

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-04-12T06:15:37.320
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3379616242312343040
 2Mass ID (if available) : 06465468+2322538

Uranus 2036-04-12T06:15:37 K13.41 G14.73 PgtRgt

ICRS Star Coord at Epoch: 06h 46m 54.68553s +23:22:53.66341s

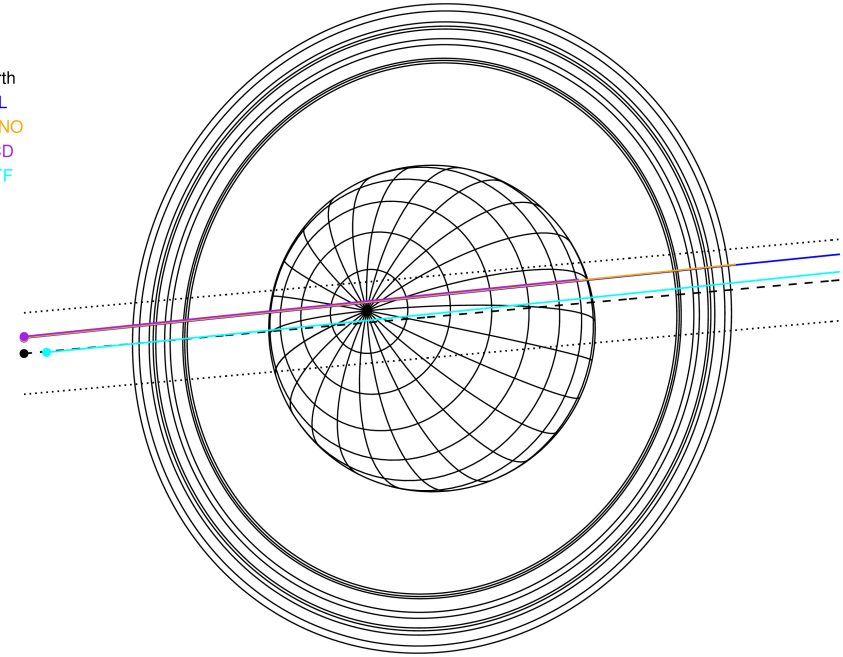
RUWE (>1.4 is poor) : 0.91
 K magnitude : 13.411
 G magnitude : 14.727
 RP magnitude : 14.259
 BP magnitude : 15.026
 DUPflag : 0
 Distance (au) : 18.986
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 12.45
 Sun-Target sep (deg) : 78.33
 Sun-Moon sep (deg) : 119.24
 B (ring opening deg) : 65.58
 PA of pole (deg) : 74.79

Uranus 2036-04-12T06:15:37 K13.41 G14.73
 PgtRgt



2036-04-12T06:15:37.3200 ex: 06 46 54.6855 s: +23 22 53.663 C/A 0.141" PA 185.16 deg v_sky +12.45 km/s D 18.99 AU
 Credit: Styled after SORA/Lucky Star

