

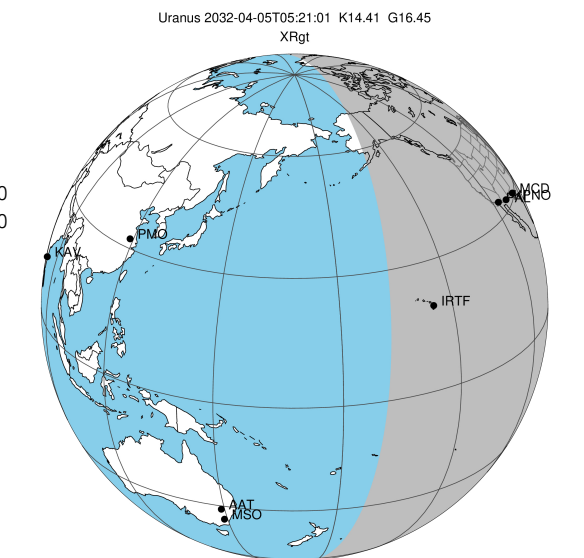
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-04-05T05:21:01.710
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3416185105698145024
 2Mass ID (if available) : 05304415+2325355

ICRS Star Coord at Epoch: 05h 30m 44.15341s +23:25:35.52618s

RUWE (>1.4 is poor) : 0.92
 K magnitude : 14.407
 G magnitude : 16.452
 RP magnitude : 15.768
 BP magnitude : 16.959
 DUPflag : 0
 Distance (au) : 19.423
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.61
 Sun-Target sep (deg) : 67.75
 Sun-Moon sep (deg) : 133.65
 B (ring opening deg) : 80.32
 PA of pole (deg) : 32.51

a(km) ring

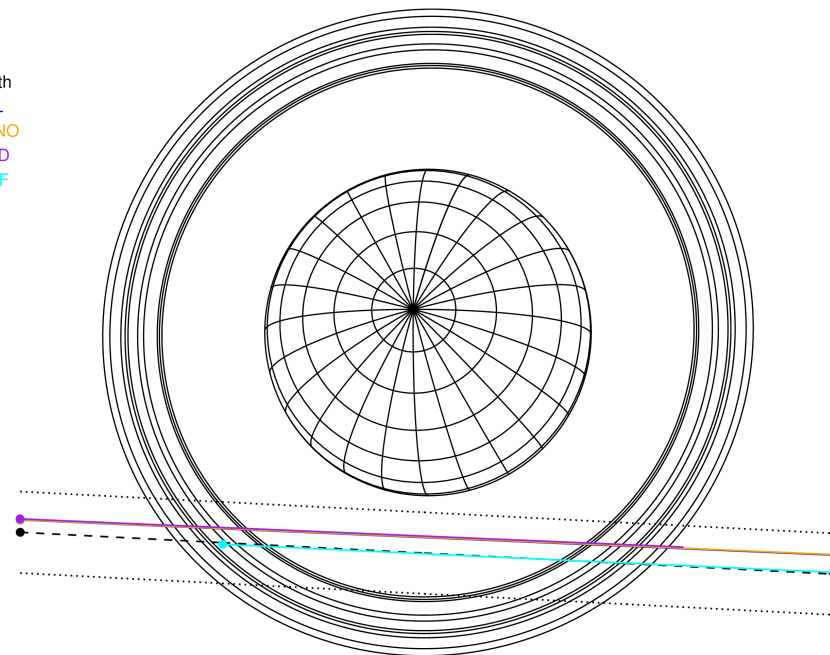
- 1 41837.2 6
- 2 42235.0 5
- 3 42571.2 4
- 4 44718.5 alpha
- 5 45661.1 beta
- 6 47176.1 eta
- 7 47626.3 gamma
- 8 48300.3 delta
- 9 50026.7 lambda
- 10 51149.4 epsilon



2032-04-05T05:21:01.7100 ex: 05 30 44.1534 s: +23 25 35.526 C/A 2.445° PA 357.06 deg v_sky +17.61 km/s D 19.42 AU
 Credit: Styled after SORA/Lucky Star

