74
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.115
 C/A sky separation (km) : 42271.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itr93_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

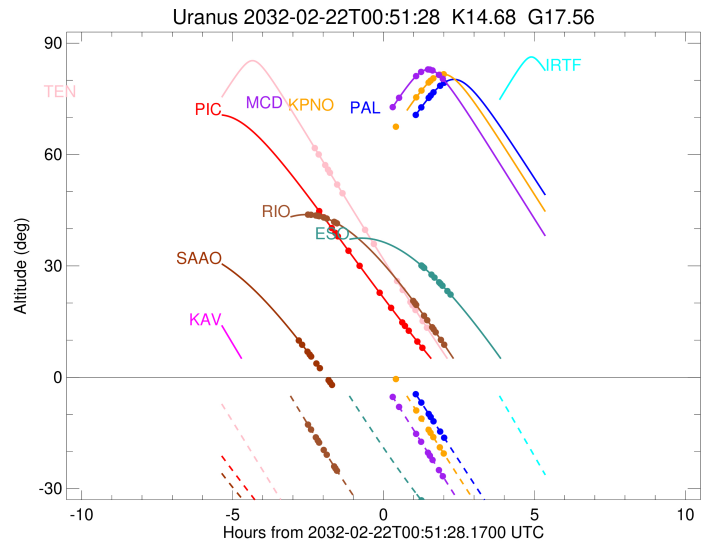
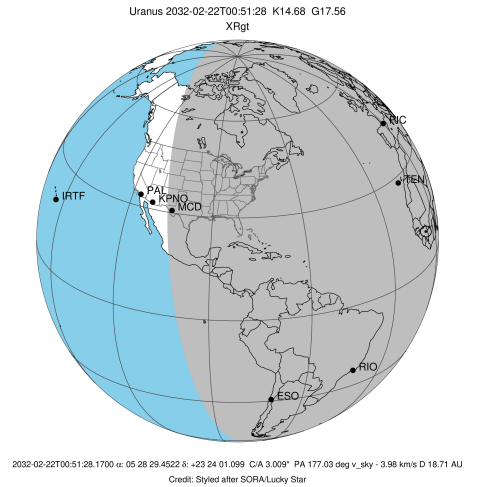
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-02-21T23:13:09.532		37.19	26.82x	51544.32	-2.37		
lambda	I	2032-02-21T23:24:09.334		39.49	24.91x	50026.71	-2.22		
delta	I	2032-02-21T23:37:47.142		42.34	22.49x	48300.35	-2.00		
gamma	I	2032-02-21T23:43:35.101		43.56	21.43x	47622.73	-1.90		
eta	I	2032-02-21T23:47:35.315		44.40	20.70x	47176.12	-1.82		
beta	I	2032-02-22T00:02:32.466		47.54	17.92x	45671.37	-1.53		
alpha	I	2032-02-22T00:13:27.838		49.83	15.86x	44749.26	-1.29		

No planet occultations

alpha	E	2032-02-22T01:55:48.603		70.70	-4.60x	44751.98	1.31		
beta	E	2032-02-22T02:06:37.023		72.71	-6.83	45680.20	1.56		
eta	E	2032-02-22T02:21:10.035		75.24	-9.85	47176.12	1.86		
gamma	E	2032-02-22T02:25:06.926		75.88	-10.67	47627.19	1.94		
delta	E	2032-02-22T02:30:43.977		76.74	-11.84	48300.35	2.05		
lambda	E	2032-02-22T02:43:59.368		78.52	-14.61	50026.71	2.29		
epsilon	E	2032-02-22T02:52:25.094		79.38	-16.37	51217.81	2.45		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2032-02-22T01:04:54.540
Event type          : XRgt
: No Uranus occs
: Ring occs: geocentric, topocentric
Observer code       : KPNO
Location            : Kitt Peak Natl Obs
Latitude (deg)      : 31.96333
E. Longitude (deg)  : 248.40000
Altitude (km)       : 2.120
Gaia source ID      : 3416207675751592448
2Mass ID (if available) : 05282944+2324012
ICRS Star Coord at Epoch: 05h 28m 29.45218s +23:24:01.09893s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 14.682
G magnitude          : 17.563
RP magnitude         : 16.626
BP magnitude         : 18.481
DUPflag             : 0
Distance (au)       : 18.709
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -3.97
Sun-Target sep (deg) : 110.27
Sun-Moon sep (deg)  : 24.19
B (ring opening deg) : 80.61
PA of pole (deg)    : 29.74
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.097
C/A sky separation (km) : 42018.0
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall11.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall11.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.bsp
earthstns_itr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```

