

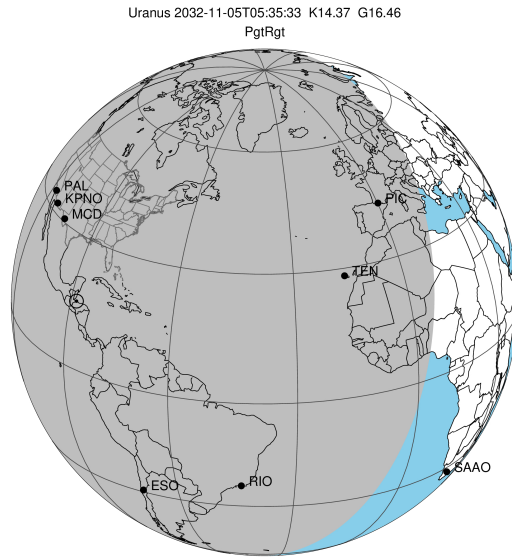
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-11-05T05:35:33.570
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3424683265429811328
 2Mass ID (if available) : 06033822+2338168

Uranus 2032-11-05T05:35:33 K14.37 G16.46 PgtRgt

ICRS Star Coord at Epoch: 06h 03m 38.22591s +23:38:16.79010s

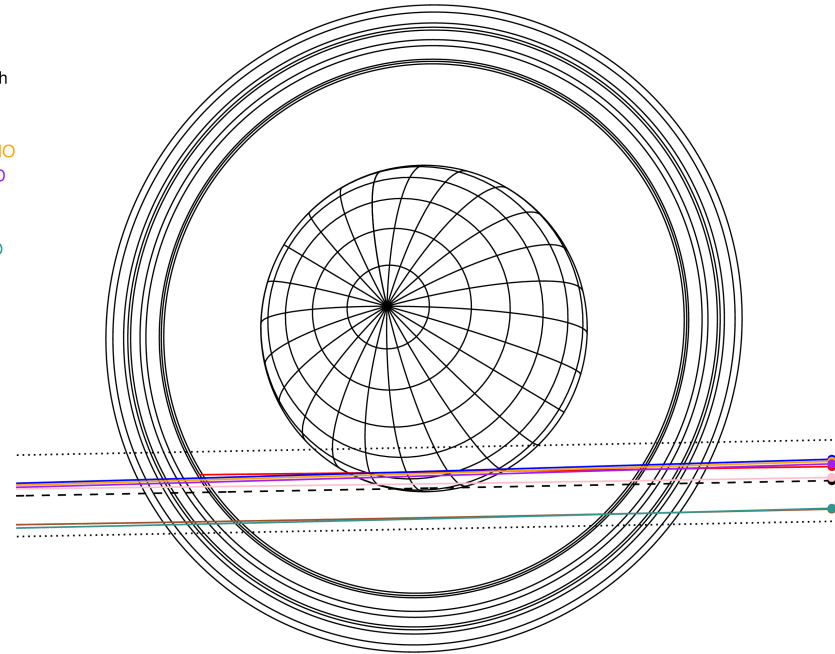
RUWE (>1.4 is poor) : 1.09
 K magnitude : 14.368
 G magnitude : 16.462
 RP magnitude : 15.737
 BP magnitude : 17.024
 DUPflag : 0
 Distance (au) : 18.349
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -13.60
 Sun-Target sep (deg) : 132.07
 Sun-Moon sep (deg) : 155.50
 B (ring opening deg) : 74.65
 PA of pole (deg) : 59.00

#	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



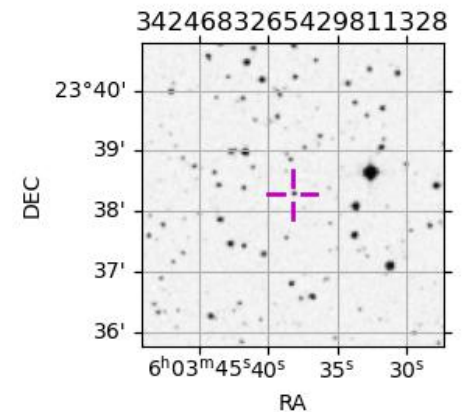
2032-11-05T05:35:33.5700 α: 06 03 38.22591 δ: +23 38 16.790 C/A 1.871" PA 1.07 deg v_sky -13.60 km/s D 18.35 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 RIO
 ESO