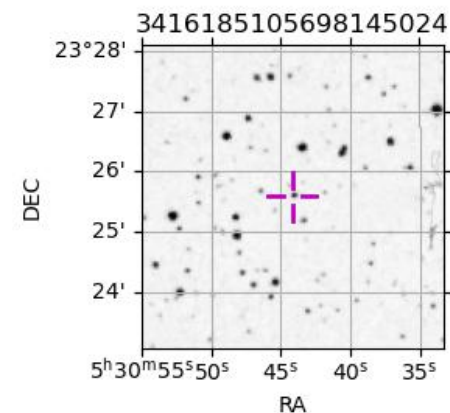
Uranus 2032-04-05T05:21:01 K14.41 G16.45 XRgt

Earth
 PAL
 KPNO
 MCD
 IRTF

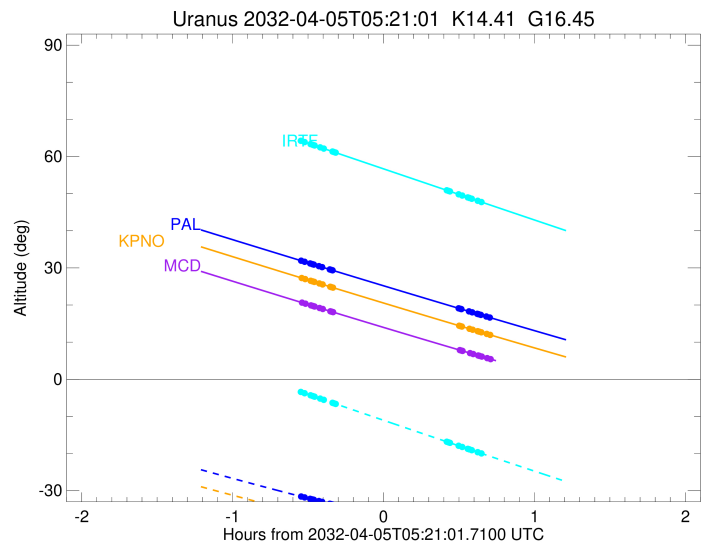
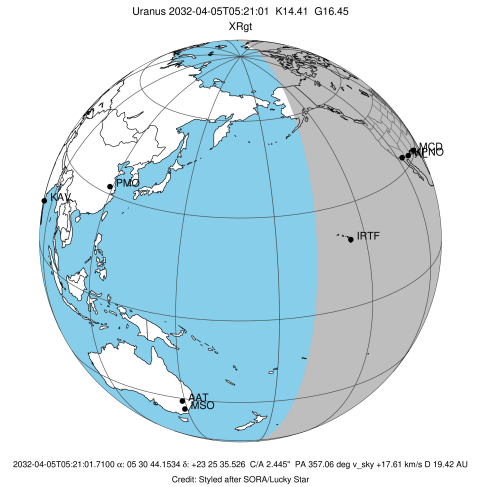


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++++		+++++	APR 05 04:48 - APR 05 06:02	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	APR 05 04:48 - APR 05 06:03	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	APR 05 04:48 - APR 05 06:03	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5		+++++	+++++	APR 05 04:55 - APR 05 05:59	PnnRie
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
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



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-04-05T05:26:17.200
 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 : 3416185105698145024
 2Mass ID (if available) : 05304415+2325355
 ICRS Star Coord at Epoch: 05h 30m 44.15341s +23:25:35.52618s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 14.407
 G magnitude : 16.452
 RP magnitude : 15.768
 BP magnitude : 16.959
 DUPflag : 0
 Distance (au) : 19.423
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.61
 Sun-Target sep (deg) : 67.75
 Sun-Moon sep (deg) : 133.43
 B (ring opening deg) : 80.32
 PA of pole (deg) : 32.51
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.279
 C/A sky separation (km) : 32107.7
 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

