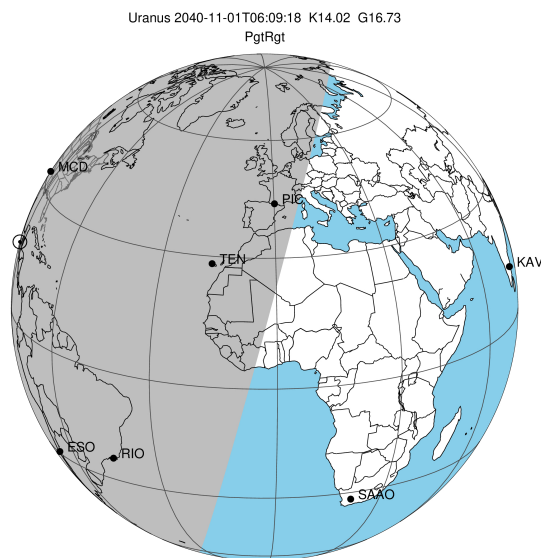


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-11-01T06:09:18.250
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 661189947271998848
 2Mass ID (if available) : 08400316+1859131

ICRS Star Coord at Epoch: 08h 40m 03.18334s +18:59:12.26779s

RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.023
 G magnitude : 16.734
 RP magnitude : 15.880
 BP magnitude : 17.496
 DUPflag : 0
 Distance (au) : 18.496
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 5.87
 Sun-Target sep (deg) : 91.42
 Sun-Moon sep (deg) : 48.68
 B (ring opening deg) : 39.66
 PA of pole (deg) : 94.26

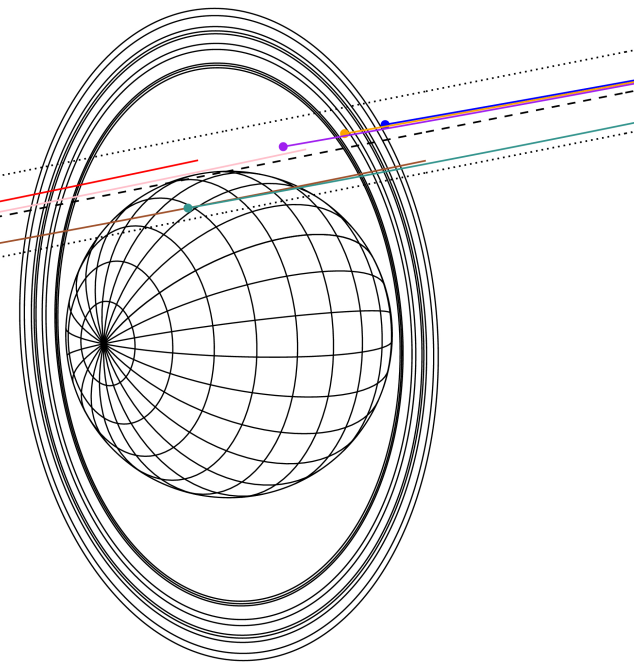
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2040-11-01T06:09:18.2500 ra: 08 40 03.1833 s: +18 59 12.268 C/A 1.862° PA 192.78 deg v_sky + 5.86 km/s D 18.50 AU
 Credit: Styled after SORA/Lucky Star

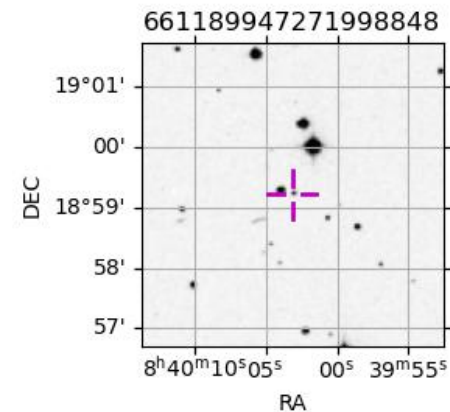
Uranus 2040-11-01T06:09:18 K14.02 G16.73 PgtRgt

