

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-08T06:56:35.610
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3377569703278030208
 2Mass ID (if available) : 06230704+2335352

ICRS Star Coord at Epoch: 06h 23m 07.04871s +23:35:35.06326s

RUWE (>1.4 is poor) : 1.02
 K magnitude : 13.386
 G magnitude : 16.709
 RP magnitude : 15.738
 BP magnitude : 17.654
 DUPflag : 0
 Distance (au) : 18.304
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.91
 Sun-Target sep (deg) : 130.42
 Sun-Moon sep (deg) : 29.86
 B (ring opening deg) : 70.68
 PA of pole (deg) : 67.52

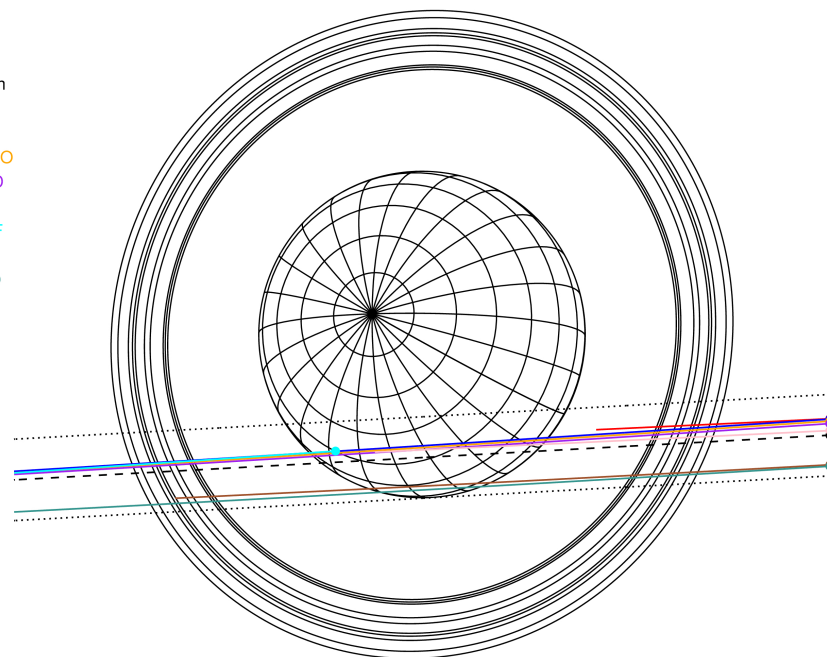
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2033-11-08T06:56:35.6100 α: 06 23 07.04871 δ: +23 35 35.063 C/A 1.440° PA 3.14 deg v_sky -12.91 km/s D 18.30 AU
 Credit: Styled after SORA/Lucky Star

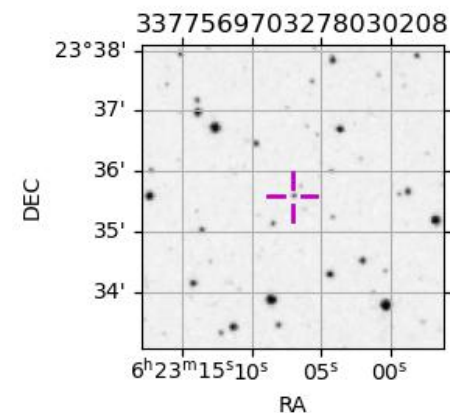
Uranus 2033-11-08T06:56:35 K13.39 G16.71 PgtRgt

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO

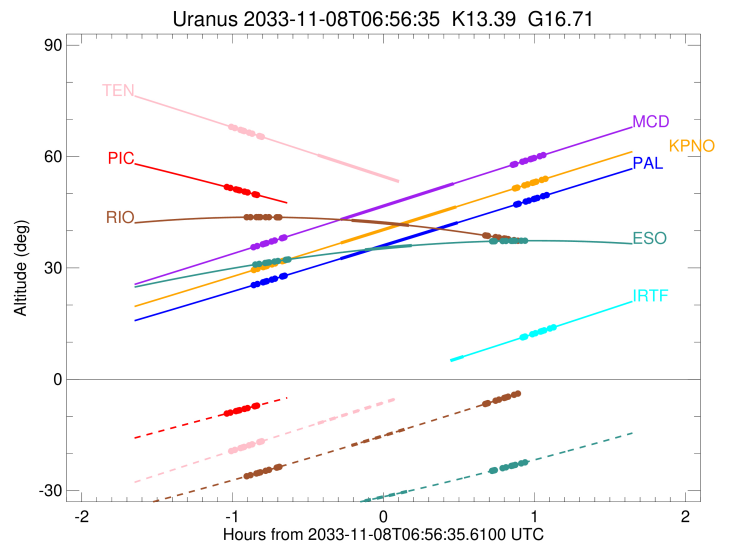
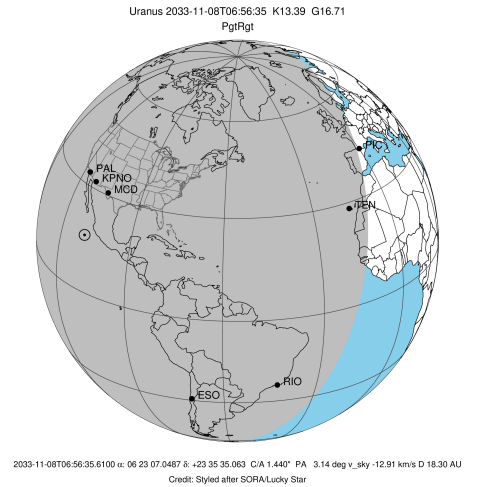


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++			NOV 08 05:54 - NOV 08 06:06	PnnRin
PAL	Palomar Mt (200")	33.4	243.1	+++++	+ +	+++++	NOV 08 06:05 - NOV 08 08:01	PieRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	NOV 08 06:05 - NOV 08 08:01	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	NOV 08 06:05 - NOV 08 08:00	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+		NOV 08 05:56 - NOV 08 06:30	PinRin
IRTF	Mauna Kea/IRTF	19.8	204.5		+	+++++	NOV 08 07:28 - NOV 08 08:04	PneRne
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++	+ +	+++++	NOV 08 06:02 - NOV 08 07:44	PieRie
ESO	European Southern Obs	-29.3	289.3	+++++	+ +	+++++	NOV 08 06:06 - NOV 08 07:53	PieRie
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

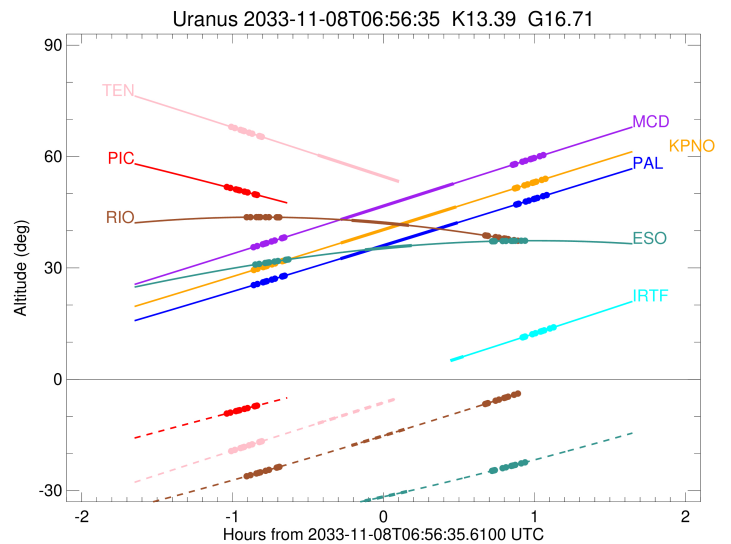
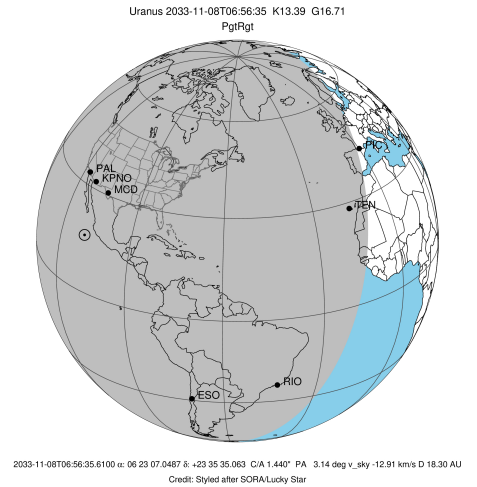


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-08T06:52:05.260
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3377569703278030208
 2Mass ID (if available) : 06230704+2335352
 ICRS Star Coord at Epoch: 06h 23m 07.04871s +23:35:35.06326s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 13.386
 G magnitude : 16.709
 RP magnitude : 15.738
 BP magnitude : 17.654
 DUPflag : 0
 Distance (au) : 18.304
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.91
 Sun-Target sep (deg) : 130.42
 Sun-Moon sep (deg) : 30.77
 B (ring opening deg) : 70.68
 PA of pole (deg) : 67.52
