

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-02-06T04:46:06.850
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 675910994920334976
 2Mass ID (if available) : 08095452+2041581

ICRS Star Coord at Epoch: 08h 09m 54.55030s +20:41:57.14035s

RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.914
 G magnitude : 18.661
 RP magnitude : 17.458
 BP magnitude : 19.756
 DUPflag : 0
 Distance (au) : 17.638
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.05
 Sun-Target sep (deg) : 163.70
 Sun-Moon sep (deg) : 109.56
 B (ring opening deg) : 46.81
 PA of pole (deg) : 90.36

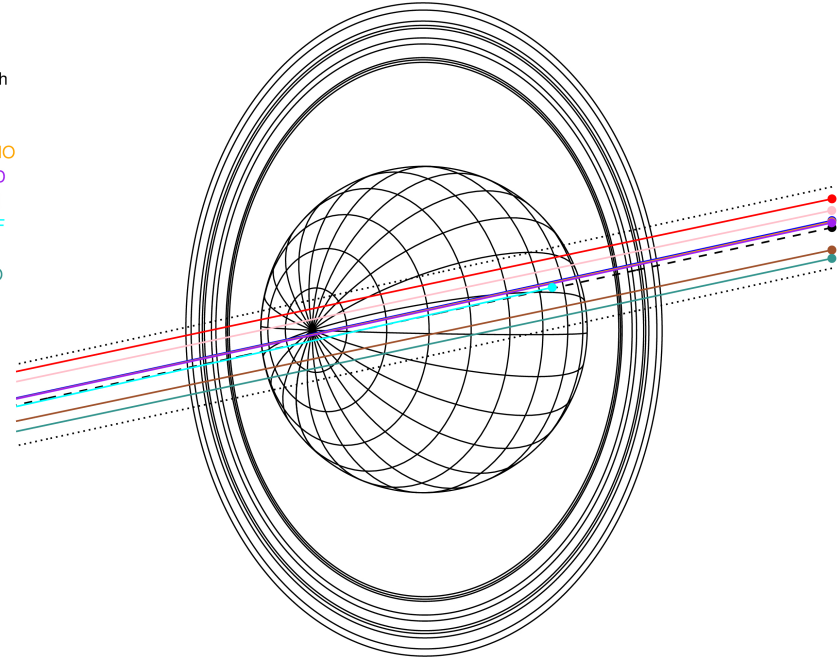
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2040-02-06T04:46:06.8500 ex: 08 09 54.55030 s: +20 41 57.140 C/A 0.165° PA 192.28 deg v_sky -22.05 km/s D 17.64 AU
 Credit: Styled after SORA/Lucky Star

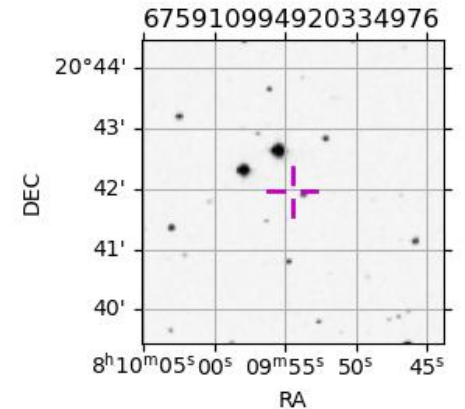
Uranus 2040-02-06T04:46:06 K14.91 G18.66 PgtRgt

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO

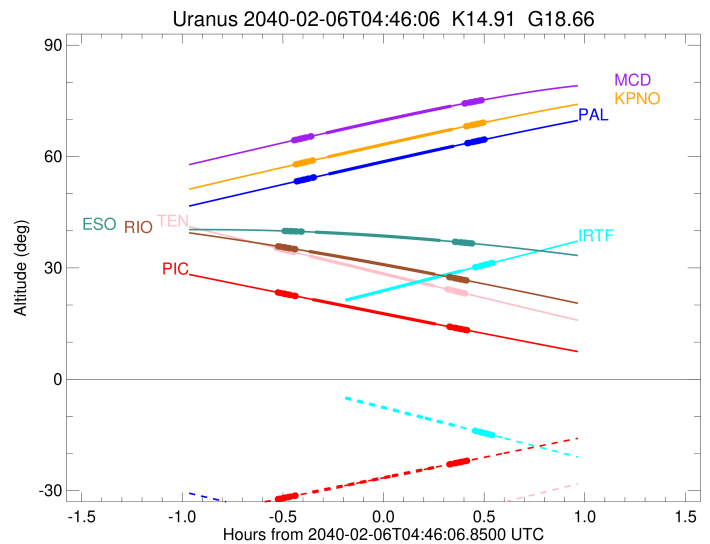
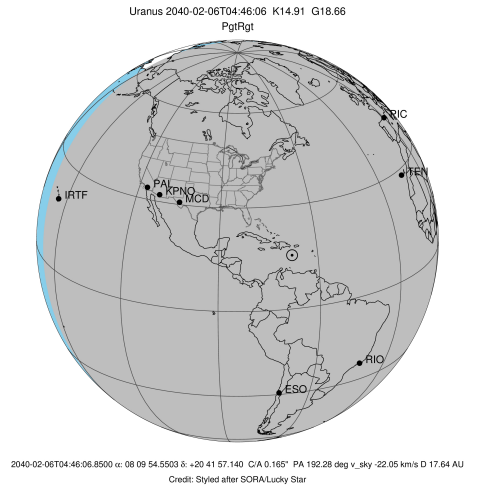