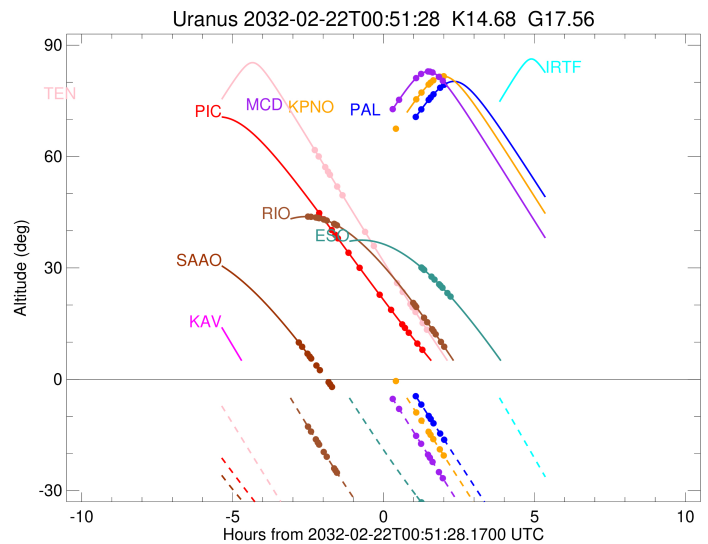
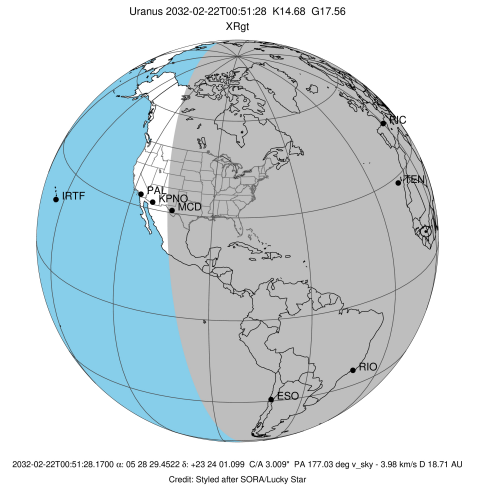


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-02-21T23:10:39.188		40.96	24.29x	51545.29	-2.42		
lambda	I	2032-02-21T23:21:24.807		43.25	22.31x	50026.71	-2.27		
delta	I	2032-02-21T23:34:41.633		46.08	19.82x	48300.35	-2.06		
gamma	I	2032-02-21T23:40:19.345		47.27	18.75x	47622.67	-1.96		
eta	I	2032-02-21T23:44:11.825		48.10	18.01x	47176.12	-1.88		
beta	I	2032-02-21T23:58:34.249		51.16	15.22x	45671.07	-1.60		
alpha	I	2032-02-22T00:08:54.644		53.36	13.18x	44748.96	-1.38		
4	I	2032-02-22T00:53:12.527		62.74	4.25x	42526.71	-0.27		

No planet occultations

4	E	2032-02-22T01:12:48.108		66.81	0.21x	42527.92	0.27		
alpha	E	2032-02-22T01:56:43.597		75.44	-8.99	44751.89	1.39		
beta	E	2032-02-22T02:06:59.165		77.23	-11.15	45680.28	1.63		
eta	E	2032-02-22T02:21:01.064		79.38	-14.13	47176.12	1.92		
gamma	E	2032-02-22T02:24:51.303		79.88	-14.94	47627.23	2.00		
delta	E	2032-02-22T02:30:19.790		80.51	-16.10	48300.35	2.10		
lambda	E	2032-02-22T02:43:18.564		81.48	-18.86	50026.71	2.33		
epsilon	E	2032-02-22T02:51:34.694		81.63	-20.61	51215.29	2.49		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-02-22T01:01:54.690
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 3416207675751592448
 2Mass ID (if available) : 05282944+2324012
 ICRS Star Coord at Epoch: 05h 28m 29.45218s +23:24:01.09893s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.682
 G magnitude : 17.563
 RP magnitude : 16.626
 BP magnitude : 18.481
 DUPflag : 0
 Distance (au) : 18.709
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -3.97
 Sun-Target sep (deg) : 110.27
 Sun-Moon sep (deg) : 24.12
 B (ring opening deg) : 80.61
 PA of pole (deg) : 29.74
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.077
 C/A sky separation (km) : 41747.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