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 RIO
 ESO
 SAAO

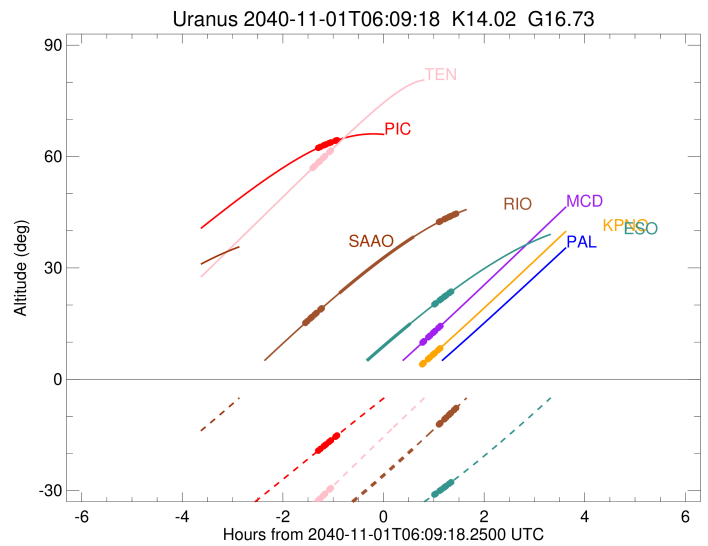
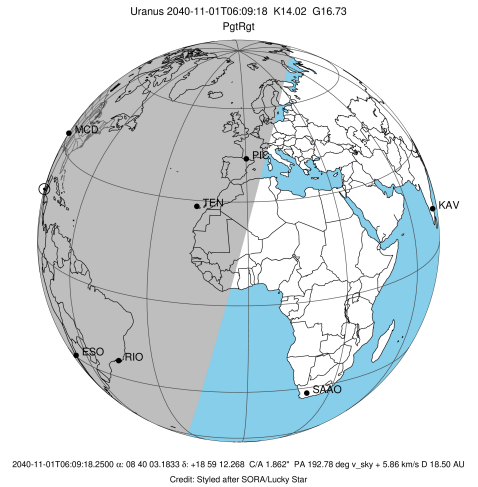


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++			NOV 01 04:51 - NOV 01 05:13	PnnRin
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4			+++++	NOV 01 07:02 - NOV 01 07:17	PnnRne
MCD	McDonald Obs. 2.7m	30.7	256.0			+++++	NOV 01 06:55 - NOV 01 07:17	PnnRne
TEN	Teide Obs./Tenerife	28.3	343.5	+++++			NOV 01 04:44 - NOV 01 05:06	PnnRin
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++	+ +	+++++	NOV 01 04:36 - NOV 01 07:36	PieRie
ESO	European Southern Obs	-29.3	289.3		+	+++++	NOV 01 06:41 - NOV 01 07:30	PneRne
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 : 2040-11-01T06:07:24.830
 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 : 661189947271998848
 2Mass ID (if available) : 08400316+1859131
 ICRS Star Coord at Epoch: 08h 40m 03.18334s +18:59:12.26779s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.023
 G magnitude : 16.734
 RP magnitude : 15.880
 BP magnitude : 17.496
 DUPflag : 0
 Distance (au) : 18.496
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 5.87
 Sun-Target sep (deg) : 91.42
 Sun-Moon sep (deg) : 49.34
 B (ring opening deg) : 39.66
 PA of pole (deg) : 94.26
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.065
 C/A sky separation (km) : 27694.9
 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

