

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-09-22T08:09:32.240
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3379729835608552576
 2Mass ID (if available) : 06425305+2322163

ICRS Star Coord at Epoch: 06h 42m 53.05619s +23:22:15.90294s

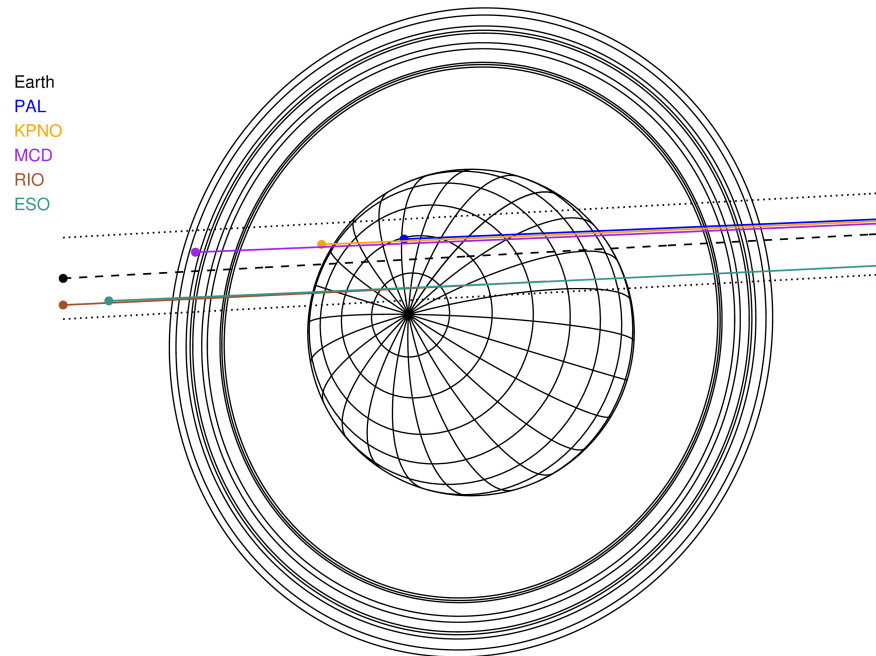
RUWE (>1.4 is poor) : 0.92
 K magnitude : 14.180
 G magnitude : 17.328
 RP magnitude : 16.348
 BP magnitude : 18.277
 DUPflag : 0
 Distance (au) : 19.070
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 12.04
 Sun-Target sep (deg) : 79.10
 Sun-Moon sep (deg) : 171.56
 B (ring opening deg) : 66.47
 PA of pole (deg) : 73.85

#	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



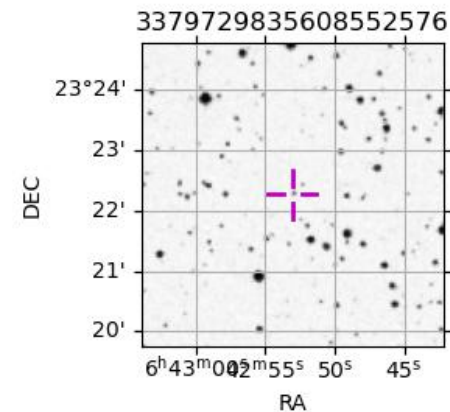
2034-09-22T08:09:32.2400 ex: 06 42 53.0562 s: +23 22 15.903 C/A 0.866° PA 183.11 deg v_sky +12.04 km/s D 19.07 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2034-09-22T08:09:32 K14.18 G17.33 PgtRgt

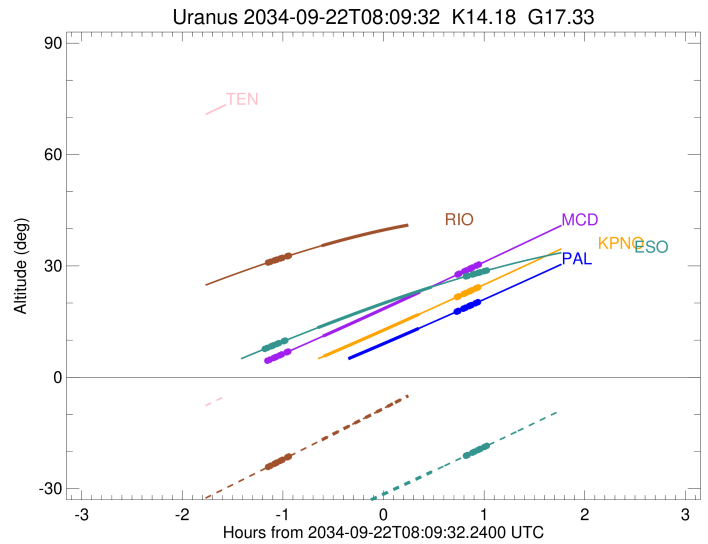
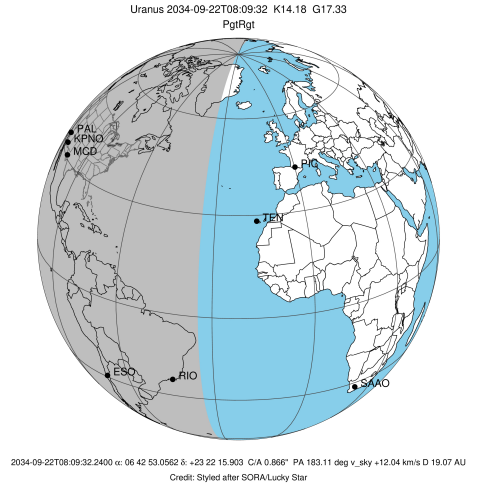


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1		+	+++++	SEP 22 08:30 - SEP 22 09:05	PneRne
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4		+	+++++	SEP 22 07:34 - SEP 22 09:05	PieRne
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+	+++++	SEP 22 07:04 - SEP 22 09:06	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
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	+++++	+		SEP 22 07:00 - SEP 22 07:32	PinRin
ESO	European Southern Obs	-29.3	289.3	+++++	+	+++++	SEP 22 06:58 - SEP 22 09:10	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

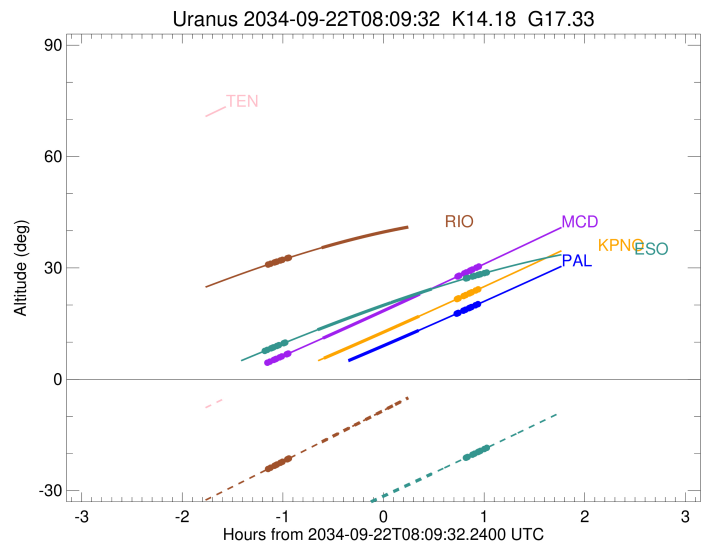
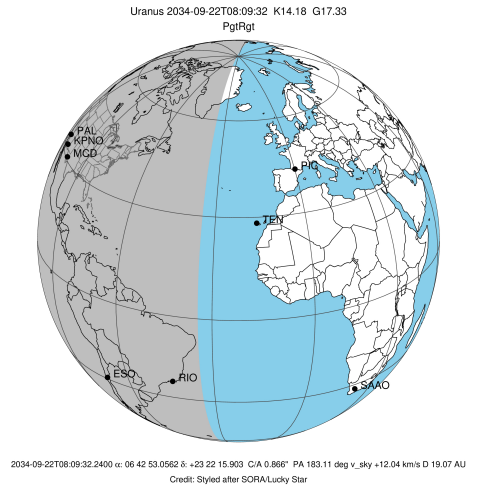


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-09-22T08:02:12.120
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3379729835608552576
