

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-04-21T22:24:41.630
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3404538490125104896
 2Mass ID (if available) : 05332127+2327221

ICRS Star Coord at Epoch: 05h 33m 21.27922s +23:27:22.17845s

RUWE (>1.4 is poor) : 0.96
 K magnitude : 14.212
 G magnitude : 16.688
 RP magnitude : 15.908
 BP magnitude : 17.339
 DUPflag : 0
 Distance (au) : 19.666
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.69
 Sun-Target sep (deg) : 51.97
 Sun-Moon sep (deg) : 85.14
 B (ring opening deg) : 79.96
 PA of pole (deg) : 35.53

a(km) ring

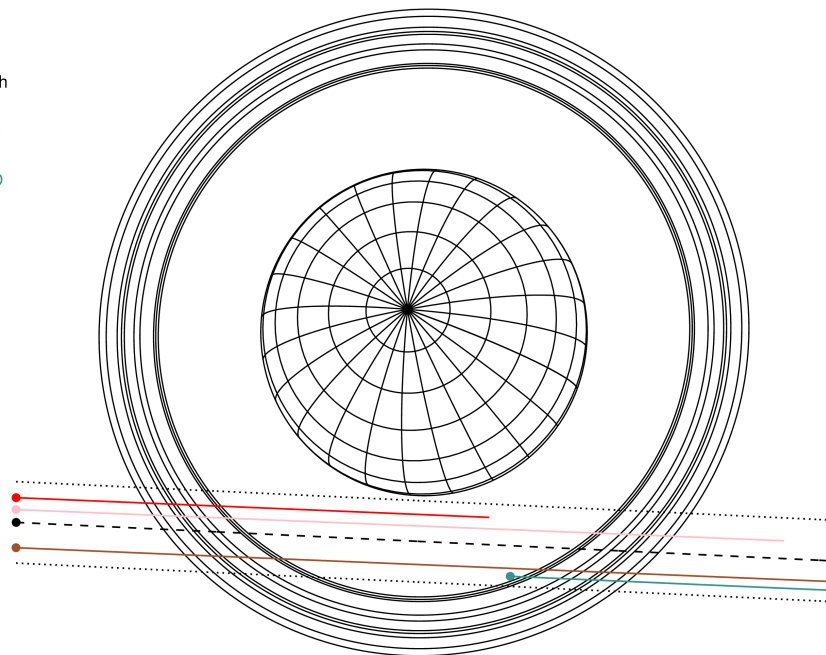
- 1 41837.2 6
- 2 42235.0 5
- 3 42571.2 4
- 4 44718.5 alpha
- 5 45661.1 beta
- 6 47176.1 eta
- 7 47626.3 gamma
- 8 48300.3 delta
- 9 50026.7 lambda
- 10 51149.4 epsilon



2032-04-21T22:24:41.6300 ex: 05 33 21.2792 s: +23 27 22.178 C/A 2.288° PA 357.30 deg v_sky +24.69 km/s D 19.67 AU
 Credit: Styled after SORA/Lucky Star

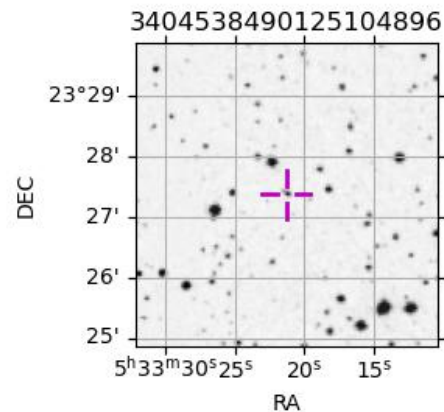
Uranus 2032-04-21T22:24:41 K14.21 G16.69 XRgt

Earth
 PIC
 TEN
 RIO
 ESO



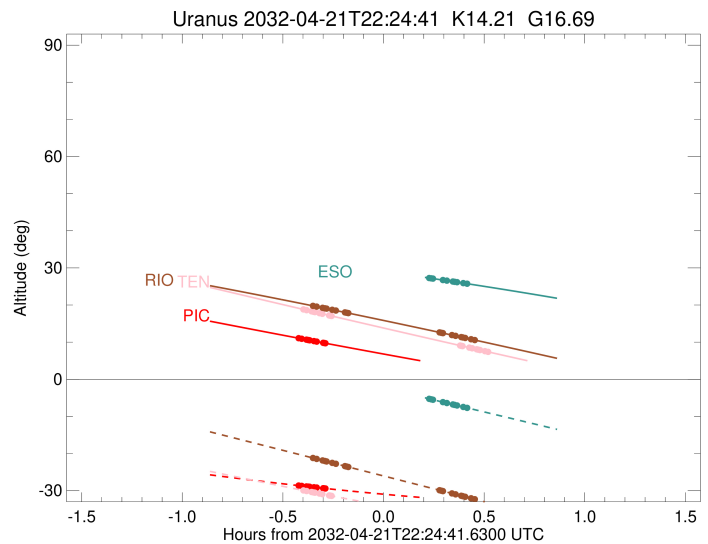
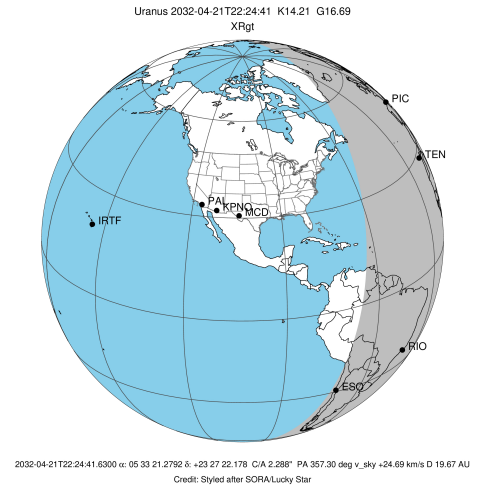
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++			APR 21 21:59 - APR 21 22:07	PnnRin
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					PnnRnn
MCD	McDonald Obs. 2.7m	30.7	256.0					PnnRnn
TEN	Teide Obs./Tenerife	28.3	343.5	+++++		+++++	APR 21 22:00 - APR 21 22:55	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	+++++		+++++	APR 21 22:03 - APR 21 22:51	PnnRie
ESO	European Southern Obs	-29.3	289.3			+++++	APR 21 22:38 - APR 21 22:49	PnnRne
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             : 2032-04-21T22:27:59.550