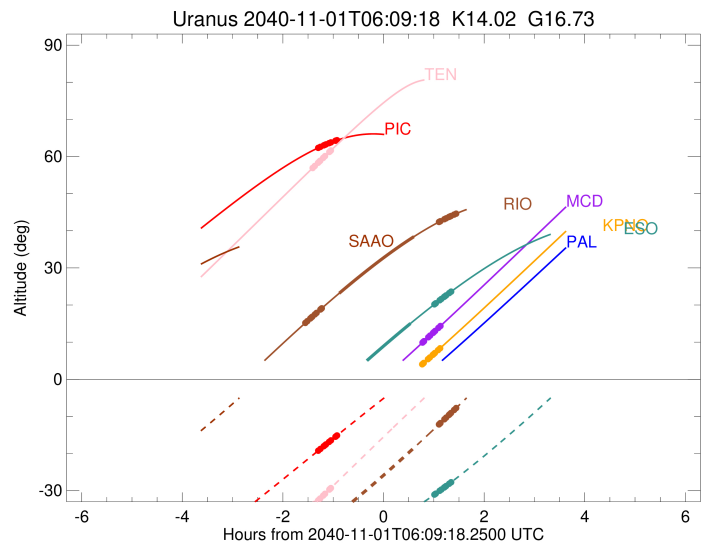
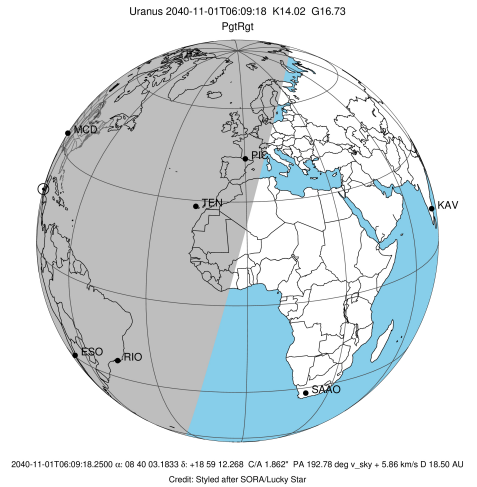


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2040-11-01T04:51:32.242		62.35	-19.23	51139.96	-7.33		
lambda	I	2040-11-01T04:54:05.649		62.62	-18.76	50026.71	-7.22		
delta	I	2040-11-01T04:58:06.754		63.02	-18.02	48300.35	-7.10		
gamma	I	2040-11-01T04:59:42.677		63.17	-17.73	47622.00	-7.05		
eta	I	2040-11-01T05:00:46.123		63.28	-17.54	47176.12	-7.01		
beta	I	2040-11-01T05:04:21.803		63.61	-16.88	45676.18	-6.88		
alpha	I	2040-11-01T05:06:38.963		63.81	-16.46	44736.04	-6.79		
4	I	2040-11-01T05:12:05.258		64.26	-15.47	42570.44	-6.56		
5	I	2040-11-01T05:12:52.246		64.32	-15.33	42293.85	-6.52		
6	I	2040-11-01T05:13:47.000		64.39	-15.16	41860.16	-6.47		

No planet occultations

6	E	2040-11-01T07:14:05.933		61.07	5.95x	41799.08	6.44		
5	E	2040-11-01T07:15:05.277		60.95	6.11x	42173.28	6.50		
4	E	2040-11-01T07:15:57.447		60.85	6.25x	42526.51	6.53		
alpha	E	2040-11-01T07:21:27.103		60.17	7.15x	44686.31	6.75		
beta	E	2040-11-01T07:23:49.861		59.87	7.53x	45670.16	6.85		
eta	E	2040-11-01T07:27:28.214		59.39	8.12x	47176.12	6.97		
gamma	E	2040-11-01T07:28:33.236		59.25	8.30x	47630.61	7.01		
delta	E	2040-11-01T07:30:08.463		59.04	8.55x	48300.35	7.06		
lambda	E	2040-11-01T07:34:10.960		58.49	9.19x	50026.71	7.18		
epsilon	E	2040-11-01T07:37:37.869		58.01	9.74x	51521.66	7.29		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-11-01T05:55:06.590
 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 : 661189947271998848
 2Mass ID (if available) : 08400316+1859131
 ICRS Star Coord at Epoch: 08h 40m 03.18334s +18:59:12.26779s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.023
 G magnitude : 16.734
 RP magnitude : 15.880
 BP magnitude : 17.496
 DUPflag : 0
 Distance (au) : 18.496
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 5.87
 Sun-Target sep (deg) : 91.42
 Sun-Moon sep (deg) : 49.16
 B (ring opening deg) : 39.66
 PA of pole (deg) : 94.26
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.080
 C/A sky separation (km) : 27902.7
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

