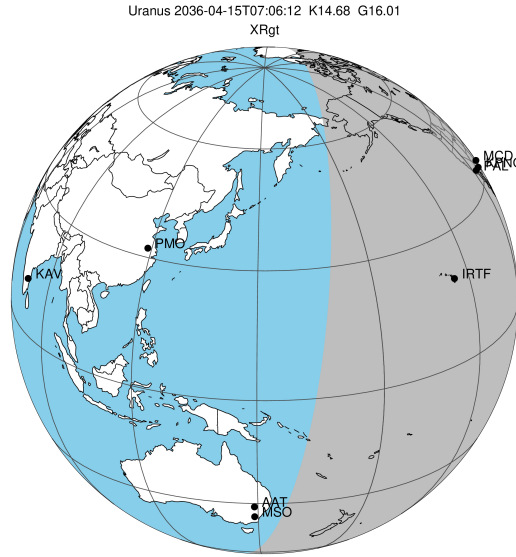


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-04-15T07:06:12.250
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3379615314599387648
 2Mass ID (if available) : 06471279+2322285

ICRS Star Coord at Epoch: 06h 47m 12.80005s +23:22:28.39550s

RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.682
 G magnitude : 16.008
 RP magnitude : 15.511
 BP magnitude : 16.340
 DUPflag : 0
 Distance (au) : 19.036
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 13.91
 Sun-Target sep (deg) : 75.43
 Sun-Moon sep (deg) : 157.72
 B (ring opening deg) : 65.51
 PA of pole (deg) : 74.87

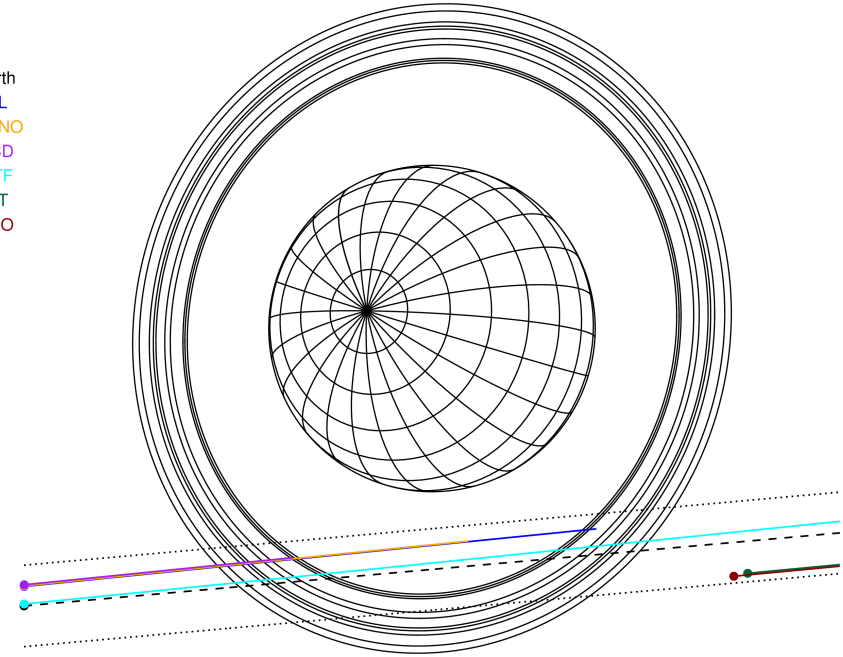
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2036-04-15T07:06:12.2500 α: 06 47 12.8000 α: +23 22 28.395 C/A 2.713° PA 5.12 deg v_sky +13.91 km/s D 19.04 AU
 Credit: Styled after SORA/Lucky Star

