

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2042-01-12T06:06:43.580
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 611925985189817856
 2Mass ID (if available) : 08540921+1808502

Uranus 2042-01-12T06:06:43 K13.16 G14.47 PgtRgt

ICRS Star Coord at Epoch: 08h 54m 09.20728s +18:08:50.08621s

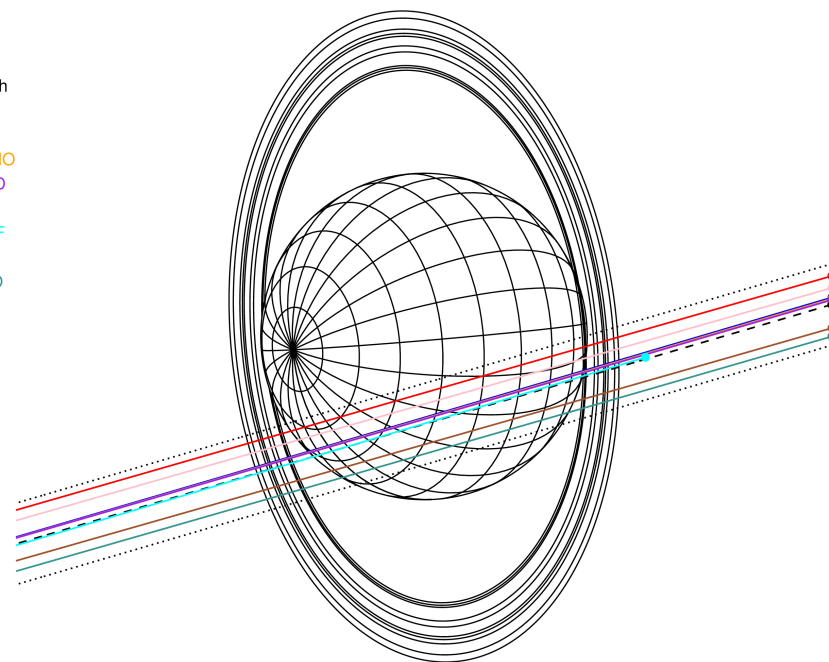
RUWE (>1.4 is poor) : 0.93
 K magnitude : 13.161
 G magnitude : 14.470
 RP magnitude : 14.022
 BP magnitude : 14.746
 DUPflag : 0
 Distance (au) : 17.556
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.49
 Sun-Target sep (deg) : 160.67
 Sun-Moon sep (deg) : 46.67
 B (ring opening deg) : 36.25
 PA of pole (deg) : 95.81

Uranus 2042-01-12T06:06:43 K13.16 G14.47
 PgtRgt



2042-01-12T06:06:43.5800 α: 08 54 09.2073 δ: +18 08 50.086 C/A 1.025° PA 16.35 deg v_sky -21.49 km/s D 17.56 AU
 Credit: Styled after SORA/Lucky Star

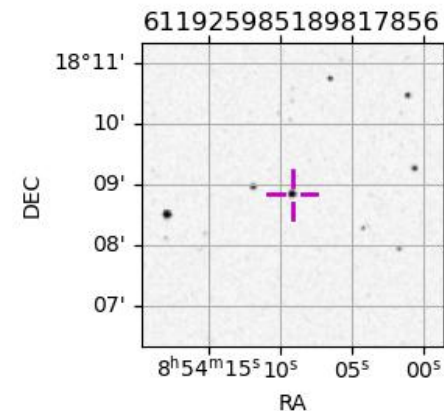
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO



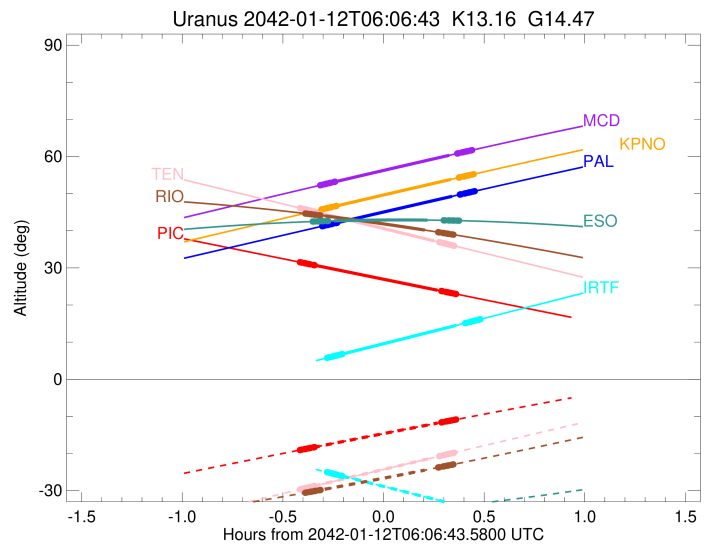
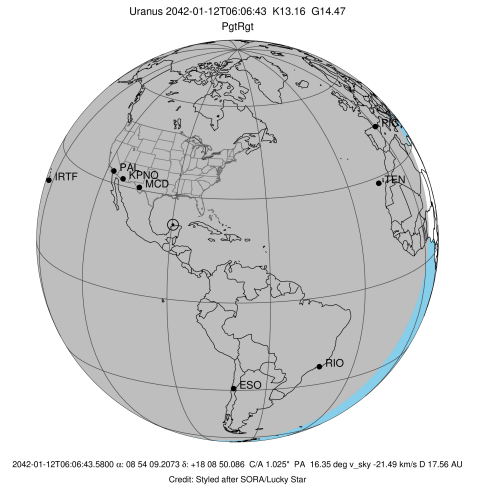
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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	+++++++	+ +	+++++++	JAN 12 05:41 - JAN 12 06:28	PieRie
PAL	Palomar Mt (200")	33.4	243.1	+++++++	+ +	+++++++	JAN 12 05:48 - JAN 12 06:33	PieRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++++	+ +	+++++++	JAN 12 05:48 - JAN 12 06:33	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++++	+ +	+++++++	JAN 12 05:47 - JAN 12 06:33	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++++	+ +	+++++++	JAN 12 05:41 - JAN 12 06:27	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++++	+ +	+++++++	JAN 12 05:49 - JAN 12 06:35	PieRie
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++++	+ +	+++++++	JAN 12 05:43 - JAN 12 06:27	PieRie
ESO	European Southern Obs	-29.3	289.3	+++++++	+ +	+++++++	JAN 12 05:45 - JAN 12 06:29	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

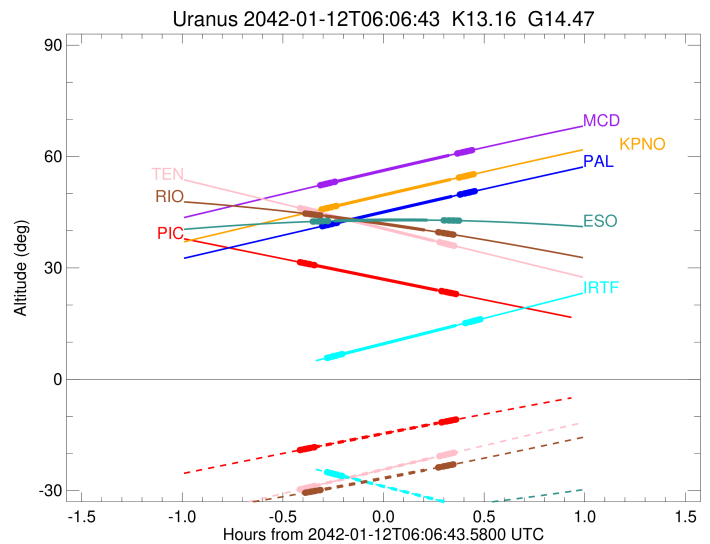
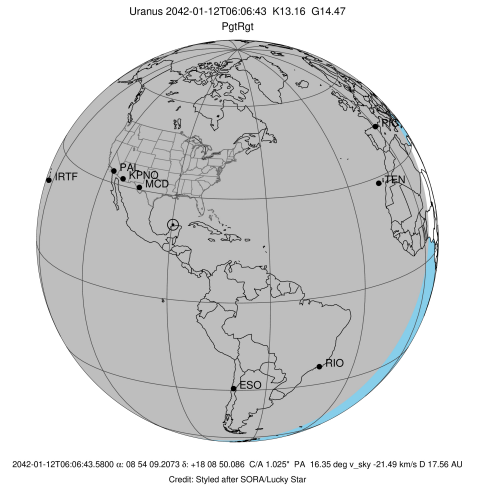


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2042-01-12T06:04:18.680
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 611925985189817856
 2Mass ID (if available) : 08540921+1808502
 ICRS Star Coord at Epoch: 08h 54m 09.20728s +18:08:50.08621s
 RUWE (>1.4 is poor) : 0.93
 K magnitude : 13.161
 G magnitude : 14.470
 RP magnitude : 14.022
 BP magnitude : 14.746
 DUPflag : 0
 Distance (au) : 17.556
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.49