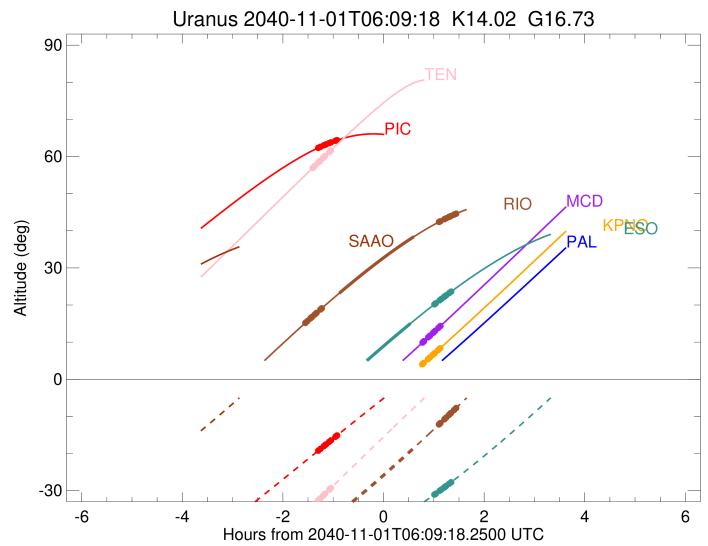
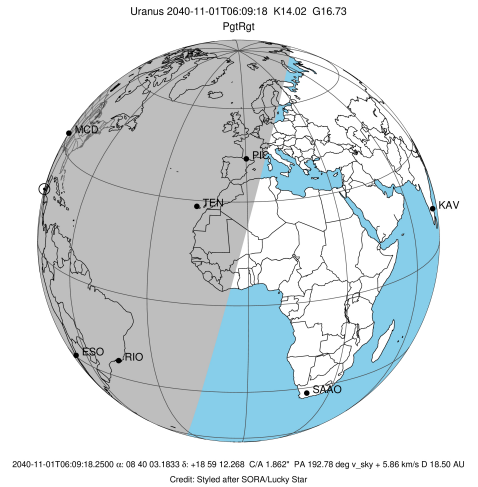


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2040-11-01T04:44:15.617	-20.31x	-52.64	51150.06	-8.05			
lambda	I	2040-11-01T04:46:36.534	-19.92x	-53.12	50026.71	-7.93			
delta	I	2040-11-01T04:50:16.160	-19.31x	-53.85	48300.35	-7.79			
gamma	I	2040-11-01T04:51:43.574	-19.07x	-54.14	47622.08	-7.73			
eta	I	2040-11-01T04:52:41.425	-18.91x	-54.33	47176.12	-7.69			
beta	I	2040-11-01T04:55:58.096	-18.36x	-54.98	45676.52	-7.54			
alpha	I	2040-11-01T04:58:03.490	-18.00x	-55.39	44735.28	-7.43			
4	I	2040-11-01T05:03:01.503	-17.15x	-56.37	42569.23	-7.17			
5	I	2040-11-01T05:03:44.490	-17.03x	-56.51	42292.37	-7.13			
6	I	2040-11-01T05:04:34.650	-16.88x	-56.67	41859.20	-7.07			

No planet occultations

6	E	2040-11-01T06:55:16.810	4.00x	-72.53	41798.71	6.82			
5	E	2040-11-01T06:56:12.551	4.18x	-72.57	42172.26	6.88			
4	E	2040-11-01T06:57:02.034	4.35x	-72.60	42526.67	6.91			
alpha	E	2040-11-01T07:02:13.626	5.39	-72.77	44686.10	7.14			
beta	E	2040-11-01T07:04:28.623	5.85	-72.81	45669.78	7.23			
eta	E	2040-11-01T07:07:55.425	6.54	-72.85	47176.12	7.36			
gamma	E	2040-11-01T07:08:57.044	6.75	-72.86	47630.67	7.39			
delta	E	2040-11-01T07:10:27.303	7.06	-72.86	48300.35	7.44			
lambda	E	2040-11-01T07:14:17.377	7.84	-72.83	50026.71	7.56			
epsilon	E	2040-11-01T07:17:33.446	8.50	-72.77	51517.97	7.67			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-11-01T05:54:25.680
 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 : 661189947271998848
 2Mass ID (if available) : 08400316+1859131
 ICRS Star Coord at Epoch: 08h 40m 03.18334s +18:59:12.26779s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.023
 G magnitude : 16.734
 RP magnitude : 15.880
 BP magnitude : 17.496
 DUPflag : 0
 Distance (au) : 18.496
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 5.87
 Sun-Target sep (deg) : 91.42
 Sun-Moon sep (deg) : 49.25
 B (ring opening deg) : 39.66
 PA of pole (deg) : 94.26
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.052
 C/A sky separation (km) : 27526.6
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