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	FEB 06 04:14 - FEB 06 05:10	PieRie
PAL	Palomar Mt (200")	33.4	243.1	+++++	+ +	+++++	FEB 06 04:20 - FEB 06 05:16	PieRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	FEB 06 04:19 - FEB 06 05:15	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	FEB 06 04:19 - FEB 06 05:15	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+ +	+++++	FEB 06 04:13 - FEB 06 05:10	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5		+	+++++	FEB 06 05:09 - FEB 06 05:18	PneRne
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++	+ +	+++++	FEB 06 04:14 - FEB 06 05:10	PieRie
ESO	European Southern Obs	-29.3	289.3	+++++	+ +	+++++	FEB 06 04:16 - FEB 06 05:12	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

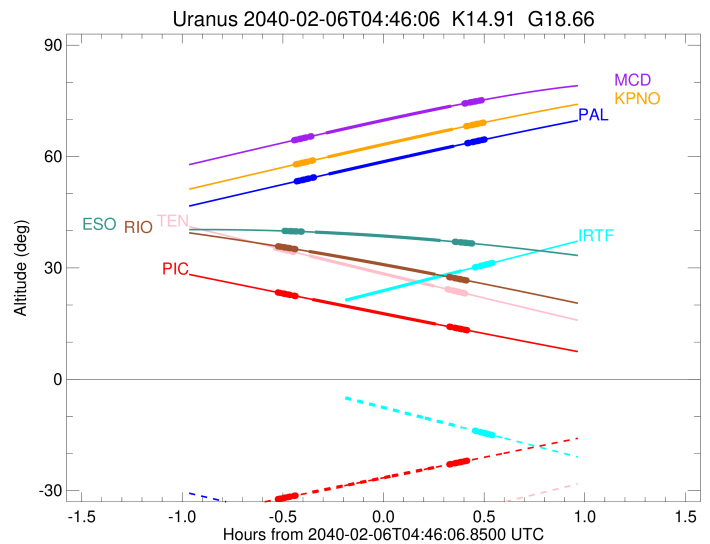
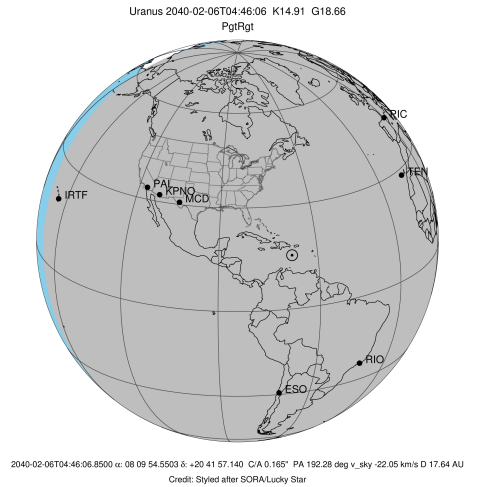


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-02-06T04:43:17.060
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 675910994920334976
 2Mass ID (if available) : 08095452+2041581
 ICRS Star Coord at Epoch: 08h 09m 54.55030s +20:41:57.14035s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.914
 G magnitude : 18.661
 RP magnitude : 17.458
 BP magnitude : 19.756
 DUPflag : 0
 Distance (au) : 17.638
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.05
 Sun-Target sep (deg) : 163.70
 Sun-Moon sep (deg) : 110.04
 B (ring opening deg) : 46.81
 PA of pole (deg) : 90.36
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.532
 C/A sky separation (km) : 6802.1
 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_itrff93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