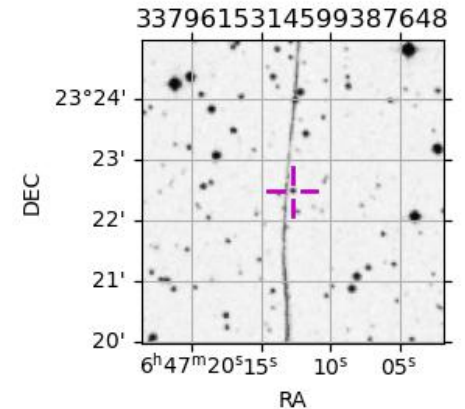
Earth
 PAL
 KPNO
 MCD
 IRTF
 AAT
 MSO

Uranus 2036-04-15T07:06:12 K14.68 G16.01 XRgt

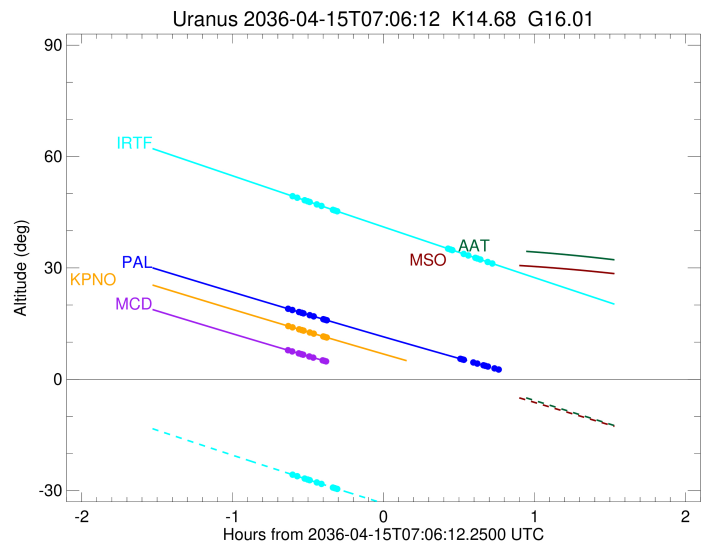
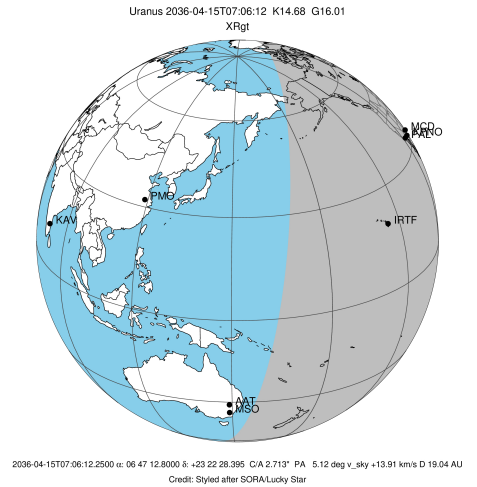


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	+++++		+++	APR 15 06:28 - APR 15 07:38	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++			APR 15 06:28 - APR 15 06:43	PnnRin
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++			APR 15 06:28 - APR 15 06:41	PnnRin
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++		+++++	APR 15 06:30 - APR 15 07:50	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 : 2036-04-15T07:12:37.690
 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 : 3379615314599387648
 2Mass ID (if available) : 06471279+2322285
 ICRS Star Coord at Epoch: 06h 47m 12.80005s +23:22:28.39550s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.682
 G magnitude : 16.008
 RP magnitude : 15.511
 BP magnitude : 16.340
 DUPflag : 0
 Distance (au) : 19.036
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 13.91
 Sun-Target sep (deg) : 75.43
 Sun-Moon sep (deg) : 158.55
 B (ring opening deg) : 65.51
 PA of pole (deg) : 74.87
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.447
 C/A sky separation (km) : 33786.4
 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