 2Mass ID (if available) : 06425305+2322163
 ICRS Star Coord at Epoch: 06h 42m 53.05619s +23:22:15.90294s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 14.180
 G magnitude : 17.328
 RP magnitude : 16.348
 BP magnitude : 18.277
 DUPflag : 0
 Distance (au) : 19.070
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 12.04
 Sun-Target sep (deg) : 79.10
 Sun-Moon sep (deg) : 172.46
 B (ring opening deg) : 66.47
 PA of pole (deg) : 73.85
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.089
 C/A sky separation (km) : 15059.3
 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



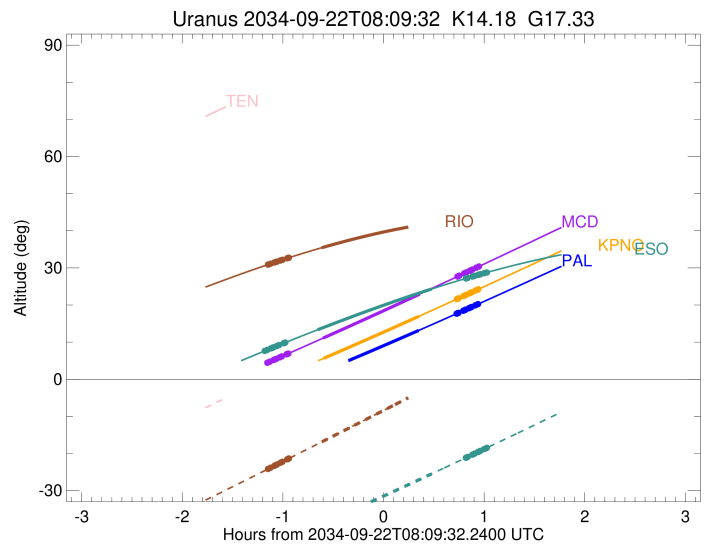
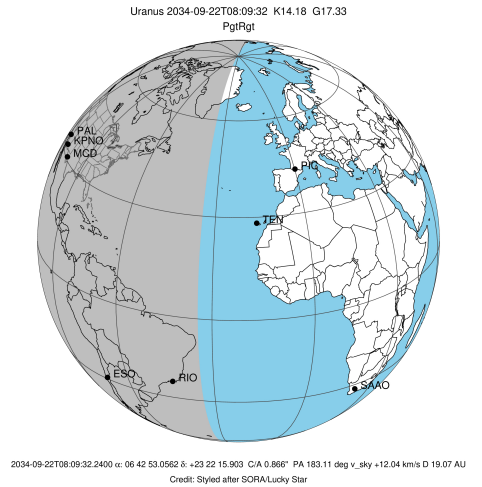
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-09-22T07:01:13.870	-3.77x	-55.33	51147.92	-12.56			
lambda	I	2034-09-22T07:02:43.002	-3.51x	-55.43	50026.71	-12.56			
delta	I	2034-09-22T07:05:00.687	-3.09x	-55.56	48300.35	-12.51			
gamma	I	2034-09-22T07:05:54.753	-2.93x	-55.61	47624.43	-12.49			
eta	I	2034-09-22T07:06:30.666	-2.82x	-55.64	47176.12	-12.48			
beta	I	2034-09-22T07:08:32.349	-2.45x	-55.75	45662.12	-12.42			
alpha	I	2034-09-22T07:09:51.087	-2.22x	-55.82	44687.14	-12.39			
4	I	2034-09-22T07:12:39.400	-1.70x	-55.95	42609.80	-12.30			
5	I	2034-09-22T07:13:14.762	-1.60x	-55.98	42154.83	-12.27			
6	I	2034-09-22T07:13:37.129	-1.53x	-55.99	41879.30	-12.26			
Uranus	I	2034-09-22T07:34:31.412	2.35x	-56.55	25114.59			22.27	23.22
Uranus	E	2034-09-22T08:30:29.427	13.15	-54.56	25393.27			-13.27	-13.87
6	E	2034-09-22T08:53:07.197	17.66	-52.45	41810.25	12.06			
5	E	2034-09-22T08:53:47.375	17.80	-52.38	42294.01	12.07			
4	E	2034-09-22T08:54:05.316	17.86	-52.35	42526.61	12.09			
alpha	E	2034-09-22T08:57:08.908	18.47	-52.01	44750.90	12.17			
beta	E	2034-09-22T08:58:22.861	18.72	-51.87	45647.82	12.20			