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.216
 C/A sky separation (km) : 16144.7
 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_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	2033-11-08T05:54:48.800		51.70	-9.14	50758.05	-13.07		
lambda	I	2033-11-08T05:55:44.852		51.54	-8.98	50026.71	-13.05		
delta	I	2033-11-08T05:57:57.576		51.15	-8.58	48300.35	-12.98		
gamma	I	2033-11-08T05:58:49.818		50.99	-8.43	47623.01	-12.95		
eta	I	2033-11-08T05:59:24.342		50.89	-8.33	47176.12	-12.94		
beta	I	2033-11-08T06:01:20.181		50.55	-7.98	45680.10	-12.88		
alpha	I	2033-11-08T06:02:33.525		50.33	-7.77	44741.78	-12.83		
4	I	2033-11-08T06:05:23.320		49.83	-7.27	42559.52	-12.72		
5	I	2033-11-08T06:05:54.158		49.74	-7.18	42182.59	-12.72		
6	I	2033-11-08T06:06:18.472		49.66	-7.11	41878.67	-12.69		
Uranus	I	2033-11-08T06:27:42.314		45.81	-3.37x	25071.70		-18.64	-19.46
Uranus	E	2033-11-08T07:17:09.311		36.75	4.91x	25459.38		8.21	8.60
6	E	2033-11-08T07:39:41.914		32.60	8.49x	41801.49	12.61		
5	E	2033-11-08T07:40:22.881		32.48	8.59x	42315.05	12.63		
4	E	2033-11-08T07:40:41.450		32.42	8.64x	42548.61	12.64		
alpha	E	2033-11-08T07:43:29.198		31.91	9.07x	44684.70	12.74		
beta	E	2033-11-08T07:44:45.255		31.67	9.27x	45651.38	12.78		
eta	E	2033-11-08T07:46:44.199		31.31	9.57x	47176.12	12.84		
gamma	E	2033-11-08T07:47:19.643		31.20	9.66x	47631.46	12.86		
delta	E	2033-11-08T07:48:11.631		31.04	9.79x	48300.35	12.88		
lambda	E	2033-11-08T07:50:25.405		30.63	10.13x	50026.71	12.93		
epsilon	E	2033-11-08T07:52:21.199		30.28	10.43x	51526.57	12.96		

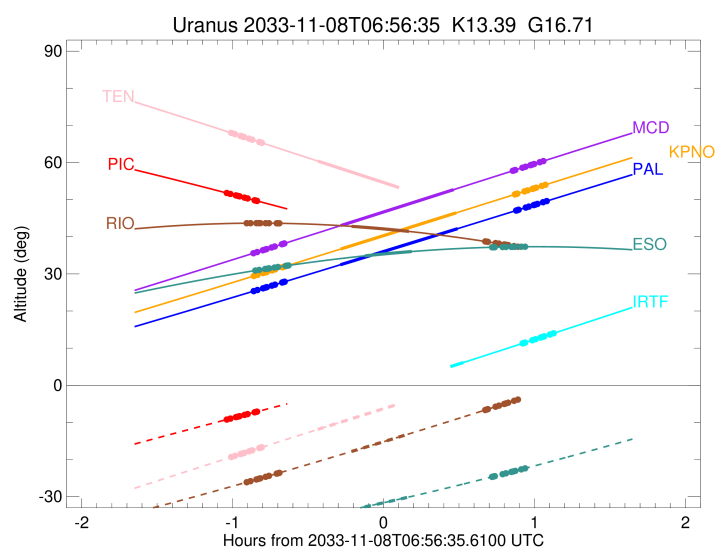
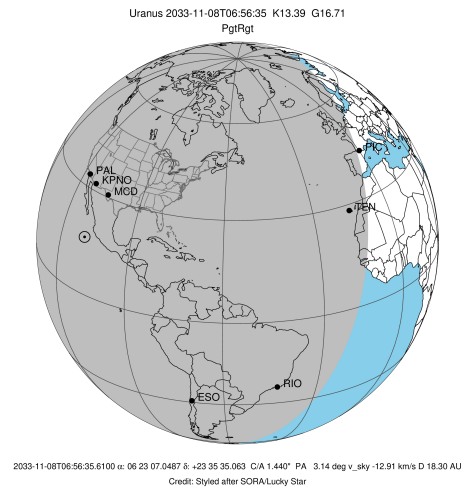
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-08T07:02:28.770
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3377569703278030208
 2Mass ID (if available) : 06230704+2335352
 ICRS Star Coord at Epoch: 06h 23m 07.04871s +23:35:35.06326s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 13.386
 G magnitude : 16.709
 RP magnitude : 15.738
 BP magnitude : 17.654
 DUPflag : 0
 Distance (au) : 18.304
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.91
 Sun-Target sep (deg) : 130.42
 Sun-Moon sep (deg) : 29.55
 B (ring opening deg) : 70.68
 PA of pole (deg) : 67.52
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.310
 C/A sky separation (km) : 17393.5
 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	2033-11-08T06:05:32.169		25.47	-64.61	50758.99	-12.80		
lambda	I	2033-11-08T06:06:29.468		25.67	-64.78	50026.71	-12.77		