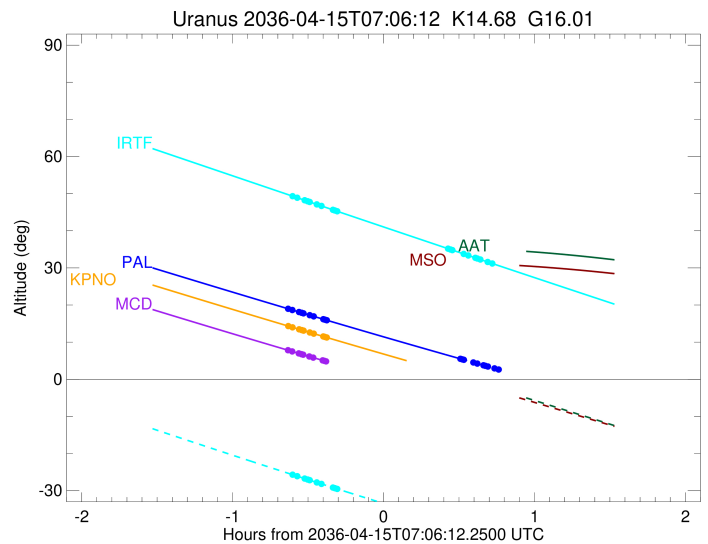
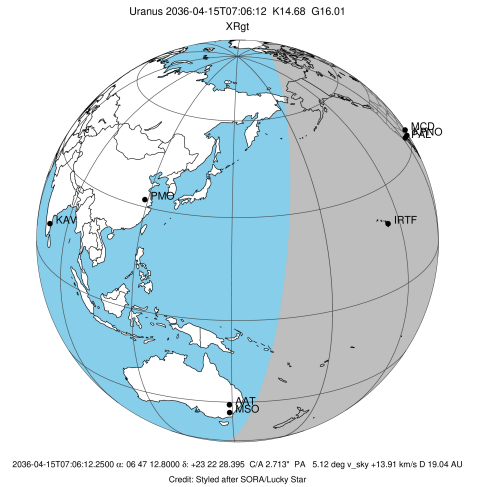
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-04-15T06:28:16.246		18.99	-42.90	51171.92	-11.29		
lambda	I	2036-04-15T06:29:59.347		18.65	-43.06	50026.71	-11.00		
delta	I	2036-04-15T06:32:38.761		18.11	-43.30	48300.35	-10.65		
gamma	I	2036-04-15T06:33:42.615		17.90	-43.40	47625.11	-10.50		
eta	I	2036-04-15T06:34:25.599		17.75	-43.46	47176.12	-10.39		
beta	I	2036-04-15T06:36:54.282		17.26	-43.68	45658.99	-10.00		
alpha	I	2036-04-15T06:38:27.856		16.94	-43.81	44734.22	-9.72		
4	I	2036-04-15T06:42:14.013		16.19	-44.12	42616.55	-9.02		
5	I	2036-04-15T06:43:06.012		16.02	-44.19	42155.39	-8.84		
6	I	2036-04-15T06:43:38.985		15.91	-44.24	41864.47	-8.73		

No planet occultations

6	E	2036-04-15T07:36:47.726		5.51	-46.74	41877.09	8.80		
5	E	2036-04-15T07:37:26.064		5.38	-46.75	42200.80	8.91		
4	E	2036-04-15T07:38:07.232		5.25	-46.75	42582.98	9.09		
alpha	E	2036-04-15T07:41:50.659		4.54x	-46.79	44691.59	9.82		
beta	E	2036-04-15T07:43:30.116		4.23x	-46.80	45680.71	10.10		
eta	E	2036-04-15T07:45:55.156		3.77x	-46.81	47176.12	10.50		
gamma	E	2036-04-15T07:46:38.280		3.63x	-46.81	47631.41	10.61		
delta	E	2036-04-15T07:47:40.848		3.44x	-46.81	48300.35	10.77		
lambda	E	2036-04-15T07:50:18.448		2.94x	-46.80	50026.71	11.13		
epsilon	E	2036-04-15T07:52:33.427		2.52x	-46.79	51548.90	11.43		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2036-04-15T07:12:39.110
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      : 3379615314599387648
2Mass ID (if available) : 06471279+2322285
ICRS Star Coord at Epoch: 06h 47m 12.80005s +23:22:28.39550s
RUWE (>1.4 is poor) : 0.97
K magnitude         : 14.682
G magnitude         : 16.008
RP magnitude        : 15.511
BP magnitude        : 16.340
DUPflag            : 0
Distance (au)       : 19.036
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : 13.91
Sun-Target sep (deg) : 75.43
Sun-Moon sep (deg)  : 158.53
B (ring opening deg) : 65.51
PA of pole (deg)    : 74.87
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.441
C/A sky separation (km) : 33704.6
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
    