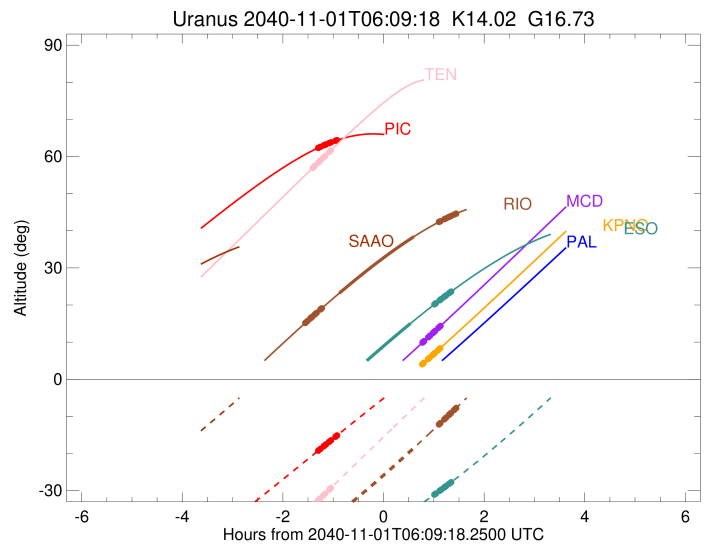
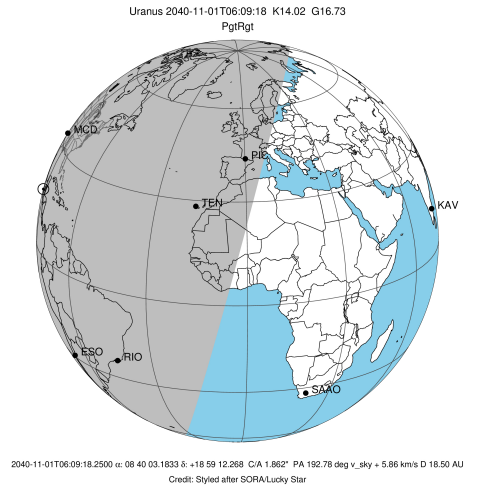
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2040-11-01T04:42:37.045		-16.17x	-58.82	51146.57	-8.05		
lambda	I	2040-11-01T04:44:57.534		-15.75x	-59.28	50026.71	-7.93		
delta	I	2040-11-01T04:48:37.079		-15.09x	-60.00	48300.35	-7.79		
gamma	I	2040-11-01T04:50:04.428		-14.82x	-60.28	47622.05	-7.74		
eta	I	2040-11-01T04:51:02.217		-14.65x	-60.46	47176.12	-7.70		
beta	I	2040-11-01T04:54:18.625		-14.05x	-61.09	45676.39	-7.56		
alpha	I	2040-11-01T04:56:23.681		-13.67x	-61.49	44735.59	-7.45		
4	I	2040-11-01T05:01:20.837		-12.76x	-62.42	42569.76	-7.20		
5	I	2040-11-01T05:02:03.648		-12.63x	-62.56	42293.03	-7.16		
6	I	2040-11-01T05:02:53.561		-12.47x	-62.71	41859.63	-7.10		

No planet occultations

6	E	2040-11-01T06:55:39.389		9.85	-73.72	41798.51	6.83		
5	E	2040-11-01T06:56:34.876		10.04	-73.67	42171.69	6.89		
4	E	2040-11-01T06:57:24.412		10.21	-73.62	42526.77	6.92		
alpha	E	2040-11-01T07:02:35.894		11.29	-73.28	44686.00	7.14		
beta	E	2040-11-01T07:04:50.950		11.76	-73.11	45669.60	7.23		
eta	E	2040-11-01T07:08:18.052		12.48	-72.83	47176.12	7.35		
gamma	E	2040-11-01T07:09:19.786		12.69	-72.73	47630.70	7.38		
delta	E	2040-11-01T07:10:50.230		13.01	-72.60	48300.35	7.43		
lambda	E	2040-11-01T07:14:40.898		13.81	-72.21	50026.71	7.54		
epsilon	E	2040-11-01T07:17:57.405		14.50	-71.86	51516.57	7.64		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-11-01T06:04:03.650
 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 : 661189947271998848
 2Mass ID (if available) : 08400316+1859131
 ICRS Star Coord at Epoch: 08h 40m 03.18334s +18:59:12.26779s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.023
 G magnitude : 16.734
 RP magnitude : 15.880
 BP magnitude : 17.496
 DUPflag : 0
 Distance (au) : 18.496
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 5.87
 Sun-Target sep (deg) : 91.42
 Sun-Moon sep (deg) : 49.50
 B (ring opening deg) : 39.66
 PA of pole (deg) : 94.26
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.931
 C/A sky separation (km) : 25903.1
 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