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       : 3404538490125104896
2Mass ID (if available) : 05332127+2327221
ICRS Star Coord at Epoch: 05h 33m 21.27922s +23:27:22.17845s
RUWE (>1.4 is poor) : 0.96
K magnitude          : 14.212
G magnitude          : 16.688
RP magnitude         : 15.908
BP magnitude         : 17.339
DUPflag             : 0
Distance (au)        : 19.666
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 24.69
Sun-Target sep (deg) : 51.97
Sun-Moon sep (deg)   : 85.19
B (ring opening deg) : 79.96
PA of pole (deg)     : 35.53
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.998
C/A sky separation (km) : 28505.1
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_itrff93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
```

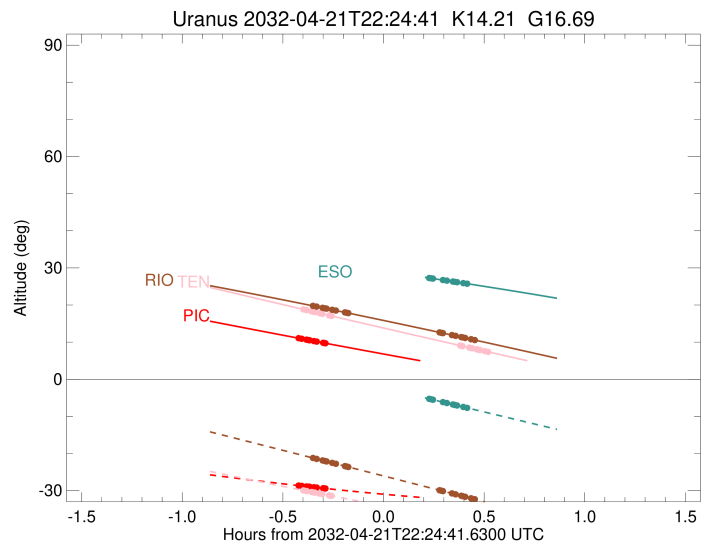
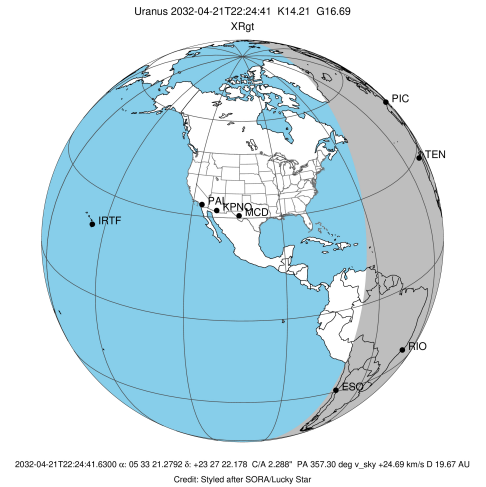


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-04-21T21:59:23.646		11.06	-28.64	51158.42	-20.44		
lambda	I	2032-04-21T22:00:19.011		10.90	-28.73	50026.71	-20.33		
delta	I	2032-04-21T22:01:44.687		10.66	-28.87	48300.35	-19.96		
gamma	I	2032-04-21T22:02:18.563		10.56	-28.93	47626.75	-19.81		
eta	I	2032-04-21T22:02:41.378		10.50	-28.96	47176.12	-19.70		
beta	I	2032-04-21T22:03:58.189		10.28	-29.09	45678.06	-19.31		
alpha	I	2032-04-21T22:04:46.498		10.15	-29.17	44751.93	-19.04		
4	I	2032-04-21T22:06:45.637		9.81	-29.36	42526.76	-18.30		
5	I	2032-04-21T22:07:01.358		9.76	-29.39	42239.33	-18.16		
6	I	2032-04-21T22:07:21.183		9.71	-29.42	41879.58	-18.06		

No planet occultations

6	E	2032-04-21T22:47:59.316		3.01x	-32.67	41838.74	18.12		
5	E	2032-04-21T22:48:16.314		2.96x	-32.69	42154.83	18.22		