delta	I	2033-11-08T06:08:45.003		26.13	-65.16	48300.35	-12.71		
gamma	I	2033-11-08T06:09:38.364		26.31	-65.31	47623.05	-12.68		
eta	I	2033-11-08T06:10:13.637		26.43	-65.40	47176.12	-12.66		
beta	I	2033-11-08T06:12:12.009		26.84	-65.73	45680.18	-12.60		
alpha	I	2033-11-08T06:13:27.020		27.09	-65.94	44741.46	-12.55		
4	I	2033-11-08T06:16:20.751		27.69	-66.41	42558.87	-12.43		
5	I	2033-11-08T06:16:52.206		27.80	-66.49	42183.52	-12.42		
6	I	2033-11-08T06:17:17.185		27.88	-66.56	41878.52	-12.39		
Uranus	I	2033-11-08T06:39:28.405		32.47	-69.80	25084.80		-18.37	-19.18
Uranus	E	2033-11-08T07:26:07.597		42.20	-73.46	25491.19		6.76	7.08
6	E	2033-11-08T07:49:16.161		47.06	-73.01	41802.70	12.55		
5	E	2033-11-08T07:49:57.224		47.20	-72.97	42315.24	12.57		
4	E	2033-11-08T07:50:15.651		47.26	-72.96	42546.68	12.58		
alpha	E	2033-11-08T07:53:04.134		47.85	-72.79	44684.62	12.71		
beta	E	2033-11-08T07:54:20.380		48.12	-72.70	45652.23	12.77		
eta	E	2033-11-08T07:56:19.343		48.54	-72.56	47176.12	12.84		
gamma	E	2033-11-08T07:56:54.785		48.66	-72.52	47631.50	12.86		
delta	E	2033-11-08T07:57:46.740		48.84	-72.45	48300.35	12.89		
lambda	E	2033-11-08T08:00:00.322		49.31	-72.28	50026.71	12.96		
epsilon	E	2033-11-08T08:01:55.285		49.71	-72.11	51519.63	13.00		

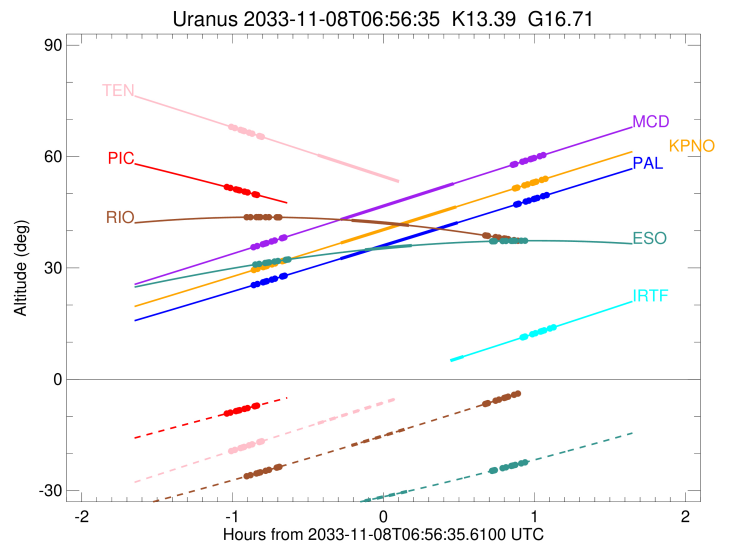
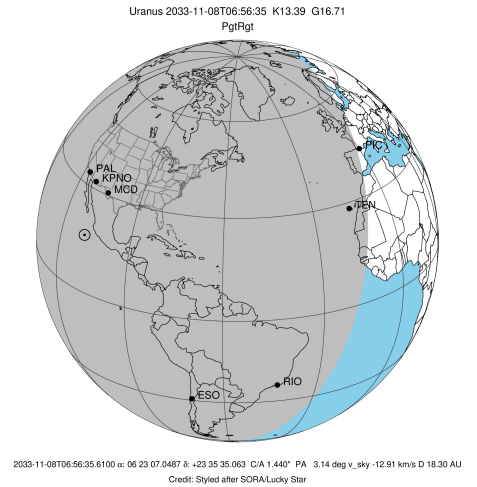
```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2033-11-08T07:02:13.010
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        : 3377569703278030208
2Mass ID (if available) : 06230704+2335352
ICRS Star Coord at Epoch: 06h 23m 07.04871s +23:35:35.06326s
RUWE (>1.4 is poor)  : 1.02
K magnitude           : 13.386
G magnitude           : 16.709
RP magnitude          : 15.738
BP magnitude          : 17.654
DUPflag              : 0
Distance (au)         : 18.304
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s)  : -12.91
Sun-Target sep (deg)  : 130.42
Sun-Moon sep (deg)    : 29.60
B (ring opening deg)  : 70.68
PA of pole (deg)      : 67.52
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.332
C/A sky separation (km) : 17682.5
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_itrff93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```



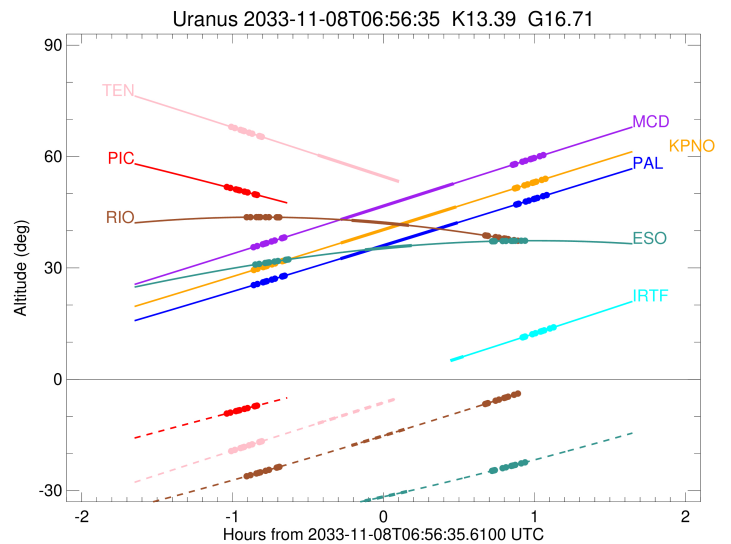
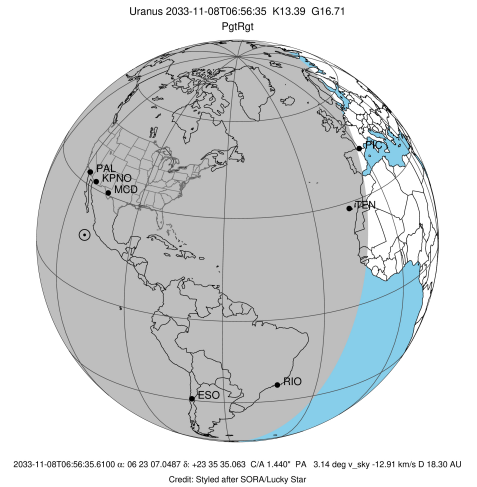
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-11-08T06:05:34.083		29.54	-68.95	50759.73	-12.81		
lambda	I	2033-11-08T06:06:31.417		29.74	-69.10	50026.71	-12.77		
delta	I	2033-11-08T06:08:46.918		30.21	-69.45	48300.35	-12.71		