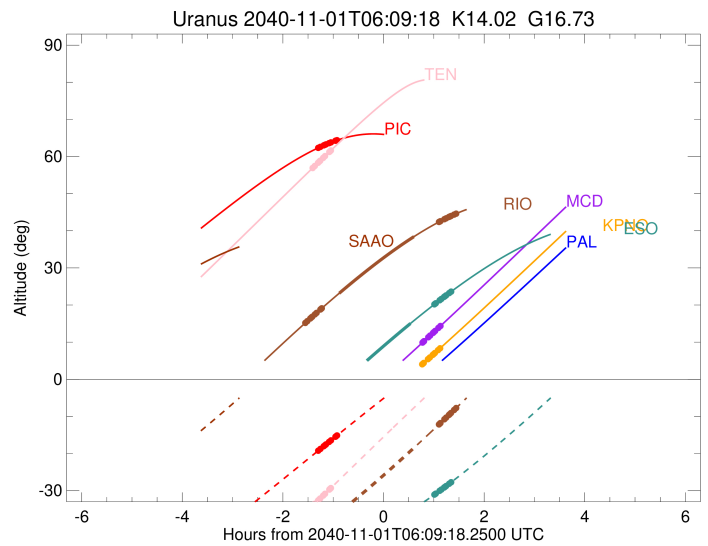
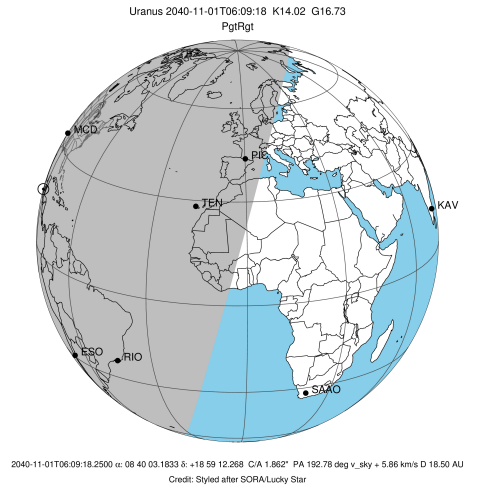


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2040-11-01T04:44:55.254		56.93	-34.08	51124.71	-7.50		
lambda	I	2040-11-01T04:47:22.898		57.47	-33.53	50026.71	-7.41		
delta	I	2040-11-01T04:51:17.706		58.32	-32.67	48300.35	-7.30		
gamma	I	2040-11-01T04:52:50.969		58.66	-32.33	47621.87	-7.25		
eta	I	2040-11-01T04:53:52.567		58.89	-32.10	47176.12	-7.22		
beta	I	2040-11-01T04:57:21.743		59.64	-31.33	45675.56	-7.11		
alpha	I	2040-11-01T04:59:33.964		60.12	-30.85	44737.39	-7.03		
4	I	2040-11-01T05:04:48.317		61.26	-29.69	42572.77	-6.83		
5	I	2040-11-01T05:05:33.334		61.42	-29.53	42296.61	-6.81		
6	I	2040-11-01T05:06:25.675		61.61	-29.34	41862.03	-6.75		