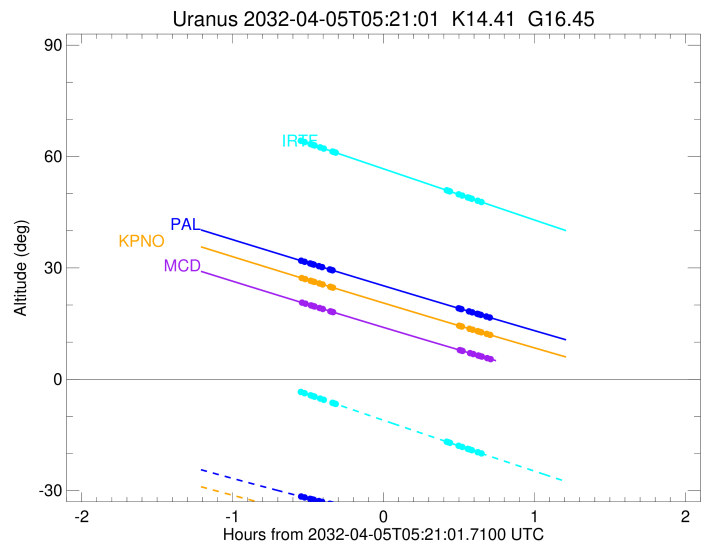
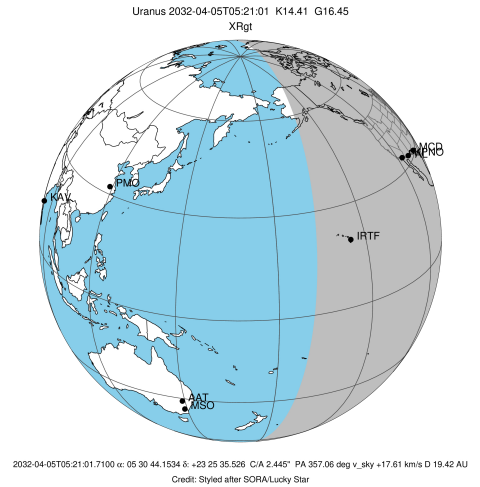


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-04-05T04:48:32.375		31.89	-31.63	50965.77	-13.43		
lambda	I	2032-04-05T04:49:42.346		31.64	-31.83	50026.71	-13.33		
delta	I	2032-04-05T04:51:53.536		31.19	-32.21	48300.35	-12.98		
gamma	I	2032-04-05T04:52:45.506		31.01	-32.36	47629.71	-12.83		
eta	I	2032-04-05T04:53:21.011		30.89	-32.46	47176.12	-12.72		
beta	I	2032-04-05T04:55:20.300		30.48	-32.80	45681.05	-12.34		
alpha	I	2032-04-05T04:56:36.856		30.21	-33.02	44746.86	-12.07		
4	I	2032-04-05T04:59:45.583		29.56	-33.55	42536.35	-11.35		
5	I	2032-04-05T05:00:17.445		29.45	-33.64	42174.51	-11.19		
6	I	2032-04-05T05:00:45.216		29.36	-33.72	41865.34	-11.08		

No planet occultations

6	E	2032-04-05T05:50:50.798		19.13	-41.44	41811.71	11.14		
5	E	2032-04-05T05:51:22.257		19.02	-41.51	42172.05	11.26		
4	E	2032-04-05T05:51:59.538		18.90	-41.60	42594.09	11.42		
alpha	E	2032-04-05T05:54:58.319		18.30	-42.00	44701.42	12.15		
beta	E	2032-04-05T05:56:16.151		18.04	-42.18	45658.65	12.42		
eta	E	2032-04-05T05:58:16.446		17.63	-42.44	47176.12	12.82		
gamma	E	2032-04-05T05:58:51.715		17.52	-42.52	47630.05	12.93		
delta	E	2032-04-05T05:59:43.265		17.34	-42.63	48300.35	13.08		
lambda	E	2032-04-05T06:01:53.417		16.91	-42.91	50026.71	13.44		
epsilon	E	2032-04-05T06:02:52.489		16.71	-43.04	50825.34	13.54		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-04-05T05:26:28.440
 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 : 3416185105698145024
 2Mass ID (if available) : 05304415+2325355
 ICRS Star Coord at Epoch: 05h 30m 44.15341s +23:25:35.52618s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 14.407
 G magnitude : 16.452
 RP magnitude : 15.768
 BP magnitude : 16.959
 DUPflag : 0
 Distance (au) : 19.423
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.61
 Sun-Target sep (deg) : 67.75
 Sun-Moon sep (deg) : 133.36
 B (ring opening deg) : 80.32
 PA of pole (deg) : 32.51
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.275
 C/A sky separation (km) : 32048.5
 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