gamma	I	2033-11-08T06:09:40.270		30.40	-69.59	47623.08	-12.68		
eta	I	2033-11-08T06:10:15.545		30.52	-69.68	47176.12	-12.66		
beta	I	2033-11-08T06:12:13.927		30.94	-69.97	45680.23	-12.59		
alpha	I	2033-11-08T06:13:28.976		31.20	-70.16	44741.27	-12.55		
4	I	2033-11-08T06:16:22.819		31.81	-70.58	42558.52	-12.42		
5	I	2033-11-08T06:16:54.239		31.92	-70.65	42184.02	-12.41		
6	I	2033-11-08T06:17:19.285		32.01	-70.71	41878.43	-12.38		
Uranus	I	2033-11-08T06:39:37.114		36.71	-73.37	25089.77		-18.27	-19.07
Uranus	E	2033-11-08T07:25:28.239		46.44	-74.50	25496.35		6.50	6.80
6	E	2033-11-08T07:48:44.954		51.40	-72.54	41802.88	12.53		
5	E	2033-11-08T07:49:26.059		51.55	-72.46	42315.25	12.56		
4	E	2033-11-08T07:49:44.481		51.61	-72.42	42546.42	12.56		
alpha	E	2033-11-08T07:52:33.181		52.21	-72.09	44684.62	12.70		
beta	E	2033-11-08T07:53:49.500		52.48	-71.93	45652.34	12.76		
eta	E	2033-11-08T07:55:48.538		52.91	-71.68	47176.12	12.83		
gamma	E	2033-11-08T07:56:24.001		53.03	-71.61	47631.51	12.85		
delta	E	2033-11-08T07:57:15.982		53.22	-71.50	48300.35	12.88		
lambda	E	2033-11-08T07:59:29.614		53.69	-71.20	50026.71	12.95		
epsilon	E	2033-11-08T08:01:24.532		54.10	-70.94	51518.72	13.00		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-08T07:01:42.540
 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 : 3377569703278030208
 2Mass ID (if available) : 06230704+2335352
 ICRS Star Coord at Epoch: 06h 23m 07.04871s +23:35:35.06326s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 13.386
 G magnitude : 16.709
 RP magnitude : 15.738
 BP magnitude : 17.654
 DUPflag : 0
 Distance (au) : 18.304
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.91
 Sun-Target sep (deg) : 130.42
 Sun-Moon sep (deg) : 29.69
 B (ring opening deg) : 70.68
 PA of pole (deg) : 67.52
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.357
 C/A sky separation (km) : 18009.7
 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_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	2033-11-08T06:05:25.479		35.69	-74.09	50760.62	-12.82		
lambda	I	2033-11-08T06:06:22.824		35.89	-74.20	50026.71	-12.78		
delta	I	2033-11-08T06:08:38.208		36.37	-74.44	48300.35	-12.72		
gamma	I	2033-11-08T06:09:31.521		36.56	-74.53	47623.12	-12.69		
eta	I	2033-11-08T06:10:06.778		36.69	-74.59	47176.12	-12.67		
beta	I	2033-11-08T06:12:05.105		37.11	-74.79	45680.28	-12.60		
alpha	I	2033-11-08T06:13:20.159		37.38	-74.90	44741.04	-12.55		
4	I	2033-11-08T06:16:14.038		38.00	-75.16	42558.11	-12.41		