No planet occultations

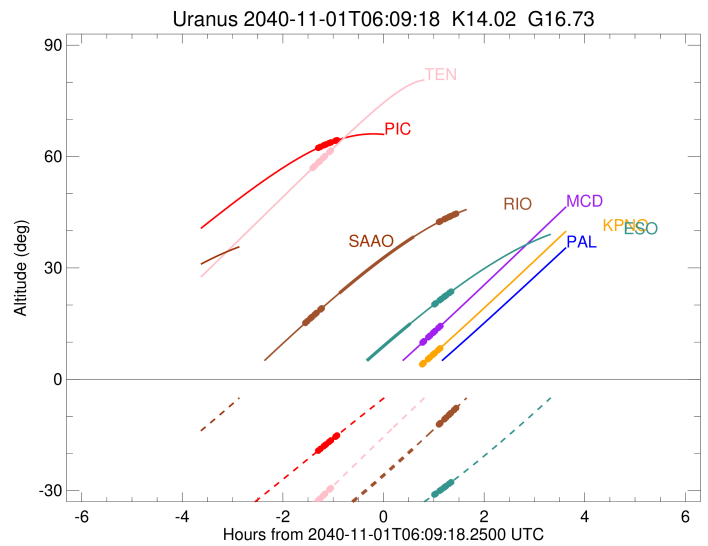
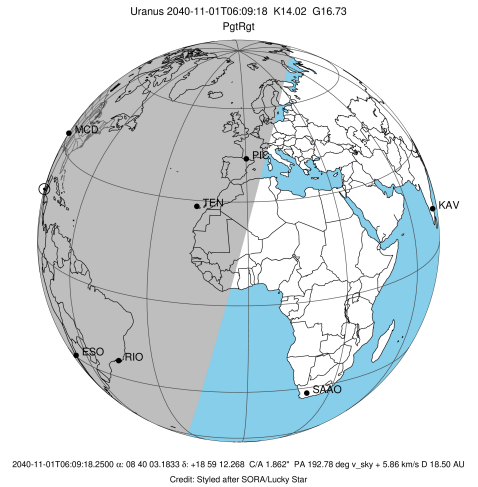
6	E	2040-11-01T07:13:57.706		80.41	-1.62x	41798.05	6.65		
5	E	2040-11-01T07:14:54.413		80.35	-1.42x	42170.43	6.69		
4	E	2040-11-01T07:15:45.701		80.30	-1.24x	42527.00	6.72		
alpha	E	2040-11-01T07:21:07.255		79.87	-0.11x	44685.80	6.90		
beta	E	2040-11-01T07:23:26.969		79.65	0.38x	45669.23	6.98		
eta	E	2040-11-01T07:27:01.691		79.26	1.14x	47176.12	7.08		
gamma	E	2040-11-01T07:28:05.756		79.13	1.36x	47630.75	7.11		
delta	E	2040-11-01T07:29:39.643		78.94	1.69x	48300.35	7.15		
lambda	E	2040-11-01T07:33:39.332		78.42	2.53x	50026.71	7.25		
epsilon	E	2040-11-01T07:37:03.404		77.94	3.24x	51514.30	7.34		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-11-01T06:00:38.990
 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 : 661189947271998848
 2Mass ID (if available) : 08400316+1859131
 ICRS Star Coord at Epoch: 08h 40m 03.18334s +18:59:12.26779s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.023
 G magnitude : 16.734
 RP magnitude : 15.880
 BP magnitude : 17.496
 DUPflag : 0
 Distance (au) : 18.496
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 5.87
 Sun-Target sep (deg) : 91.42
 Sun-Moon sep (deg) : 49.36
 B (ring opening deg) : 39.66
 PA of pole (deg) : 94.26
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.541
 C/A sky separation (km) : 20675.0
 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	2040-11-01T04:36:16.386		15.22	-42.49	51081.55	-8.16		
lambda	I	2040-11-01T04:38:26.500		15.66	-42.16	50026.71	-8.09		
delta	I	2040-11-01T04:42:00.918		16.38	-41.61	48300.35	-8.02		
gamma	I	2040-11-01T04:43:25.767		16.67	-41.39	47621.55	-7.99		
eta	I	2040-11-01T04:44:21.621		16.86	-41.24	47176.12	-7.96		
beta	I	2040-11-01T04:47:30.955		17.49	-40.74	45673.68	-7.89		
alpha	I	2040-11-01T04:49:28.814		17.88	-40.42	44740.89	-7.84		
4	I	2040-11-01T04:54:09.366		18.81	-39.66	42579.08	-7.72		
5	I	2040-11-01T04:54:48.995		18.94	-39.56	42303.26	-7.70		
6	I	2040-11-01T04:55:35.179		19.10	-39.43	41866.73	-7.67		
Uranus	I	2040-11-01T05:16:27.407		23.16	-35.85	25451.39		31.12	32.30
Uranus	E	2040-11-01T06:45:38.387		38.42	-18.47	25502.53		-21.95	-22.88
6	E	2040-11-01T07:15:18.392		42.36	-12.20	41795.93	7.38		
5	E	2040-11-01T07:16:07.204		42.45	-12.02	42163.73	7.41		
4	E	2040-11-01T07:16:55.280		42.55	-11.85	42529.08	7.43		
alpha	E	2040-11-01T07:21:48.496		43.11	-10.80	44684.85	7.52		
beta	E	2040-11-01T07:23:56.629		43.35	-10.34	45666.53	7.57		