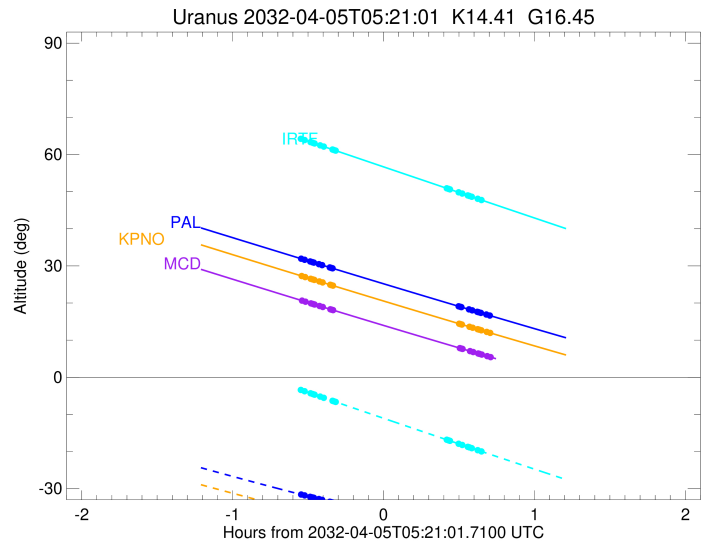
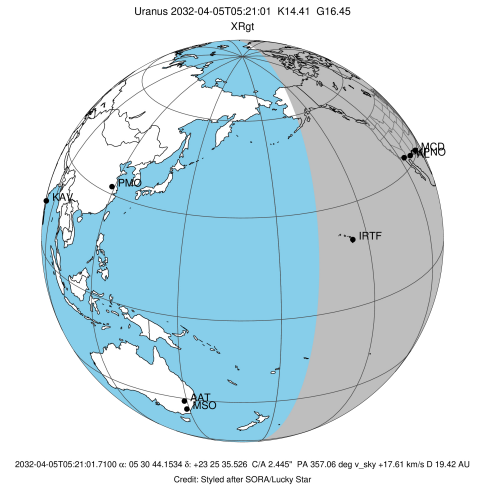


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-04-05T04:48:45.205		27.22	-36.08	50966.16	-13.47		
lambda	I	2032-04-05T04:49:54.986		26.98	-36.28	50026.71	-13.38		
delta	I	2032-04-05T04:52:05.747		26.53	-36.64	48300.35	-13.02		
gamma	I	2032-04-05T04:52:57.541		26.35	-36.79	47629.70	-12.87		
eta	I	2032-04-05T04:53:32.923		26.22	-36.88	47176.12	-12.77		
beta	I	2032-04-05T04:55:31.780		25.81	-37.21	45681.06	-12.38		
alpha	I	2032-04-05T04:56:48.042		25.55	-37.42	44746.89	-12.11		
4	I	2032-04-05T04:59:55.992		24.90	-37.93	42536.30	-11.40		
5	I	2032-04-05T05:00:27.701		24.79	-38.01	42174.60	-11.24		
6	I	2032-04-05T05:00:55.347		24.69	-38.09	41865.40	-11.13		