```

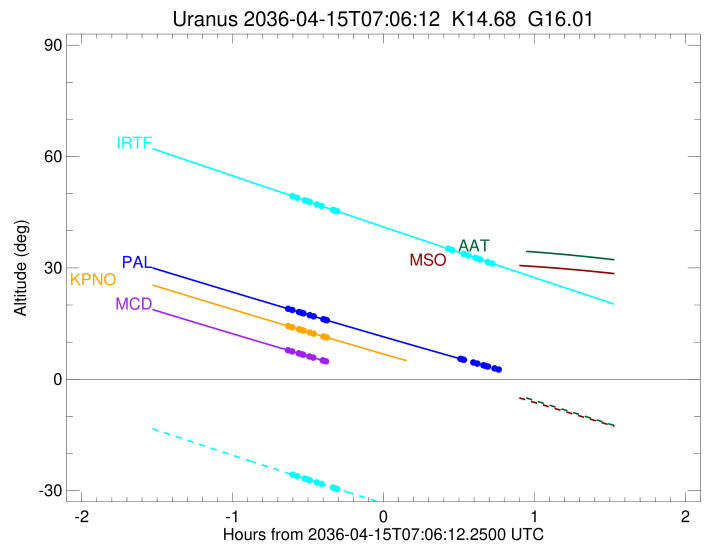
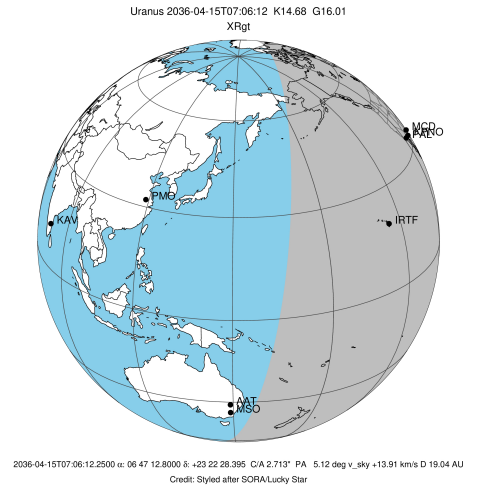


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-04-15T06:28:20.375		14.33	-45.97	51171.01	-11.34		
lambda	I	2036-04-15T06:30:02.914		13.98	-46.10	50026.71	-11.05		
delta	I	2036-04-15T06:32:41.546		13.45	-46.29	48300.35	-10.70		
gamma	I	2036-04-15T06:33:45.073		13.24	-46.36	47625.09	-10.55		
eta	I	2036-04-15T06:34:27.830		13.10	-46.41	47176.12	-10.45		
beta	I	2036-04-15T06:36:55.699		12.60	-46.58	45658.93	-10.06		
alpha	I	2036-04-15T06:38:28.707		12.29	-46.67	44734.31	-9.78		
4	I	2036-04-15T06:42:13.411		11.54	-46.90	42616.55	-9.08		
5	I	2036-04-15T06:43:05.039		11.37	-46.95	42155.42	-8.90		
6	I	2036-04-15T06:43:37.786		11.26	-46.98	41864.35	-8.80		

No planet occultations

6	E	2036-04-15T07:36:53.326	0.89x	-48.12	41877.04	8.87
5	E	2036-04-15T07:37:31.416	0.77x	-48.11	42201.02	8.97
4	E	2036-04-15T07:38:12.250	0.64x	-48.10	42582.84	9.16
alpha	E	2036-04-15T07:41:54.232	-0.06x	-48.03	44691.54	9.87
beta	E	2036-04-15T07:43:33.108	-0.37x	-47.99	45680.72	10.16
eta	E	2036-04-15T07:45:57.345	-0.82x	-47.93	47176.12	10.56
gamma	E	2036-04-15T07:46:40.241	-0.96x	-47.91	47631.41	10.67
delta	E	2036-04-15T07:47:42.486	-1.15x	-47.88	48300.35	10.82
lambda	E	2036-04-15T07:50:19.311	-1.64x	-47.80	50026.71	11.19
epsilon	E	2036-04-15T07:52:33.650	-2.06x	-47.73	51548.76	11.48

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-04-15T07:12:31.030
 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 : 3379615314599387648
 2Mass ID (if available) : 06471279+2322285
 ICRS Star Coord at Epoch: 06h 47m 12.80005s +23:22:28.39550s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.682
 G magnitude : 16.008
 RP magnitude : 15.511
 BP magnitude : 16.340
 DUPflag : 0
 Distance (au) : 19.036
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 13.91
 Sun-Target sep (deg) : 75.43
 Sun-Moon sep (deg) : 158.49
 B (ring opening deg) : 65.51
 PA of pole (deg) : 74.87
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.429
 C/A sky separation (km) : 33540.6
 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



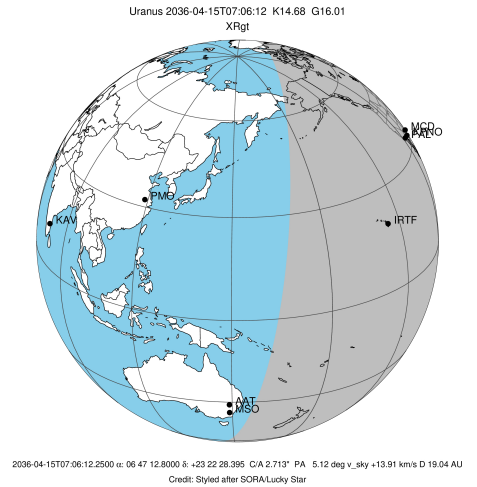