 Sun-Target sep (deg) : 160.67
 Sun-Moon sep (deg) : 46.63
 B (ring opening deg) : 36.25
 PA of pole (deg) : 95.81
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.667
 C/A sky separation (km) : 8488.4
 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	2042-01-12T05:41:44.257		31.54	-19.08	51347.84	-35.67		
lambda	I	2042-01-12T05:42:21.355		31.43	-18.97	50026.71	-35.60		
delta	I	2042-01-12T05:43:09.881		31.28	-18.82	48300.35	-35.55		
gamma	I	2042-01-12T05:43:28.758		31.23	-18.77	47629.35	-35.54		
eta	I	2042-01-12T05:43:41.514		31.19	-18.73	47176.12	-35.52		
beta	I	2042-01-12T05:44:24.145		31.06	-18.60	45663.69	-35.48		
alpha	I	2042-01-12T05:44:51.126		30.97	-18.52	44721.73	-35.46		
4	I	2042-01-12T05:45:51.712	b	30.79	-18.34	42590.54	-35.41		
5	I	2042-01-12T05:45:59.883	b	30.76	-18.32	42247.34	-35.35		
6	I	2042-01-12T05:46:12.802	b	30.72	-18.28	41874.97	-35.40		
Uranus	I	2042-01-12T05:45:51.683		30.79	-18.34	25360.93		-52.72	-53.97
Uranus	E	2042-01-12T06:22:49.047		23.99	-11.81	25405.16		44.45	45.77
6	E	2042-01-12T06:23:55.476		23.78	-11.62	41810.49	35.33		
5	E	2042-01-12T06:24:10.650		23.74	-11.58	42254.92	35.28		
4	E	2042-01-12T06:24:17.780		23.71	-11.55	42569.59	35.33		
alpha	E	2042-01-12T06:25:18.432		23.53	-11.38	44702.81	35.38		
beta	E	2042-01-12T06:25:46.044		23.44	-11.30	45666.10	35.40		
eta	E	2042-01-12T06:26:28.650		23.31	-11.18	47176.12	35.44		
gamma	E	2042-01-12T06:26:41.225		23.28	-11.14	47621.86	35.45		
delta	E	2042-01-12T06:27:00.359		23.22	-11.08	48300.35	35.47		
lambda	E	2042-01-12T06:27:49.006		23.07	-10.94	50026.71	35.51		
epsilon	E	2042-01-12T06:28:18.464		22.98	-10.86	51072.99	35.58		

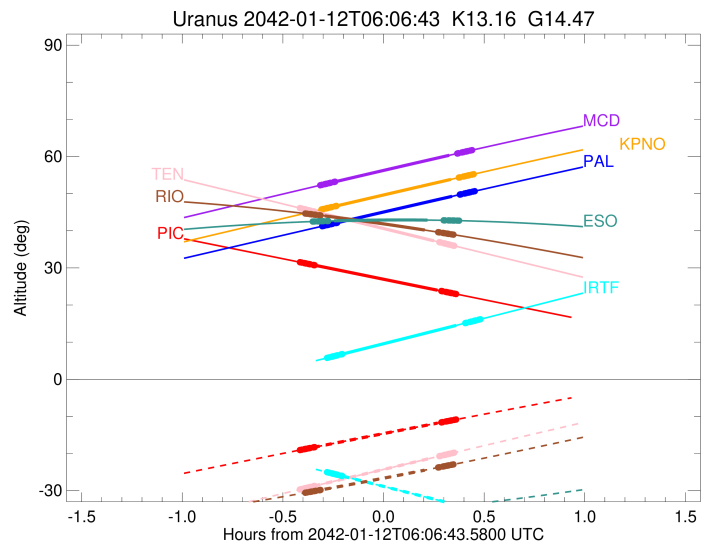
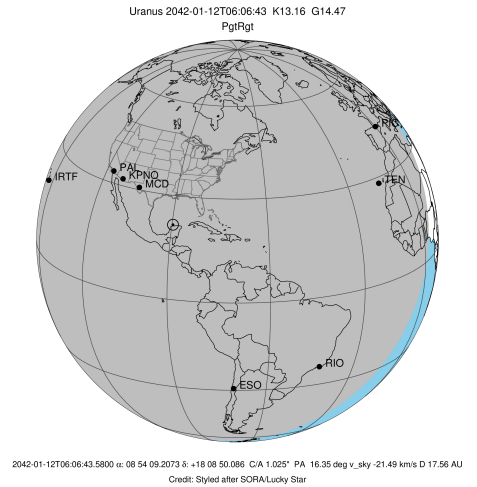
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2042-01-12T06:10:05.170
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 611925985189817856
 2Mass ID (if available) : 08540921+1808502
 ICRS Star Coord at Epoch: 08h 54m 09.20728s +18:08:50.08621s
 RUWE (>1.4 is poor) : 0.93
 K magnitude : 13.161
 G magnitude : 14.470
 RP magnitude : 14.022
 BP magnitude : 14.746
 DUPflag : 0
 Distance (au) : 17.556
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.49
 Sun-Target sep (deg) : 160.67
 Sun-Moon sep (deg) : 47.56
 B (ring opening deg) : 36.25
 PA of pole (deg) : 95.81
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.957
 C/A sky separation (km) : 12184.7
