

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-11-25T10:22:58.550
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3424859286071874304
 2Mass ID (if available) : 06005358+2338477

Uranus 2032-11-25T10:22:58 K14.00 G16.42 PgtRgt

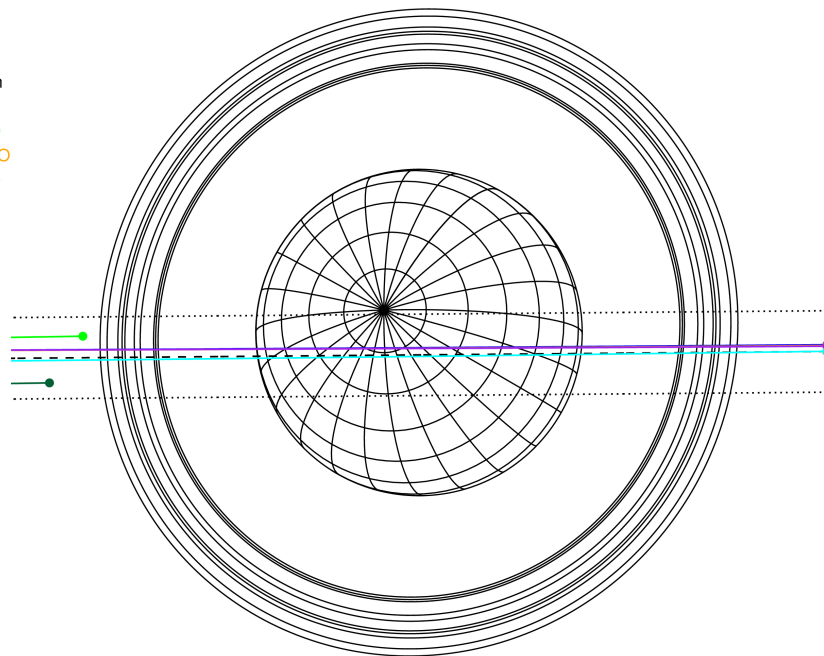
ICRS Star Coord at Epoch: 06h 00m 53.58773s +23:38:47.49546s

RUWE (>1.4 is poor) : 1.00
 K magnitude : 13.998
 G magnitude : 16.422
 RP magnitude : 15.636
 BP magnitude : 17.077
 DUPflag : 0
 Distance (au) : 18.139
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.18
 Sun-Target sep (deg) : 153.04
 Sun-Moon sep (deg) : 68.34
 B (ring opening deg) : 75.18
 PA of pole (deg) : 57.48



2032-11-25T10:22:58.5500 a: 06 00 53.5877 s: +23 38 47.495 C/A 0.259° PA 0.49 deg v_sky -20.18 km/s D 18.14 AU
 Credit: Styled after SORA/Lucky Star

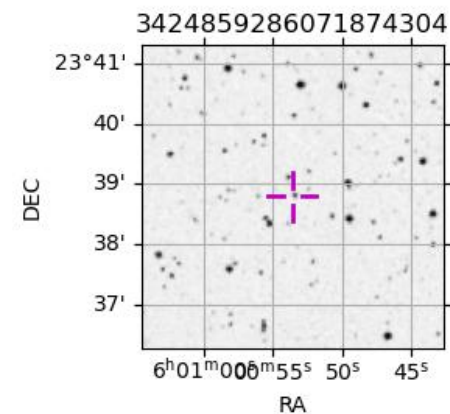
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 AAT