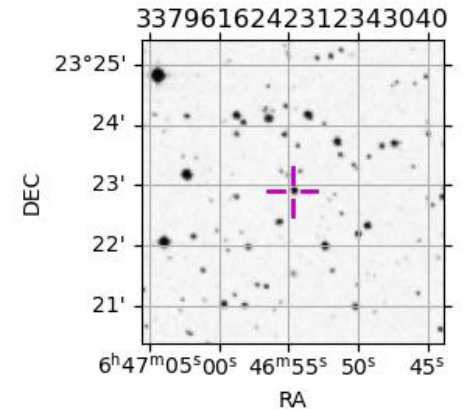
Earth
 PAL
 KPNO
 MCD
 IRTF



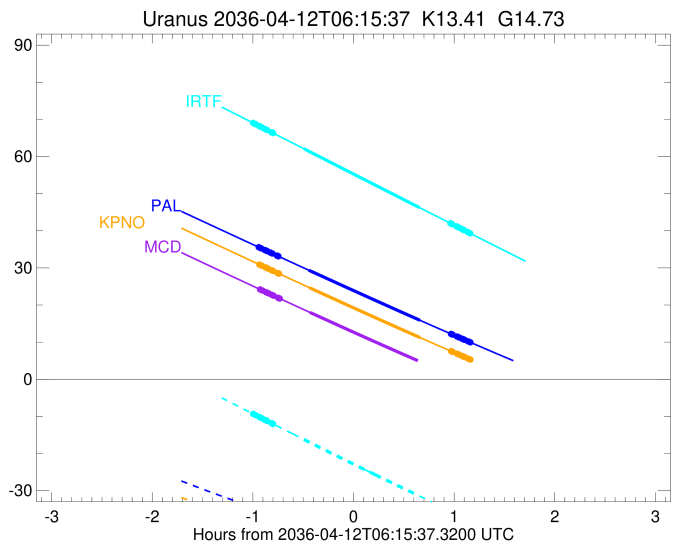
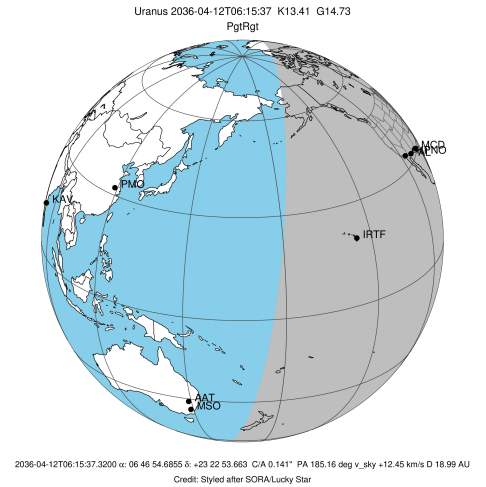
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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 12 05:19 - APR 12 07:25	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	APR 12 05:19 - APR 12 07:25	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+		APR 12 05:20 - APR 12 05:49	PinRin
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++	+ +	+++++	APR 12 05:16 - APR 12 07:25	PieRie
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



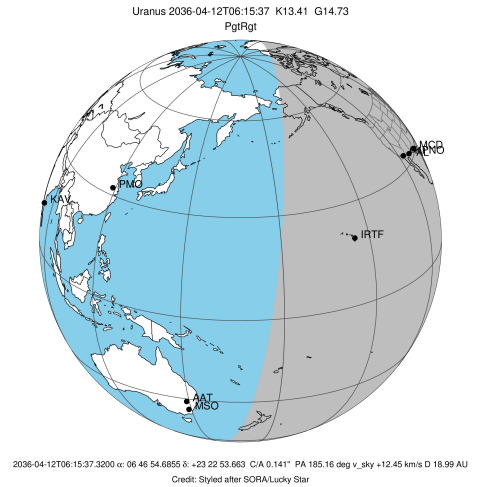
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-04-12T06:22:08.020
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3379616242312343040
 2Mass ID (if available) : 06465468+2322538
 ICRS Star Coord at Epoch: 06h 46m 54.68553s +23:22:53.66341s
 RUWE (>1.4 is poor) : 0.91
 K magnitude : 13.411
 G magnitude : 14.727
 RP magnitude : 14.259
 BP magnitude : 15.026
 DUPflag : 0
 Distance (au) : 18.986
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 12.45
 Sun-Target sep (deg) : 78.33
 Sun-Moon sep (deg) : 119.96
 B (ring opening deg) : 65.58
 PA of pole (deg) : 74.79
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.366
 C/A sky separation (km) : 5045.6
 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