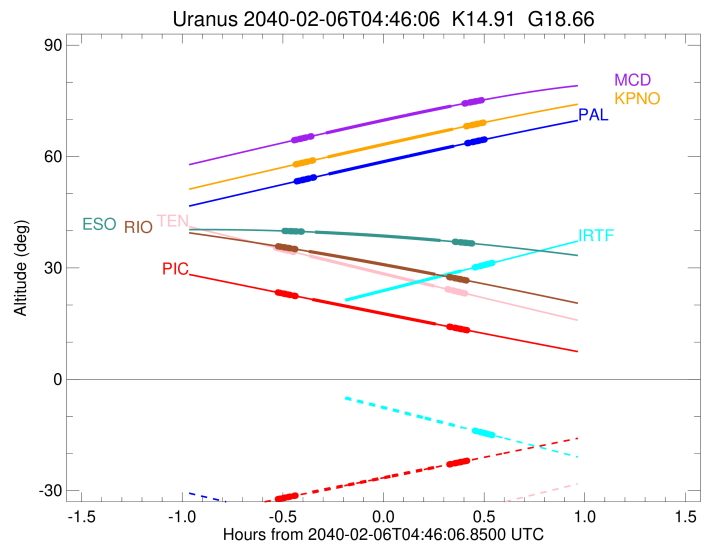
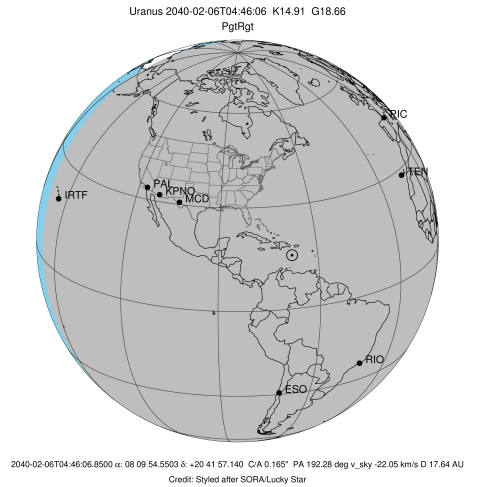
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2040-02-06T04:14:29.101		23.41	-32.31	51459.37	-29.77		
lambda	I	2040-02-06T04:15:17.269		23.26	-32.17	50026.71	-29.73		
delta	I	2040-02-06T04:16:15.351		23.09	-31.99	48300.35	-29.71		
gamma	I	2040-02-06T04:16:38.134		23.02	-31.92	47623.57	-29.70		
eta	I	2040-02-06T04:16:53.201		22.97	-31.88	47176.12	-29.69		
beta	I	2040-02-06T04:17:44.277		22.82	-31.72	45659.10	-29.67		
alpha	I	2040-02-06T04:18:15.263		22.72	-31.63	44745.19	-29.65		
4	I	2040-02-06T04:19:29.951		22.49	-31.40	42548.64	-29.62		
5	I	2040-02-06T04:19:43.253		22.45	-31.36	42155.65	-29.62		
6	I	2040-02-06T04:19:53.960		22.42	-31.33	41796.97	-29.58		
Uranus	I	2040-02-06T04:24:52.550		21.51	-30.42	25312.88		-37.51	-38.79
Uranus	E	2040-02-06T05:01:40.084		14.88	-23.68	25250.72		43.06	44.37
6	E	2040-02-06T05:05:47.603		14.15	-22.92	41879.75	29.48		
5	E	2040-02-06T05:06:00.174		14.11	-22.88	42313.89	29.52		
4	E	2040-02-06T05:06:09.529		14.08	-22.85	42580.02	29.52		
alpha	E	2040-02-06T05:07:21.576		13.87	-22.63	44686.73	29.55		
beta	E	2040-02-06T05:07:54.442		13.77	-22.53	45657.12	29.56		
eta	E	2040-02-06T05:08:45.814		13.62	-22.37	47176.12	29.58		
gamma	E	2040-02-06T05:09:01.073		13.57	-22.33	47627.54	29.59		
delta	E	2040-02-06T05:09:23.810		13.51	-22.26	48300.35	29.60		
lambda	E	2040-02-06T05:10:22.122		13.33	-22.08	50026.71	29.61		
epsilon	E	2040-02-06T05:10:52.169		13.25	-21.99	50916.67	29.65		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-02-06T04:48:27.820
 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 : 675910994920334976
 2Mass ID (if available) : 08095452+2041581
 ICRS Star Coord at Epoch: 08h 09m 54.55030s +20:41:57.14035s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.914
 G magnitude : 18.661
 RP magnitude : 17.458
 BP magnitude : 19.756
 DUPflag : 0
 Distance (au) : 17.638
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.05
 Sun-Target sep (deg) : 163.70
 Sun-Moon sep (deg) : 110.17
 B (ring opening deg) : 46.81
 PA of pole (deg) : 90.36
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.238
 C/A sky separation (km) : 3040.8
 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_itrff93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