eta	E	2040-11-01T07:27:15.730		43.71	-9.63	47176.12	7.62		
gamma	E	2040-11-01T07:28:15.352		43.82	-9.41	47631.09	7.64		
delta	E	2040-11-01T07:29:42.829		43.97	-9.10	48300.35	7.66		
lambda	E	2040-11-01T07:33:27.343		44.36	-8.29	50026.71	7.72		
epsilon	E	2040-11-01T07:36:36.420		44.67	-7.60	51489.53	7.77		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-11-01T05:57:36.590
 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 : 661189947271998848
 2Mass ID (if available) : 08400316+1859131
 ICRS Star Coord at Epoch: 08h 40m 03.18334s +18:59:12.26779s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.023
 G magnitude : 16.734
 RP magnitude : 15.880
 BP magnitude : 17.496
 DUPflag : 0
 Distance (au) : 18.496
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 5.87
 Sun-Target sep (deg) : 91.42
 Sun-Moon sep (deg) : 49.22
 B (ring opening deg) : 39.66
 PA of pole (deg) : 94.26
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.538
 C/A sky separation (km) : 20625.9
 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_itrfr93_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	2040-11-01T04:35:30.084	-10.16x	-46.24	51083.44	-8.44		
lambda	I	2040-11-01T04:37:36.038	-9.72x	-46.21	50026.71	-8.37		
delta	I	2040-11-01T04:41:03.223	-9.00x	-46.15	48300.35	-8.30		
gamma	I	2040-11-01T04:42:25.204	-8.71x	-46.12	47621.56	-8.26		
eta	I	2040-11-01T04:43:19.172	-8.52x	-46.10	47176.12	-8.24		
beta	I	2040-11-01T04:46:22.091	-7.88x	-46.02	45673.76	-8.17		
alpha	I	2040-11-01T04:48:15.993	-7.49x	-45.97	44740.77	-8.11		
4	I	2040-11-01T04:52:47.016	-6.54x	-45.83	42578.88	-7.99		
5	I	2040-11-01T04:53:25.306	-6.41x	-45.80	42303.07	-7.97		
6	I	2040-11-01T04:54:09.915	-6.26x	-45.78	41866.59	-7.94		
Uranus	I	2040-11-01T05:14:33.229	-2.04x	-44.76	25453.03		30.85	32.02
Uranus	E	2040-11-01T06:41:31.943	15.04	-35.44	25499.41		-22.58	-23.54
6	E	2040-11-01T07:09:49.572	20.15	-31.10	41795.83	7.58		
5	E	2040-11-01T07:10:36.974	20.29	-30.97	42163.37	7.61		
4	E	2040-11-01T07:11:23.925	20.43	-30.85	42529.24	7.62		
alpha	E	2040-11-01T07:16:09.719	21.26	-30.07	44684.81	7.72		
beta	E	2040-11-01T07:18:14.641	21.62	-29.72	45666.34	7.76		
eta	E	2040-11-01T07:21:28.884	22.17	-29.18	47176.12	7.81		
gamma	E	2040-11-01T07:22:27.063	22.34	-29.02	47631.12	7.83		
delta	E	2040-11-01T07:23:52.432	22.58	-28.78	48300.35	7.85		
lambda	E	2040-11-01T07:27:31.616	23.20	-28.16	50026.71	7.90		
epsilon	E	2040-11-01T07:30:36.017	23.71	-27.63	51487.37	7.96		