No planet occultations

6	E	2032-04-05T05:51:03.229		14.43	-45.32	41811.62	11.19		
5	E	2032-04-05T05:51:34.557		14.33	-45.39	42172.18	11.31		
4	E	2032-04-05T05:52:11.664		14.20	-45.46	42594.19	11.47		
alpha	E	2032-04-05T05:55:09.657		13.61	-45.82	44701.35	12.20		
beta	E	2032-04-05T05:56:27.177		13.35	-45.98	45658.61	12.47		
eta	E	2032-04-05T05:58:27.016		12.95	-46.22	47176.12	12.86		
gamma	E	2032-04-05T05:59:02.154		12.83	-46.28	47630.05	12.97		
delta	E	2032-04-05T05:59:53.518		12.66	-46.38	48300.35	13.13		
lambda	E	2032-04-05T06:02:03.215		12.23	-46.63	50026.71	13.49		
epsilon	E	2032-04-05T06:03:02.120		12.03	-46.74	50825.78	13.59		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-04-05T05:26:37.430
 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 : 3416185105698145024
 2Mass ID (if available) : 05304415+2325355
 ICRS Star Coord at Epoch: 05h 30m 44.15341s +23:25:35.52618s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 14.407
 G magnitude : 16.452
 RP magnitude : 15.768
 BP magnitude : 16.959
 DUPflag : 0
 Distance (au) : 19.423
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.61
 Sun-Target sep (deg) : 67.75
 Sun-Moon sep (deg) : 133.27
 B (ring opening deg) : 80.32
 PA of pole (deg) : 32.51
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.263
 C/A sky separation (km) : 31883.5
 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



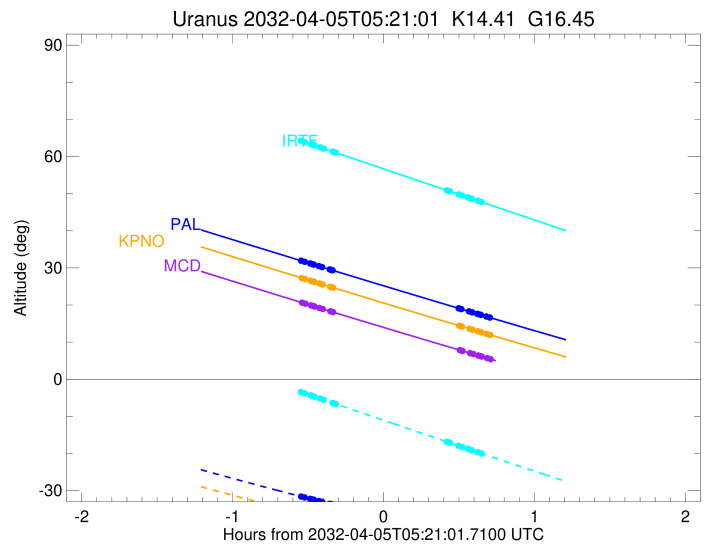
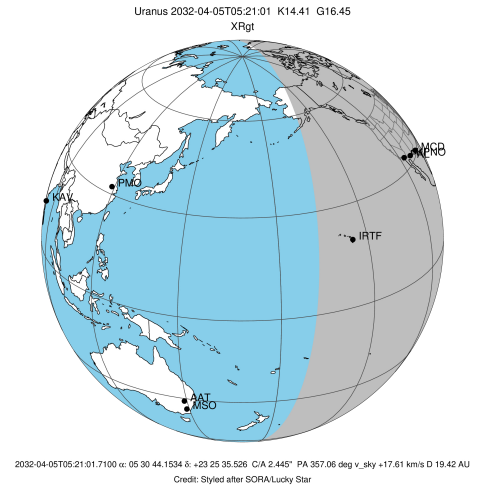
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-04-05T04:48:53.212		20.59	-41.85	50967.54	-13.56		
lambda	I	2032-04-05T04:50:02.644		20.35	-42.02	50026.71	-13.46		
delta	I	2032-04-05T04:52:12.516		19.90	-42.35	48300.35	-13.12		
gamma	I	2032-04-05T04:53:03.941		19.72	-42.48	47629.68	-12.97		
eta	I	2032-04-05T04:53:39.061		19.60	-42.57	47176.12	-12.86		
beta	I	2032-04-05T04:55:36.999		19.20	-42.87	45681.07	-12.48		
alpha	I	2032-04-05T04:56:52.624		18.93	-43.06	44746.98	-12.22		
4	I	2032-04-05T04:59:58.874		18.29	-43.51	42536.14	-11.51		
5	I	2032-04-05T05:00:30.228		18.18	-43.59	42174.90	-11.36		
6	I	2032-04-05T05:00:57.599		18.09	-43.65	41865.58	-11.25		