eta	E	2034-09-22T09:00:27.904	19.14	-51.63	47176.12	12.24			
gamma	E	2034-09-22T09:01:05.019	19.27	-51.56	47630.73	12.26			
delta	E	2034-09-22T09:01:59.621	19.45	-51.45	48300.35	12.27			
lambda	E	2034-09-22T09:04:20.054	19.92	-51.18	50026.71	12.31			
epsilon	E	2034-09-22T09:05:32.208	20.17	-51.03	50915.86	12.31			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-09-22T08:02:03.930
 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 : 3379729835608552576
 2Mass ID (if available) : 06425305+2322163
 ICRS Star Coord at Epoch: 06h 42m 53.05619s +23:22:15.90294s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 14.180
 G magnitude : 17.328
 RP magnitude : 16.348
 BP magnitude : 18.277
 DUPflag : 0
 Distance (au) : 19.070
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 12.04
 Sun-Target sep (deg) : 79.10
 Sun-Moon sep (deg) : 172.45
 B (ring opening deg) : 66.47
 PA of pole (deg) : 73.85
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.066
 C/A sky separation (km) : 14742.2
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



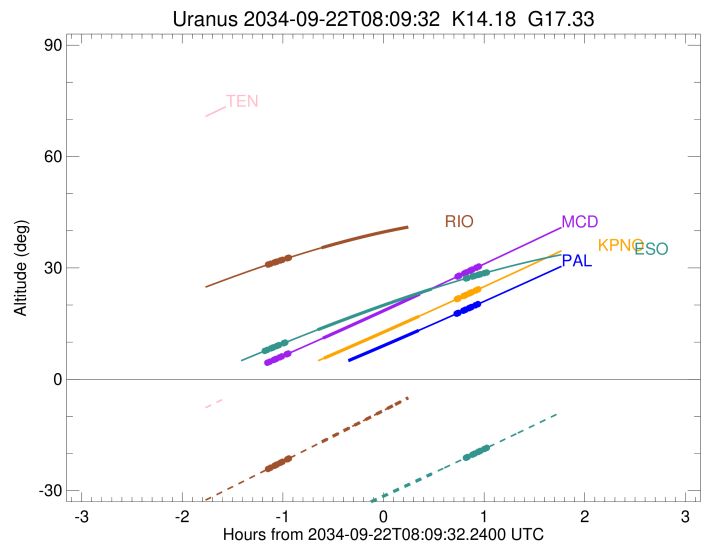
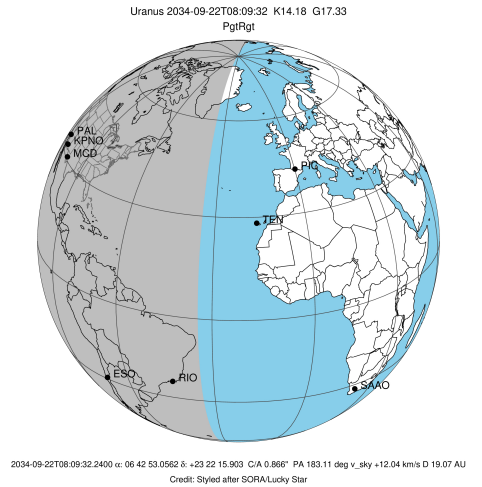
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-09-22T07:00:46.720	-0.69x	-57.67	51150.48	-12.56			
lambda	I	2034-09-22T07:02:16.096	-0.41x	-57.71	50026.71	-12.56			
delta	I	2034-09-22T07:04:33.828	0.03x	-57.77	48300.35	-12.51			
gamma	I	2034-09-22T07:05:27.909	0.20x	-57.80	47624.40	-12.49			
eta	I	2034-09-22T07:06:03.825	0.31x	-57.81	47176.12	-12.47			
beta	I	2034-09-22T07:08:05.503	0.69x	-57.85	45662.27	-12.42			
alpha	I	2034-09-22T07:09:24.258	0.94x	-57.88	44687.05	-12.39			
4	I	2034-09-22T07:12:12.504	1.47x	-57.92	42609.98	-12.30			
5	I	2034-09-22T07:12:47.858	1.59x	-57.93	42154.84	-12.28			
6	I	2034-09-22T07:13:10.221	1.66x	-57.93	41879.26	-12.27			