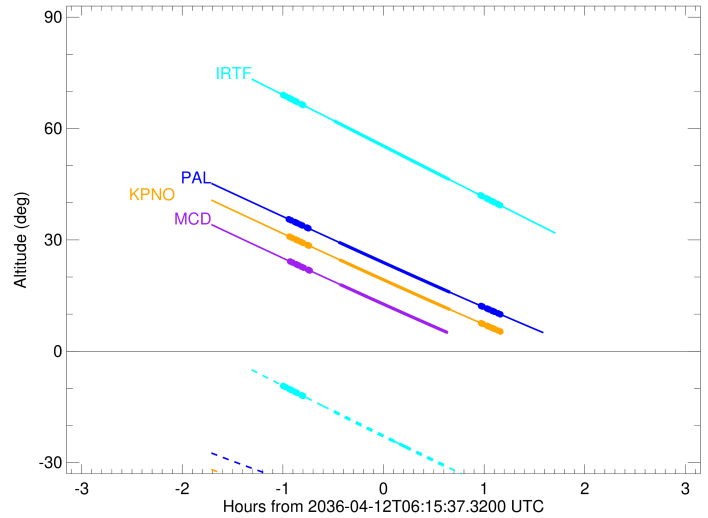
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-04-12T05:19:28.488		35.50	-35.05	50888.12	-13.23		
lambda	I	2036-04-12T05:20:33.547		35.27	-35.22	50026.71	-13.24		
delta	I	2036-04-12T05:22:43.939		34.82	-35.55	48300.35	-13.24		
gamma	I	2036-04-12T05:23:35.201		34.64	-35.68	47621.71	-13.24		
eta	I	2036-04-12T05:24:08.859		34.52	-35.76	47176.12	-13.24		
beta	I	2036-04-12T05:26:04.436		34.12	-36.05	45644.75	-13.24		
alpha	I	2036-04-12T05:27:11.851		33.89	-36.21	44751.58	-13.23		
4	I	2036-04-12T05:29:55.327		33.32	-36.61	42600.13	-13.23		
5	I	2036-04-12T05:30:25.503		33.22	-36.69	42194.37	-13.23		
6	I	2036-04-12T05:30:54.420		33.12	-36.76	41827.44	-13.23		
Uranus	I	2036-04-12T05:48:57.574		29.38	-39.26	25086.96		24.07	25.07
Uranus	E	2036-04-12T06:55:18.118		15.88	-46.06	25212.27		-20.38	-21.26
6	E	2036-04-12T07:13:44.601		12.22	-47.11	41836.81	13.45		
5	E	2036-04-12T07:14:19.195		12.11	-47.13	42290.73	13.46		
4	E	2036-04-12T07:14:37.142		12.05	-47.15	42534.94	13.46		
alpha	E	2036-04-12T07:17:17.983		11.52	-47.26	44687.98	13.47		
beta	E	2036-04-12T07:18:31.080		11.28	-47.31	45674.58	13.48		
eta	E	2036-04-12T07:20:22.330		10.92	-47.38	47176.12	13.49		
gamma	E	2036-04-12T07:20:55.988		10.81	-47.40	47630.15	13.49		
delta	E	2036-04-12T07:21:45.658		10.64	-47.43	48300.35	13.50		
lambda	E	2036-04-12T07:23:53.533		10.23	-47.50	50026.71	13.51		
epsilon	E	2036-04-12T07:25:30.740		9.91	-47.55	51339.88	13.50		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2036-04-12T06:22:20.820
Event type           : PgtRgt
: Uranus occs: geocentric, topocentric
: 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       : 3379616242312343040
2Mass ID (if available) : 06465468+2322538
ICRS Star Coord at Epoch: 06h 46m 54.68553s +23:22:53.66341s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 13.411
G magnitude           : 14.727
RP magnitude          : 14.259
BP magnitude          : 15.026
DUPflag              : 0
Distance (au)        : 18.986
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 12.45
Sun-Target sep (deg) : 78.33
Sun-Moon sep (deg)   : 119.91
B (ring opening deg) : 65.58
PA of pole (deg)     : 74.79
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.373
C/A sky separation (km) : 5130.7
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
    