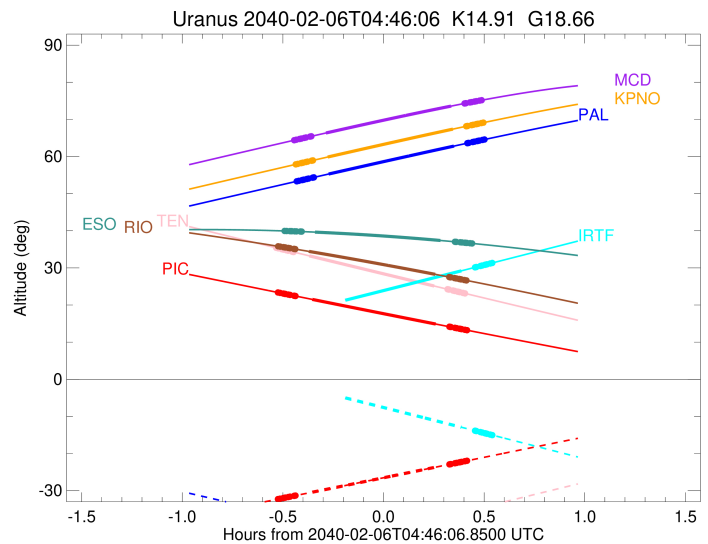
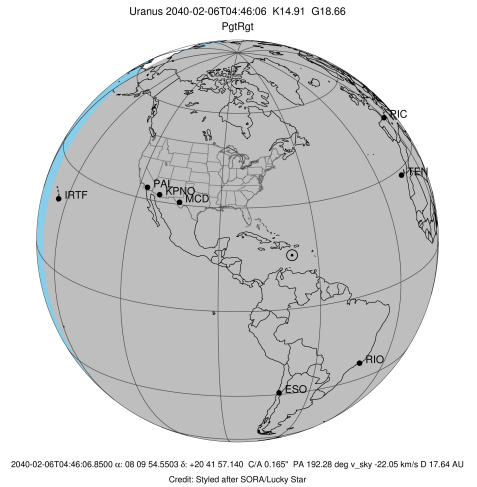
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2040-02-06T04:20:05.663		53.30	-37.37	51440.27	-30.31		
lambda	I	2040-02-06T04:20:52.314		53.46	-37.53	50026.71	-30.30		
delta	I	2040-02-06T04:21:49.294		53.65	-37.73	48300.35	-30.30		
gamma	I	2040-02-06T04:22:11.623		53.73	-37.80	47623.93	-30.29		
eta	I	2040-02-06T04:22:26.405		53.78	-37.86	47176.12	-30.29		
beta	I	2040-02-06T04:23:16.411		53.95	-38.03	45660.69	-30.29		
alpha	I	2040-02-06T04:23:46.723		54.06	-38.13	44746.80	-30.29		
4	I	2040-02-06T04:24:59.798		54.31	-38.39	42552.07	-30.29		
5	I	2040-02-06T04:25:13.020		54.35	-38.43	42154.96	-30.29		
6	I	2040-02-06T04:25:23.285		54.39	-38.47	41795.94	-30.26		
Uranus	I	2040-02-06T04:29:46.541		55.29	-39.38	25280.97		-40.38	-41.68
Uranus	E	2040-02-06T05:07:07.156		62.81	-47.07	25251.50		42.99	44.30
6	E	2040-02-06T05:11:08.012		63.60	-47.89	41879.58	30.30		
5	E	2040-02-06T05:11:20.454		63.64	-47.93	42314.92	30.34		
4	E	2040-02-06T05:11:29.575		63.67	-47.96	42584.13	30.33		
alpha	E	2040-02-06T05:12:39.601		63.90	-48.20	44687.91	30.33		
beta	E	2040-02-06T05:13:11.683		64.00	-48.31	45658.84	30.34		
eta	E	2040-02-06T05:14:01.685		64.16	-48.47	47176.12	30.34		
gamma	E	2040-02-06T05:14:16.576		64.21	-48.52	47627.97	30.34		
delta	E	2040-02-06T05:14:38.734		64.28	-48.60	48300.35	30.35		
lambda	E	2040-02-06T05:15:35.616		64.46	-48.79	50026.71	30.35		
epsilon	E	2040-02-06T05:16:04.103		64.56	-48.89	50891.41	30.37		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-02-06T04:48:08.500
 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 : 675910994920334976
 2Mass ID (if available) : 08095452+2041581
 ICRS Star Coord at Epoch: 08h 09m 54.55030s +20:41:57.14035s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.914
 G magnitude : 18.661
 RP magnitude : 17.458
 BP magnitude : 19.756
 DUPflag : 0
 Distance (au) : 17.638
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.05
 Sun-Target sep (deg) : 163.70
 Sun-Moon sep (deg) : 110.23
 B (ring opening deg) : 46.81
 PA of pole (deg) : 90.36
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.227
 C/A sky separation (km) : 2898.3
 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