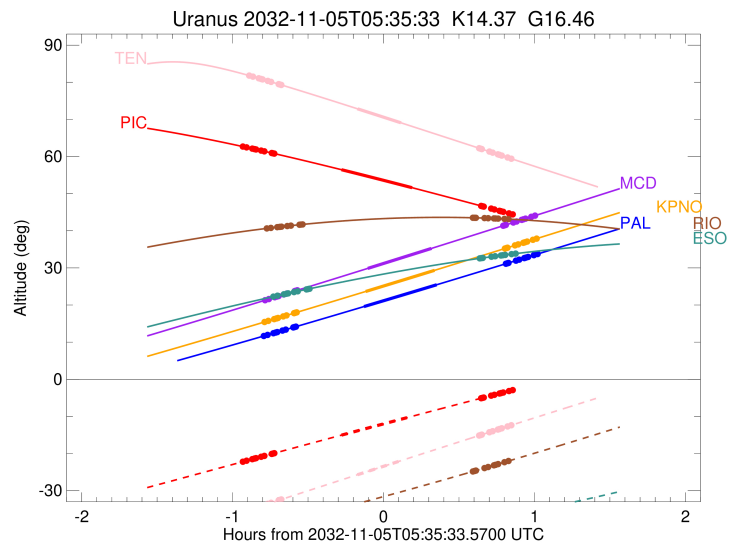
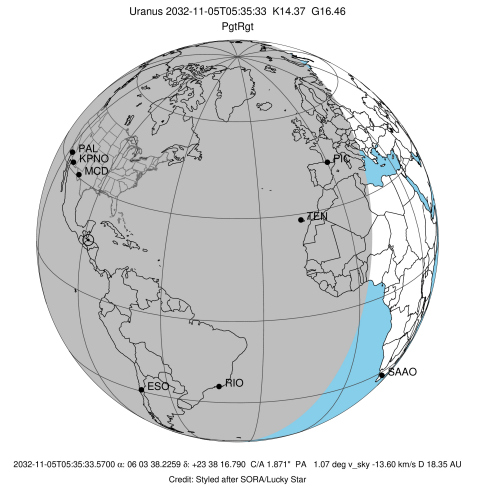


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	++	NOV 05 04:39 - NOV 05 06:14	PieRie
PAL	Palomar Mt (200")	33.4	243.1	+++++	+ +	+++++	NOV 05 04:47 - NOV 05 06:36	PieRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	NOV 05 04:48 - NOV 05 06:35	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	NOV 05 04:48 - NOV 05 06:35	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+ +	+++++	NOV 05 04:41 - NOV 05 06:25	PieRie
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 05 04:49 - NOV 05 06:24	PnnRie
ESO	European Southern Obs	-29.3	289.3	+++++		+++++	NOV 05 04:51 - NOV 05 06:27	PnnRie
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

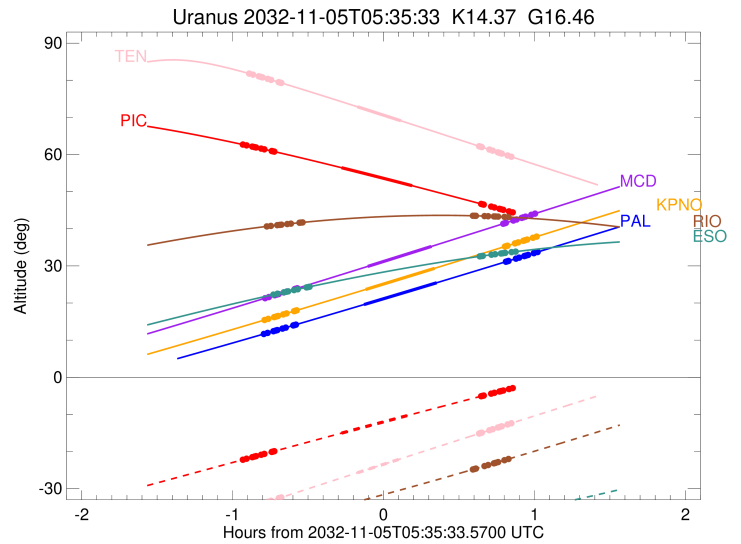
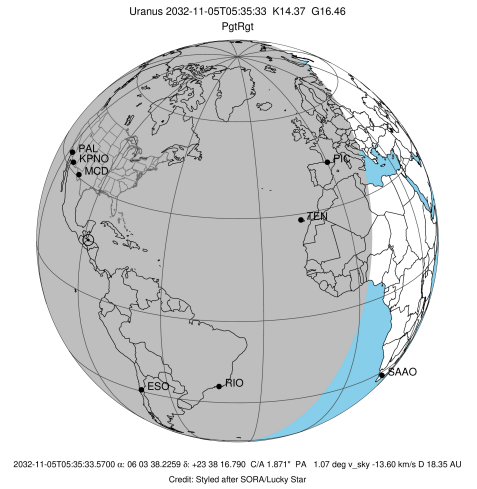


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-11-05T05:32:21.920
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3424683265429811328
 2Mass ID (if available) : 06033822+2338168
 ICRS Star Coord at Epoch: 06h 03m 38.22591s +23:38:16.79010s
 RUWE (>1.4 is poor) : 1.09
 K magnitude : 14.368
 G magnitude : 16.462
 RP magnitude : 15.737
 BP magnitude : 17.024
 DUPflag : 0
 Distance (au) : 18.349
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -13.60
 Sun-Target sep (deg) : 132.07
 Sun-Moon sep (deg) : 156.24
 B (ring opening deg) : 74.65
 PA of pole (deg) : 59.00
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.690
 C/A sky separation (km) : 22493.6
 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



