

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-06T06:06:46.070
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3424869701370727296
 2Mass ID (if available) : 05590290+2339011

ICRS Star Coord at Epoch: 05h 59m 02.90639s +23:39:00.61472s

RUWE (>1.4 is poor) : 1.06
 K magnitude : 12.406
 G magnitude : 15.006
 RP magnitude : 14.174
 BP magnitude : 15.731
 DUPflag : 0
 Distance (au) : 18.071
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.34
 Sun-Target sep (deg) : 164.43
 Sun-Moon sep (deg) : 151.70
 B (ring opening deg) : 75.53
 PA of pole (deg) : 56.40

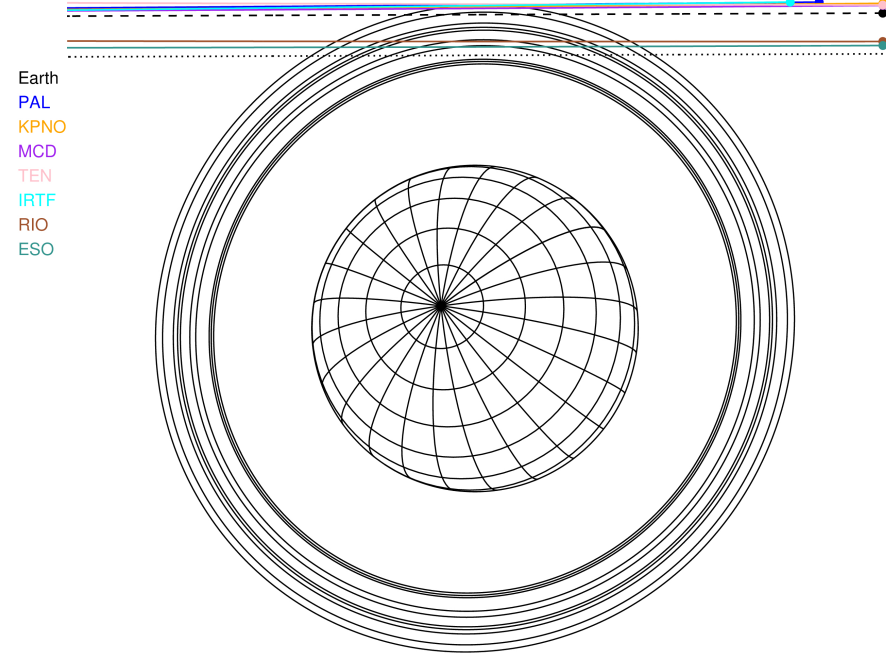
a(km) ring

- 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



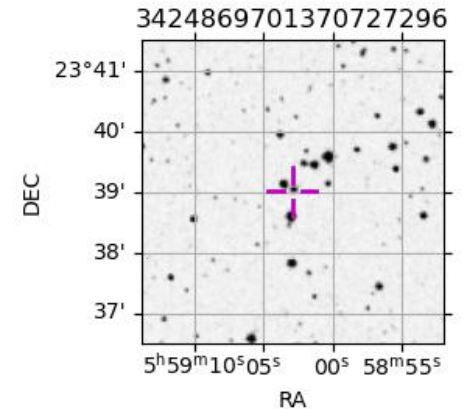
2032-12-06T06:06:46.0700 ex: 05 59 02.9064 ex: +23 39 00.615 C/A 3.758" PA 180.21 deg v_sky -22.34 km/s D 18.07 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2032-12-06T06:06:46 K12.41 G15.01 XRgt