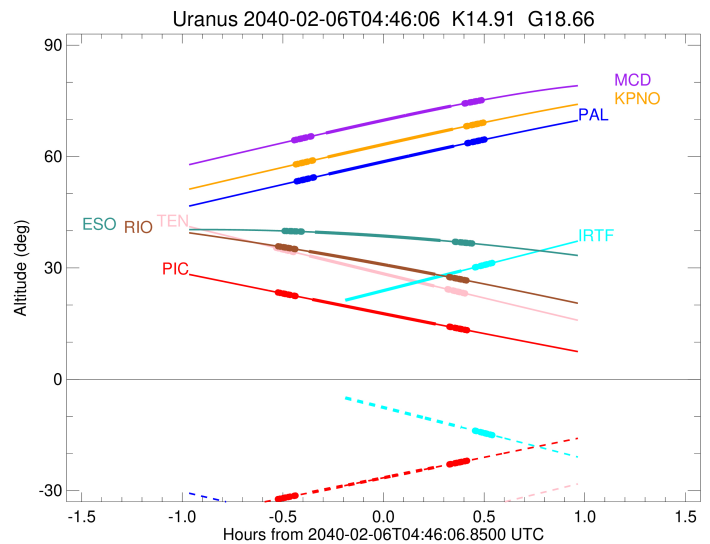
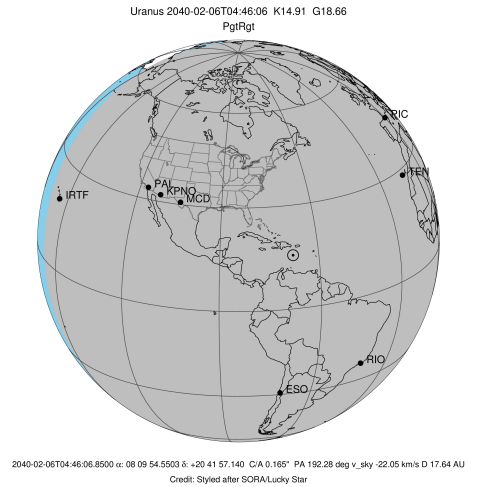
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2040-02-06T04:19:48.508		57.86	-41.87	51439.33	-30.35		
lambda	I	2040-02-06T04:20:35.068		58.02	-42.04	50026.71	-30.34		
delta	I	2040-02-06T04:21:31.976		58.22	-42.24	48300.35	-30.33		
gamma	I	2040-02-06T04:21:54.275		58.30	-42.31	47623.94	-30.33		
eta	I	2040-02-06T04:22:09.039		58.35	-42.37	47176.12	-30.33		
beta	I	2040-02-06T04:22:58.979		58.52	-42.54	45660.76	-30.33		
alpha	I	2040-02-06T04:23:29.249		58.63	-42.65	44746.87	-30.33		
4	I	2040-02-06T04:24:42.227		58.88	-42.90	42552.23	-30.33		
5	I	2040-02-06T04:24:55.442		58.93	-42.95	42154.94	-30.34		
6	I	2040-02-06T04:25:05.684		58.96	-42.98	41795.90	-30.30		
Uranus	I	2040-02-06T04:29:27.580		59.87	-43.90	25279.80		-40.48	-41.78
Uranus	E	2040-02-06T05:06:47.662		67.38	-51.65	25251.77		42.97	44.28
6	E	2040-02-06T05:10:48.470		68.16	-52.47	41879.57	30.33		
5	E	2040-02-06T05:11:00.906		68.20	-52.51	42314.95	30.37		
4	E	2040-02-06T05:11:10.017		68.23	-52.54	42584.27	30.37		
alpha	E	2040-02-06T05:12:19.967		68.45	-52.78	44687.95	30.36		
beta	E	2040-02-06T05:12:52.017		68.55	-52.89	45658.90	30.37		
eta	E	2040-02-06T05:13:41.967		68.71	-53.06	47176.12	30.37		
gamma	E	2040-02-06T05:13:56.843		68.76	-53.11	47627.98	30.37		
delta	E	2040-02-06T05:14:18.979		68.83	-53.18	48300.35	30.38		
lambda	E	2040-02-06T05:15:15.805		69.01	-53.37	50026.71	30.38		
epsilon	E	2040-02-06T05:15:44.241		69.10	-53.47	50890.68	30.40		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-02-06T04:47:38.440
 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 : 675910994920334976
 2Mass ID (if available) : 08095452+2041581
 ICRS Star Coord at Epoch: 08h 09m 54.55030s +20:41:57.14035s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.914
 G magnitude : 18.661
 RP magnitude : 17.458
 BP magnitude : 19.756
 DUPflag : 0
 Distance (au) : 17.638
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.05
 Sun-Target sep (deg) : 163.70
 Sun-Moon sep (deg) : 110.31
 B (ring opening deg) : 46.81
 PA of pole (deg) : 90.36
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.219
 C/A sky separation (km) : 2803.0
 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_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	2040-02-06T04:19:20.723		64.37	-48.38	51438.60	-30.39		
lambda	I	2040-02-06T04:20:07.195		64.53	-48.54	50026.71	-30.38		
delta	I	2040-02-06T04:21:04.024		64.72	-48.74	48300.35	-30.38		
gamma	I	2040-02-06T04:21:26.291		64.80	-48.82	47623.96	-30.37		
eta	I	2040-02-06T04:21:41.035		64.85	-48.88	47176.12	-30.37		
beta	I	2040-02-06T04:22:30.904		65.02	-49.05	45660.82	-30.37		
alpha	I	2040-02-06T04:23:01.131		65.13	-49.16	44746.92	-30.37		
4	I	2040-02-06T04:24:14.007		65.38	-49.41	42552.36	-30.37		
5	I	2040-02-06T04:24:27.210		65.42	-49.46	42154.93	-30.38		
6	I	2040-02-06T04:24:37.432		65.46	-49.50	41795.87	-30.34		
Uranus	I	2040-02-06T04:28:58.222		66.35	-50.41	25278.94		-40.56	-41.86
Uranus	E	2040-02-06T05:06:17.131		73.59	-58.11	25251.93		42.95	44.26
6	E	2040-02-06T05:10:17.823		74.30	-58.92	41879.56	30.36		
5	E	2040-02-06T05:10:30.250		74.34	-58.96	42314.96	30.40		
4	E	2040-02-06T05:10:39.354		74.36	-58.99	42584.33	30.40		
alpha	E	2040-02-06T05:11:49.234		74.56	-59.22	44687.97	30.39		
beta	E	2040-02-06T05:12:21.255		74.66	-59.33	45658.93	30.39		
eta	E	2040-02-06T05:13:11.157		74.80	-59.49	47176.12	30.40		
gamma	E	2040-02-06T05:13:26.020		74.84	-59.54	47627.99	30.40		
delta	E	2040-02-06T05:13:48.135		74.90	-59.62	48300.35	30.40		
lambda	E	2040-02-06T05:14:44.911		75.06	-59.80	50026.71	30.41		
epsilon	E	2040-02-06T05:15:13.308		75.14	-59.90	50890.30	30.42		