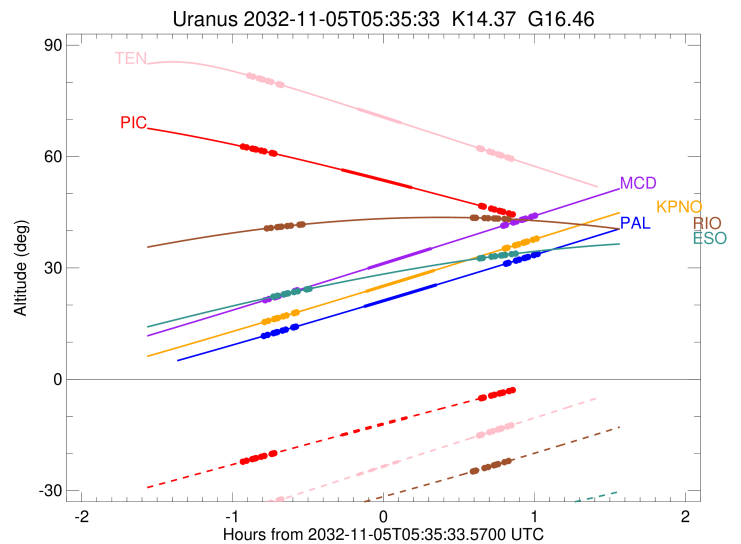
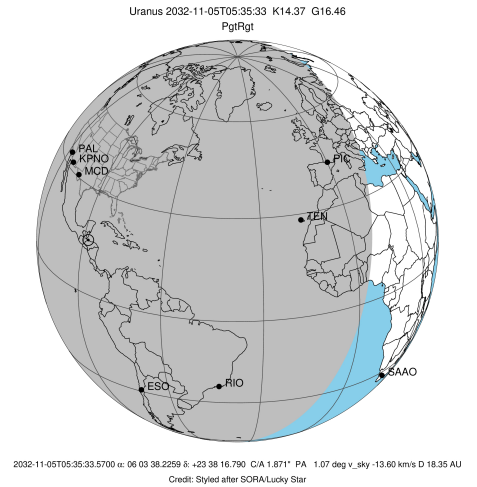
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-11-05T04:39:25.113		62.72	-22.25	51342.97	-12.75		
lambda	I	2032-11-05T04:41:08.354		62.47	-21.94	50026.71	-12.71		
delta	I	2032-11-05T04:43:24.858		62.13	-21.52	48300.35	-12.58		
gamma	I	2032-11-05T04:44:18.225		61.99	-21.36	47630.08	-12.53		
eta	I	2032-11-05T04:44:54.496		61.90	-21.25	47176.12	-12.50		
beta	I	2032-11-05T04:46:55.040		61.60	-20.88	45676.99	-12.37		
alpha	I	2032-11-05T04:48:10.234		61.41	-20.65	44748.29	-12.29		
4	I	2032-11-05T04:51:11.454		60.94	-20.10	42547.45	-12.06		
5	I	2032-11-05T04:51:30.280		60.89	-20.04	42308.07	-12.03		
6	I	2032-11-05T04:52:09.981		60.79	-19.92	41840.00	-11.96		
Uranus	I	2032-11-05T05:18:49.232		56.46	-15.05	25161.05		-13.02	-13.62
Uranus	E	2032-11-05T05:46:57.023		51.60	-9.97	25557.09		-0.89	-0.93
6	E	2032-11-05T06:14:18.820		46.71	-5.12	41797.46	11.92		
5	E	2032-11-05T06:14:55.245		46.60	-5.01	42233.76	11.99		
4	E	2032-11-05T06:15:26.545		46.50	-4.92x	42616.33	12.02		
alpha	E	2032-11-05T06:18:20.029		45.98	-4.41x	44718.15	12.24		
beta	E	2032-11-05T06:19:37.146		45.75	-4.19x	45663.71	12.32		
eta	E	2032-11-05T06:21:39.232		45.38	-3.84x	47176.12	12.45		
gamma	E	2032-11-05T06:22:15.430		45.27	-3.73x	47627.27	12.48		
delta	E	2032-11-05T06:23:09.250		45.10	-3.57x	48300.35	12.53		
lambda	E	2032-11-05T06:25:26.355		44.69	-3.18x	50026.71	12.65		
epsilon	E	2032-11-05T06:26:23.260		44.52	-3.01x	50747.86	12.69		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-11-05T05:41:43.090
 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 : 3424683265429811328
 2Mass ID (if available) : 06033822+2338168
 ICRS Star Coord at Epoch: 06h 03m 38.22591s +23:38:16.79010s
 RUWE (>1.4 is poor) : 1.09
 K magnitude : 14.368
 G magnitude : 16.462
 RP magnitude : 15.737
 BP magnitude : 17.024
 DUPflag : 0
 Distance (au) : 18.349
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -13.60
 Sun-Target sep (deg) : 132.07
 Sun-Moon sep (deg) : 154.99
 B (ring opening deg) : 74.65
 PA of pole (deg) : 59.00
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.682
 C/A sky separation (km) : 22388.3
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