Uranus	I	2034-09-22T07:33:59.641	5.67	-57.78	25110.29			22.39	23.34
Uranus	E	2034-09-22T08:30:44.654	16.98	-53.78	25386.09			-13.56	-14.18
6	E	2034-09-22T08:53:16.264	21.59	-51.01	41809.98	12.06			
5	E	2034-09-22T08:53:56.496	21.73	-50.92	42294.45	12.07			
4	E	2034-09-22T08:54:14.382	21.79	-50.88	42526.55	12.09			
alpha	E	2034-09-22T08:57:18.018	22.42	-50.46	44750.97	12.17			
beta	E	2034-09-22T08:58:32.002	22.67	-50.29	45647.93	12.19			
eta	E	2034-09-22T09:00:37.106	23.11	-49.99	47176.12	12.23			
gamma	E	2034-09-22T09:01:14.244	23.23	-49.91	47630.71	12.25			
delta	E	2034-09-22T09:02:08.887	23.42	-49.78	48300.35	12.26			
lambda	E	2034-09-22T09:04:29.439	23.91	-49.44	50026.71	12.30			
epsilon	E	2034-09-22T09:05:41.840	24.16	-49.27	50918.04	12.30			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-09-22T08:02:01.980
 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 : 3379729835608552576
 2Mass ID (if available) : 06425305+2322163
 ICRS Star Coord at Epoch: 06h 42m 53.05619s +23:22:15.90294s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 14.180
 G magnitude : 17.328
 RP magnitude : 16.348
 BP magnitude : 18.277
 DUPflag : 0
 Distance (au) : 19.070
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 12.04
 Sun-Target sep (deg) : 79.10
 Sun-Moon sep (deg) : 172.42
 B (ring opening deg) : 66.47
 PA of pole (deg) : 73.85
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.037
 C/A sky separation (km) : 14341.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



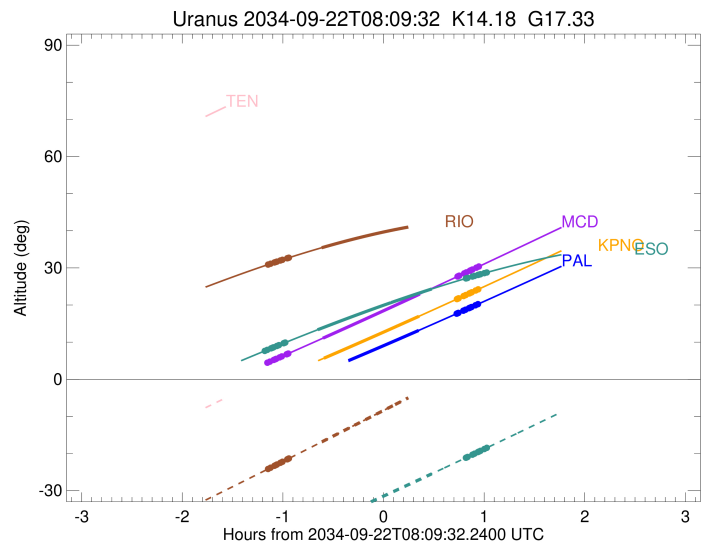
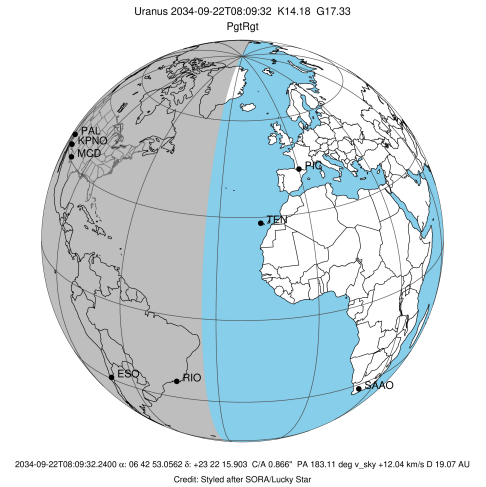
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-09-22T07:00:18.234		4.46x	-59.13	51153.78	-12.54		
lambda	I	2034-09-22T07:01:48.003		4.76x	-59.09	50026.71	-12.54		
delta	I	2034-09-22T07:04:05.917		5.21	-59.03	48300.35	-12.49		