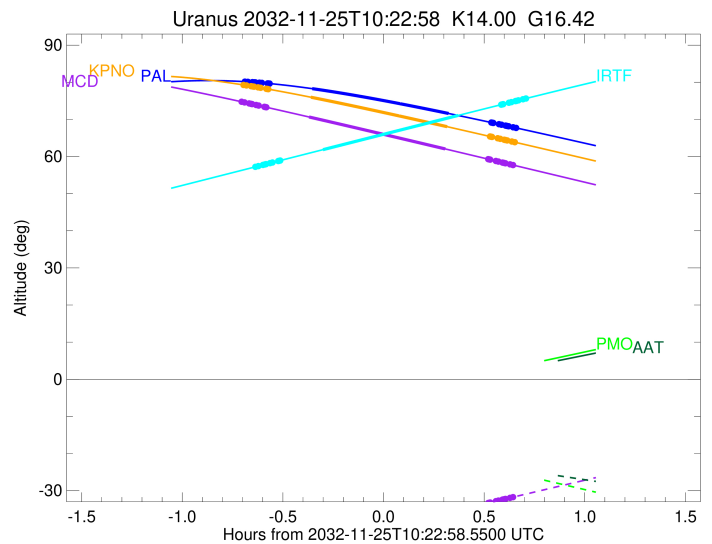
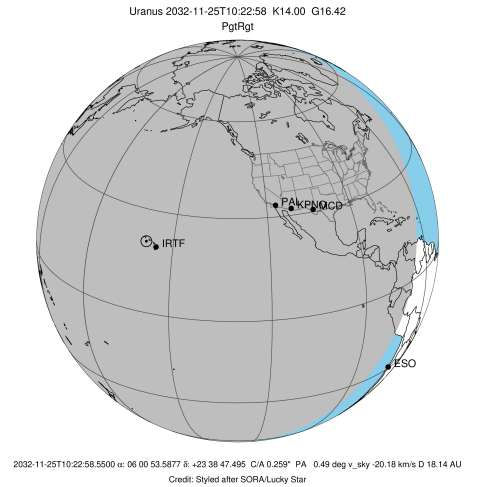
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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	OEncode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	+++++	+ +	+++++	NOV 25 09:41 - NOV 25 11:02	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	NOV 25 09:41 - NOV 25 11:01	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	NOV 25 09:40 - NOV 25 11:01	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++	+ +	+++++	NOV 25 09:44 - NOV 25 11:05	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

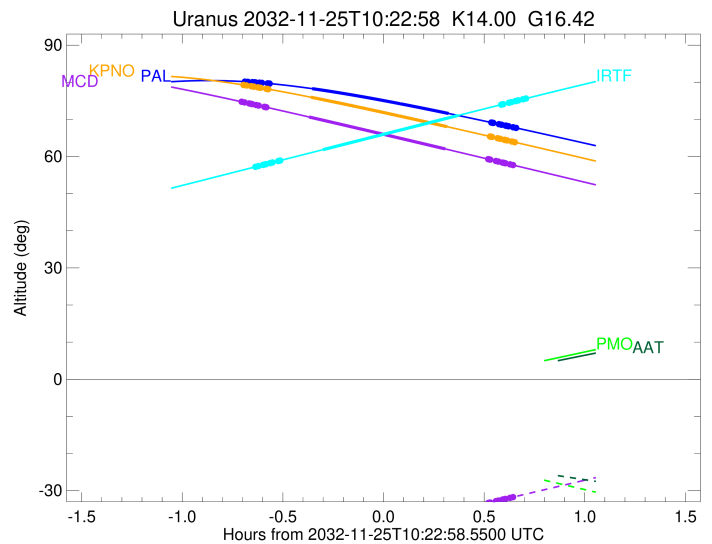
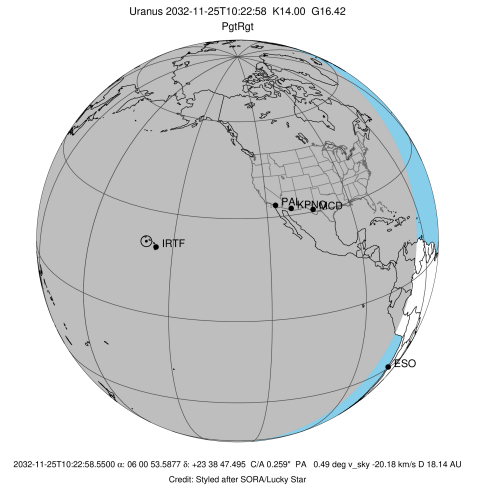