4	E	2032-04-21T22:48:39.317		2.90x	-32.71	42566.28	18.35		
alpha	E	2032-04-21T22:50:34.117		2.60x	-32.83	44718.50	19.10		
beta	E	2032-04-21T22:51:23.390		2.47x	-32.88	45668.28	19.37		
eta	E	2032-04-21T22:52:40.467		2.26x	-32.96	47176.12	19.77		
gamma	E	2032-04-21T22:53:03.427		2.20x	-32.98	47631.23	19.88		
delta	E	2032-04-21T22:53:36.955		2.11x	-33.02	48300.35	20.04		
lambda	E	2032-04-21T22:55:02.312		1.89x	-33.10	50026.71	20.41		
epsilon	E	2032-04-21T22:55:38.418		1.79x	-33.13	50766.27	20.52		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-04-21T22:28:41.660
 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 : 3404538490125104896
 2Mass ID (if available) : 05332127+2327221
 ICRS Star Coord at Epoch: 05h 33m 21.27922s +23:27:22.17845s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 14.212
 G magnitude : 16.688
 RP magnitude : 15.908
 BP magnitude : 17.339
 DUPflag : 0
 Distance (au) : 19.666
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.69
 Sun-Target sep (deg) : 51.97
 Sun-Moon sep (deg) : 85.29
 B (ring opening deg) : 79.96
 PA of pole (deg) : 35.53
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.125
 C/A sky separation (km) : 30307.9
 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

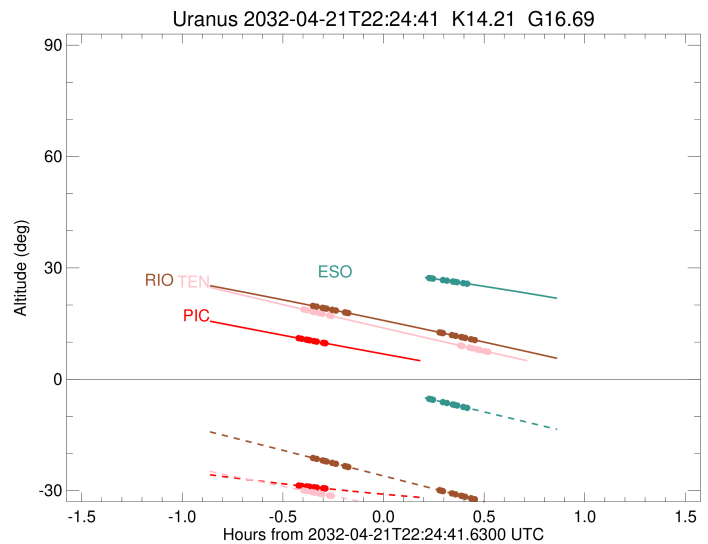
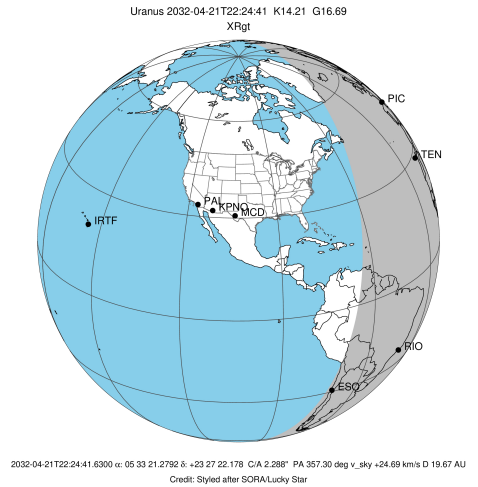


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-04-21T22:00:50.464		18.81	-29.94	51140.17	-19.71		
lambda	I	2032-04-21T22:01:46.981		18.62	-30.11	50026.71	-19.57		
delta	I	2032-04-21T22:03:16.134		18.30	-30.37	48300.35	-19.15		
gamma	I	2032-04-21T22:03:51.471		18.18	-30.48	47627.01	-18.96		
eta	I	2032-04-21T22:04:15.329		18.09	-30.55	47176.12	-18.83		