 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_itrf93_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	2042-01-12T05:48:22.460		41.22	-59.64	51372.37	-35.33		
lambda	I	2042-01-12T05:49:00.642		41.35	-59.77	50026.71	-35.21		
delta	I	2042-01-12T05:49:49.725		41.52	-59.93	48300.35	-35.13		
gamma	I	2042-01-12T05:50:08.844		41.59	-60.00	47629.01	-35.10		
eta	I	2042-01-12T05:50:21.752		41.63	-60.04	47176.12	-35.07		
beta	I	2042-01-12T05:51:04.925		41.78	-60.19	45665.29	-34.99		
alpha	I	2042-01-12T05:51:32.415		41.88	-60.28	44718.95	-34.93		
4	I	2042-01-12T05:52:33.801		42.09	-60.49	42594.02	-34.81		
5	I	2042-01-12T05:52:42.141		42.12	-60.51	42254.24	-34.75		
6	I	2042-01-12T05:52:55.290		42.17	-60.56	41876.55	-34.78		
Uranus	I	2042-01-12T05:53:02.017		42.19	-60.58	25375.08		-50.03	-51.32
Uranus	E	2042-01-12T06:27:10.565		49.28	-67.29	25436.17		38.70	39.99
6	E	2042-01-12T06:29:26.807		49.75	-67.72	41813.77	34.86		
5	E	2042-01-12T06:29:42.212		49.80	-67.77	42262.20	34.83		
4	E	2042-01-12T06:29:49.377		49.82	-67.79	42573.85	34.90		
alpha	E	2042-01-12T06:30:50.479		50.03	-67.98	44700.19	35.02		
beta	E	2042-01-12T06:31:18.458		50.13	-68.07	45667.78	35.08		
eta	E	2042-01-12T06:32:01.366		50.27	-68.20	47176.12	35.17		
gamma	E	2042-01-12T06:32:14.030		50.32	-68.24	47621.62	35.19		
delta	E	2042-01-12T06:32:33.307		50.38	-68.30	48300.35	35.23		
lambda	E	2042-01-12T06:33:22.254		50.55	-68.45	50026.71	35.31		
epsilon	E	2042-01-12T06:33:52.750		50.65	-68.55	51104.33	35.43		

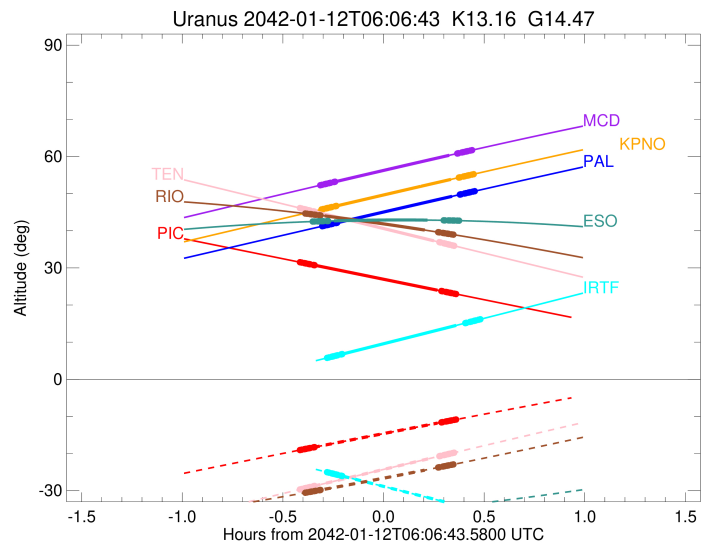
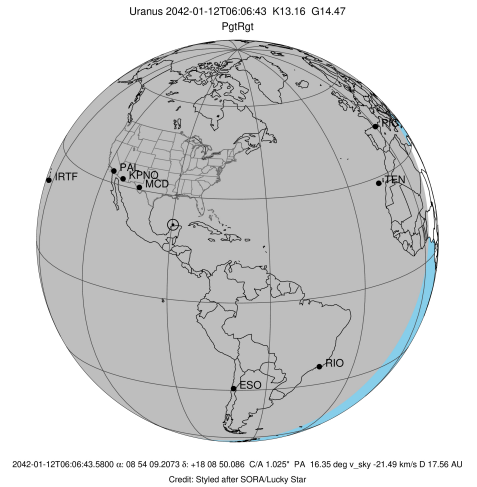
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2042-01-12T06:09:49.230
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       : 611925985189817856
2Mass ID (if available) : 08540921+1808502
ICRS Star Coord at Epoch: 08h 54m 09.20728s +18:08:50.08621s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 13.161
G magnitude           : 14.470
RP magnitude          : 14.022
BP magnitude          : 14.746
DUPflag              : 0
Distance (au)         : 17.556
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -21.49
Sun-Target sep (deg) : 160.67
Sun-Moon sep (deg)   : 47.56
B (ring opening deg) : 36.25
PA of pole (deg)     : 95.81
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.969
C/A sky separation (km) : 12337.8
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_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
```



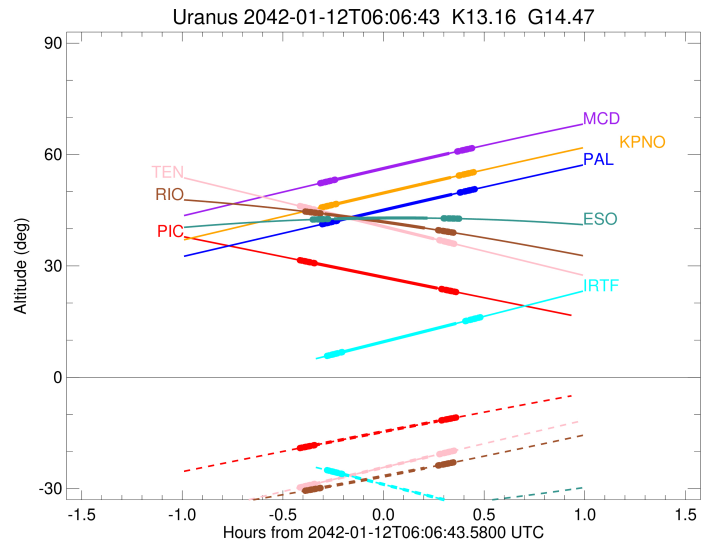
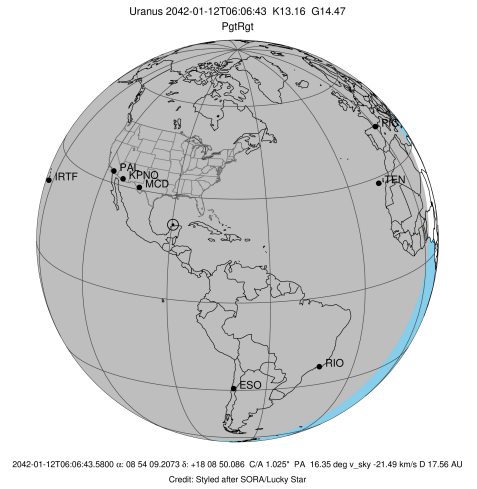
