

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2047-11-04T12:34:20.050
 Event type : PgtX
 : Uranus occs: geocentric, topocentric
 : No ring occs
 Gaia source ID : 3869174344333138048
 2Mass ID (if available) : 10460765+0837388

Uranus 2047-11-04T12:34:20 K13.04 G14.77 PgtX

ICRS Star Coord at Epoch: 10h 46m 07.58054s +08:37:38.31431s

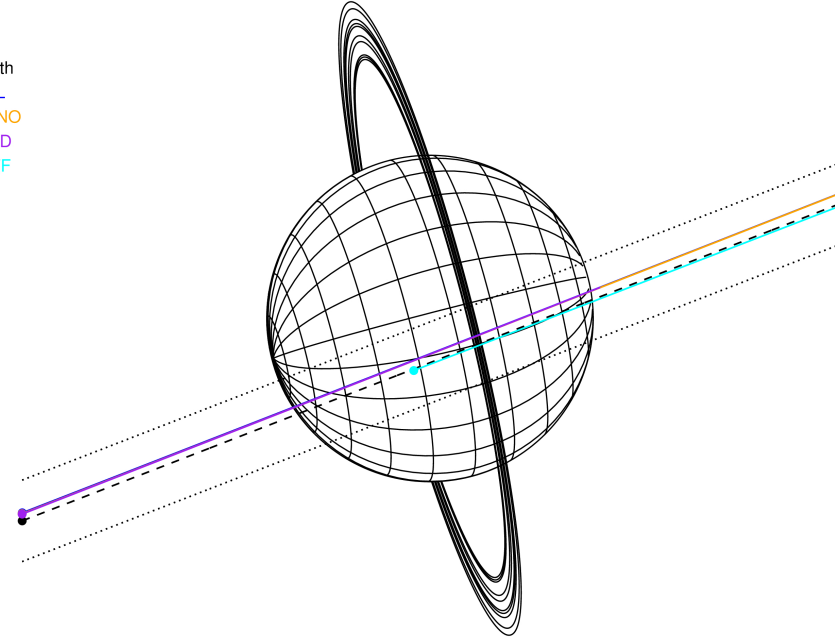
RUWE (>1.4 is poor) : 1.04
 K magnitude : 13.045
 G magnitude : 14.768
 RP magnitude : 14.198
 BP magnitude : 15.175
 DUPflag : 0
 Distance (au) : 18.753
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.99
 Sun-Target sep (deg) : 61.65
 Sun-Moon sep (deg) : 98.61
 B (ring opening deg) : 7.78
 PA of pole (deg) : 104.27

#	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



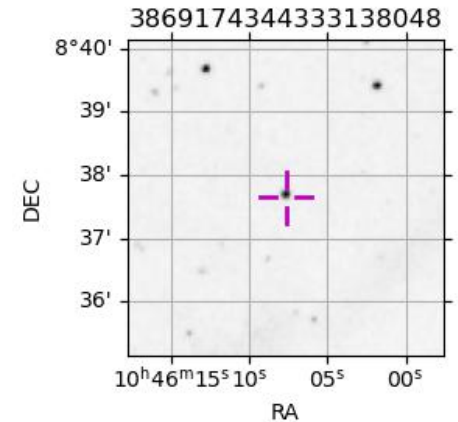
2047-11-04T12:34:20.0500 cr: 10 46 07.5805 s: +08 37 38.314 C/A 0.4777 PA 21.19 deg v_sky +20.99 km/s D 18.75 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PAL
 KPNO
 MCD
 IRTF

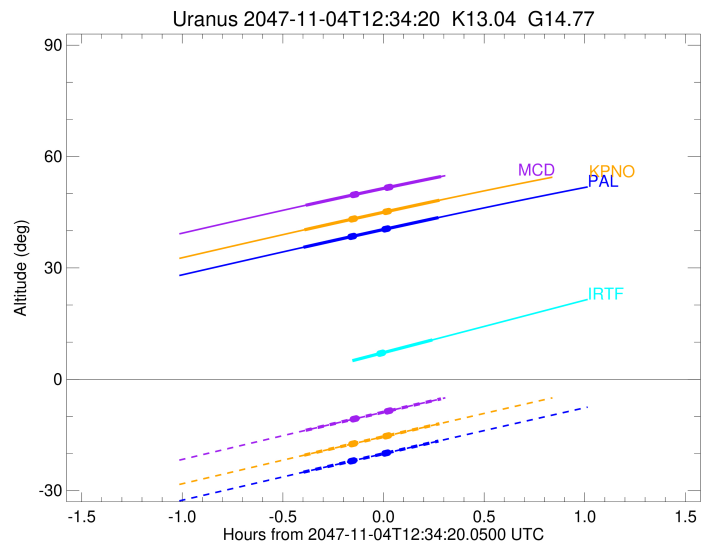
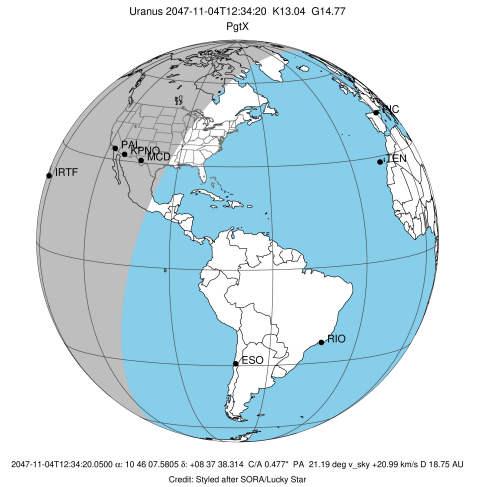


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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		+	+	NOV 04 12:10 - NOV 04 12:50	PieRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4		+	+	NOV 04 12:10 - NOV 04 12:51	PieRnn
MCD	McDonald Obs. 2.7m	30.7	256.0		+	+	NOV 04 12:11 - NOV 04 12:51	PieRnn
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5		+		NOV 04 12:48 - NOV 04 12:48	PneRnn
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



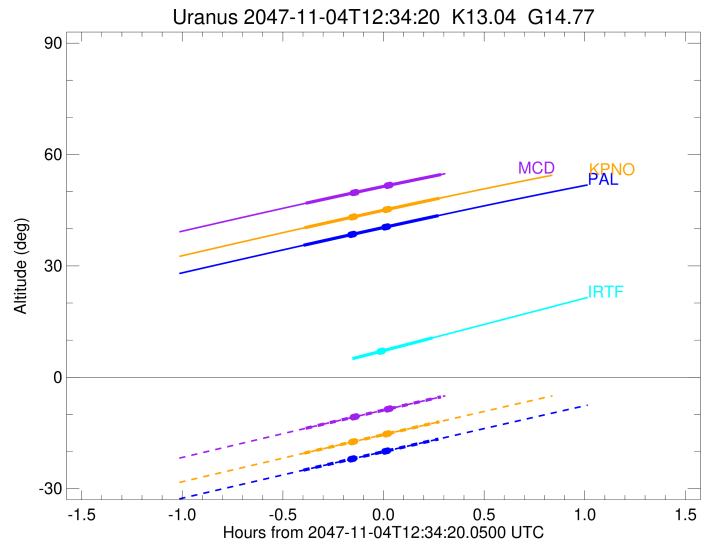
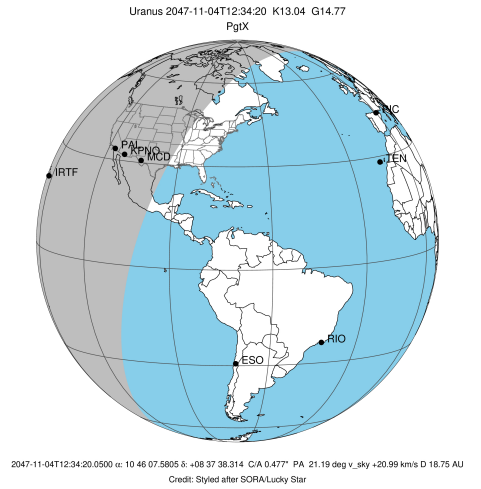
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2047-11-04T12:30:35.020
 Event type : PgtX
 : Uranus occs: geocentric, topocentric
 : No ring occs
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 386917434433138048
 2Mass ID (if available) : 10460765+0837388