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-04-15T06:28:13.836		7.83	-48.96	51169.10	-11.43		
lambda	I	2036-04-15T06:29:55.396		7.49	-49.02	50026.71	-11.14		
delta	I	2036-04-15T06:32:32.703		6.97	-49.11	48300.35	-10.80		
gamma	I	2036-04-15T06:33:35.673		6.76	-49.15	47625.06	-10.65		
eta	I	2036-04-15T06:34:18.041		6.62	-49.17	47176.12	-10.54		
beta	I	2036-04-15T06:36:44.511		6.14	-49.24	45658.82	-10.16		
alpha	I	2036-04-15T06:38:16.535		5.83	-49.28	44734.50	-9.89		
4	I	2036-04-15T06:41:58.703		5.10	-49.36	42616.56	-9.19		
5	I	2036-04-15T06:42:49.676		4.93x	-49.38	42155.50	-9.02		
6	I	2036-04-15T06:43:22.029		4.83x	-49.39	41864.11	-8.92		

No planet occultations

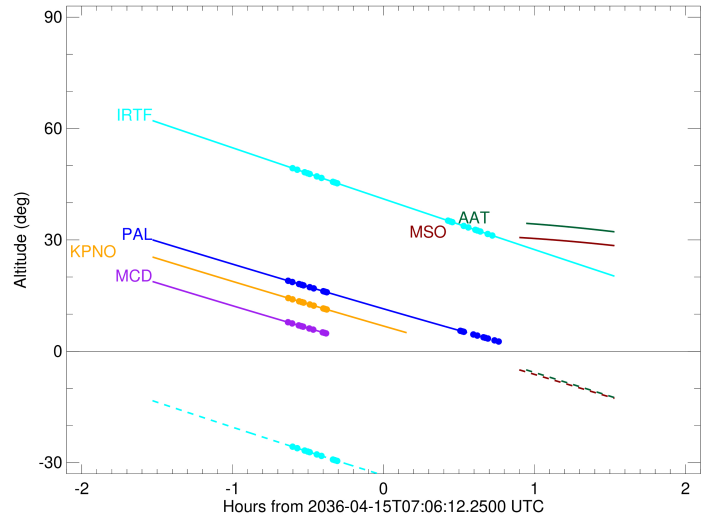
6	E	2036-04-15T07:36:55.772		-5.41x	-48.31	41876.95	8.98		
5	E	2036-04-15T07:37:33.435		-5.53x	-48.27	42201.47	9.09		
4	E	2036-04-15T07:38:13.679		-5.65x	-48.24	42582.58	9.27		
alpha	E	2036-04-15T07:41:53.172		-6.32x	-48.01	44691.43	9.98		
beta	E	2036-04-15T07:43:31.061		-6.62x	-47.91	45680.74	10.26		
eta	E	2036-04-15T07:45:53.945		-7.06x	-47.75	47176.12	10.65		
gamma	E	2036-04-15T07:46:36.461		-7.19x	-47.70	47631.42	10.76		
delta	E	2036-04-15T07:47:38.169		-7.38x	-47.63	48300.35	10.92		
lambda	E	2036-04-15T07:50:13.712		-7.85x	-47.44	50026.71	11.28		
epsilon	E	2036-04-15T07:52:27.001		-8.25x	-47.27	51548.49	11.57		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2036-04-15T07:12:29.070
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       : 3379615314599387648
2Mass ID (if available) : 06471279+2322285
ICRS Star Coord at Epoch: 06h 47m 12.80005s +23:22:28.39550s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 14.682
G magnitude          : 16.008
RP magnitude         : 15.511
BP magnitude         : 16.340
DUPflag             : 0
Distance (au)        : 19.036
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 13.91
Sun-Target sep (deg) : 75.43
Sun-Moon sep (deg)   : 158.58
B (ring opening deg) : 65.51
PA of pole (deg)     : 74.87
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.647
C/A sky separation (km) : 36541.2
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
    
```