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2042-01-12T05:48:09.852		45.73	-64.24	51373.56	-35.35		
lambda	I	2042-01-12T05:48:48.045		45.86	-64.37	50026.71	-35.23		
delta	I	2042-01-12T05:49:37.102		46.04	-64.54	48300.35	-35.15		
gamma	I	2042-01-12T05:49:56.212		46.10	-64.61	47628.99	-35.11		
eta	I	2042-01-12T05:50:09.114		46.15	-64.65	47176.12	-35.09		
beta	I	2042-01-12T05:50:52.268		46.30	-64.79	45665.37	-35.00		
alpha	I	2042-01-12T05:51:19.753		46.40	-64.89	44718.81	-34.94		
4	I	2042-01-12T05:52:21.114		46.61	-65.09	42594.19	-34.82		
5	I	2042-01-12T05:52:29.455		46.64	-65.12	42254.57	-34.75		
6	I	2042-01-12T05:52:42.601		46.69	-65.17	41876.62	-34.78		
Uranus	I	2042-01-12T05:52:51.162		46.72	-65.20	25375.98		-49.86	-51.15
Uranus	E	2042-01-12T06:26:49.645		53.84	-71.81	25437.39		38.47	39.76
6	E	2042-01-12T06:29:08.742		54.32	-72.23	41813.89	34.86		
5	E	2042-01-12T06:29:24.147		54.37	-72.28	42262.45	34.83		
4	E	2042-01-12T06:29:31.310		54.40	-72.30	42574.00	34.90		
alpha	E	2042-01-12T06:30:32.399		54.61	-72.48	44700.10	35.03		
beta	E	2042-01-12T06:31:00.377		54.70	-72.57	45667.84	35.09		
eta	E	2042-01-12T06:31:43.273		54.85	-72.70	47176.12	35.17		
gamma	E	2042-01-12T06:31:55.934		54.90	-72.73	47621.61	35.20		
delta	E	2042-01-12T06:32:15.206		54.96	-72.79	48300.35	35.24		
lambda	E	2042-01-12T06:33:04.138		55.13	-72.94	50026.71	35.32		
epsilon	E	2042-01-12T06:33:34.653		55.24	-73.03	51105.41	35.45		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2042-01-12T06:09:23.160
 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 : 611925985189817856
 2Mass ID (if available) : 08540921+1808502
 ICRS Star Coord at Epoch: 08h 54m 09.20728s +18:08:50.08621s
 RUWE (>1.4 is poor) : 0.93
 K magnitude : 13.161
 G magnitude : 14.470
 RP magnitude : 14.022
 BP magnitude : 14.746
 DUPflag : 0
 Distance (au) : 17.556
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.49
 Sun-Target sep (deg) : 160.67
 Sun-Moon sep (deg) : 47.55
 B (ring opening deg) : 36.25
 PA of pole (deg) : 95.81
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.978
 C/A sky separation (km) : 12448.2
 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



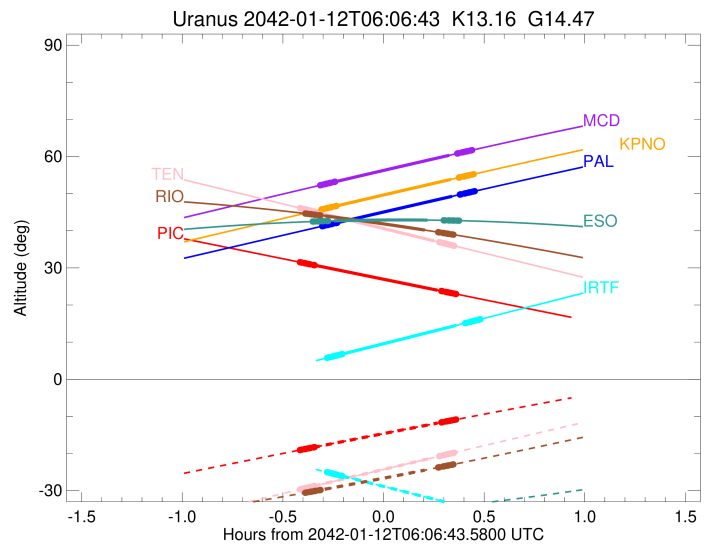
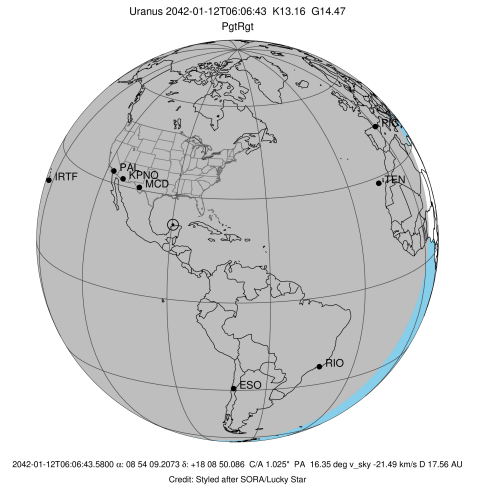
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2042-01-12T05:47:46.873		52.25	-70.71	51374.50	-35.39		
lambda	I	2042-01-12T05:48:25.050		52.38	-70.83	50026.71	-35.27		
delta	I	2042-01-12T05:49:14.053		52.56	-70.99	48300.35	-35.19		
gamma	I	2042-01-12T05:49:33.143		52.63	-71.06	47628.98	-35.15		