 ICRS Star Coord at Epoch: 10h 46m 07.58054s +08:37:38.31431s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 13.045
 G magnitude : 14.768
 RP magnitude : 14.198
 BP magnitude : 15.175
 DUPflag : 0
 Distance (au) : 18.753
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.99
 Sun-Target sep (deg) : 61.65
 Sun-Moon sep (deg) : 99.29
 B (ring opening deg) : 7.78
 PA of pole (deg) : 104.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.379
 C/A sky separation (km) : 5156.5
 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	2047-11-04T12:24:34.303	b	38.40	-22.08	50955.86	-150.95		
lambda	I	2047-11-04T12:24:40.463	b	38.42	-22.06	50026.72	-150.81		
delta	I	2047-11-04T12:24:51.912	b	38.46	-22.02	48300.35	-150.76		
gamma	I	2047-11-04T12:24:56.352	b	38.47	-22.00	47631.08	-150.74		
eta	I	2047-11-04T12:24:59.370	b	38.48	-21.99	47176.11	-150.73		
beta	I	2047-11-04T12:25:09.416	b	38.51	-21.96	45667.95	-150.72		
alpha	I	2047-11-04T12:25:16.431	b	38.54	-21.93	44687.75	-150.92		
4	I	2047-11-04T12:25:29.334	b	38.58	-21.89	42532.28	-150.16		
5	I	2047-11-04T12:25:33.304	b	38.59	-21.87	42314.09	-151.54		
6	I	2047-11-04T12:25:34.104	b	38.60	-21.87	41813.22	-150.20		
Uranus	I	2047-11-04T12:10:28.582		35.55	-25.02	25549.48		69.79	70.62
Uranus	E	2047-11-04T12:50:43.072		43.56	-16.64	25548.45		-81.00	-81.39
6	E	2047-11-04T12:34:34.287	b	40.39	-20.00	41851.69	149.93		
5	E	2047-11-04T12:34:34.079	b	40.39	-20.00	42155.09	151.27		
4	E	2047-11-04T12:34:39.598	b	40.41	-19.98	42603.29	149.87		
alpha	E	2047-11-04T12:34:52.695	b	40.45	-19.93	44745.10	150.61		
beta	E	2047-11-04T12:34:59.181	b	40.47	-19.91	45658.84	150.41		
eta	E	2047-11-04T12:35:09.352	b	40.51	-19.88	47176.11	150.41		
gamma	E	2047-11-04T12:35:12.310	b	40.52	-19.86	47621.07	150.42		
delta	E	2047-11-04T12:35:16.826	b	40.53	-19.85	48300.34	150.43		
lambda	E	2047-11-04T12:35:28.301	b	40.57	-19.81	50026.72	150.47		