5	I	2033-11-08T06:16:45.399		38.11	-75.20	42184.61	-12.41		
6	I	2033-11-08T06:17:10.513		38.20	-75.23	41878.33	-12.38		
Uranus	I	2033-11-08T06:39:35.595		43.02	-76.17	25095.88		-18.14	-18.94
Uranus	E	2033-11-08T07:24:29.879		52.70	-72.82	25501.95		6.20	6.49
6	E	2033-11-08T07:47:55.888		57.76	-69.21	41803.07	12.51		
5	E	2033-11-08T07:48:37.034		57.91	-69.09	42315.25	12.54		
4	E	2033-11-08T07:48:55.451		57.98	-69.04	42546.13	12.55		
alpha	E	2033-11-08T07:51:44.372		58.58	-68.55	44684.62	12.69		
beta	E	2033-11-08T07:53:00.764		58.86	-68.33	45652.46	12.75		
eta	E	2033-11-08T07:54:59.872		59.28	-67.98	47176.12	12.82		
gamma	E	2033-11-08T07:55:35.354		59.41	-67.88	47631.51	12.85		
delta	E	2033-11-08T07:56:27.358		59.60	-67.72	48300.35	12.88		
lambda	E	2033-11-08T07:58:41.029		60.08	-67.32	50026.71	12.95		
epsilon	E	2033-11-08T08:00:35.885		60.49	-66.97	51517.75	12.99		

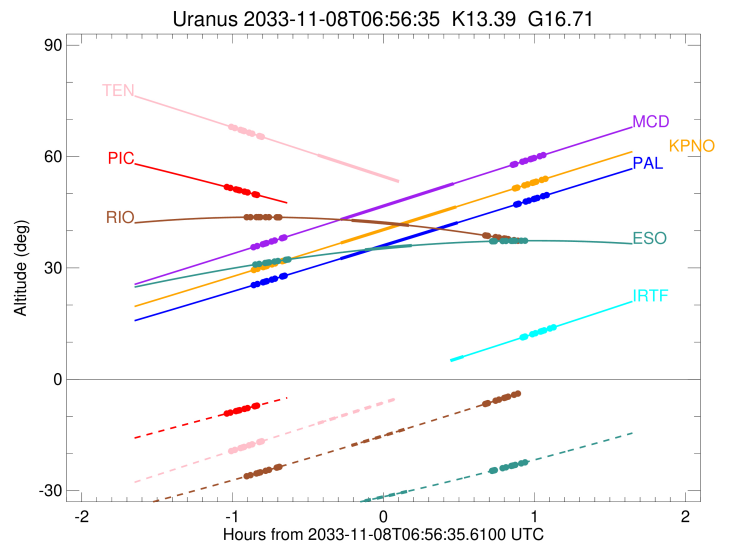
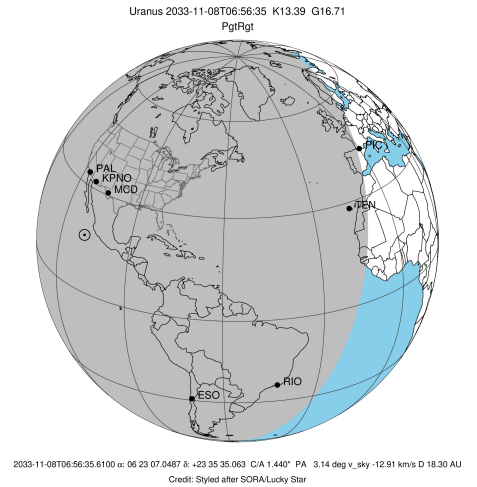
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-08T06:52:24.520
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 3377569703278030208
 2Mass ID (if available) : 06230704+2335352
 ICRS Star Coord at Epoch: 06h 23m 07.04871s +23:35:35.06326s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 13.386
 G magnitude : 16.709
 RP magnitude : 15.738
 BP magnitude : 17.654
 DUPflag : 0
 Distance (au) : 18.304
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.91
 Sun-Target sep (deg) : 130.42
 Sun-Moon sep (deg) : 30.78
 B (ring opening deg) : 70.68
 PA of pole (deg) : 67.52
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.360
 C/A sky separation (km) : 18056.9
 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	2033-11-08T05:56:35.005		67.87	-19.23	50762.60	-12.99		
lambda	I	2033-11-08T05:57:31.767		67.67	-19.02	50026.71	-12.95		
delta	I	2033-11-08T05:59:45.455		67.18	-18.54	48300.35	-12.88		
gamma	I	2033-11-08T06:00:38.110		66.98	-18.35	47623.19	-12.85		
eta	I	2033-11-08T06:01:12.945		66.86	-18.22	47176.12	-12.82		
beta	I	2033-11-08T06:03:09.860		66.43	-17.80	45680.38	-12.75		
alpha	I	2033-11-08T06:04:24.081		66.15	-17.53	44740.61	-12.69		
4	I	2033-11-08T06:07:16.040		65.52	-16.91	42557.39	-12.55		
5	I	2033-11-08T06:07:46.935		65.41	-16.79	42185.66	-12.54		
6	I	2033-11-08T06:08:11.872		65.32	-16.70	41878.14	-12.51		
Uranus	I	2033-11-08T06:30:26.712		60.41	-11.90	25102.25		-18.01	-18.80
Uranus	E	2033-11-08T07:15:06.896		50.54	-2.40x	25497.31		6.45	6.75
6	E	2033-11-08T07:38:37.252		45.36	2.49x	41802.70	12.44		