eta	I	2042-01-12T05:49:46.032		52.67	-71.10	47176.12	-35.12		
beta	I	2042-01-12T05:50:29.141		52.82	-71.24	45665.43	-35.04		
alpha	I	2042-01-12T05:50:56.604		52.92	-71.33	44718.71	-34.98		
4	I	2042-01-12T05:51:57.903		53.14	-71.53	42594.32	-34.85		
5	I	2042-01-12T05:52:06.238		53.17	-71.56	42254.82	-34.78		
6	I	2042-01-12T05:52:19.373		53.21	-71.60	41876.67	-34.81		
Uranus	I	2042-01-12T05:52:29.401		53.25	-71.63	25376.71		-49.73	-51.01
Uranus	E	2042-01-12T06:26:19.413		60.33	-77.70	25438.18		38.32	39.60
6	E	2042-01-12T06:28:40.283		60.81	-78.06	41813.97	34.88		
5	E	2042-01-12T06:28:55.680		60.86	-78.09	42262.62	34.85		
4	E	2042-01-12T06:29:02.839		60.88	-78.11	42574.10	34.92		
alpha	E	2042-01-12T06:30:03.886		61.09	-78.26	44700.04	35.05		
beta	E	2042-01-12T06:30:31.848		61.19	-78.33	45667.88	35.11		
eta	E	2042-01-12T06:31:14.714		61.33	-78.43	47176.12	35.20		
gamma	E	2042-01-12T06:31:27.366		61.38	-78.46	47621.61	35.22		
delta	E	2042-01-12T06:31:46.625		61.44	-78.51	48300.35	35.26		
lambda	E	2042-01-12T06:32:35.520		61.61	-78.62	50026.71	35.35		
epsilon	E	2042-01-12T06:33:06.030		61.71	-78.69	51106.08	35.47		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2042-01-12T06:03:52.710
 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 : 611925985189817856
 2Mass ID (if available) : 08540921+1808502
 ICRS Star Coord at Epoch: 08h 54m 09.20728s +18:08:50.08621s
 RUWE (>1.4 is poor) : 0.93
 K magnitude : 13.161
 G magnitude : 14.470
 RP magnitude : 14.022
 BP magnitude : 14.746
 DUPflag : 0
 Distance (au) : 17.556
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.49
 Sun-Target sep (deg) : 160.67
 Sun-Moon sep (deg) : 46.71
 B (ring opening deg) : 36.25
 PA of pole (deg) : 95.81
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.800
 C/A sky separation (km) : 10191.1
 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



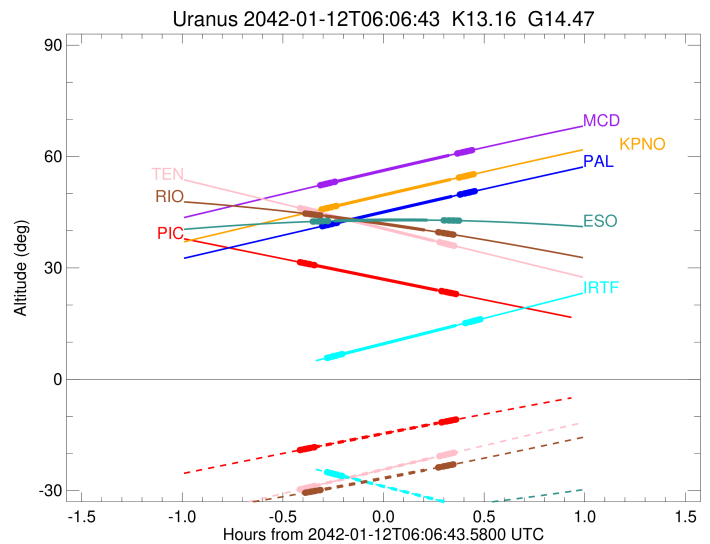
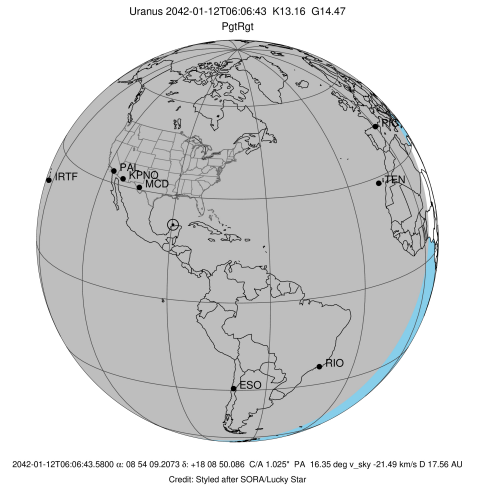
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2042-01-12T05:41:43.332		46.14	-29.70	51360.16	-35.66		
lambda	I	2042-01-12T05:42:20.799		46.00	-29.56	50026.71	-35.57		
delta	I	2042-01-12T05:43:09.377		45.82	-29.39	48300.35	-35.51		
gamma	I	2042-01-12T05:43:28.285		45.75	-29.32	47629.19	-35.48		
eta	I	2042-01-12T05:43:41.057		45.71	-29.27	47176.12	-35.46		
beta	I	2042-01-12T05:44:23.755		45.55	-29.12	45664.48	-35.41		
alpha	I	2042-01-12T05:44:50.857		45.45	-29.02	44720.37	-35.36		
4	I	2042-01-12T05:45:51.543		45.23	-28.80	42592.26	-35.28		