epsilon	E	2047-11-04T12:35:37.477	b	40.60	-19.78	51407.58	150.60		

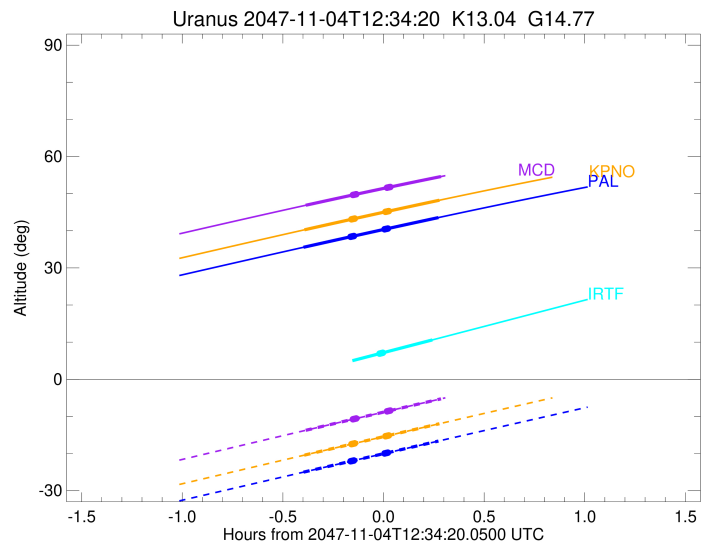
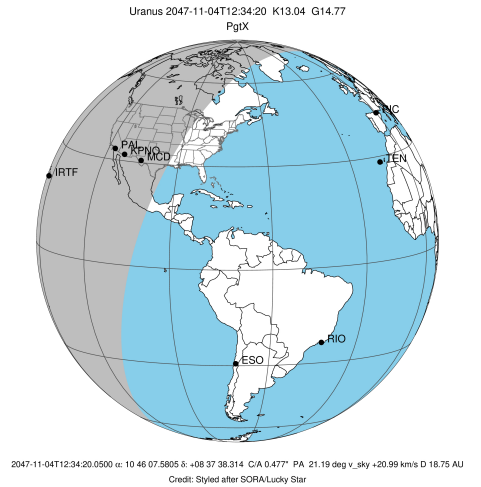
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2047-11-04T12:30:51.540
Event type           : PgtX
: Uranus occs: geocentric, topocentric
: No ring occs
Observer code        : KPNO
Location             : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)   : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 386917434433138048
2Mass ID (if available) : 10460765+0837388
ICRS Star Coord at Epoch: 10h 46m 07.58054s +08:37:38.31431s
RUWE (>1.4 is poor) : 1.04
K magnitude           : 13.045
G magnitude           : 14.768
RP magnitude          : 14.198
BP magnitude          : 15.175
DUPflag              : 0
Distance (au)         : 18.753
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : 20.99
Sun-Target sep (deg) : 61.65
Sun-Moon sep (deg)   : 99.34
B (ring opening deg) : 7.78
PA of pole (deg)     : 104.27
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.384
C/A sky separation (km) : 5225.3
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl1.spk
ural11.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.ural11.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
  
```



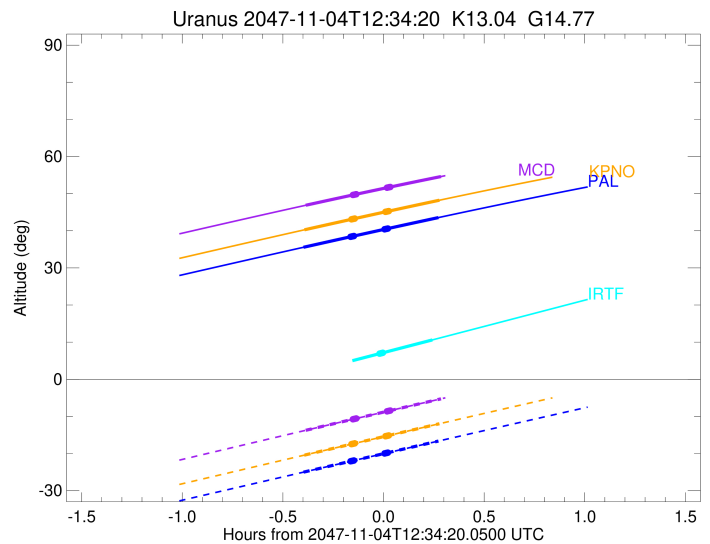
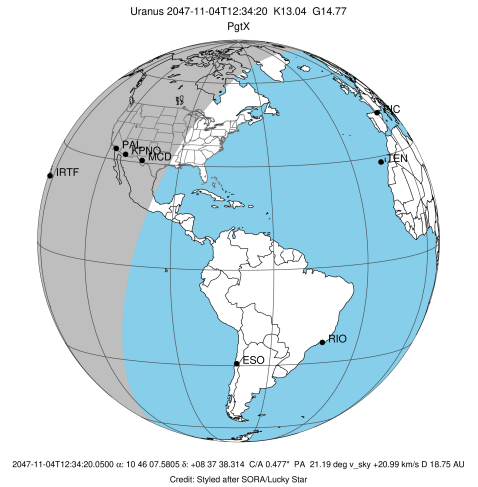
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2047-11-04T12:24:49.758	b	43.10	-17.46	50956.38	-150.73		
lambda	I	2047-11-04T12:24:55.931	b	43.12	-17.44	50026.72	-150.60		
delta	I	2047-11-04T12:25:07.396	b	43.16	-17.40	48300.36	-150.55		
gamma	I	2047-11-04T12:25:11.842	b	43.17	-17.39	47631.07	-150.53		
eta	I	2047-11-04T12:25:14.865	b	43.18	-17.38	47176.13	-150.52		
beta	I	2047-11-04T12:25:24.925	b	43.22	-17.34	45667.98	-150.51		
alpha	I	2047-11-04T12:25:31.950	b	43.24	-17.32	44687.72	-150.70		