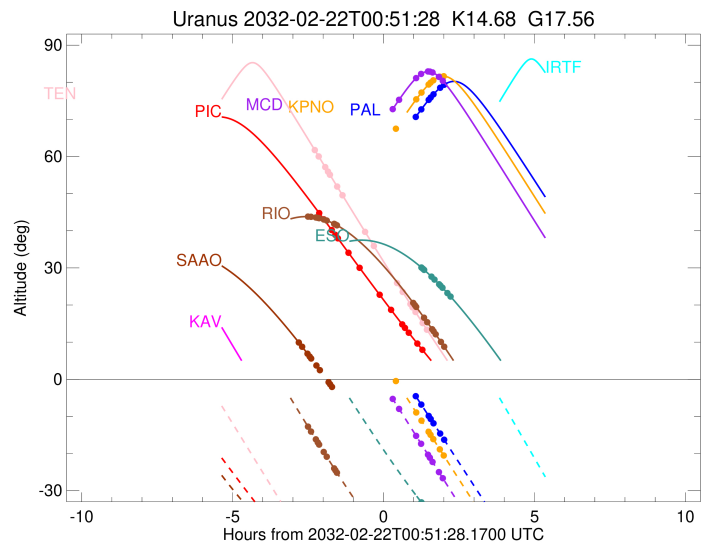
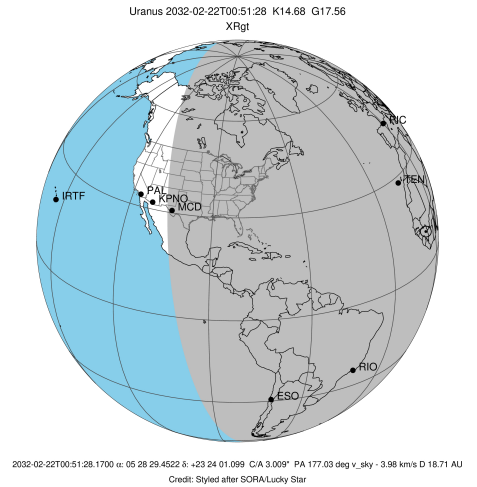


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-02-21T23:07:08.390		46.60	19.86x	51546.37	-2.48		
lambda	I	2032-02-21T23:17:38.317		48.86	17.81x	50026.71	-2.33		
delta	I	2032-02-21T23:30:32.562		51.65	15.26x	48300.35	-2.12		
gamma	I	2032-02-21T23:35:59.496		52.83	14.17x	47622.61	-2.02		
eta	I	2032-02-21T23:39:43.950		53.64	13.42x	47176.12	-1.95		
beta	I	2032-02-21T23:53:31.481		56.61	10.63x	45670.73	-1.68		
alpha	I	2032-02-22T00:03:18.635		58.72	8.63x	44748.63	-1.47		
4	I	2032-02-22T00:39:20.540		66.43	1.14x	42526.15	-0.57		
5	I	2032-02-22T00:53:31.167		69.41	-1.84x	42204.62	-0.17		

No planet occultations

5	E	2032-02-22T01:06:00.325		71.99	-4.49x	42199.12	0.17		
4	E	2032-02-22T01:20:41.290		74.94	-7.62	42528.69	0.57		
alpha	E	2032-02-22T01:56:28.545		81.15	-15.28	44751.80	1.48		
beta	E	2032-02-22T02:06:14.103		82.26	-17.38	45680.35	1.70		
eta	E	2032-02-22T02:19:46.574		82.92	-20.30	47176.12	1.98		
gamma	E	2032-02-22T02:23:30.435		82.88	-21.10	47627.28	2.05		
delta	E	2032-02-22T02:28:50.697		82.66	-22.25	48300.35	2.15		
lambda	E	2032-02-22T02:41:33.519		81.47	-24.99	50026.71	2.37		
epsilon	E	2032-02-22T02:49:40.643		80.34	-26.73	51213.14	2.53		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-02-22T00:25:36.590
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 3416207675751592448
 2Mass ID (if available) : 05282944+2324012
 ICRS Star Coord at Epoch: 05h 28m 29.45218s +23:24:01.09893s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.682
 G magnitude : 17.563
 RP magnitude : 16.626
 BP magnitude : 18.481
 DUPflag : 0
 Distance (au) : 18.709
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -3.97
 Sun-Target sep (deg) : 110.27
 Sun-Moon sep (deg) : 23.06
 B (ring opening deg) : 80.61
 PA of pole (deg) : 29.74
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.105
 C/A sky separation (km) : 42125.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