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-11-25T10:22:00.700
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3424859286071874304
 2Mass ID (if available) : 06005358+2338477
 ICRS Star Coord at Epoch: 06h 00m 53.58773s +23:38:47.49546s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 13.998
 G magnitude : 16.422
 RP magnitude : 15.636
 BP magnitude : 17.077
 DUPflag : 0
 Distance (au) : 18.139
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.18
 Sun-Target sep (deg) : 153.04
 Sun-Moon sep (deg) : 69.10
 B (ring opening deg) : 75.18
 PA of pole (deg) : 57.48
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.181
 C/A sky separation (km) : 2383.8
 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	2032-11-25T09:41:31.086		80.18	-59.32	51317.19	-21.03		
lambda	I	2032-11-25T09:42:32.444		80.12	-59.12	50026.71	-21.03		
delta	I	2032-11-25T09:43:54.534		80.04	-58.84	48300.35	-21.03		
gamma	I	2032-11-25T09:44:26.380		80.00	-58.73	47630.66	-21.03		
eta	I	2032-11-25T09:44:47.996		79.98	-58.66	47176.12	-21.03		
beta	I	2032-11-25T09:45:59.129		79.89	-58.42	45679.55	-21.03		
alpha	I	2032-11-25T09:46:43.383		79.84	-58.27	44751.71	-21.02		
4	I	2032-11-25T09:48:27.576		79.70	-57.92	42564.82	-21.02		
5	I	2032-11-25T09:48:38.930		79.69	-57.88	42315.25	-21.02		
6	I	2032-11-25T09:49:02.230		79.65	-57.80	41820.94	-21.01		
Uranus	I	2032-11-25T10:01:44.175		78.28	-55.21	25125.29		-13.12	-13.72
Uranus	E	2032-11-25T10:42:22.017		71.60	-46.79	25217.82		11.58	12.11
6	E	2032-11-25T10:55:08.164		69.16	-44.13	41848.98	21.00		
5	E	2032-11-25T10:55:22.505		69.11	-44.08	42155.25	21.00		
4	E	2032-11-25T10:55:42.411		69.05	-44.01	42582.48	21.01		
alpha	E	2032-11-25T10:57:22.683		68.72	-43.66	44686.23	21.01		
beta	E	2032-11-25T10:58:08.378		68.57	-43.50	45643.66	21.01		
eta	E	2032-11-25T10:59:21.270		68.33	-43.24	47176.12	21.01		
gamma	E	2032-11-25T10:59:42.499		68.26	-43.17	47622.19	21.01		
delta	E	2032-11-25T11:00:14.771		68.16	-43.06	48300.35	21.01		
lambda	E	2032-11-25T11:01:36.921		67.89	-42.77	50026.71	21.02		
epsilon	E	2032-11-25T11:02:20.549		67.74	-42.62	50943.58	21.01		