gamma	I	2034-09-22T07:05:00.065		5.39	-59.01	47624.35	-12.47		
eta	I	2034-09-22T07:05:36.017		5.51	-58.99	47176.12	-12.46		
beta	I	2034-09-22T07:07:37.798		5.91	-58.93	45662.45	-12.41		
alpha	I	2034-09-22T07:08:56.644		6.17	-58.88	44686.93	-12.38		
4	I	2034-09-22T07:11:44.958		6.72	-58.77	42610.22	-12.30		
5	I	2034-09-22T07:12:20.334		6.84	-58.75	42154.86	-12.28		
6	I	2034-09-22T07:12:42.711		6.91	-58.73	41879.19	-12.27		
Uranus	I	2034-09-22T07:33:27.397		11.07	-57.48	25105.11		22.53	23.48
Uranus	E	2034-09-22T08:31:12.736		22.96	-50.81	25377.19		-13.92	-14.55
6	E	2034-09-22T08:53:37.846		27.67	-47.31	41809.66	12.06		
5	E	2034-09-22T08:54:18.171		27.81	-47.20	42294.98	12.06		
4	E	2034-09-22T08:54:36.003		27.88	-47.15	42526.48	12.08		
alpha	E	2034-09-22T08:57:39.810		28.52	-46.64	44751.06	12.15		
beta	E	2034-09-22T08:58:53.883		28.79	-46.43	45648.07	12.18		
eta	E	2034-09-22T09:00:59.139		29.23	-46.08	47176.12	12.22		
gamma	E	2034-09-22T09:01:36.329		29.36	-45.98	47630.69	12.23		
delta	E	2034-09-22T09:02:31.057		29.55	-45.82	48300.35	12.24		
lambda	E	2034-09-22T09:04:51.843		30.05	-45.42	50026.71	12.28		
epsilon	E	2034-09-22T09:06:04.590		30.31	-45.21	50920.69	12.27		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-09-22T08:06:57.280
 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 : 3379729835608552576
 2Mass ID (if available) : 06425305+2322163
 ICRS Star Coord at Epoch: 06h 42m 53.05619s +23:22:15.90294s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 14.180
 G magnitude : 17.328
 RP magnitude : 16.348
 BP magnitude : 18.277
 DUPflag : 0
 Distance (au) : 19.070
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 12.04
 Sun-Target sep (deg) : 79.10
 Sun-Moon sep (deg) : 171.41
 B (ring opening deg) : 66.47
 PA of pole (deg) : 73.85