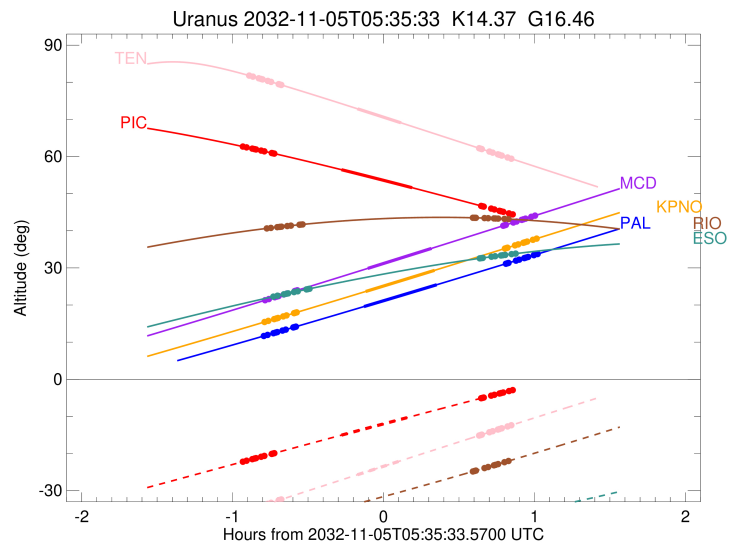
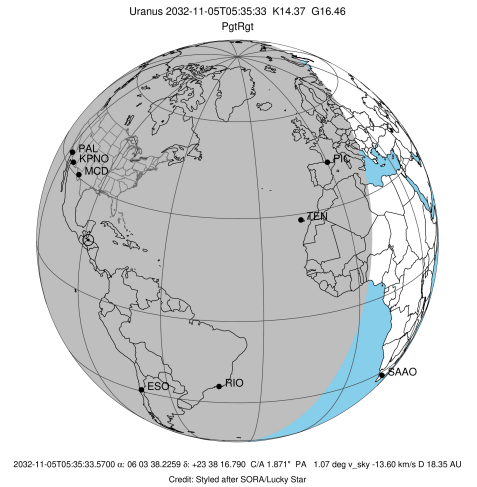
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-11-05T04:47:44.266	11.61	-49.35	51349.53	-12.47			
lambda	I	2032-11-05T04:49:30.307	11.96	-49.71	50026.71	-12.43			
delta	I	2032-11-05T04:51:49.762	12.41	-50.17	48300.35	-12.32			
gamma	I	2032-11-05T04:52:44.270	12.59	-50.36	47630.01	-12.27			
eta	I	2032-11-05T04:53:21.300	12.71	-50.48	47176.12	-12.24			
beta	I	2032-11-05T04:55:24.370	13.12	-50.89	45676.75	-12.12			
alpha	I	2032-11-05T04:56:41.112	13.37	-51.15	44747.98	-12.04			
4	I	2032-11-05T04:59:45.979	13.98	-51.76	42546.72	-11.83			
5	I	2032-11-05T05:00:05.146	14.04	-51.83	42307.42	-11.80			
6	I	2032-11-05T05:00:45.482	14.18	-51.96	41840.81	-11.73			
Uranus	I	2032-11-05T05:27:45.477	19.58	-57.24	25148.98	-13.23		-13.83	
Uranus	E	2032-11-05T05:56:42.441	25.46	-62.55	25556.46	-1.02		-1.07	
6	E	2032-11-05T06:24:09.291	31.11	-67.02	41797.25	11.87			
5	E	2032-11-05T06:24:45.971	31.24	-67.11	42234.92	11.94			
4	E	2032-11-05T06:25:17.309	31.35	-67.18	42616.25	11.97			
alpha	E	2032-11-05T06:28:11.466	31.95	-67.60	44718.65	12.20			
beta	E	2032-11-05T06:29:28.827	32.21	-67.79	45664.01	12.28			
eta	E	2032-11-05T06:31:31.276	32.64	-68.07	47176.12	12.41			
gamma	E	2032-11-05T06:32:07.589	32.76	-68.16	47627.35	12.45			
delta	E	2032-11-05T06:33:01.557	32.95	-68.28	48300.35	12.50			
lambda	E	2032-11-05T06:35:19.024	33.43	-68.59	50026.71	12.62			
epsilon	E	2032-11-05T06:36:15.998	33.62	-68.71	50747.01	12.66			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-11-05T05:41:39.330
 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 : 3424683265429811328
 2Mass ID (if available) : 06033822+2338168
 ICRS Star Coord at Epoch: 06h 03m 38.22591s +23:38:16.79010s
 RUWE (>1.4 is poor) : 1.09
 K magnitude : 14.368
 G magnitude : 16.462
 RP magnitude : 15.737
 BP magnitude : 17.024
 DUPflag : 0
 Distance (au) : 18.349
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -13.60
 Sun-Target sep (deg) : 132.07
 Sun-Moon sep (deg) : 155.02
 B (ring opening deg) : 74.65
 PA of pole (deg) : 59.00
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.706
 C/A sky separation (km) : 22705.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