5	I	2042-01-12T05:45:59.755		45.20	-28.77	42250.72	-35.22		
6	I	2042-01-12T05:46:12.726	b	45.15	-28.72	41875.78	-35.27		
Uranus	I	2042-01-12T05:46:02.765		45.18	-28.76	25366.72		-51.61	-52.88
Uranus	E	2042-01-12T06:21:46.391		37.29	-21.07	25417.84		42.11	43.42
6	E	2042-01-12T06:23:20.395		36.94	-20.73	41811.86	35.19		
5	E	2042-01-12T06:23:35.647		36.89	-20.68	42258.07	35.15		
4	E	2042-01-12T06:23:42.773		36.86	-20.65	42571.41	35.21		
alpha	E	2042-01-12T06:24:43.510		36.64	-20.43	44701.68	35.29		
beta	E	2042-01-12T06:25:11.233		36.53	-20.34	45666.82	35.32		
eta	E	2042-01-12T06:25:53.897		36.38	-20.18	47176.12	35.38		
gamma	E	2042-01-12T06:26:06.490		36.33	-20.14	47621.75	35.40		
delta	E	2042-01-12T06:26:25.655		36.26	-20.07	48300.35	35.42		
lambda	E	2042-01-12T06:27:14.356		36.08	-19.90	50026.71	35.48		
epsilon	E	2042-01-12T06:27:44.208		35.97	-19.79	51086.21	35.57		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2042-01-12T06:11:32.020
 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 : 611925985189817856
 2Mass ID (if available) : 08540921+1808502
 ICRS Star Coord at Epoch: 08h 54m 09.20728s +18:08:50.08621s
 RUWE (>1.4 is poor) : 0.93
 K magnitude : 13.161
 G magnitude : 14.470
 RP magnitude : 14.022
 BP magnitude : 14.746
 DUPflag : 0
 Distance (au) : 17.556
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.49
 Sun-Target sep (deg) : 160.67
 Sun-Moon sep (deg) : 47.38
 B (ring opening deg) : 36.25
 PA of pole (deg) : 95.81
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.027
 C/A sky separation (km) : 13078.7
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



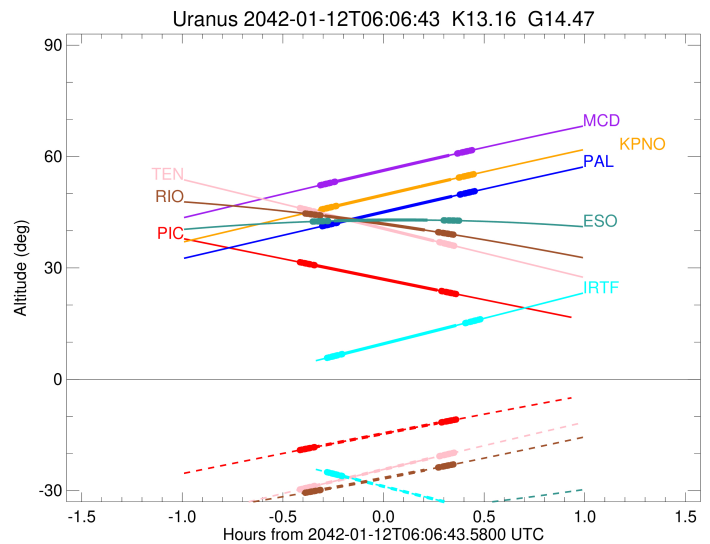
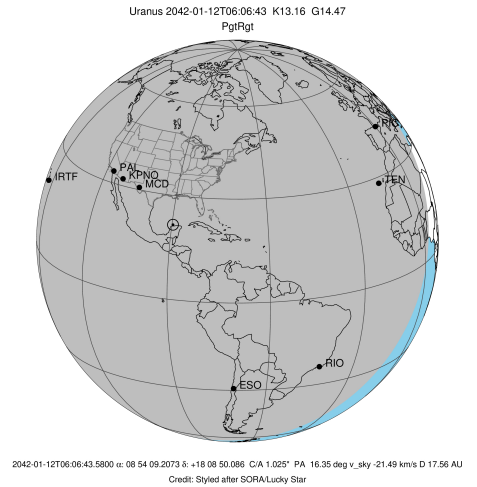
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2042-01-12T05:49:48.972		5.74	-25.01	51377.55	-34.79		
lambda	I	2042-01-12T05:50:27.902		5.89	-25.16	50026.71	-34.67		
delta	I	2042-01-12T05:51:17.769		6.07	-25.35	48300.35	-34.57		
gamma	I	2042-01-12T05:51:37.201		6.15	-25.42	47628.93	-34.53		
eta	I	2042-01-12T05:51:50.319		6.20	-25.47	47176.12	-34.50		
beta	I	2042-01-12T05:52:34.203		6.36	-25.64	45665.64	-34.41		
alpha	I	2042-01-12T05:53:02.185		6.47	-25.74	44718.33	-34.34		
4	I	2042-01-12T05:54:04.602		6.70	-25.98	42594.78	-34.20		
5	I	2042-01-12T05:54:13.100		6.73	-26.01	42255.76	-34.14		
6	I	2042-01-12T05:54:26.483		6.78	-26.06	41876.87	-34.16		
Uranus	I	2042-01-12T05:54:42.469		6.84	-26.12	25379.50		-49.20	-50.50
Uranus	E	2042-01-12T06:28:23.600		14.51	-33.80	25445.27		36.97	38.25