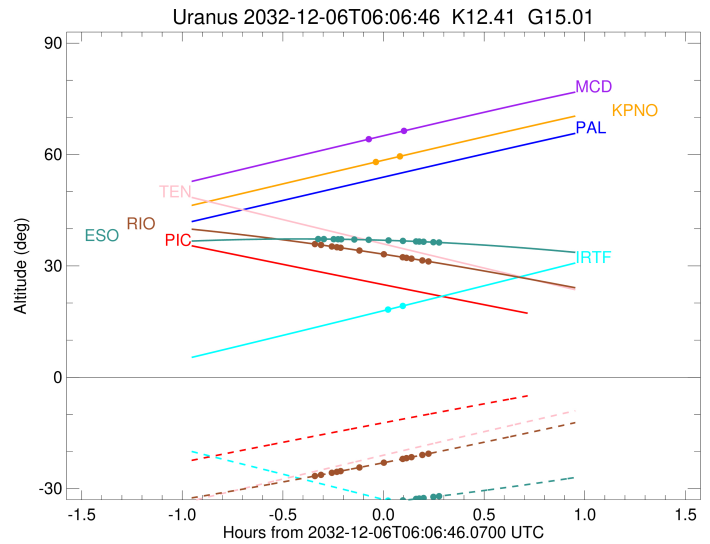
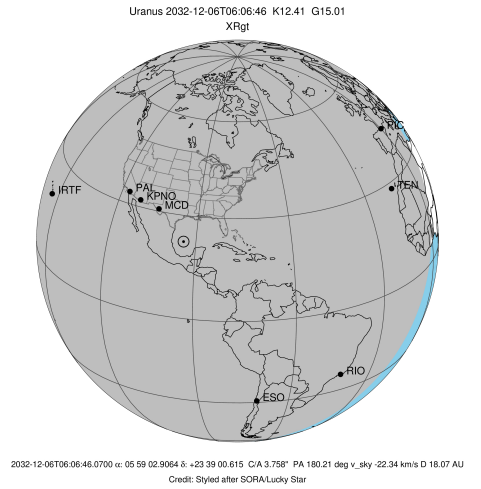


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
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					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+			DEC 06 06:02 - DEC 06 06:13	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+			DEC 06 06:00 - DEC 06 06:14	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+			DEC 06 06:05 - DEC 06 06:15	PnnRie
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++		+++++	DEC 06 05:45 - DEC 06 06:20	PnnRie
ESO	European Southern Obs	-29.3	289.3	+++++		+++++	DEC 06 05:46 - DEC 06 06:23	PnnRie
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



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-06T06:09:10.600
 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 : 3424869701370727296
 2Mass ID (if available) : 05590290+2339011
 ICRS Star Coord at Epoch: 05h 59m 02.90639s +23:39:00.61472s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 12.406
 G magnitude : 15.006
 RP magnitude : 14.174
 BP magnitude : 15.731
 DUPflag : 0
 Distance (au) : 18.071
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.34
 Sun-Target sep (deg) : 164.43
 Sun-Moon sep (deg) : 152.53
 B (ring opening deg) : 75.53
 PA of pole (deg) : 56.40
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.846
 C/A sky separation (km) : 50405.4
 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

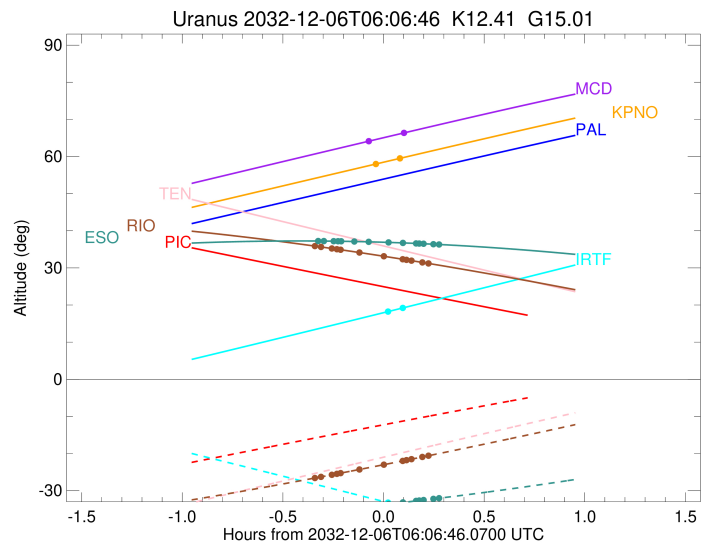
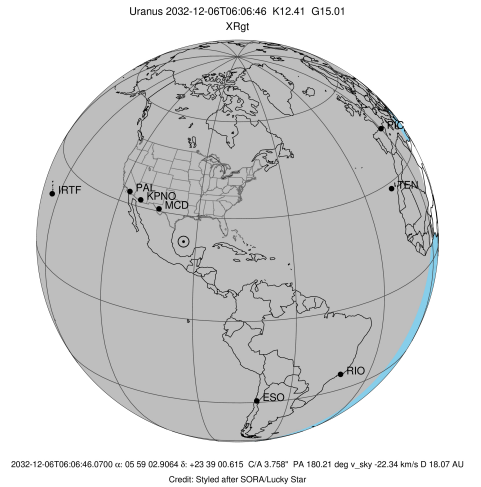
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-12-06T06:02:17.091		57.52	-70.93	51562.08	-3.64		