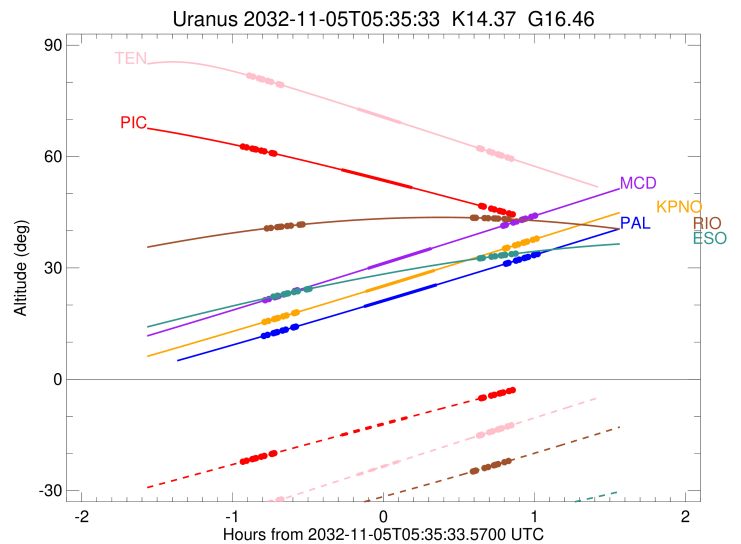
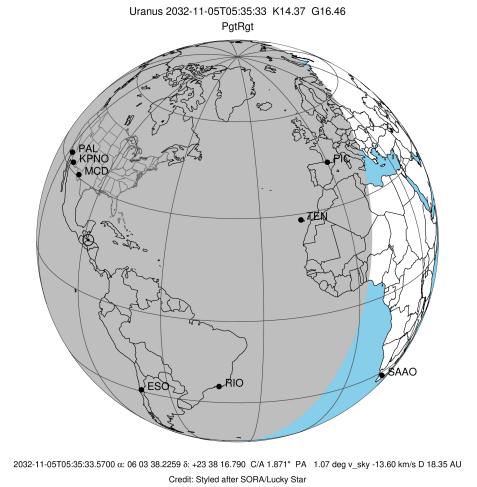
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-11-05T04:48:01.228		15.38	-54.06	51347.02	-12.46		
lambda	I	2032-11-05T04:49:47.168		15.74	-54.41	50026.71	-12.42		
delta	I	2032-11-05T04:52:06.792		16.21	-54.88	48300.35	-12.30		
gamma	I	2032-11-05T04:53:01.376		16.39	-55.07	47630.04	-12.26		
eta	I	2032-11-05T04:53:38.468		16.52	-55.19	47176.12	-12.22		
beta	I	2032-11-05T04:55:41.755		16.93	-55.60	45676.86	-12.10		
alpha	I	2032-11-05T04:56:58.656		17.19	-55.86	44748.12	-12.02		
4	I	2032-11-05T05:00:03.990		17.82	-56.47	42547.07	-11.80		
5	I	2032-11-05T05:00:23.227		17.89	-56.54	42307.73	-11.76		
6	I	2032-11-05T05:01:03.757		18.02	-56.67	41840.42	-11.70		
Uranus	I	2032-11-05T05:28:28.553		23.65	-61.96	25162.02		-13.00	-13.60
Uranus	E	2032-11-05T05:55:52.759		29.35	-66.81	25554.09		-1.42	-1.49
6	E	2032-11-05T06:23:45.105		35.20	-70.91	41797.13	11.83		
5	E	2032-11-05T06:24:21.979		35.33	-70.99	42235.62	11.90		
4	E	2032-11-05T06:24:53.370		35.44	-71.05	42616.21	11.93		
alpha	E	2032-11-05T06:27:48.045		36.06	-71.40	44718.92	12.17		
beta	E	2032-11-05T06:29:05.579		36.33	-71.55	45664.16	12.25		
eta	E	2032-11-05T06:31:08.268		36.76	-71.78	47176.12	12.39		
gamma	E	2032-11-05T06:31:44.649		36.89	-71.85	47627.38	12.42		
delta	E	2032-11-05T06:32:38.706		37.08	-71.95	48300.35	12.48		
lambda	E	2032-11-05T06:34:56.372		37.57	-72.19	50026.71	12.60		
epsilon	E	2032-11-05T06:35:53.388		37.77	-72.28	50746.66	12.65		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-11-05T05:41:25.370
 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 : 3424683265429811328
 2Mass ID (if available) : 06033822+2338168
 ICRS Star Coord at Epoch: 06h 03m 38.22591s +23:38:16.79010s
 RUWE (>1.4 is poor) : 1.09
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 RP magnitude : 15.737
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 Distance (au) : 18.349
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 g0 (km) : 0.000
 skyplane vel. (km/s) : -13.60
 Sun-Target sep (deg) : 132.07
 Sun-Moon sep (deg) : 155.07
 B (ring opening deg) : 74.65
 PA of pole (deg) : 59.00
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.735
 C/A sky separation (km) : 23091.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