```

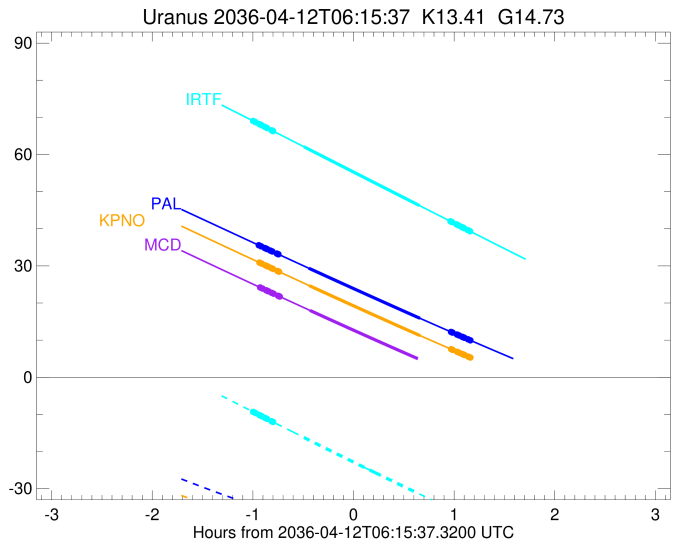
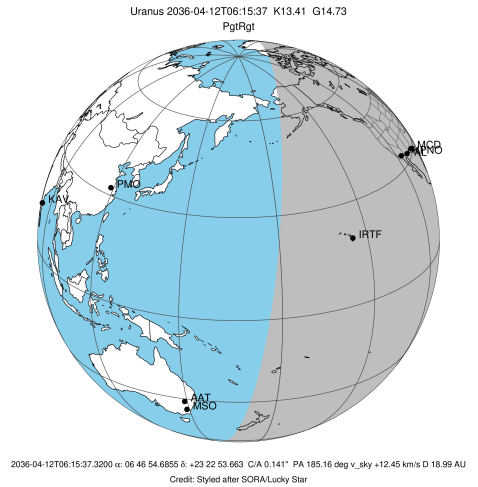


Uranus 2036-04-12T06:15:37 K13.41 G14.73



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-04-12T05:19:52.452		30.82	-39.22	50887.67	-13.26		
lambda	I	2036-04-12T05:20:57.325		30.59	-39.37	50026.71	-13.27		
delta	I	2036-04-12T05:23:07.413		30.14	-39.68	48300.35	-13.27		
gamma	I	2036-04-12T05:23:58.554		29.96	-39.79	47621.70	-13.27		
eta	I	2036-04-12T05:24:32.134		29.84	-39.87	47176.12	-13.27		
beta	I	2036-04-12T05:26:27.442		29.44	-40.14	45644.73	-13.27		
alpha	I	2036-04-12T05:27:34.697		29.20	-40.29	44751.60	-13.27		
4	I	2036-04-12T05:30:17.798		28.64	-40.66	42600.06	-13.26		
5	I	2036-04-12T05:30:47.887		28.53	-40.73	42194.50	-13.27		
6	I	2036-04-12T05:31:16.754		28.43	-40.79	41827.36	-13.26		
Uranus	I	2036-04-12T05:49:17.330		24.68	-43.07	25086.46		24.08	25.08
Uranus	E	2036-04-12T06:55:23.957		11.21	-48.59	25213.77		-20.33	-21.21
6	E	2036-04-12T07:13:48.130		7.57	-49.16	41836.72	13.49		
5	E	2036-04-12T07:14:22.644		7.45	-49.17	42290.85	13.49		
4	E	2036-04-12T07:14:40.533		7.40	-49.18	42534.89	13.49		
alpha	E	2036-04-12T07:17:20.951		6.87	-49.22	44688.01	13.51		
beta	E	2036-04-12T07:18:33.849		6.63	-49.23	45674.55	13.51		
eta	E	2036-04-12T07:20:24.801		6.27	-49.25	47176.12	13.52		
gamma	E	2036-04-12T07:20:58.368		6.16	-49.26	47630.14	13.53		
delta	E	2036-04-12T07:21:47.903		6.00	-49.26	48300.35	13.53		
lambda	E	2036-04-12T07:23:55.432		5.59	-49.27	50026.71	13.54		
epsilon	E	2036-04-12T07:25:32.330		5.28	-49.28	51339.30	13.54		

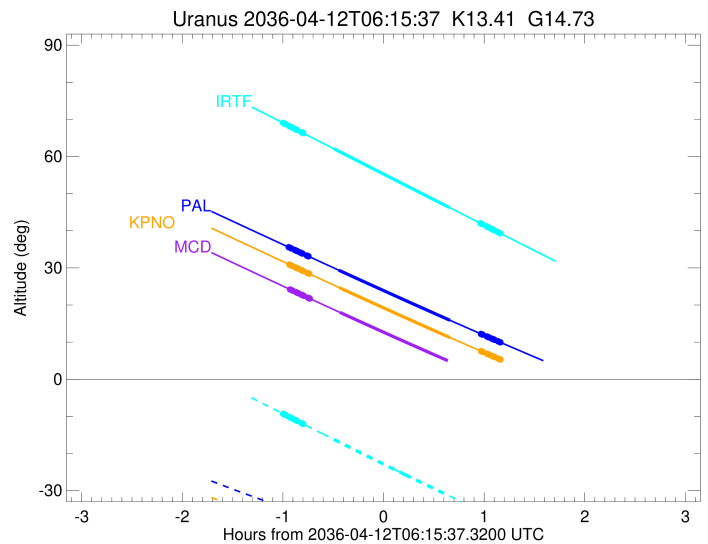
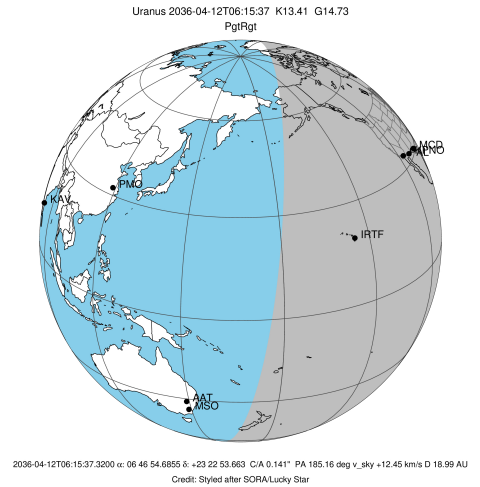
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-04-12T06:22:28.810
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 3379616242312343040
 2Mass ID (if available) : 06465468+2322538
 ICRS Star Coord at Epoch: 06h 46m 54.68553s +23:22:53.66341s
 RUWE (>1.4 is poor) : 0.91
 K magnitude : 13.411
 G magnitude : 14.727
 RP magnitude : 14.259
 BP magnitude : 15.026