No planet occultations

epsilon	E	2032-12-06T06:13:44.852		59.95	-73.11	51531.65	3.63		
---------	---	-------------------------	--	-------	--------	----------	------	--	--

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2032-12-06T06:08:42.980
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      : 3424869701370727296
2Mass ID (if available) : 05590290+2339011
ICRS Star Coord at Epoch: 05h 59m 02.90639s +23:39:00.61472s
RUWE (>1.4 is poor) : 1.06
K magnitude         : 12.406
G magnitude         : 15.006
RP magnitude        : 14.174
BP magnitude        : 15.731
DUPflag            : 0
Distance (au)       : 18.071
f0 (km)            : 0.000
g0 (km)            : 0.000
skyplane vel. (km/s) : -22.34
Sun-Target sep (deg) : 164.43
Sun-Moon sep (deg)  : 152.47
B (ring opening deg) : 75.53
PA of pole (deg)    : 56.40
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.825
C/A sky separation (km) : 50128.1
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl1.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
  
```

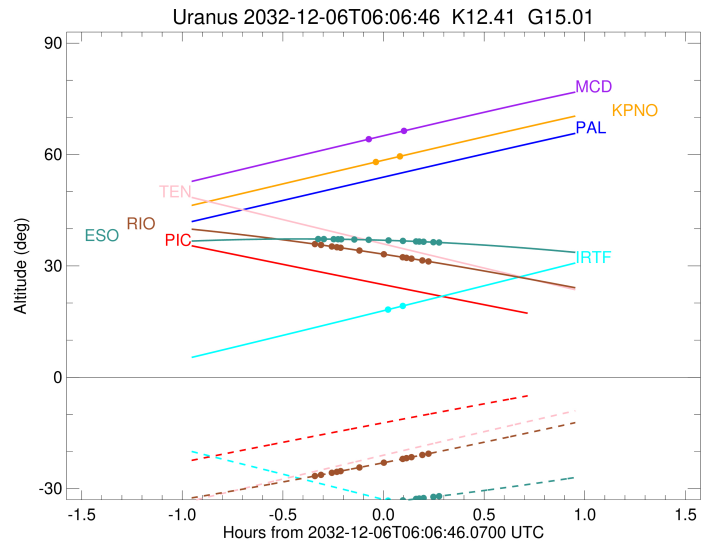
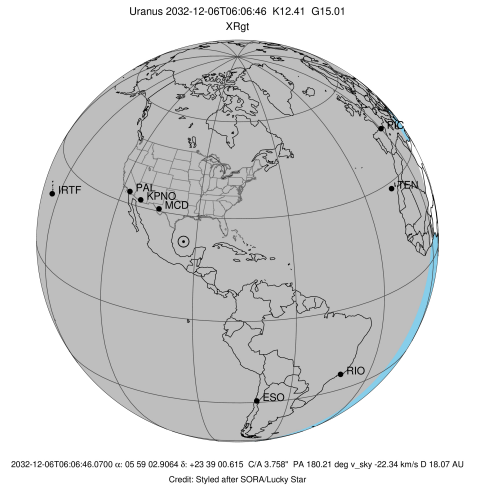


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-12-06T06:00:41.001		63.77	-76.92	51556.32	-4.35		

No planet occultations

epsilon	E	2032-12-06T06:14:26.720		66.70	-79.20	51522.03	4.36		
---------	---	-------------------------	--	-------	--------	----------	------	--	--

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-06T06:11:25.990
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 3424869701370727296
 2Mass ID (if available) : 05590290+2339011
 ICRS Star Coord at Epoch: 05h 59m 02.90639s +23:39:00.61472s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 12.406
 G magnitude : 15.006
 RP magnitude : 14.174
 BP magnitude : 15.731
 DUPflag : 0
 Distance (au) : 18.071
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.34
 Sun-Target sep (deg) : 164.43
 Sun-Moon sep (deg) : 152.67