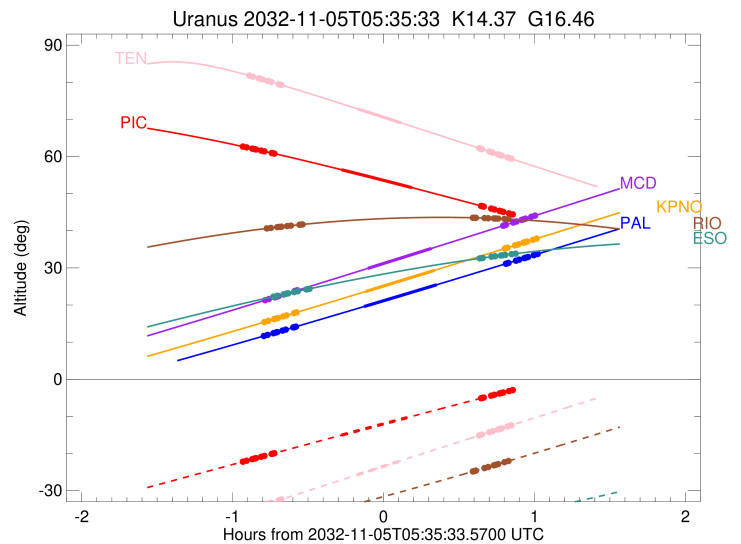
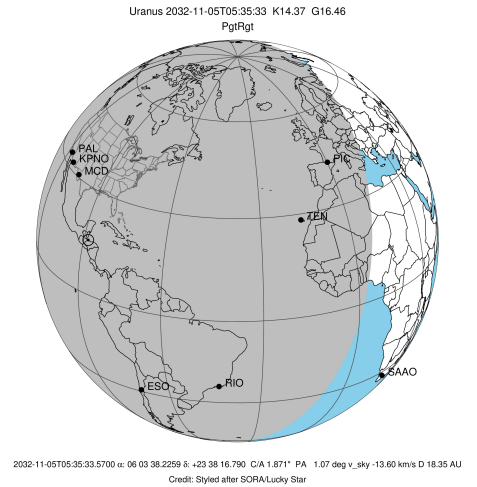
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-11-05T04:48:14.312		21.24	-60.62	51343.85	-12.45		
lambda	I	2032-11-05T04:50:00.064		21.61	-60.97	50026.71	-12.41		
delta	I	2032-11-05T04:52:19.826		22.10	-61.43	48300.35	-12.29		
gamma	I	2032-11-05T04:53:14.479		22.29	-61.60	47630.08	-12.24		
eta	I	2032-11-05T04:53:51.628		22.41	-61.72	47176.12	-12.20		
beta	I	2032-11-05T04:55:55.123		22.84	-62.12	45676.99	-12.07		
alpha	I	2032-11-05T04:57:12.184		23.11	-62.37	44748.29	-11.99		
4	I	2032-11-05T05:00:18.013		23.76	-62.97	42547.50	-11.76		
5	I	2032-11-05T05:00:37.330		23.83	-63.03	42308.12	-11.72		
6	I	2032-11-05T05:01:18.083		23.97	-63.16	41839.92	-11.65		
Uranus	I	2032-11-05T05:29:15.902		29.86	-68.23	25179.60		-12.70	-13.28
Uranus	E	2032-11-05T05:54:38.580		35.25	-72.09	25549.92		-1.93	-2.02
6	E	2032-11-05T06:23:05.057		41.35	-74.87	41796.98	11.78		
5	E	2032-11-05T06:23:42.162		41.48	-74.91	42236.45	11.85		
4	E	2032-11-05T06:24:13.614		41.59	-74.93	42616.15	11.89		
alpha	E	2032-11-05T06:27:08.898		42.22	-75.08	44719.25	12.13		
beta	E	2032-11-05T06:28:26.633		42.50	-75.13	45664.35	12.22		
eta	E	2032-11-05T06:30:29.595		42.94	-75.21	47176.12	12.36		
gamma	E	2032-11-05T06:31:06.054		43.07	-75.22	47627.43	12.40		
delta	E	2032-11-05T06:32:00.209		43.26	-75.25	48300.35	12.45		
lambda	E	2032-11-05T06:34:18.095		43.76	-75.30	50026.71	12.59		
epsilon	E	2032-11-05T06:35:15.156		43.96	-75.32	50746.28	12.63		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-11-05T05:33:18.780
 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 : 3424683265429811328
 2Mass ID (if available) : 06033822+2338168
 ICRS Star Coord at Epoch: 06h 03m 38.22591s +23:38:16.79010s
 RUWE (>1.4 is poor) : 1.09
 K magnitude : 14.368
 G magnitude : 16.462
 RP magnitude : 15.737
 BP magnitude : 17.024
 DUPflag : 0
 Distance (au) : 18.349
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -13.60
 Sun-Target sep (deg) : 132.07
 Sun-Moon sep (deg) : 156.15
 B (ring opening deg) : 74.65
 PA of pole (deg) : 59.00
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.828
 C/A sky separation (km) : 24330.2
 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	2032-11-05T04:41:57.209	81.85	-35.24	51328.86	-12.55		
lambda	I	2032-11-05T04:43:40.923	81.52	-34.86	50026.71	-12.50		
delta	I	2032-11-05T04:45:59.775	81.07	-34.35	48300.35	-12.36		
gamma	I	2032-11-05T04:46:54.131	80.90	-34.15	47630.24	-12.30		
eta	I	2032-11-05T04:47:31.124	80.78	-34.01	47176.12	-12.25		
beta	I	2032-11-05T04:49:34.166	80.37	-33.56	45677.54	-12.10		
alpha	I	2032-11-05T04:50:51.069	80.11	-33.28	44749.02	-12.00		
4	I	2032-11-05T04:53:56.924	79.49	-32.60	42549.43	-11.73		
5	I	2032-11-05T04:54:16.382	79.42	-32.53	42309.67	-11.69		
6	I	2032-11-05T04:54:57.624	79.28	-32.37	41837.79	-11.60		
Uranus	I	2032-11-05T05:25:13.112	72.86	-25.72	25259.62		-11.24	-11.75
Uranus	E	2032-11-05T05:42:31.102	69.08	-21.93	25525.32		-3.72	-3.89
6	E	2032-11-05T06:13:30.774	62.25	-15.17	41796.70	11.58		
5	E	2032-11-05T06:14:08.664	62.12	-15.03	42238.12	11.67		
4	E	2032-11-05T06:14:40.494	62.00	-14.92	42616.01	11.70		
alpha	E	2032-11-05T06:17:38.355	61.34	-14.28	44719.86	11.97		
beta	E	2032-11-05T06:18:57.048	61.05	-13.99	45664.68	12.08		
eta	E	2032-11-05T06:21:01.393	60.60	-13.54	47176.12	12.23		
gamma	E	2032-11-05T06:21:38.247	60.46	-13.41	47627.51	12.27		
delta	E	2032-11-05T06:22:32.949	60.26	-13.21	48300.35	12.33		
lambda	E	2032-11-05T06:24:52.128	59.74	-12.71	50026.71	12.47		
epsilon	E	2032-11-05T06:25:49.637	59.53	-12.51	50745.71	12.52		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-11-05T05:36:07.010
 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 : 3424683265429811328
 2Mass ID (if available) : 06033822+2338168
 ICRS Star Coord at Epoch: 06h 03m 38.22591s +23:38:16.79010s
 RUWE (>1.4 is poor) : 1.09
 K magnitude : 14.368
 G magnitude : 16.462
 RP magnitude : 15.737
 BP magnitude : 17.024
 DUPflag : 0
 Distance (au) : 18.349
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -13.60
 Sun-Target sep (deg) : 132.07
 Sun-Moon sep (deg) : 155.60
 B (ring opening deg) : 74.65
 PA of pole (deg) : 59.00
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.227
 C/A sky separation (km) : 29631.3
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