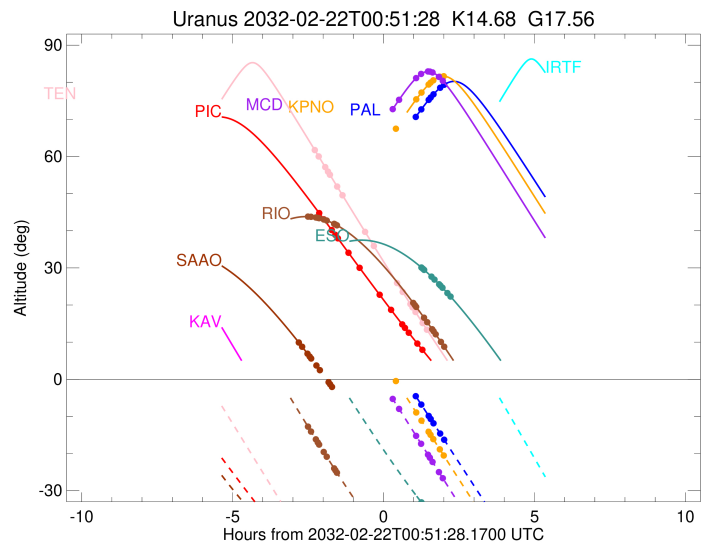
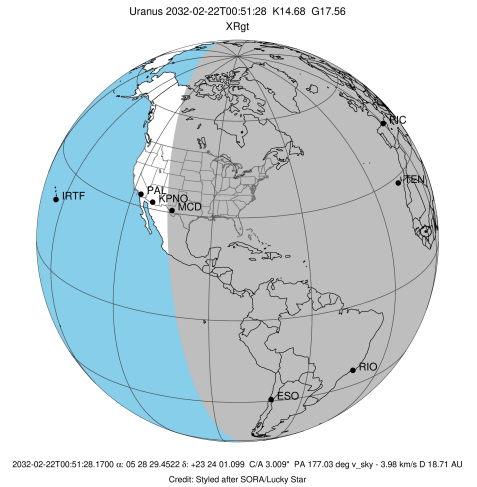


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-02-21T22:32:19.519		62.31	-47.05	51549.09	-2.51		
lambda	I	2032-02-21T22:42:47.037		60.00	-49.26	50026.71	-2.34		
delta	I	2032-02-21T22:55:45.877		57.13	-51.96	48300.35	-2.09		
gamma	I	2032-02-21T23:01:18.274		55.90	-53.10	47622.49	-1.98		
eta	I	2032-02-21T23:05:07.767		55.06	-53.88	47176.12	-1.91		
beta	I	2032-02-21T23:19:26.394		51.90	-56.75	45670.27	-1.60		
alpha	I	2032-02-21T23:29:51.026		49.60	-58.78	44748.27	-1.36		
4	I	2032-02-22T00:25:22.446		37.41	-68.20	42532.50	-0.03		