 B (ring opening deg) : 75.53
 PA of pole (deg) : 56.40
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.857
 C/A sky separation (km) : 50552.3
 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

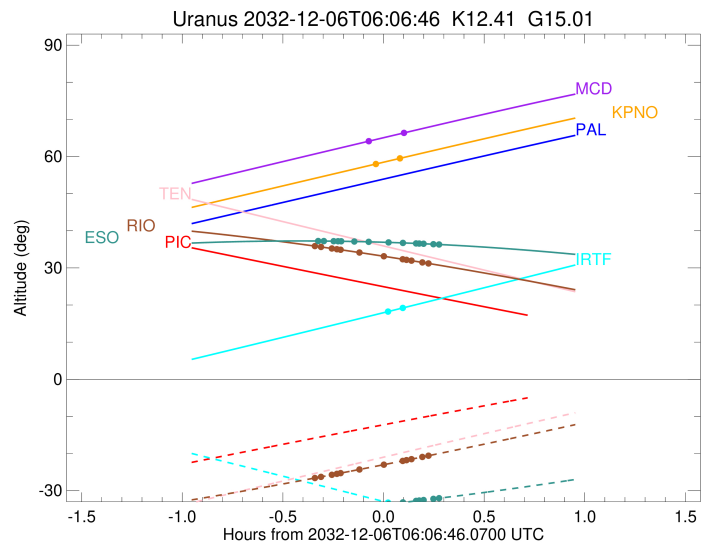
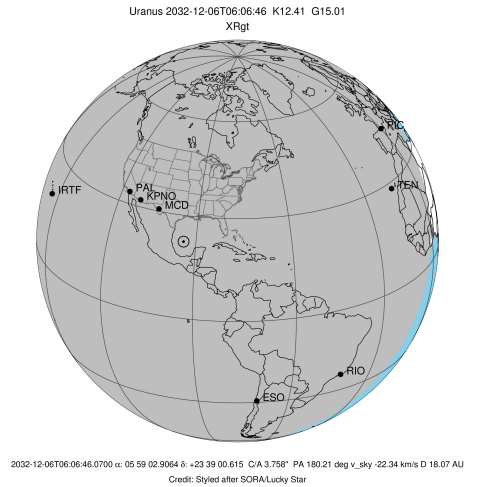


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-12-06T06:05:12.879		17.59	-32.56	51604.77	-3.27		

No planet occultations

epsilon	E	2032-12-06T06:15:17.208		19.83	-34.86	51566.36	3.23		
---------	---	-------------------------	--	-------	--------	----------	------	--	--

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-06T06:04:12.250
 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 : 3424869701370727296
 2Mass ID (if available) : 05590290+2339011
 ICRS Star Coord at Epoch: 05h 59m 02.90639s +23:39:00.61472s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 12.406
 G magnitude : 15.006
 RP magnitude : 14.174
 BP magnitude : 15.731
 DUPflag : 0
 Distance (au) : 18.071
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.34
 Sun-Target sep (deg) : 164.43
 Sun-Moon sep (deg) : 151.40
 B (ring opening deg) : 75.53
 PA of pole (deg) : 56.40
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.429
 C/A sky separation (km) : 44943.2
 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

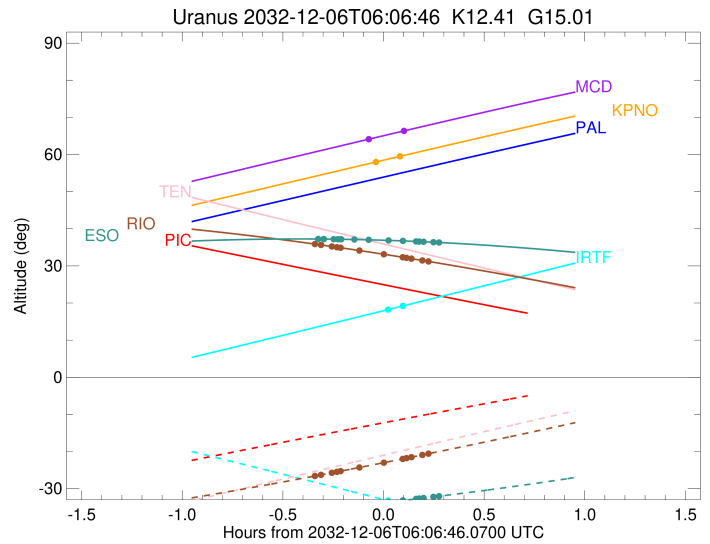
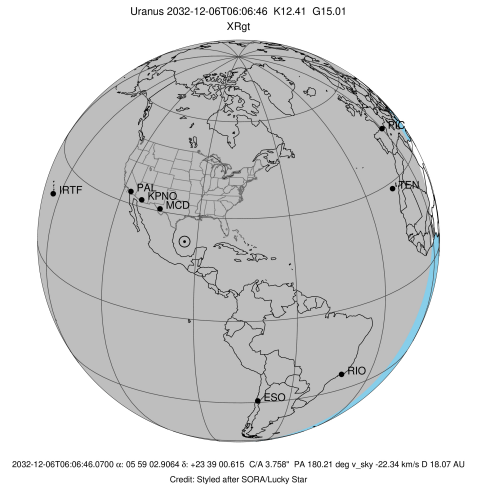


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-12-06T05:45:43.805		35.95	-26.70	51539.77	-11.05		
lambda	I	2032-12-06T05:48:09.331		35.64	-26.29	50026.71	-9.77		
delta	I	2032-12-06T05:51:23.961		35.23	-25.73	48300.35	-7.94		
gamma	I	2032-12-06T05:52:53.980		35.03	-25.47	47626.24	-7.03		
eta	I	2032-12-06T05:54:01.359		34.88	-25.28	47176.12	-6.33		
beta	I	2032-12-06T05:59:41.611		34.13	-24.28	45661.78	-2.50		

No planet occultations

beta	E	2032-12-06T06:06:45.175		33.15	-23.03	45657.47	2.50		