 DUPflag : 0
 Distance (au) : 18.986
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 12.45
 Sun-Target sep (deg) : 78.33
 Sun-Moon sep (deg) : 119.83
 B (ring opening deg) : 65.58
 PA of pole (deg) : 74.79
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.386
 C/A sky separation (km) : 5313.2
 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	2036-04-12T05:20:18.211		24.12	-44.30	50886.56	-13.31		
lambda	I	2036-04-12T05:21:22.768		23.89	-44.43	50026.71	-13.32		
delta	I	2036-04-12T05:23:32.390		23.44	-44.69	48300.35	-13.32		
gamma	I	2036-04-12T05:24:23.350		23.26	-44.79	47621.69	-13.32		
eta	I	2036-04-12T05:24:56.810		23.15	-44.86	47176.12	-13.32		
beta	I	2036-04-12T05:26:51.713		22.75	-45.08	45644.69	-13.31		
alpha	I	2036-04-12T05:27:58.726		22.51	-45.21	44751.63	-13.31		
4	I	2036-04-12T05:30:41.267		21.95	-45.51	42599.91	-13.31		
5	I	2036-04-12T05:31:11.212		21.84	-45.57	42194.80	-13.31		
6	I	2036-04-12T05:31:40.020		21.74	-45.62	41827.18	-13.31		
Uranus	I	2036-04-12T05:49:36.785		18.02	-47.42	25085.35		24.11	25.11
Uranus	E	2036-04-12T06:55:20.822		4.74x	-50.57	25216.87		-20.23	-21.11
6	E	2036-04-12T07:13:42.282		1.16x	-50.36	41836.55	13.54		
5	E	2036-04-12T07:14:16.696		1.05x	-50.35	42291.08	13.54		
4	E	2036-04-12T07:14:34.500		0.99x	-50.34	42534.78	13.54		
alpha	E	2036-04-12T07:17:14.347		0.48x	-50.26	44688.06	13.56		
beta	E	2036-04-12T07:18:26.969		0.24x	-50.23	45674.50	13.56		
eta	E	2036-04-12T07:20:17.517		-0.11x	-50.17	47176.12	13.57		
gamma	E	2036-04-12T07:20:50.959		-0.22x	-50.15	47630.13	13.58		
delta	E	2036-04-12T07:21:40.312		-0.37x	-50.12	48300.35	13.58		
lambda	E	2036-04-12T07:23:47.366		-0.78x	-50.04	50026.71	13.59		
epsilon	E	2036-04-12T07:25:23.816		-1.08x	-49.97	51338.13	13.59		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2036-04-12T06:20:33.060
Event type           : PgtRgt
: Uranus occs: geocentric, topocentric
: 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       : 3379616242312343040