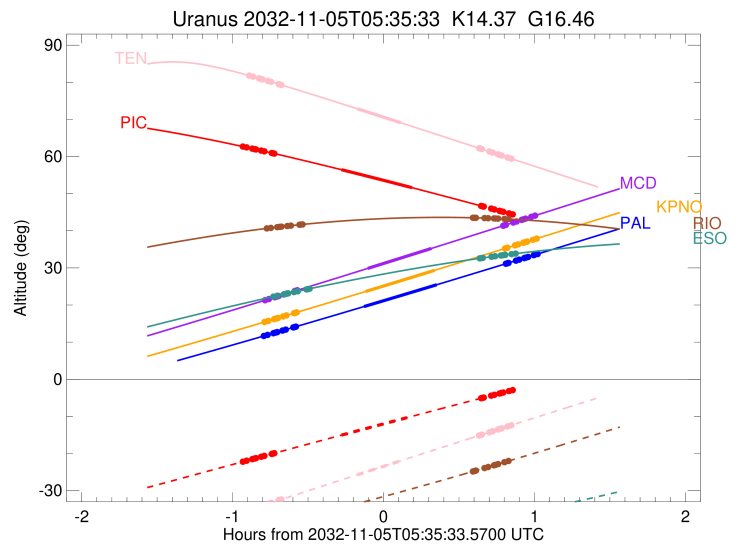
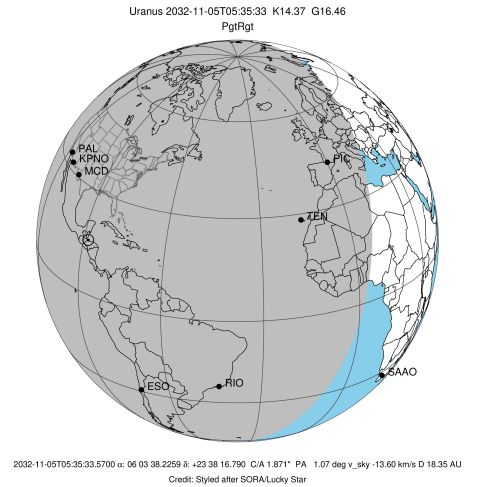
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-11-05T04:49:00.188	40.62	-39.59	51284.22	-11.59		
lambda	I	2032-11-05T04:50:48.763	40.77	-39.31	50026.71	-11.50		
delta	I	2032-11-05T04:53:20.346	40.98	-38.90	48300.35	-11.27		
gamma	I	2032-11-05T04:54:20.032	41.05	-38.74	47630.67	-11.17		
eta	I	2032-11-05T04:55:00.855	41.11	-38.63	47176.12	-11.10		
beta	I	2032-11-05T04:57:17.260	41.28	-38.27	45679.01	-10.85		
alpha	I	2032-11-05T04:58:43.272	41.38	-38.03	44750.86	-10.68		
4	I	2032-11-05T05:02:13.719	41.63	-37.45	42556.02	-10.22		
5	I	2032-11-05T05:02:36.587	41.66	-37.39	42313.43	-10.15		
6	I	2032-11-05T05:03:25.323	41.71	-37.25	41830.80	-10.02		