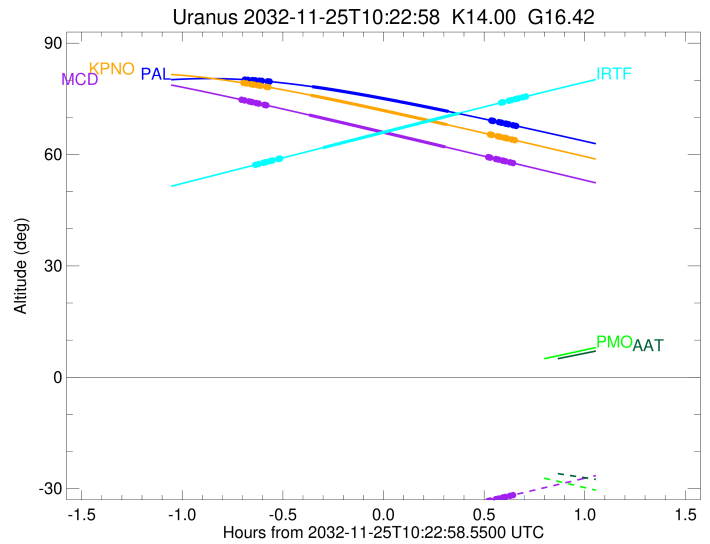
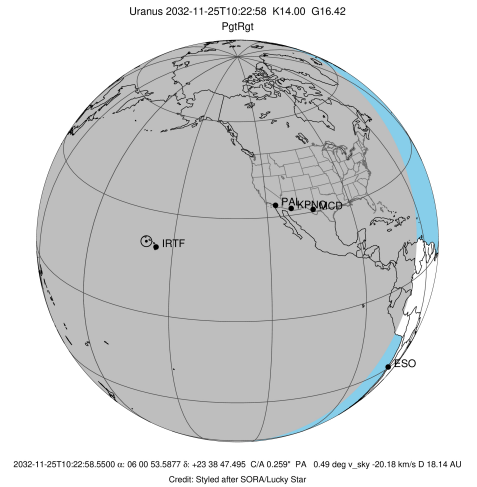
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-11-25T10:21:36.510
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 3424859286071874304
 2Mass ID (if available) : 06005358+2338477
 ICRS Star Coord at Epoch: 06h 00m 53.58773s +23:38:47.49546s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 13.998
 G magnitude : 16.422
 RP magnitude : 15.636
 BP magnitude : 17.077
 DUPflag : 0
 Distance (au) : 18.139
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.18
 Sun-Target sep (deg) : 153.04
 Sun-Moon sep (deg) : 69.06
 B (ring opening deg) : 75.18
 PA of pole (deg) : 57.48
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.188
 C/A sky separation (km) : 2477.6
 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



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-11-25T09:41:07.267	79.30	-55.36	51316.25	-21.03		
lambda	I	2032-11-25T09:42:08.577	79.15	-55.15	50026.71	-21.03		
delta	I	2032-11-25T09:43:30.664	78.95	-54.86	48300.35	-21.03		
gamma	I	2032-11-25T09:44:02.509	78.87	-54.75	47630.67	-21.03		
eta	I	2032-11-25T09:44:24.125	78.81	-54.67	47176.12	-21.03		
beta	I	2032-11-25T09:45:35.256	78.63	-54.42	45679.57	-21.03		
alpha	I	2032-11-25T09:46:19.510	78.52	-54.27	44751.73	-21.02		
4	I	2032-11-25T09:48:03.701	78.24	-53.90	42564.95	-21.02		
5	I	2032-11-25T09:48:15.060	78.21	-53.86	42315.25	-21.02		
6	I	2032-11-25T09:48:38.366	78.15	-53.78	41820.83	-21.01		
Uranus	I	2032-11-25T10:01:20.387	75.98	-51.10	25123.33		-13.15	-13.75
Uranus	E	2032-11-25T10:41:57.769	68.04	-42.49	25219.43		11.55	12.08
6	E	2032-11-25T10:54:44.401	65.40	-39.78	41848.92	20.99		
5	E	2032-11-25T10:54:58.753	65.35	-39.73	42155.26	20.99		
4	E	2032-11-25T10:55:18.673	65.28	-39.65	42582.55	21.00		
alpha	E	2032-11-25T10:56:58.996	64.94	-39.30	44686.25	21.00		
beta	E	2032-11-25T10:57:44.716	64.78	-39.14	45643.67	21.00		
eta	E	2032-11-25T10:58:57.648	64.52	-38.88	47176.12	21.00		
gamma	E	2032-11-25T10:59:18.888	64.45	-38.81	47622.20	21.00		
delta	E	2032-11-25T10:59:51.178	64.34	-38.69	48300.35	21.00		
lambda	E	2032-11-25T11:01:13.373	64.05	-38.40	50026.71	21.00		
epsilon	E	2032-11-25T11:01:57.005	63.90	-38.25	50943.16	21.00		