No planet occultations

4	E	2032-02-22T00:21:41.224		38.21	-67.69	42532.57	0.03		
alpha	E	2032-02-22T01:18:37.025		25.88	-72.28	44752.17	1.29		
beta	E	2032-02-22T01:29:40.526		23.51	-72.12	45679.92	1.51		
eta	E	2032-02-22T01:44:51.070		20.28	-71.30	47176.12	1.77		
gamma	E	2032-02-22T01:49:00.611		19.40	-70.97	47626.96	1.84		
delta	E	2032-02-22T01:54:57.657		18.14	-70.42	48300.35	1.93		
lambda	E	2032-02-22T02:09:07.154		15.17	-68.79	50026.71	2.13		
epsilon	E	2032-02-22T02:18:20.019		13.25	-67.53	51235.53	2.27		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-02-22T00:35:33.950
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 3416207675751592448
 2Mass ID (if available) : 05282944+2324012
 ICRS Star Coord at Epoch: 05h 28m 29.45218s +23:24:01.09893s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.682
 G magnitude : 17.563
 RP magnitude : 16.626
 BP magnitude : 18.481
 DUPflag : 0
 Distance (au) : 18.709
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -3.97
 Sun-Target sep (deg) : 110.27
 Sun-Moon sep (deg) : 23.13
 B (ring opening deg) : 80.61
 PA of pole (deg) : 29.74
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.683
 C/A sky separation (km) : 36402.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itrff93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

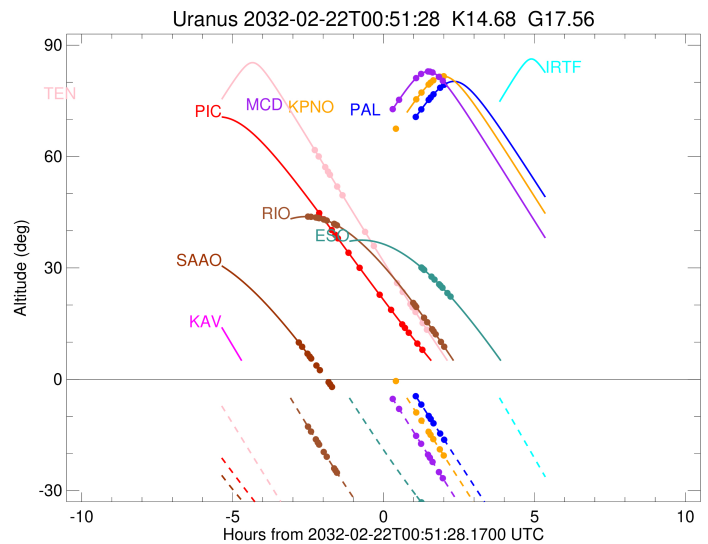
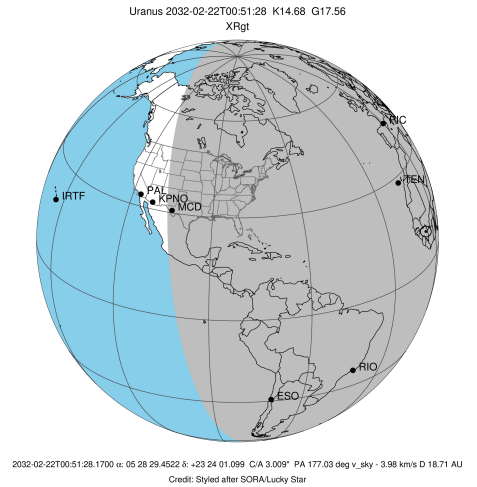


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-02-21T22:19:17.793		43.82	-12.31	51555.26	-3.17		
lambda	I	2032-02-21T22:27:27.850		43.76	-14.11	50026.71	-3.07		
delta	I	2032-02-21T22:37:03.565		43.58	-16.20	48300.35	-2.93		
gamma	I	2032-02-21T22:40:57.573		43.47	-17.05	47621.81	-2.87		
eta	I	2032-02-21T22:43:34.008		43.39	-17.62	47176.12	-2.83		
beta	I	2032-02-21T22:52:42.682		43.04	-19.60	45665.66	-2.68		
alpha	I	2032-02-21T22:58:34.949		42.76	-20.86	44742.78	-2.57		
4	I	2032-02-21T23:13:50.832		41.84	-24.11	42528.35	-2.26		
5	I	2032-02-21T23:15:58.099		41.69	-24.55	42243.68	-2.21		
6	I	2032-02-21T23:18:46.554		41.48	-25.14	41879.71	-2.15		