eta	E	2032-12-06T06:12:27.271		32.34	-22.00	47176.12	6.32		
gamma	E	2032-12-06T06:13:34.270		32.18	-21.80	47623.19	7.02		
delta	E	2032-12-06T06:15:04.806		31.96	-21.53	48300.35	7.93		
lambda	E	2032-12-06T06:18:19.654		31.48	-20.93	50026.71	9.76		
epsilon	E	2032-12-06T06:20:37.779		31.13	-20.51	51456.49	11.04		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-06T06:06:15.920
 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 : 3424869701370727296
 2Mass ID (if available) : 05590290+2339011
 ICRS Star Coord at Epoch: 05h 59m 02.90639s +23:39:00.61472s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 12.406
 G magnitude : 15.006
 RP magnitude : 14.174
 BP magnitude : 15.731
 DUPflag : 0
 Distance (au) : 18.071
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.34
 Sun-Target sep (deg) : 164.43
 Sun-Moon sep (deg) : 151.75
 B (ring opening deg) : 75.53
 PA of pole (deg) : 56.40
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.364
 C/A sky separation (km) : 44095.6
 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	2032-12-06T05:46:45.144		37.24	-35.47	51536.19	-11.75		
lambda	I	2032-12-06T05:49:00.421		37.23	-35.29	50026.71	-10.59		
delta	I	2032-12-06T05:51:56.380		37.20	-35.05	48300.35	-9.00		
gamma	I	2032-12-06T05:53:14.535		37.18	-34.95	47626.51	-8.24		
eta	I	2032-12-06T05:54:11.160		37.17	-34.87	47176.12	-7.67		
beta	I	2032-12-06T05:58:06.808		37.11	-34.53	45663.99	-5.12		
alpha	I	2032-12-06T06:02:24.442		37.02	-34.14	44726.76	-2.10		

No planet occultations

alpha	E	2032-12-06T06:08:10.493		36.87	-33.60	44720.73	2.10		
beta	E	2032-12-06T06:12:29.385		36.74	-33.17	45655.19	5.12		
eta	E	2032-12-06T06:16:26.711		36.59	-32.77	47176.12	7.67		
gamma	E	2032-12-06T06:17:22.908		36.56	-32.67	47622.94	8.24		
delta	E	2032-12-06T06:18:41.505		36.51	-32.53	48300.35	9.00		
lambda	E	2032-12-06T06:21:37.485		36.38	-32.22	50026.71	10.59		
epsilon	E	2032-12-06T06:23:45.091		36.29	-31.99	51446.41	11.75		