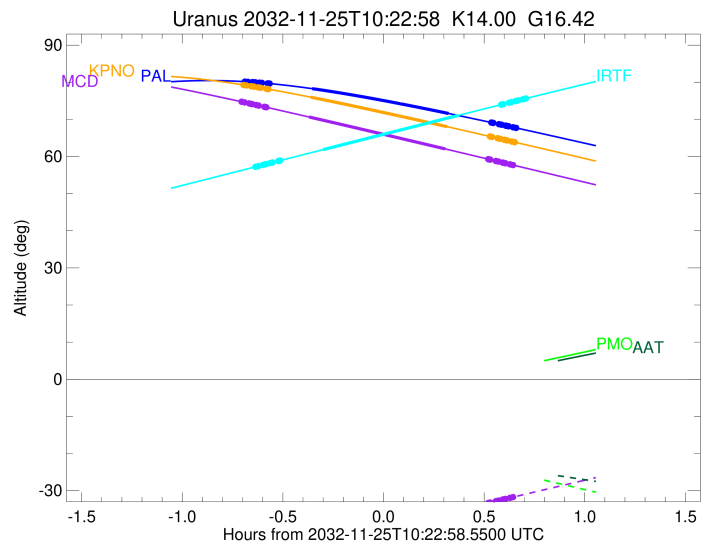
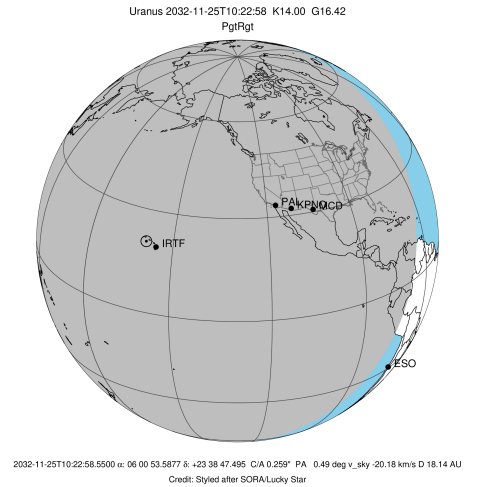
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-11-25T10:21:02.670
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 3424859286071874304
 2Mass ID (if available) : 06005358+2338477
 ICRS Star Coord at Epoch: 06h 00m 53.58773s +23:38:47.49546s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 13.998
 G magnitude : 16.422
 RP magnitude : 15.636
 BP magnitude : 17.077
 DUPflag : 0
 Distance (au) : 18.139
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.18
 Sun-Target sep (deg) : 153.04
 Sun-Moon sep (deg) : 68.99
 B (ring opening deg) : 75.18
 PA of pole (deg) : 57.48
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.190
 C/A sky separation (km) : 2504.2
 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