No planet occultations

6	E	2032-02-22T01:50:37.362		20.55	-52.00	41862.27	2.05		
5	E	2032-02-22T01:53:10.639		20.09	-52.30	42172.12	2.10		
4	E	2032-02-22T01:55:58.237		19.58	-52.62	42536.80	2.15		
alpha	E	2032-02-22T02:12:06.635		16.57	-54.28	44749.47	2.42		
beta	E	2032-02-22T02:18:25.745		15.36	-54.83	45681.14	2.51		
eta	E	2032-02-22T02:28:06.757		13.50	-55.55	47176.12	2.64		
gamma	E	2032-02-22T02:30:57.149		12.95	-55.73	47628.14	2.67		
delta	E	2032-02-22T02:35:06.646		12.13	-55.98	48300.35	2.72		
lambda	E	2032-02-22T02:45:28.983		10.09	-56.46	50026.71	2.83		
epsilon	E	2032-02-22T02:52:05.733		8.77	-56.67	51160.92	2.91		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-02-22T00:48:03.330
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 3416207675751592448
 2Mass ID (if available) : 05282944+2324012
 ICRS Star Coord at Epoch: 05h 28m 29.45218s +23:24:01.09893s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.682
 G magnitude : 17.563
 RP magnitude : 16.626
 BP magnitude : 18.481
 DUPflag : 0
 Distance (au) : 18.709
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -3.97
 Sun-Target sep (deg) : 110.27
 Sun-Moon sep (deg) : 23.48
 B (ring opening deg) : 80.61
 PA of pole (deg) : 29.74
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.629
 C/A sky separation (km) : 35674.3
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ural11.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ural11.bsp
 ural61.bsp
 vgr2.ural61.bsp
 peph.ural60.bsp
 earthstns_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



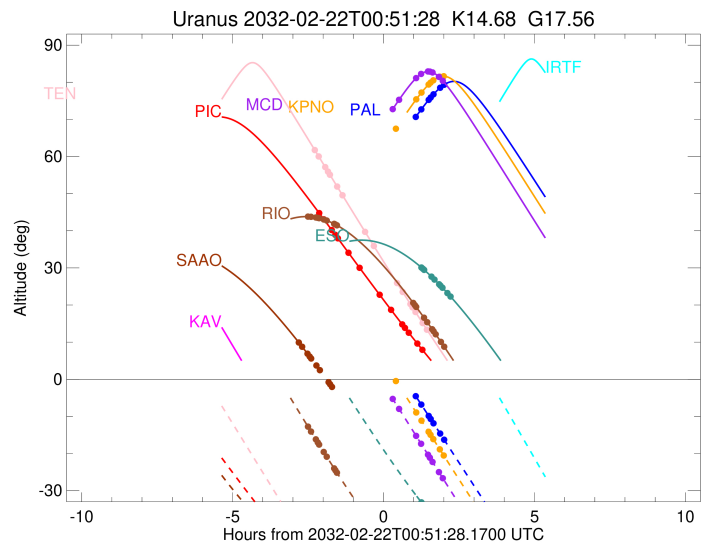
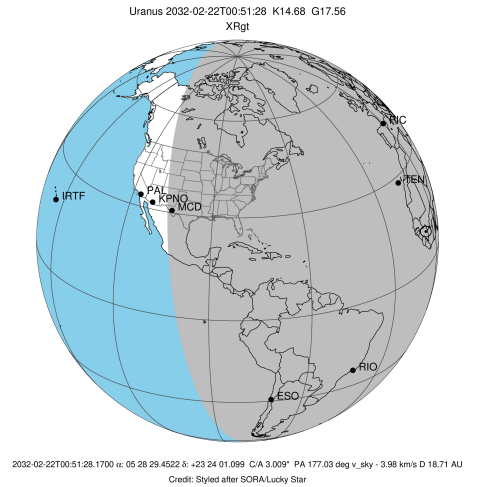
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-02-21T22:28:35.913		32.32	11.10x	51555.28	-3.18		
lambda	I	2032-02-21T22:36:43.253		33.10	9.34x	50026.71	-3.09		
delta	I	2032-02-21T22:46:13.059		33.94	7.28x	48300.35	-2.97		
gamma	I	2032-02-21T22:50:03.732		34.26	6.45x	47621.79	-2.92		
eta	I	2032-02-21T22:52:37.593		34.47	5.89x	47176.12	-2.88		
beta	I	2032-02-21T23:01:35.007		35.13	3.96x	45665.46	-2.74		
alpha	I	2032-02-21T23:07:17.861		35.51	2.73x	44742.50	-2.65		
4	I	2032-02-21T23:21:58.947		36.35	-0.42x	42528.60	-2.37		
5	I	2032-02-21T23:23:59.539		36.44	-0.85x	42245.09	-2.32		
6	I	2032-02-21T23:26:39.697		36.57	-1.42x	41879.67	-2.27		