beta	I	2032-04-21T22:05:35.808		17.81	-30.79	45678.61	-18.38		
alpha	I	2032-04-21T22:06:26.664		17.63	-30.93	44752.20	-18.06		
4	I	2032-04-21T22:08:32.912		17.19	-31.30	42526.32	-17.18		
5	I	2032-04-21T22:08:49.911		17.13	-31.35	42234.38	-17.02		
6	I	2032-04-21T22:09:10.759		17.06	-31.41	41879.73	-16.90		

No planet occultations

6	E	2032-04-21T22:47:31.457		9.09	-37.72	41841.31	16.96		
5	E	2032-04-21T22:47:49.441		9.03	-37.77	42154.91	17.08		
4	E	2032-04-21T22:48:13.774		8.94	-37.83	42563.65	17.24		
alpha	E	2032-04-21T22:50:15.580		8.53	-38.14	44720.31	18.13		
beta	E	2032-04-21T22:51:07.364		8.35	-38.27	45669.24	18.45		
eta	E	2032-04-21T22:52:28.060		8.07	-38.47	47176.12	18.91		
gamma	E	2032-04-21T22:52:52.047		7.99	-38.53	47631.32	19.04		
delta	E	2032-04-21T22:53:27.011		7.87	-38.62	48300.35	19.23		
lambda	E	2032-04-21T22:54:55.777		7.57	-38.84	50026.71	19.66		
epsilon	E	2032-04-21T22:55:32.955		7.45	-38.93	50760.89	19.80		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-04-21T22:28:11.080
 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 : 3404538490125104896
 2Mass ID (if available) : 05332127+2327221
 ICRS Star Coord at Epoch: 05h 33m 21.27922s +23:27:22.17845s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 14.212
 G magnitude : 16.688
 RP magnitude : 15.908
 BP magnitude : 17.339
 DUPflag : 0
 Distance (au) : 19.666
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.69
 Sun-Target sep (deg) : 51.97
 Sun-Moon sep (deg) : 85.32
 B (ring opening deg) : 79.96
 PA of pole (deg) : 35.53
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.548
 C/A sky separation (km) : 36349.4
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