6	E	2042-01-12T06:31:03.876		15.12	-34.42	41814.69	34.29		
5	E	2042-01-12T06:31:19.535		15.18	-34.48	42264.13	34.26		
4	E	2042-01-12T06:31:26.811		15.21	-34.50	42575.01	34.33		
alpha	E	2042-01-12T06:32:28.833		15.44	-34.74	44699.50	34.48		
beta	E	2042-01-12T06:32:57.272		15.55	-34.85	45668.23	34.55		
eta	E	2042-01-12T06:33:40.817		15.72	-35.01	47176.12	34.65		
gamma	E	2042-01-12T06:33:53.669		15.77	-35.06	47621.56	34.67		
delta	E	2042-01-12T06:34:13.232		15.84	-35.14	48300.35	34.72		
lambda	E	2042-01-12T06:35:02.887		16.03	-35.33	50026.71	34.82		
epsilon	E	2042-01-12T06:35:34.062		16.15	-35.45	51113.00	34.95		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2042-01-12T06:04:03.400
 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 : 611925985189817856
 2Mass ID (if available) : 08540921+1808502
 ICRS Star Coord at Epoch: 08h 54m 09.20728s +18:08:50.08621s
 RUWE (>1.4 is poor) : 0.93
 K magnitude : 13.161
 G magnitude : 14.470
 RP magnitude : 14.022
 BP magnitude : 14.746
 DUPflag : 0
 Distance (au) : 17.556
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.49
 Sun-Target sep (deg) : 160.67
 Sun-Moon sep (deg) : 46.78
 B (ring opening deg) : 36.25
 PA of pole (deg) : 95.81
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.278
 C/A sky separation (km) : 16274.7
 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_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	2042-01-12T05:43:18.268		44.66	-30.58	51401.52	-34.72		
lambda	I	2042-01-12T05:43:58.015		44.59	-30.48	50026.71	-34.50		
delta	I	2042-01-12T05:44:48.117		44.50	-30.34	48300.35	-34.38		
gamma	I	2042-01-12T05:45:07.676		44.46	-30.29	47628.56	-34.31		
eta	I	2042-01-12T05:45:20.871		44.44	-30.25	47176.12	-34.27		
beta	I	2042-01-12T05:46:05.062		44.35	-30.13	45667.23	-34.11		
alpha	I	2042-01-12T05:46:33.421		44.30	-30.05	44715.48	-34.00		
4	I	2042-01-12T05:47:36.386		44.19	-29.88	42598.10	-33.76		
5	I	2042-01-12T05:47:45.050		44.17	-29.86	42262.56	-33.67		
6	I	2042-01-12T05:47:58.591		44.14	-29.82	41878.09	-33.67		
Uranus	I	2042-01-12T05:49:10.406		44.01	-29.62	25405.16		-44.45	-45.77
Uranus	E	2042-01-12T06:19:00.969		40.19	-24.48	25473.72		31.36	32.54
6	E	2042-01-12T06:22:58.713		39.63	-23.77	41817.44	33.64		
5	E	2042-01-12T06:23:14.640		39.59	-23.72	42269.55	33.64		
4	E	2042-01-12T06:23:22.042		39.57	-23.70	42578.29	33.72		
alpha	E	2042-01-12T06:24:24.911		39.42	-23.51	44697.62	33.96		
beta	E	2042-01-12T06:24:53.834		39.35	-23.43	45669.47	34.07		