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.534
 C/A sky separation (km) : 7388.5
 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	2034-09-22T07:00:38.483		30.89	-24.18	51213.56	-12.52		
lambda	I	2034-09-22T07:02:13.172		31.13	-23.82	50026.71	-12.53		
delta	I	2034-09-22T07:04:31.032		31.47	-23.30	48300.35	-12.52		
gamma	I	2034-09-22T07:05:25.119		31.61	-23.10	47623.60	-12.51		
eta	I	2034-09-22T07:06:00.896		31.70	-22.96	47176.12	-12.51		
beta	I	2034-09-22T07:08:01.795		32.00	-22.50	45665.74	-12.49		
alpha	I	2034-09-22T07:09:20.540		32.19	-22.20	44685.30	-12.48		
4	I	2034-09-22T07:12:06.766		32.59	-21.57	42613.70	-12.46		
5	I	2034-09-22T07:12:41.755		32.68	-21.44	42156.56	-12.45		
6	I	2034-09-22T07:13:04.157		32.73	-21.36	41877.26	-12.45		
Uranus	I	2034-09-22T07:32:42.692		35.44	-16.87	25067.82		23.52	24.50
Uranus	E	2034-09-22T08:41:32.959		42.26	-1.03x	25235.26		-18.80	-19.63
6	E	2034-09-22T09:02:03.305		43.32	3.70x	41804.75	12.33		
5	E	2034-09-22T09:02:43.755		43.34	3.86x	42302.81	12.33		
4	E	2034-09-22T09:03:00.319		43.35	3.92x	42525.93	12.34		
alpha	E	2034-09-22T09:06:00.829		43.46	4.61x	44752.13	12.36		
beta	E	2034-09-22T09:07:13.839		43.50	4.89x	45650.47	12.36		
eta	E	2034-09-22T09:09:17.206		43.56	5.37x	47176.12	12.37		
gamma	E	2034-09-22T09:09:53.906		43.58	5.51x	47630.23	12.38		
delta	E	2034-09-22T09:10:48.048		43.61	5.72x	48300.35	12.38		
lambda	E	2034-09-22T09:13:07.454		43.67	6.25x	50026.71	12.39		
epsilon	E	2034-09-22T09:14:23.281		43.70	6.54x	50966.25	12.38		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-09-22T08:04:06.200
 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 : 3379729835608552576
 2Mass ID (if available) : 06425305+2322163
 ICRS Star Coord at Epoch: 06h 42m 53.05619s +23:22:15.90294s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 14.180