2Mass ID (if available) : 06465468+2322538
ICRS Star Coord at Epoch: 06h 46m 54.68553s +23:22:53.66341s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 13.411
G magnitude          : 14.727
RP magnitude         : 14.259
BP magnitude         : 15.026
DUPflag              : 0
Distance (au)        : 18.986
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 12.45
Sun-Target sep (deg) : 78.33
Sun-Moon sep (deg)   : 120.19
B (ring opening deg) : 65.58
PA of pole (deg)     : 74.79
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.166
C/A sky separation (km) : 2287.3
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	2036-04-12T05:16:07.122		68.97	-9.40	50904.77	-13.05		
lambda	I	2036-04-12T05:17:14.404		68.71	-9.66	50026.71	-13.05		
delta	I	2036-04-12T05:19:26.681		68.21	-10.16	48300.35	-13.05		
gamma	I	2036-04-12T05:20:18.663		68.01	-10.36	47621.87	-13.05		
eta	I	2036-04-12T05:20:52.814		67.88	-10.49	47176.12	-13.05		
beta	I	2036-04-12T05:22:49.964		67.43	-10.94	45645.47	-13.05		
alpha	I	2036-04-12T05:23:58.395		67.17	-11.20	44751.07	-13.05		
4	I	2036-04-12T05:26:43.925		66.54	-11.83	42602.29	-13.06		
5	I	2036-04-12T05:27:15.081		66.42	-11.94	42190.01	-13.06		
6	I	2036-04-12T05:27:43.767		66.31	-12.05	41830.15	-13.06		
Uranus	I	2036-04-12T05:46:05.157		62.09	-16.22	25108.95		23.45	24.43
Uranus	E	2036-04-12T06:54:56.447		46.25	-31.44	25166.96		-21.76	-22.69
6	E	2036-04-12T07:13:23.674		42.03	-35.35	41839.66	13.24		
5	E	2036-04-12T07:13:58.417		41.89	-35.47	42286.78	13.24		
4	E	2036-04-12T07:14:17.025		41.82	-35.54	42536.80	13.24		
alpha	E	2036-04-12T07:17:00.376		41.20	-36.11	44687.11	13.24		
beta	E	2036-04-12T07:18:14.883		40.91	-36.36	45675.47	13.25		
eta	E	2036-04-12T07:20:08.022		40.48	-36.76	47176.12	13.25		
gamma	E	2036-04-12T07:20:42.294		40.35	-36.87	47630.36	13.25		
delta	E	2036-04-12T07:21:32.838		40.16	-37.05	48300.35	13.26		
lambda	E	2036-04-12T07:23:43.032		39.66	-37.50	50026.71	13.26		
epsilon	E	2036-04-12T07:25:23.481		39.28	-37.84	51359.18	13.26		