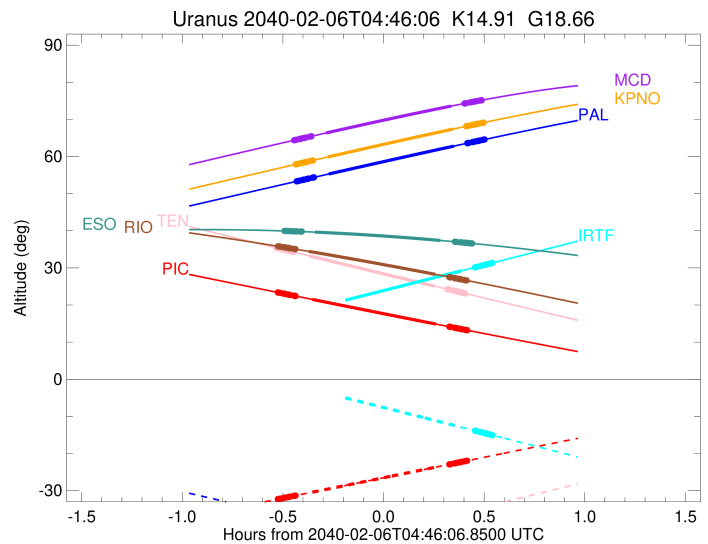
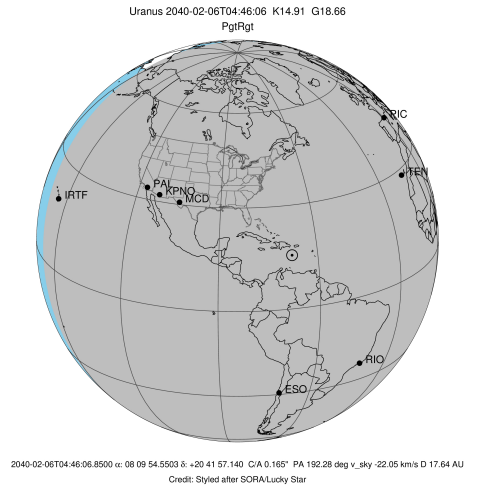
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-02-06T04:42:35.880
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 675910994920334976
 2Mass ID (if available) : 08095452+2041581
 ICRS Star Coord at Epoch: 08h 09m 54.55030s +20:41:57.14035s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.914
 G magnitude : 18.661
 RP magnitude : 17.458
 BP magnitude : 19.756
 DUPflag : 0
 Distance (au) : 17.638
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.05
 Sun-Target sep (deg) : 163.70
 Sun-Moon sep (deg) : 110.24
 B (ring opening deg) : 46.81
 PA of pole (deg) : 90.36
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.401
 C/A sky separation (km) : 5130.1
 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	2040-02-06T04:13:58.601		35.45	-48.02	51450.15	-30.05		
lambda	I	2040-02-06T04:14:45.997		35.27	-47.85	50026.71	-30.03		
delta	I	2040-02-06T04:15:43.505		35.06	-47.64	48300.35	-30.01		
gamma	I	2040-02-06T04:16:06.052		34.98	-47.56	47623.74	-30.01		
eta	I	2040-02-06T04:16:20.971		34.93	-47.51	47176.12	-30.00		
beta	I	2040-02-06T04:17:11.494		34.74	-47.32	45659.87	-29.98		
alpha	I	2040-02-06T04:17:42.132		34.63	-47.21	44745.99	-29.98		
4	I	2040-02-06T04:18:55.991		34.36	-46.94	42550.28	-29.96		
5	I	2040-02-06T04:19:09.248		34.31	-46.89	42155.24	-29.96		
6	I	2040-02-06T04:19:19.730		34.27	-46.85	41796.44	-29.92		
Uranus	I	2040-02-06T04:23:59.826		33.25	-45.83	25296.50		-38.99	-40.28
Uranus	E	2040-02-06T05:01:11.409		25.13	-37.65	25249.22		43.19	44.50
6	E	2040-02-06T05:05:14.577		24.25	-36.76	41879.72	29.81		
5	E	2040-02-06T05:05:27.094		24.20	-36.71	42314.41	29.85		
4	E	2040-02-06T05:05:36.351		24.17	-36.68	42581.74	29.85		
alpha	E	2040-02-06T05:06:47.578		23.91	-36.41	44687.19	29.86		
beta	E	2040-02-06T05:07:20.133		23.80	-36.29	45657.82	29.86		
eta	E	2040-02-06T05:08:10.961		23.61	-36.11	47176.12	29.88		
gamma	E	2040-02-06T05:08:26.076		23.56	-36.05	47627.72	29.88		
delta	E	2040-02-06T05:08:48.586		23.48	-35.97	48300.35	29.88		
lambda	E	2040-02-06T05:09:46.347		23.27	-35.76	50026.71	29.89		
epsilon	E	2040-02-06T05:10:15.764		23.16	-35.65	50906.19	29.92		

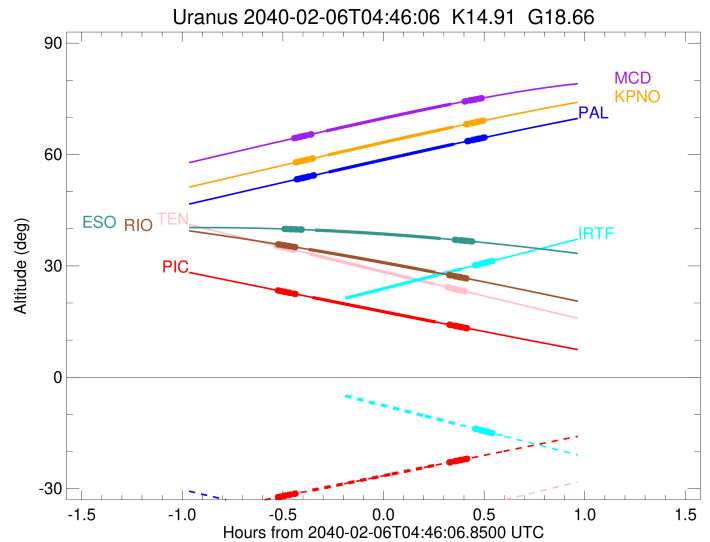
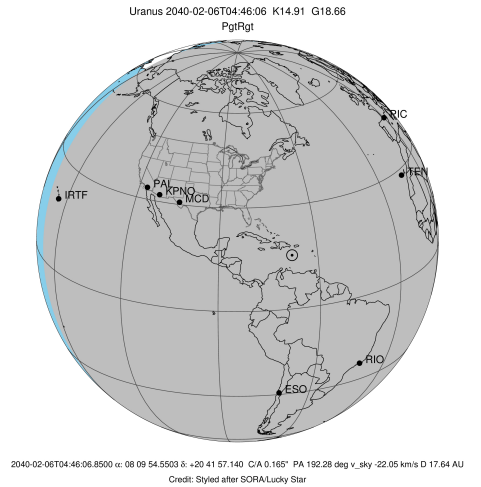
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2040-02-06T04:50:29.750
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       : 675910994920334976
2Mass ID (if available) : 08095452+2041581
ICRS Star Coord at Epoch: 08h 09m 54.55030s +20:41:57.14035s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 14.914
G magnitude           : 18.661
RP magnitude          : 17.458
BP magnitude          : 19.756
DUPflag              : 0
Distance (au)        : 17.638
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -22.05
Sun-Target sep (deg) : 163.70
Sun-Moon sep (deg)   : 109.63
B (ring opening deg) : 46.81
PA of pole (deg)     : 90.36
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.161
C/A sky separation (km) : 2056.0
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
    