No planet occultations

6	E	2032-11-05T06:10:59.621	43.51	-24.86	41795.10	10.04		
5	E	2032-11-05T06:11:44.723	43.50	-24.71	42251.77	10.18		
4	E	2032-11-05T06:12:19.915	43.49	-24.59	42614.17	10.24		
alpha	E	2032-11-05T06:15:41.481	43.42	-23.93	44725.13	10.71		
beta	E	2032-11-05T06:17:08.940	43.39	-23.64	45667.63	10.88		
eta	E	2032-11-05T06:19:25.993	43.33	-23.18	47176.12	11.13		
gamma	E	2032-11-05T06:20:06.485	43.31	-23.05	47628.23	11.20		
delta	E	2032-11-05T06:21:06.221	43.28	-22.85	48300.35	11.30		
lambda	E	2032-11-05T06:23:37.361	43.20	-22.35	50026.71	11.54		
epsilon	E	2032-11-05T06:24:39.250	43.17	-22.14	50743.64	11.63		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-11-05T05:38:52.750
 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 : 3424683265429811328
 2Mass ID (if available) : 06033822+2338168
 ICRS Star Coord at Epoch: 06h 03m 38.22591s +23:38:16.79010s
 RUWE (>1.4 is poor) : 1.09
 K magnitude : 14.368
 G magnitude : 16.462
 RP magnitude : 15.737
 BP magnitude : 17.024
 DUPflag : 0
 Distance (au) : 18.349
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -13.60
 Sun-Target sep (deg) : 132.07
 Sun-Moon sep (deg) : 155.19
 B (ring opening deg) : 74.65
 PA of pole (deg) : 59.00
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.240
 C/A sky separation (km) : 29806.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-11-05T04:51:35.807		22.23	-44.66	51284.40	-11.46		
lambda	I	2032-11-05T04:53:25.654		22.51	-44.60	50026.71	-11.37		
delta	I	2032-11-05T04:55:59.024		22.89	-44.51	48300.35	-11.14		
gamma	I	2032-11-05T04:56:59.426		23.04	-44.47	47630.67	-11.04		
eta	I	2032-11-05T04:57:40.743		23.15	-44.44	47176.12	-10.97		
beta	I	2032-11-05T04:59:58.832		23.48	-44.34	45679.02	-10.72		
alpha	I	2032-11-05T05:01:25.934		23.70	-44.28	44750.87	-10.54		
4	I	2032-11-05T05:04:59.161		24.21	-44.11	42556.07	-10.08		
5	I	2032-11-05T05:05:22.349		24.27	-44.09	42313.45	-10.02		
6	I	2032-11-05T05:06:11.773		24.39	-44.05	41830.74	-9.88		

No planet occultations

6	E	2032-11-05T06:13:43.184		32.56	-38.13	41795.04	9.94		
5	E	2032-11-05T06:14:28.845		32.64	-38.04	42252.65	10.08		
4	E	2032-11-05T06:15:04.300		32.69	-37.96	42614.01	10.14		
alpha	E	2032-11-05T06:18:27.767		33.01	-37.55	44725.48	10.61		
beta	E	2032-11-05T06:19:55.945		33.14	-37.36	45667.83	10.79		
eta	E	2032-11-05T06:22:14.058		33.35	-37.07	47176.12	11.05		
gamma	E	2032-11-05T06:22:54.857		33.41	-36.98	47628.28	11.12		
delta	E	2032-11-05T06:23:55.022		33.49	-36.85	48300.35	11.22		
lambda	E	2032-11-05T06:26:27.200		33.71	-36.52	50026.71	11.46		
epsilon	E	2032-11-05T06:27:29.501		33.80	-36.39	50743.76	11.56		