4	I	2047-11-04T12:25:44.871	b	43.28	-17.27	42532.25	-149.94		
5	I	2047-11-04T12:25:48.845	b	43.30	-17.26	42314.07	-151.32		
6	I	2047-11-04T12:25:49.646	b	43.30	-17.25	41813.16	-149.99		
Uranus	I	2047-11-04T12:10:44.165		40.26	-20.44	25549.50		69.61	70.45
Uranus	E	2047-11-04T12:51:00.415		48.23	-11.98	25548.46		-80.94	-81.33
6	E	2047-11-04T12:34:50.541	b	45.09	-15.36	41851.63	149.73		
5	E	2047-11-04T12:34:50.336	b	45.09	-15.36	42155.10	151.07		
4	E	2047-11-04T12:34:55.861	b	45.10	-15.34	42603.25	149.67		
alpha	E	2047-11-04T12:35:08.978	b	45.15	-15.29	44745.07	150.41		
beta	E	2047-11-04T12:35:15.472	b	45.17	-15.27	45658.86	150.21		
eta	E	2047-11-04T12:35:25.656	b	45.20	-15.24	47176.12	150.21		
gamma	E	2047-11-04T12:35:28.619	b	45.21	-15.23	47621.08	150.22		
delta	E	2047-11-04T12:35:33.140	b	45.23	-15.21	48300.35	150.23		
lambda	E	2047-11-04T12:35:44.630	b	45.26	-15.17	50026.72	150.27		
epsilon	E	2047-11-04T12:35:53.821	b	45.30	-15.14	51408.00	150.40		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2047-11-04T12:31:18.530
 Event type : PgtX
 : Uranus occs: geocentric, topocentric
 : No ring occs
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 386917434433138048
 2Mass ID (if available) : 10460765+0837388
 ICRS Star Coord at Epoch: 10h 46m 07.58054s +08:37:38.31431s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 13.045
 G magnitude : 14.768
 RP magnitude : 14.198
 BP magnitude : 15.175
 DUPflag : 0
 Distance (au) : 18.753
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.99
 Sun-Target sep (deg) : 61.65
 Sun-Moon sep (deg) : 99.39
 B (ring opening deg) : 7.78
 PA of pole (deg) : 104.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.384
 C/A sky separation (km) : 5216.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ural11.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ural11.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	2047-11-04T12:25:15.945	b	49.66	-10.76	50956.36	-150.47		