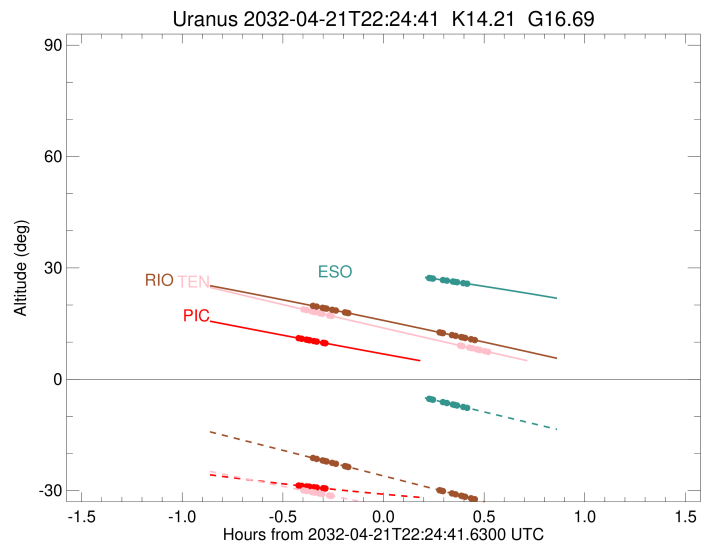
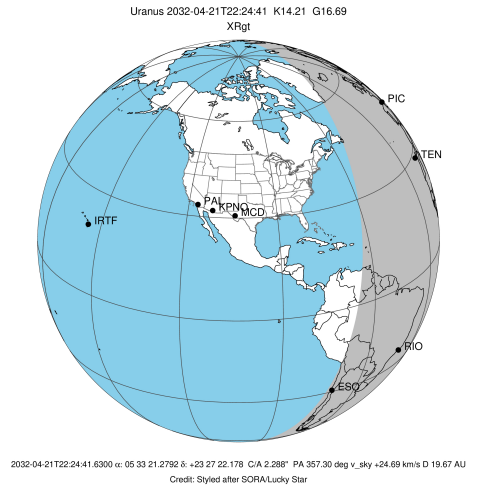


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-04-21T22:03:45.014		19.76	-21.22	51076.00	-16.94		
lambda	I	2032-04-21T22:04:47.158		19.57	-21.46	50026.71	-16.69		
delta	I	2032-04-21T22:06:32.859		19.24	-21.87	48300.35	-15.96		
gamma	I	2032-04-21T22:07:15.391		19.11	-22.03	47627.95	-15.65		
eta	I	2032-04-21T22:07:44.464		19.02	-22.14	47176.12	-15.43		
beta	I	2032-04-21T22:09:23.987		18.72	-22.52	45680.23	-14.62		
alpha	I	2032-04-21T22:10:28.704		18.52	-22.77	44752.29	-14.05		
4	I	2032-04-21T22:13:16.785		18.00	-23.42	42526.19	-12.40		
5	I	2032-04-21T22:13:42.026		17.92	-23.51	42215.13	-12.09		
6	I	2032-04-21T22:14:09.909		17.83	-23.62	41878.70	-11.82		

No planet occultations

6	E	2032-04-21T22:41:24.421		12.63	-29.89	41851.65	11.85		
5	E	2032-04-21T22:41:49.335		12.54	-29.99	42158.22	12.12		
4	E	2032-04-21T22:42:22.088		12.44	-30.12	42553.30	12.43		
alpha	E	2032-04-21T22:45:05.710		11.90	-30.75	44727.31	14.09		
beta	E	2032-04-21T22:46:11.350		11.69	-31.00	45672.73	14.67		
eta	E	2032-04-21T22:47:51.119		11.36	-31.38	47176.12	15.48		
gamma	E	2032-04-21T22:48:20.329		11.27	-31.49	47631.53	15.70		
delta	E	2032-04-21T22:49:02.495		11.13	-31.66	48300.35	16.02		
lambda	E	2032-04-21T22:50:47.835		10.78	-32.06	50026.71	16.75		
epsilon	E	2032-04-21T22:51:30.497		10.64	-32.22	50747.09	17.00		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-04-21T22:26:39.410
 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 : 3404538490125104896
 2Mass ID (if available) : 05332127+2327221
 ICRS Star Coord at Epoch: 05h 33m 21.27922s +23:27:22.17845s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 14.212