Uranus 2036-04-15T07:06:12 K14.68 G16.01



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-04-15T06:29:59.907		49.34	-25.69	51202.45	-10.30		
lambda	I	2036-04-15T06:31:56.464		48.89	-26.11	50026.71	-9.95		
delta	I	2036-04-15T06:34:53.784		48.22	-26.76	48300.35	-9.51		
gamma	I	2036-04-15T06:36:05.452		47.94	-27.01	47625.57	-9.32		
eta	I	2036-04-15T06:36:54.035		47.75	-27.19	47176.12	-9.18		
beta	I	2036-04-15T06:39:43.549		47.11	-27.80	45660.95	-8.68		
alpha	I	2036-04-15T06:41:32.762		46.69	-28.19	44731.03	-8.32		
4	I	2036-04-15T06:46:02.287		45.66	-29.16	42616.05	-7.36		
5	I	2036-04-15T06:47:06.269		45.41	-29.39	42154.83	-7.12		
6	I	2036-04-15T06:47:46.815		45.26	-29.53	41868.39	-6.96		

No planet occultations

6	E	2036-04-15T07:31:54.230		35.17	-38.70	41878.63	7.01		
5	E	2036-04-15T07:32:40.449		35.00	-38.86	42192.21	7.16		
4	E	2036-04-15T07:33:33.222		34.80	-39.03	42588.05	7.41		
alpha	E	2036-04-15T07:38:00.008		33.79	-39.92	44693.82	8.38		
beta	E	2036-04-15T07:39:55.269		33.35	-40.30	45680.18	8.76		
eta	E	2036-04-15T07:42:41.099		32.72	-40.84	47176.12	9.27		
gamma	E	2036-04-15T07:43:29.834		32.54	-41.00	47631.28	9.41		
delta	E	2036-04-15T07:44:40.204		32.27	-41.23	48300.35	9.61		
lambda	E	2036-04-15T07:47:35.712		31.61	-41.80	50026.71	10.06		
epsilon	E	2036-04-15T07:50:04.804		31.04	-42.27	51553.10	10.42		