eta	E	2042-01-12T06:25:37.906		39.24	-23.29	47176.12	34.23		
gamma	E	2042-01-12T06:25:50.908		39.21	-23.25	47621.42	34.27		
delta	E	2042-01-12T06:26:10.701		39.16	-23.19	48300.35	34.33		
lambda	E	2042-01-12T06:27:00.869		39.04	-23.04	50026.71	34.49		
epsilon	E	2042-01-12T06:27:33.006		38.96	-22.94	51136.44	34.67		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2042-01-12T06:05:52.490
 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 : 611925985189817856
 2Mass ID (if available) : 08540921+1808502
 ICRS Star Coord at Epoch: 08h 54m 09.20728s +18:08:50.08621s
 RUWE (>1.4 is poor) : 0.93
 K magnitude : 13.161
 G magnitude : 14.470
 RP magnitude : 14.022
 BP magnitude : 14.746
 DUPflag : 0
 Distance (au) : 17.556
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.49
 Sun-Target sep (deg) : 160.67
 Sun-Moon sep (deg) : 47.04
 B (ring opening deg) : 36.25
 PA of pole (deg) : 95.81
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.390
 C/A sky separation (km) : 17694.4
 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_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	2042-01-12T05:45:30.837		42.49	-37.62	51410.43	-34.38		
lambda	I	2042-01-12T05:46:11.255		42.51	-37.58	50026.71	-34.17		
delta	I	2042-01-12T05:47:01.914		42.53	-37.53	48300.35	-33.98		
gamma	I	2042-01-12T05:47:21.707		42.54	-37.51	47628.41	-33.91		
eta	I	2042-01-12T05:47:35.057		42.55	-37.49	47176.12	-33.85		
beta	I	2042-01-12T05:48:19.795		42.57	-37.45	45667.85	-33.67		
alpha	I	2042-01-12T05:48:48.582		42.59	-37.42	44714.36	-33.53		
4	I	2042-01-12T05:49:52.402		42.62	-37.35	42599.38	-33.24		
5	I	2042-01-12T05:50:01.228		42.62	-37.34	42265.25	-33.15		
6	I	2042-01-12T05:50:14.967		42.63	-37.32	41878.49	-33.13		
Uranus	I	2042-01-12T05:51:58.215		42.67	-37.21	25418.24		-42.04	-43.35
Uranus	E	2042-01-12T06:19:51.246		42.88	-34.97	25488.86		28.14	29.26
6	E	2042-01-12T06:24:37.000		42.81	-34.51	41818.93	33.14		
5	E	2042-01-12T06:24:53.132		42.81	-34.49	42272.32	33.16		
4	E	2042-01-12T06:25:00.646		42.81	-34.47	42579.99	33.25		
alpha	E	2042-01-12T06:26:04.255		42.79	-34.37	44696.67	33.54		
beta	E	2042-01-12T06:26:33.562		42.78	-34.32	45670.11	33.68		
eta	E	2042-01-12T06:27:18.104		42.77	-34.25	47176.12	33.86		
gamma	E	2042-01-12T06:27:31.241		42.76	-34.22	47621.35	33.92		
delta	E	2042-01-12T06:27:51.237		42.76	-34.19	48300.35	34.00		
lambda	E	2042-01-12T06:28:41.881		42.74	-34.11	50026.71	34.18		
epsilon	E	2042-01-12T06:29:14.666		42.73	-34.05	51149.07	34.39		