5	E	2033-11-08T07:39:18.654		45.21	2.64x	42315.24	12.47		
4	E	2033-11-08T07:39:37.233		45.14	2.70x	42546.69	12.48		
alpha	E	2033-11-08T07:42:27.057		44.52	3.28x	44684.62	12.62		
beta	E	2033-11-08T07:43:43.893		44.23	3.55x	45652.19	12.67		
eta	E	2033-11-08T07:45:43.770		43.80	3.96x	47176.12	12.74		
gamma	E	2033-11-08T07:46:19.482		43.66	4.08x	47631.50	12.76		
delta	E	2033-11-08T07:47:11.831		43.47	4.26x	48300.35	12.79		
lambda	E	2033-11-08T07:49:26.423		42.98	4.72x	50026.71	12.86		
epsilon	E	2033-11-08T07:51:22.306		42.56	5.11x	51520.28	12.90		

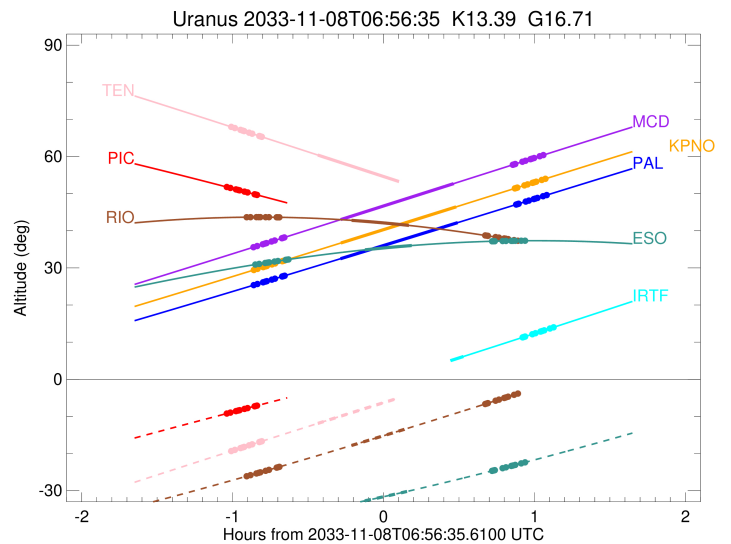
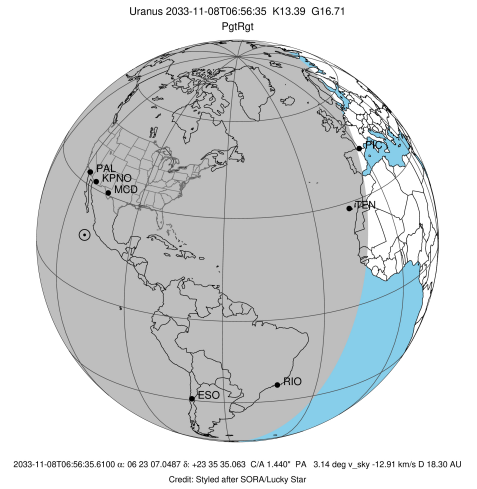
```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2033-11-08T07:04:07.450
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        : 3377569703278030208
2Mass ID (if available) : 06230704+2335352
ICRS Star Coord at Epoch: 06h 23m 07.04871s +23:35:35.06326s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 13.386
G magnitude           : 16.709
RP magnitude          : 15.738
BP magnitude          : 17.654
DUPflag              : 0
Distance (au)         : 18.304
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -12.91
Sun-Target sep (deg) : 130.42
Sun-Moon sep (deg)   : 29.09
B (ring opening deg) : 70.68
PA of pole (deg)     : 67.52
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.303
C/A sky separation (km) : 17291.7
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall11.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall11.bsp
ural161.bsp
vgr2.ural161.bsp
peph.ural160.bsp
earthstns_itr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```



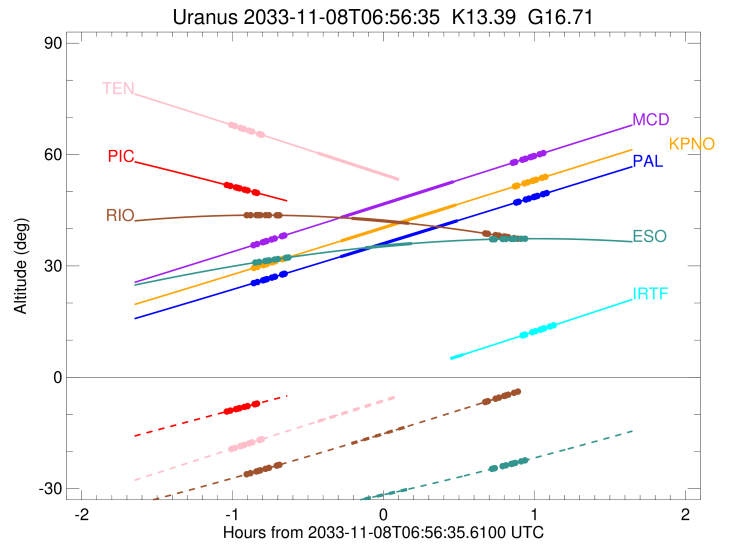
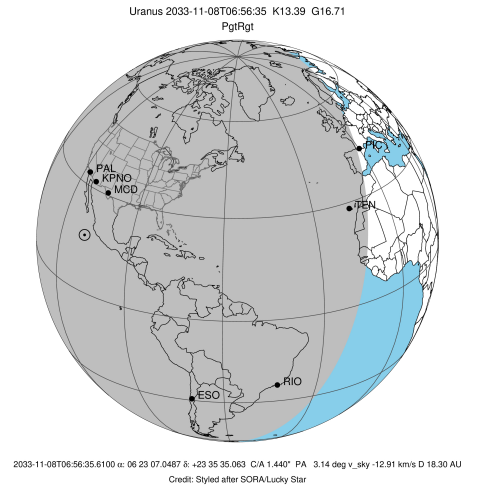
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-11-08T06:05:58.333	-11.28x	-33.29	50758.40	-12.55			
lambda	I	2033-11-08T06:06:56.752	-11.08x	-33.52	50026.71	-12.51			
delta	I	2033-11-08T06:09:15.038	-10.61x	-34.06	48300.35	-12.45			
gamma	I	2033-11-08T06:10:09.480	-10.43x	-34.27	47623.03	-12.43			
eta	I	2033-11-08T06:10:45.463	-10.30x	-34.41	47176.12	-12.41			
beta	I	2033-11-08T06:12:46.219	-9.89x	-34.88	45680.14	-12.35			
alpha	I	2033-11-08T06:14:02.718	-9.63x	-35.18	44741.60	-12.30			
4	I	2033-11-08T06:16:59.892	-9.02x	-35.87	42559.14	-12.19			
5	I	2033-11-08T06:17:32.015	-8.91x	-35.99	42183.14	-12.18			
6	I	2033-11-08T06:17:57.452	-8.82x	-36.09	41878.58	-12.16			
Uranus	I	2033-11-08T06:40:32.545	-4.11x	-41.38	25082.03			-18.43	-19.24