No planet occultations

6	E	2032-02-22T02:06:53.981		30.10	-33.16	41860.51	2.23		
5	E	2032-02-22T02:09:14.957		29.82	-33.56	42169.75	2.27		
4	E	2032-02-22T02:11:51.526		29.51	-34.01	42538.26	2.32		
alpha	E	2032-02-22T02:26:54.105		27.64	-36.52	44748.85	2.58		
beta	E	2032-02-22T02:32:50.634		26.85	-37.48	45681.20	2.66		
eta	E	2032-02-22T02:41:58.549		25.60	-38.90	47176.12	2.79		
gamma	E	2032-02-22T02:44:39.652		25.23	-39.31	47628.33	2.82		
delta	E	2032-02-22T02:48:35.607		24.67	-39.90	48300.35	2.87		
lambda	E	2032-02-22T02:58:25.282		23.23	-41.32	50026.71	2.98		
epsilon	E	2032-02-22T03:04:37.057		22.30	-42.18	51146.69	3.07		


```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2032-02-22T00:23:20.290
Event type            : XRgt
: No Uranus occs
: Ring occs: geocentric, topocentric
Observer code         : SAAO
Location              : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)        : -32.37953
E. Longitude (deg)    : 20.81070
Altitude (km)         : 1.768
Gaia source ID        : 3416207675751592448
2Mass ID (if available) : 05282944+2324012
ICRS Star Coord at Epoch: 05h 28m 29.45218s +23:24:01.09893s
RUWE (>1.4 is poor)  : 0.97
K magnitude           : 14.682
G magnitude           : 17.563
RP magnitude          : 16.626
BP magnitude          : 18.481
DUPflag              : 0
Distance (au)         : 18.709
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s)  : -3.97
Sun-Target sep (deg)  : 110.27
Sun-Moon sep (deg)    : 22.63
B (ring opening deg)  : 80.61
PA of pole (deg)      : 29.74
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.771
C/A sky separation (km) : 37602.9
NAIF SPICE kernels    : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.bsp
earthstns_itr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-02-21T22:00:51.992		10.29	-45.73	51555.22	-2.90		
lambda	I	2032-02-21T22:09:50.300		8.74	-46.25	50026.71	-2.78		
delta	I	2032-02-21T22:20:28.980		6.87	-46.75	48300.35	-2.63		
gamma	I	2032-02-21T22:24:50.769		6.10	-46.91	47621.85	-2.56		
eta	I	2032-02-21T22:27:46.590		5.57	-47.00	47176.12	-2.51		
beta	I	2032-02-21T22:38:08.682		3.70x	-47.25	45666.02	-2.34		
alpha	I	2032-02-21T22:44:53.501		2.46x	-47.33	44743.30	-2.22		
4	I	2032-02-21T23:02:53.373		-0.89x	-47.25	42527.89	-1.87		
5	I	2032-02-21T23:05:28.564		-1.38x	-47.20	42240.88	-1.81		
6	I	2032-02-21T23:08:52.968		-2.02x	-47.12	41879.75	-1.75		

No planet occultations

6	E	2032-02-22T01:36:39.296		-31.77x	-31.75	41864.92	1.61		
5	E	2032-02-22T01:39:54.190		-32.45x	-31.22	42176.12	1.67		
4	E	2032-02-22T01:43:21.244		-33.17x	-30.66	42534.71	1.72		
alpha	E	2032-02-22T02:03:12.656		-37.35x	-27.28	44750.28	2.00		
beta	E	2032-02-22T02:10:49.581		-38.95x	-25.94	45681.00	2.09		
eta	E	2032-02-22T02:22:24.410		-41.40x	-23.86	47176.12	2.21		
gamma	E	2032-02-22T02:25:46.890		-42.11x	-23.25	47627.87	2.25		
delta	E	2032-02-22T02:30:42.865		-43.16x	-22.34	48300.35	2.30		
lambda	E	2032-02-22T02:42:57.282		-45.75x	-20.06	50026.71	2.40		
epsilon	E	2032-02-22T02:50:50.633		-47.43x	-18.57	51179.12	2.49		