No planet occultations

6	E	2032-04-05T05:51:19.243		7.86	-49.82	41811.40	11.31		
5	E	2032-04-05T05:51:50.288		7.76	-49.87	42172.50	11.43		
4	E	2032-04-05T05:52:27.017		7.64	-49.92	42594.44	11.59		
alpha	E	2032-04-05T05:55:23.317		7.05	-50.20	44701.19	12.30		
beta	E	2032-04-05T05:56:40.186		6.80	-50.31	45658.50	12.58		
eta	E	2032-04-05T05:58:39.087		6.41	-50.49	47176.12	12.96		
gamma	E	2032-04-05T05:59:13.960		6.29	-50.54	47630.03	13.07		
delta	E	2032-04-05T06:00:04.948		6.12	-50.61	48300.35	13.22		
lambda	E	2032-04-05T06:02:13.740		5.70	-50.79	50026.71	13.58		
epsilon	E	2032-04-05T06:03:12.333		5.50	-50.87	50826.89	13.68		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2032-04-05T05:24:34.800
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      : 3416185105698145024
2Mass ID (if available) : 05304415+2325355
ICRS Star Coord at Epoch: 05h 30m 44.15341s +23:25:35.52618s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 14.407
G magnitude          : 16.452
RP magnitude         : 15.768
BP magnitude         : 16.959
DUPflag             : 0
Distance (au)       : 19.423
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : 17.61
Sun-Target sep (deg) : 67.75
Sun-Moon sep (deg)  : 133.87
B (ring opening deg) : 80.32
PA of pole (deg)    : 32.51
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.459
C/A sky separation (km) : 34646.3
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	2032-04-05T04:48:27.774		64.17	-3.48x	50943.16	-12.47		
lambda	I	2032-04-05T04:49:41.382		63.89	-3.77x	50026.71	-12.35		
delta	I	2032-04-05T04:52:03.692		63.35	-4.32x	48300.35	-11.91		
gamma	I	2032-04-05T04:53:00.425		63.13	-4.54x	47629.99	-11.72		
eta	I	2032-04-05T04:53:39.367		62.98	-4.69x	47176.12	-11.59		
beta	I	2032-04-05T04:55:51.094		62.47	-5.21	45680.78	-11.11		
alpha	I	2032-04-05T04:57:16.647		62.15	-5.54	44745.21	-10.76		
4	I	2032-04-05T05:00:50.672		61.33	-6.37	42539.26	-9.84		
5	I	2032-04-05T05:01:28.270		61.18	-6.51	42169.65	-9.63		
6	I	2032-04-05T05:02:00.444		61.06	-6.64	41862.01	-9.48		

No planet occultations

6	E	2032-04-05T05:46:07.674		50.92	-16.82	41815.46	9.51		
5	E	2032-04-05T05:46:43.549		50.78	-16.96	42167.23	9.67		
4	E	2032-04-05T05:47:26.746		50.61	-17.12	42590.00	9.88		
alpha	E	2032-04-05T05:50:50.977		49.83	-17.90	44704.12	10.81		
beta	E	2032-04-05T05:52:17.948		49.50	-18.23	45660.38	11.16		
eta	E	2032-04-05T05:54:30.915		48.99	-18.74	47176.12	11.65		
gamma	E	2032-04-05T05:55:09.686		48.84	-18.88	47630.34	11.78		
delta	E	2032-04-05T05:56:06.091		48.63	-19.10	48300.35	11.97		
lambda	E	2032-04-05T05:58:27.611		48.09	-19.64	50026.71	12.42		
epsilon	E	2032-04-05T05:59:30.155		47.85	-19.87	50809.03	12.55		