Uranus	E	2033-11-08T07:28:20.194	6.12	-52.61	25490.95			6.77	7.09
6	E	2033-11-08T07:51:50.067	11.26	-58.14	41802.76	12.35			
5	E	2033-11-08T07:52:31.783	11.42	-58.30	42315.24	12.38			
4	E	2033-11-08T07:52:50.495	11.49	-58.37	42546.59	12.38			
alpha	E	2033-11-08T07:55:41.684	12.11	-59.05	44684.62	12.51			
beta	E	2033-11-08T07:56:59.151	12.40	-59.35	45652.27	12.57			
eta	E	2033-11-08T07:59:00.008	12.84	-59.82	47176.12	12.64			
gamma	E	2033-11-08T07:59:36.015	12.98	-59.96	47631.51	12.66			
delta	E	2033-11-08T08:00:28.797	13.17	-60.17	48300.35	12.69			
lambda	E	2033-11-08T08:02:44.498	13.67	-60.70	50026.71	12.76			
epsilon	E	2033-11-08T08:04:41.239	14.10	-61.16	51519.13	12.80			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-08T06:54:48.990
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 3377569703278030208
 2Mass ID (if available) : 06230704+2335352
 ICRS Star Coord at Epoch: 06h 23m 07.04871s +23:35:35.06326s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 13.386
 G magnitude : 16.709
 RP magnitude : 15.738
 BP magnitude : 17.654
 DUPflag : 0
 Distance (au) : 18.304
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.91
 Sun-Target sep (deg) : 130.42
 Sun-Moon sep (deg) : 30.31
 B (ring opening deg) : 70.68
 PA of pole (deg) : 67.52
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.787
 C/A sky separation (km) : 23724.0
 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_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	2033-11-08T06:02:43.175		43.66	-26.02	50779.88	-12.33		
lambda	I	2033-11-08T06:03:44.495		43.66	-25.82	50026.71	-12.26		
delta	I	2033-11-08T06:06:06.113		43.67	-25.37	48300.35	-12.12		
gamma	I	2033-11-08T06:07:02.055		43.67	-25.19	47623.78	-12.07		
eta	I	2033-11-08T06:07:39.217		43.67	-25.07	47176.12	-12.03		
beta	I	2033-11-08T06:09:44.188		43.67	-24.66	45680.99	-11.89		
alpha	I	2033-11-08T06:11:04.267		43.66	-24.40	44736.77	-11.79		
4	I	2033-11-08T06:14:10.666		43.64	-23.79	42551.05	-11.53		
5	I	2033-11-08T06:14:43.013		43.63	-23.69	42195.84	-11.50		
6	I	2033-11-08T06:15:11.282		43.63	-23.59	41875.87	-11.45		
Uranus	I	2033-11-08T06:43:51.551		42.81	-17.84	25288.62		-13.68	-14.31
Uranus	E	2033-11-08T07:06:42.619		41.44	-13.10	25556.99		-1.16	-1.22
6	E	2033-11-08T07:36:57.161		38.75	-6.68	41807.19	11.44		
5	E	2033-11-08T07:37:41.600		38.68	-6.52	42314.46	11.50		
4	E	2033-11-08T07:38:01.156		38.64	-6.45	42540.95	11.52		
alpha	E	2033-11-08T07:41:04.735		38.31	-5.79	44684.88	11.78		
beta	E	2033-11-08T07:42:27.013		38.17	-5.50	45654.90	11.88		