lambda	I	2047-11-04T12:25:22.129	b	49.68	-10.74	50026.72	-150.34		
delta	I	2047-11-04T12:25:33.614	b	49.72	-10.70	48300.36	-150.29		
gamma	I	2047-11-04T12:25:38.068	b	49.73	-10.69	47631.08	-150.27		
eta	I	2047-11-04T12:25:41.095	b	49.74	-10.67	47176.12	-150.25		
beta	I	2047-11-04T12:25:51.173	b	49.77	-10.64	45667.98	-150.25		
alpha	I	2047-11-04T12:25:58.211	b	49.80	-10.61	44687.74	-150.44		
4	I	2047-11-04T12:26:11.154	b	49.84	-10.57	42532.25	-149.68		
5	I	2047-11-04T12:26:15.135	b	49.85	-10.56	42314.06	-151.06		
6	I	2047-11-04T12:26:15.937	b	49.85	-10.55	41813.16	-149.73		
Uranus	I	2047-11-04T12:11:09.060		46.88	-13.75	25549.50		69.58	70.42
Uranus	E	2047-11-04T12:51:29.318		54.61	-5.27	25548.45		-80.97	-81.37
6	E	2047-11-04T12:35:17.762	b	51.59	-8.65	41851.65	149.48		
5	E	2047-11-04T12:35:17.556	b	51.59	-8.65	42155.09	150.82		
4	E	2047-11-04T12:35:23.090	b	51.61	-8.63	42603.26	149.42		
alpha	E	2047-11-04T12:35:36.229	b	51.65	-8.59	44745.07	150.16		
beta	E	2047-11-04T12:35:42.734	b	51.67	-8.57	45658.85	149.96		
eta	E	2047-11-04T12:35:52.936	b	51.70	-8.53	47176.11	149.96		
gamma	E	2047-11-04T12:35:55.903	b	51.71	-8.52	47621.08	149.96		
delta	E	2047-11-04T12:36:00.432	b	51.73	-8.50	48300.35	149.98		
lambda	E	2047-11-04T12:36:11.941	b	51.76	-8.46	50026.71	150.02		
epsilon	E	2047-11-04T12:36:21.147	b	51.79	-8.43	51407.91	150.15		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2047-11-04T12:29:17.180
 Event type : PgtX
 : Uranus occs: geocentric, topocentric
 : No ring occs
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 386917434433138048
 2Mass ID (if available) : 10460765+0837388
 ICRS Star Coord at Epoch: 10h 46m 07.58054s +08:37:38.31431s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 13.045
 G magnitude : 14.768
 RP magnitude : 14.198
 BP magnitude : 15.175