 G magnitude : 16.688
 RP magnitude : 15.908
 BP magnitude : 17.339
 DUPflag : 0
 Distance (au) : 19.666
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.69
 Sun-Target sep (deg) : 51.97
 Sun-Moon sep (deg) : 85.54
 B (ring opening deg) : 79.96
 PA of pole (deg) : 35.53
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.633
 C/A sky separation (km) : 37554.0
 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	2032-04-21T22:02:59.150		31.48	2.24x	51063.16	-16.23		
lambda	I	2032-04-21T22:04:03.285		31.37	2.02x	50026.71	-15.94		
delta	I	2032-04-21T22:05:54.305		31.17	1.63x	48300.35	-15.14		
gamma	I	2032-04-21T22:06:39.217		31.09	1.47x	47628.14	-14.79		
eta	I	2032-04-21T22:07:10.035		31.03	1.36x	47176.12	-14.54		
beta	I	2032-04-21T22:08:56.172		30.83	0.99x	45680.48	-13.63		
alpha	I	2032-04-21T22:10:05.935		30.71	0.74x	44752.11	-12.98		
4	I	2032-04-21T22:13:10.770		30.36	0.09x	42526.53	-11.06		
5	I	2032-04-21T22:13:39.639		30.30	-0.01x	42210.57	-10.69		
6	I	2032-04-21T22:14:10.876		30.24	-0.13x	41878.05	-10.37		

No planet occultations

6	E	2032-04-21T22:38:18.768		27.27	-5.27	41854.28	10.38		
5	E	2032-04-21T22:38:47.001		27.21	-5.37	42159.87	10.71		
4	E	2032-04-21T22:39:23.473		27.13	-5.50	42550.75	11.08		
alpha	E	2032-04-21T22:42:23.984		26.73	-6.15	44729.00	13.00		
beta	E	2032-04-21T22:43:34.734		26.57	-6.40	45673.51	13.66		
eta	E	2032-04-21T22:45:21.223		26.33	-6.79	47176.12	14.57		
gamma	E	2032-04-21T22:45:52.213		26.26	-6.90	47631.56	14.82		
delta	E	2032-04-21T22:46:36.806		26.16	-7.06	48300.35	15.17		
lambda	E	2032-04-21T22:48:27.594		25.90	-7.45	50026.71	15.98		
epsilon	E	2032-04-21T22:49:12.142		25.80	-7.61	50745.35	16.27		