eta	E	2033-11-08T07:44:34.279		37.93	-5.04	47176.12	12.02		
gamma	E	2033-11-08T07:45:12.118		37.86	-4.90x	47631.57	12.06		
delta	E	2033-11-08T07:46:07.460		37.76	-4.70x	48300.35	12.11		
lambda	E	2033-11-08T07:48:29.201		37.49	-4.19x	50026.71	12.24		
epsilon	E	2033-11-08T07:50:28.721		37.26	-3.76x	51496.37	12.32		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-08T06:58:00.010
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 3377569703278030208
 2Mass ID (if available) : 06230704+2335352
 ICRS Star Coord at Epoch: 06h 23m 07.04871s +23:35:35.06326s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 13.386
 G magnitude : 16.709
 RP magnitude : 15.738
 BP magnitude : 17.654
 DUPflag : 0
 Distance (au) : 18.304
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.91
 Sun-Target sep (deg) : 130.42
 Sun-Moon sep (deg) : 29.89
 B (ring opening deg) : 70.68
 PA of pole (deg) : 67.52
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.831
 C/A sky separation (km) : 24312.9
 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_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	2033-11-08T06:06:09.444		30.96	-38.31	50781.21	-12.18		
lambda	I	2033-11-08T06:07:11.642		31.07	-38.20	50026.71	-12.10		
delta	I	2033-11-08T06:09:35.096		31.33	-37.92	48300.35	-11.96		
gamma	I	2033-11-08T06:10:31.784		31.43	-37.81	47623.82	-11.91		
eta	I	2033-11-08T06:11:09.456		31.49	-37.74	47176.12	-11.86		
beta	I	2033-11-08T06:13:16.186		31.71	-37.49	45681.02	-11.72		
alpha	I	2033-11-08T06:14:37.467		31.85	-37.33	44736.47	-11.61		
4	I	2033-11-08T06:17:46.806		32.17	-36.95	42550.58	-11.34		
5	I	2033-11-08T06:18:19.579		32.23	-36.88	42196.68	-11.32		
6	I	2033-11-08T06:18:48.413		32.27	-36.82	41875.65	-11.26		
Uranus	I	2033-11-08T06:49:07.617		34.86	-32.75	25322.22		-12.78	-13.36
Uranus	E	2033-11-08T07:07:50.268		36.03	-29.93	25549.16		-2.57	-2.69
6	E	2033-11-08T07:39:41.654		37.17	-24.69	41807.89	11.30		
5	E	2033-11-08T07:40:26.515		37.18	-24.56	42314.18	11.37		
4	E	2033-11-08T07:40:46.234		37.19	-24.50	42540.19	11.39		
alpha	E	2033-11-08T07:43:51.798		37.24	-23.97	44684.98	11.67		
beta	E	2033-11-08T07:45:14.837		37.26	-23.72	45655.31	11.78		
eta	E	2033-11-08T07:47:23.115		37.28	-23.35	47176.12	11.92		
gamma	E	2033-11-08T07:48:01.241		37.29	-23.24	47631.58	11.97		
delta	E	2033-11-08T07:48:56.985		37.30	-23.08	48300.35	12.03		
lambda	E	2033-11-08T07:51:19.664		37.32	-22.66	50026.71	12.17		
epsilon	E	2033-11-08T07:53:19.550		37.33	-22.30	51492.31	12.25		