```



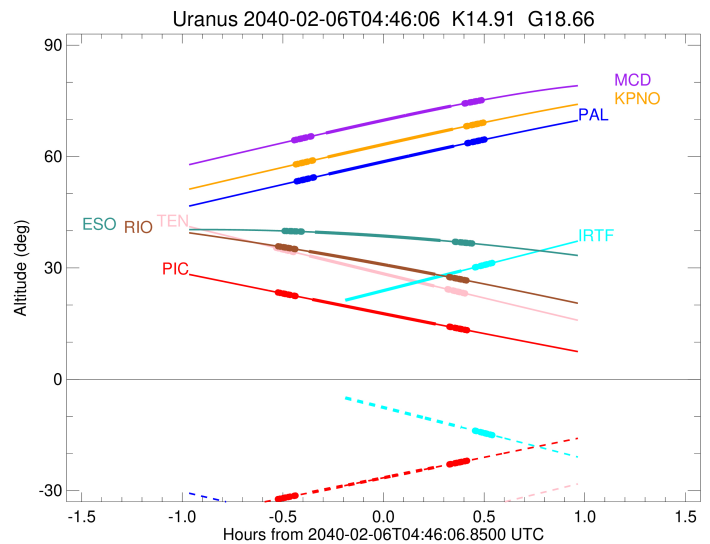
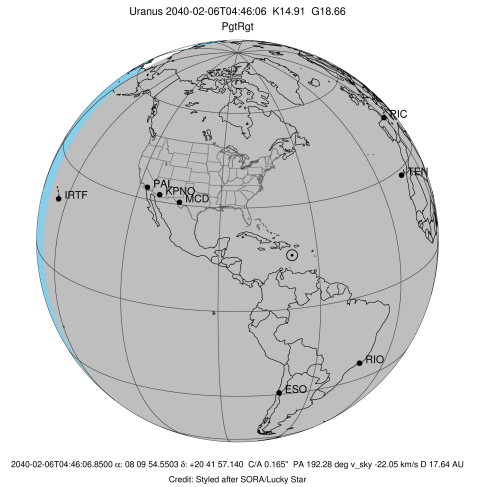
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2040-02-06T04:21:56.060		18.38	-2.11x	51435.75	-30.07		
lambda	I	2040-02-06T04:22:42.927		18.56	-2.28x	50026.71	-30.06		
delta	I	2040-02-06T04:23:40.349		18.78	-2.50x	48300.35	-30.06		
gamma	I	2040-02-06T04:24:02.846		18.86	-2.59x	47624.01	-30.06		
eta	I	2040-02-06T04:24:17.744		18.92	-2.64x	47176.12	-30.06		
beta	I	2040-02-06T04:25:08.118		19.11	-2.83x	45661.05	-30.06		
alpha	I	2040-02-06T04:25:38.649		19.23	-2.95x	44747.14	-30.06		
4	I	2040-02-06T04:26:52.254		19.50	-3.22x	42552.89	-30.07		
5	I	2040-02-06T04:27:05.621		19.55	-3.28x	42154.88	-30.08		
6	I	2040-02-06T04:27:15.915		19.59	-3.31x	41795.75	-30.04		
Uranus	I	2040-02-06T04:31:35.710		20.58	-4.30x	25274.87		-40.92	-42.22
Uranus	E	2040-02-06T05:09:21.331		29.22	-12.93	25254.40		42.73	44.05
6	E	2040-02-06T05:13:25.802		30.16	-13.86	41879.46	30.14		
5	E	2040-02-06T05:13:38.374		30.20	-13.91	42315.09	30.18		
4	E	2040-02-06T05:13:47.550		30.24	-13.95	42585.31	30.18		
alpha	E	2040-02-06T05:14:57.911		30.51	-14.22	44688.30	30.17		
beta	E	2040-02-06T05:15:30.180		30.63	-14.34	45659.35	30.17		
eta	E	2040-02-06T05:16:20.430		30.82	-14.53	47176.12	30.18		
gamma	E	2040-02-06T05:16:35.406		30.88	-14.59	47628.09	30.18		
delta	E	2040-02-06T05:16:57.679		30.97	-14.68	48300.35	30.18		
lambda	E	2040-02-06T05:17:54.870		31.19	-14.90	50026.71	30.19		
epsilon	E	2040-02-06T05:18:23.275		31.30	-15.00	50884.24	30.20		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-02-06T04:42:40.580
 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 : 675910994920334976
 2Mass ID (if available) : 08095452+2041581
 ICRS Star Coord at Epoch: 08h 09m 54.55030s +20:41:57.14035s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.914
 G magnitude : 18.661
 RP magnitude : 17.458
 BP magnitude : 19.756
 DUPflag : 0
 Distance (au) : 17.638
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.05
 Sun-Target sep (deg) : 163.70
 Sun-Moon sep (deg) : 110.27
 B (ring opening deg) : 46.81
 PA of pole (deg) : 90.36
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.075
 C/A sky separation (km) : 953.9
 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	2040-02-06T04:14:34.053		35.84	-48.08	51415.32	-30.39		
lambda	I	2040-02-06T04:15:19.735		35.73	-48.01	50026.71	-30.40		
delta	I	2040-02-06T04:16:16.534		35.59	-47.91	48300.35	-30.39		
gamma	I	2040-02-06T04:16:38.776		35.53	-47.88	47624.37	-30.39		
eta	I	2040-02-06T04:16:53.525		35.50	-47.85	47176.12	-30.39		
beta	I	2040-02-06T04:17:43.316		35.37	-47.77	45662.57	-30.39		
alpha	I	2040-02-06T04:18:13.491		35.30	-47.72	44748.46	-30.39		
4	I	2040-02-06T04:19:26.280		35.12	-47.59	42556.28	-30.40		
5	I	2040-02-06T04:19:39.691		35.08	-47.57	42154.90	-30.40		
6	I	2040-02-06T04:19:49.714		35.06	-47.55	41795.14	-30.36		