 DUPflag : 0
 Distance (au) : 18.753
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.99
 Sun-Target sep (deg) : 61.65
 Sun-Moon sep (deg) : 98.86
 B (ring opening deg) : 7.78
 PA of pole (deg) : 104.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.492
 C/A sky separation (km) : 6695.0
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ural11.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ural11.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	2047-11-04T12:23:13.583	b	4.58x	-56.91	50966.57	-152.44		
lambda	I	2047-11-04T12:23:19.755	b	4.60x	-56.89	50026.71	-152.25		
delta	I	2047-11-04T12:23:31.096	b	4.64x	-56.84	48300.35	-152.17		
gamma	I	2047-11-04T12:23:35.495	b	4.66x	-56.83	47631.00	-152.14		
eta	I	2047-11-04T12:23:38.486	b	4.67x	-56.82	47176.12	-152.12		
beta	I	2047-11-04T12:23:48.431	b	4.71x	-56.78	45668.58	-152.08		
alpha	I	2047-11-04T12:23:55.401	b	4.74x	-56.75	44687.27	-152.25		
4	I	2047-11-04T12:24:08.171	b	4.79x	-56.70	42531.48	-151.42		
5	I	2047-11-04T12:24:12.078	b	4.80x	-56.68	42313.56	-152.81		
6	I	2047-11-04T12:24:12.860	b	4.81x	-56.68	41811.95	-151.44		
Uranus	I	2047-11-04T12:09:40.772		1.41x	-60.10	25549.87		66.77	67.70
Uranus	E	2047-11-04T12:48:55.847		10.61	-50.87	25548.61		-78.58	-79.08
6	E	2047-11-04T12:33:05.894	b	6.89	-54.59	41850.15	151.35		
5	E	2047-11-04T12:33:05.770	b	6.89	-54.59	42155.38	152.72		
4	E	2047-11-04T12:33:11.201	b	6.91	-54.57	42602.07	151.31		
alpha	E	2047-11-04T12:33:24.225	b	6.96	-54.52	44744.34	152.11		
beta	E	2047-11-04T12:33:30.638	b	6.99	-54.49	45659.52	151.93		
eta	E	2047-11-04T12:33:40.707	b	7.02	-54.45	47176.12	151.94		
gamma	E	2047-11-04T12:33:43.636	b	7.04	-54.44	47621.04	151.96		
delta	E	2047-11-04T12:33:48.106	b	7.05	-54.43	48300.36	151.98		
lambda	E	2047-11-04T12:33:59.463	b	7.10	-54.38	50026.71	152.03		
epsilon	E	2047-11-04T12:34:08.608	b	7.13	-54.34	51417.22	152.20		