 G magnitude : 17.328
 RP magnitude : 16.348
 BP magnitude : 18.277
 DUPflag : 0
 Distance (au) : 19.070
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 12.04
 Sun-Target sep (deg) : 79.10
 Sun-Moon sep (deg) : 171.58
 B (ring opening deg) : 66.47
 PA of pole (deg) : 73.85
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.537
 C/A sky separation (km) : 7423.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-09-22T06:58:39.909		7.63	-45.34	51211.41	-12.71		
lambda	I	2034-09-22T07:00:13.067		7.91	-45.06	50026.71	-12.71		
delta	I	2034-09-22T07:02:28.956		8.33	-44.65	48300.35	-12.70		
gamma	I	2034-09-22T07:03:22.270		8.50	-44.48	47623.62	-12.69		
eta	I	2034-09-22T07:03:57.541		8.60	-44.38	47176.12	-12.69		
beta	I	2034-09-22T07:05:56.737		8.97	-44.01	45665.63	-12.67		
alpha	I	2034-09-22T07:07:14.359		9.21	-43.77	44685.34	-12.66		
4	I	2034-09-22T07:09:58.264		9.70	-43.26	42613.61	-12.64		
5	I	2034-09-22T07:10:32.767		9.81	-43.15	42156.47	-12.62		
6	I	2034-09-22T07:10:54.841		9.88	-43.08	41877.34	-12.62		
Uranus	I	2034-09-22T07:30:17.511		13.34	-39.37	25067.63		23.52	24.50
Uranus	E	2034-09-22T08:38:19.426		24.33	-25.47	25233.14		-18.87	-19.69
6	E	2034-09-22T08:58:38.463		27.16	-21.15	41804.62	12.43		
5	E	2034-09-22T08:59:18.612		27.25	-21.01	42303.01	12.43		
4	E	2034-09-22T08:59:35.020		27.28	-20.95	42525.93	12.44		
alpha	E	2034-09-22T09:02:34.095		27.68	-20.31	44752.15	12.45		
beta	E	2034-09-22T09:03:46.539		27.83	-20.05	45650.55	12.46		
eta	E	2034-09-22T09:05:48.947		28.09	-19.62	47176.12	12.47		
gamma	E	2034-09-22T09:06:25.365		28.17	-19.48	47630.21	12.47		
delta	E	2034-09-22T09:07:19.098		28.29	-19.29	48300.35	12.47		
lambda	E	2034-09-22T09:09:37.462		28.58	-18.80	50026.71	12.48		
epsilon	E	2034-09-22T09:10:52.880		28.74	-18.53	50968.12	12.47		