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-11-25T09:40:32.469	74.78	-49.17	51315.69	-21.02		
lambda	I	2032-11-25T09:41:33.769	74.58	-48.95	50026.71	-21.03		
delta	I	2032-11-25T09:42:55.878	74.30	-48.65	48300.35	-21.02		
gamma	I	2032-11-25T09:43:27.732	74.20	-48.54	47630.67	-21.02		
eta	I	2032-11-25T09:43:49.355	74.12	-48.46	47176.12	-21.02		
beta	I	2032-11-25T09:45:00.507	73.89	-48.21	45679.58	-21.02		
alpha	I	2032-11-25T09:45:44.774	73.74	-48.05	44751.74	-21.02		
4	I	2032-11-25T09:47:28.998	73.39	-47.67	42565.02	-21.02		
5	I	2032-11-25T09:47:40.363	73.35	-47.63	42315.25	-21.01		
6	I	2032-11-25T09:48:03.681	73.27	-47.55	41820.77	-21.00		
Uranus	I	2032-11-25T10:00:46.013	70.66	-44.81	25122.44		-13.16	-13.76
Uranus	E	2032-11-25T10:41:24.794	62.04	-36.07	25219.49		11.55	12.08
6	E	2032-11-25T10:54:12.202	59.29	-33.33	41848.93	20.97		
5	E	2032-11-25T10:54:26.569	59.24	-33.28	42155.26	20.97		
4	E	2032-11-25T10:54:46.509	59.17	-33.21	42582.53	20.98		
alpha	E	2032-11-25T10:56:26.940	58.81	-32.85	44686.24	20.98		
beta	E	2032-11-25T10:57:12.709	58.65	-32.69	45643.67	20.98		
eta	E	2032-11-25T10:58:25.719	58.38	-32.43	47176.12	20.98		
gamma	E	2032-11-25T10:58:46.983	58.31	-32.35	47622.20	20.98		
delta	E	2032-11-25T10:59:19.308	58.19	-32.24	48300.35	20.98		
lambda	E	2032-11-25T11:00:41.593	57.90	-31.94	50026.71	20.98		
epsilon	E	2032-11-25T11:01:25.280	57.74	-31.79	50943.30	20.97		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-11-25T10:25:03.600
 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 : 3424859286071874304
 2Mass ID (if available) : 06005358+2338477
 ICRS Star Coord at Epoch: 06h 00m 53.58773s +23:38:47.49546s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 13.998
 G magnitude : 16.422
 RP magnitude : 15.636
 BP magnitude : 17.077
 DUPflag : 0
 Distance (au) : 18.139
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.18
 Sun-Target sep (deg) : 153.04
 Sun-Moon sep (deg) : 69.24
 B (ring opening deg) : 75.18
 PA of pole (deg) : 57.48
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.285
 C/A sky separation (km) : 3750.1
 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	2032-11-25T09:44:39.427		57.19	-84.18	51309.07	-20.95		
lambda	I	2032-11-25T09:45:40.594		57.43	-84.42	50026.71	-20.96		
delta	I	2032-11-25T09:47:02.950		57.74	-84.73	48300.35	-20.96		
gamma	I	2032-11-25T09:47:34.898		57.87	-84.85	47630.73	-20.96		
eta	I	2032-11-25T09:47:56.588		57.95	-84.93	47176.12	-20.96		
beta	I	2032-11-25T09:49:07.949		58.22	-85.20	45679.75	-20.95		
alpha	I	2032-11-25T09:49:52.352		58.39	-85.37	44751.88	-20.95		
4	I	2032-11-25T09:51:36.865		58.79	-85.77	42566.05	-20.95		
5	I	2032-11-25T09:51:48.300		58.84	-85.81	42315.20	-20.94		
6	I	2032-11-25T09:52:11.739		58.93	-85.90	41819.85	-20.94		
Uranus	I	2032-11-25T10:04:56.703		61.85	-88.49	25104.29		-13.45	-14.06
Uranus	E	2032-11-25T10:45:16.505		71.08	-81.41	25249.77		11.01	11.51
6	E	2032-11-25T10:58:04.754		73.98	-78.43	41847.41	21.00		
5	E	2032-11-25T10:58:19.180		74.03	-78.37	42155.62	21.01		
4	E	2032-11-25T10:58:39.170		74.11	-78.29	42584.12	21.02		
alpha	E	2032-11-25T11:00:19.324		74.48	-77.91	44686.63	21.02		
beta	E	2032-11-25T11:01:04.985		74.65	-77.73	45644.02	21.03		
eta	E	2032-11-25T11:02:17.798		74.93	-77.44	47176.12	21.03		
gamma	E	2032-11-25T11:02:39.011		75.00	-77.36	47622.31	21.03		
delta	E	2032-11-25T11:03:11.244		75.13	-77.24	48300.35	21.04		
lambda	E	2032-11-25T11:04:33.295		75.43	-76.92	50026.71	21.04		
epsilon	E	2032-11-25T11:05:16.334		75.59	-76.75	50932.45	21.04		