Uranus	I	2040-02-06T04:23:51.922		34.45	-47.13	25257.21		-42.48	-43.80
Uranus	E	2040-02-06T05:01:30.963		28.27	-42.36	25266.15		41.69	43.00
6	E	2040-02-06T05:05:44.055		27.53	-41.75	41879.05	30.28		
5	E	2040-02-06T05:05:56.727		27.49	-41.72	42315.25	30.31		
4	E	2040-02-06T05:06:05.889		27.47	-41.69	42587.98	30.31		
alpha	E	2040-02-06T05:07:15.871		27.26	-41.52	44689.26	30.30		
beta	E	2040-02-06T05:07:48.044		27.17	-41.44	45660.51	30.30		
eta	E	2040-02-06T05:08:38.054		27.02	-41.32	47176.12	30.30		
gamma	E	2040-02-06T05:08:52.982		26.98	-41.28	47628.36	30.30		
delta	E	2040-02-06T05:09:15.163		26.91	-41.22	48300.35	30.29		
lambda	E	2040-02-06T05:10:12.149		26.74	-41.08	50026.71	30.29		
epsilon	E	2040-02-06T05:10:39.952		26.66	-41.01	50869.01	30.29		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-02-06T04:44:23.670
 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 : 675910994920334976
 2Mass ID (if available) : 08095452+2041581
 ICRS Star Coord at Epoch: 08h 09m 54.55030s +20:41:57.14035s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.914
 G magnitude : 18.661
 RP magnitude : 17.458
 BP magnitude : 19.756
 DUPflag : 0
 Distance (au) : 17.638
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.05
 Sun-Target sep (deg) : 163.70
 Sun-Moon sep (deg) : 110.24
 B (ring opening deg) : 46.81
 PA of pole (deg) : 90.36
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.188
 C/A sky separation (km) : 2402.9
 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	2040-02-06T04:16:29.973		39.95	-44.11	51406.97	-30.43		
lambda	I	2040-02-06T04:17:15.316		39.93	-44.15	50026.71	-30.44		
delta	I	2040-02-06T04:18:12.036		39.90	-44.20	48300.35	-30.43		
gamma	I	2040-02-06T04:18:34.244		39.89	-44.22	47624.51	-30.43		
eta	I	2040-02-06T04:18:48.978		39.88	-44.23	47176.12	-30.43		
beta	I	2040-02-06T04:19:38.688		39.86	-44.27	45663.18	-30.43		
alpha	I	2040-02-06T04:20:08.815		39.84	-44.29	44748.94	-30.43		
4	I	2040-02-06T04:21:21.497		39.80	-44.35	42557.70	-30.43		
5	I	2040-02-06T04:21:34.964		39.79	-44.36	42155.06	-30.44		
6	I	2040-02-06T04:21:44.918		39.79	-44.37	41794.97	-30.39		
Uranus	I	2040-02-06T04:25:43.182		39.64	-44.54	25252.72		-42.88	-44.19
Uranus	E	2040-02-06T05:03:05.758		37.39	-45.14	25275.41		40.87	42.18
6	E	2040-02-06T05:07:26.048		37.03	-45.10	41878.75	30.36		
5	E	2040-02-06T05:07:38.777		37.02	-45.09	42315.20	30.40		
4	E	2040-02-06T05:07:47.930		37.00	-45.09	42589.48	30.40		
alpha	E	2040-02-06T05:08:57.662		36.90	-45.07	44689.86	30.39		
beta	E	2040-02-06T05:09:29.755		36.86	-45.07	45661.19	30.39		
eta	E	2040-02-06T05:10:19.582		36.79	-45.05	47176.12	30.39		
gamma	E	2040-02-06T05:10:34.468		36.76	-45.05	47628.52	30.39		
delta	E	2040-02-06T05:10:56.572		36.73	-45.04	48300.35	30.39		
lambda	E	2040-02-06T05:11:53.370		36.65	-45.02	50026.71	30.40		
epsilon	E	2040-02-06T05:12:20.793		36.61	-45.01	50860.30	30.39		