

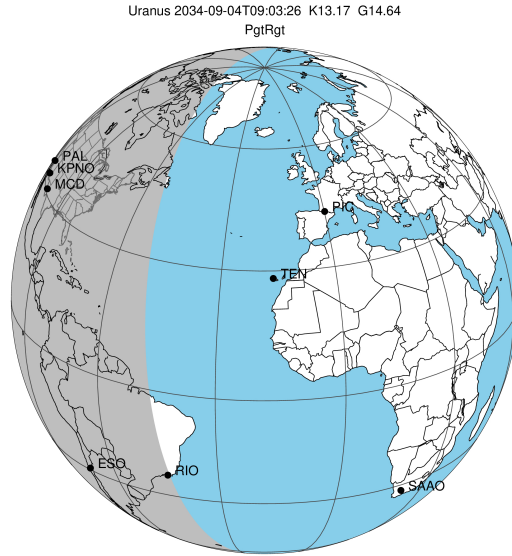
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-09-04T09:03:26.610
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3379768146717003264
 2Mass ID (if available) : 06404163+2324017

Uranus 2034-09-04T09:03:26 K13.17 G14.64 PgtRgt

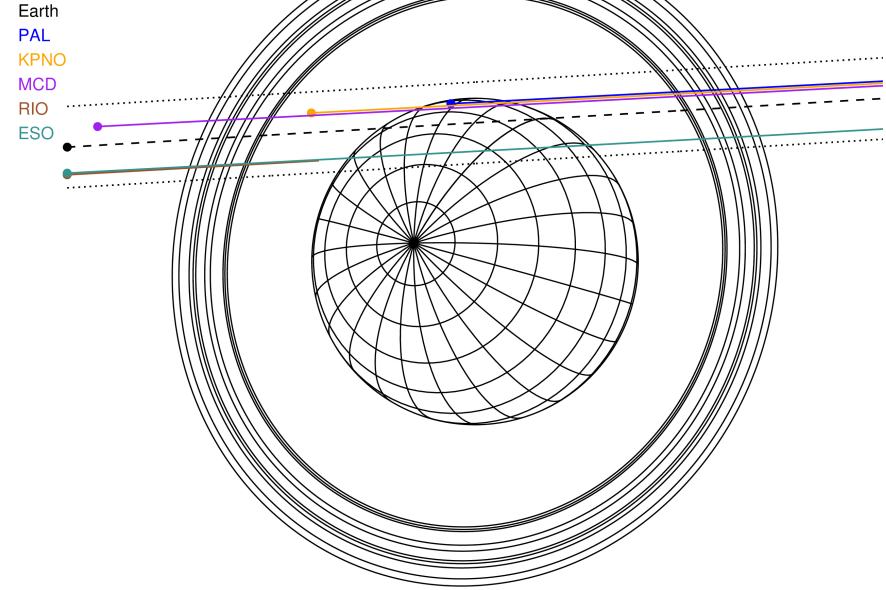
ICRS Star Coord at Epoch: 06h 40m 41.64040s +23:24:01.76805s

RUWE (>1.4 is poor) : 1.03
 K magnitude : 13.174
 G magnitude : 14.643
 RP magnitude : 14.121
 BP magnitude : 14.999
 DUPflag : 0
 Distance (au) : 19.360
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.35
 Sun-Target sep (deg) : 62.12
 Sun-Moon sep (deg) : 42.86
 B (ring opening deg) : 66.94
 PA of pole (deg) : 73.24

#	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

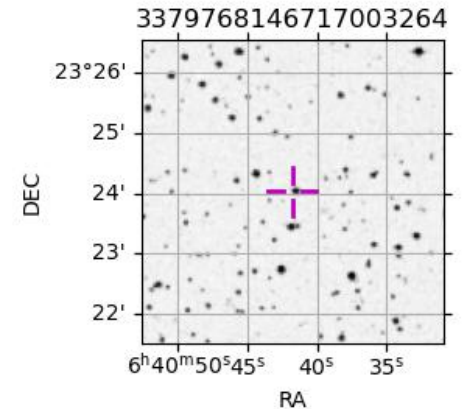


2034-09-04T09:03:26.6100 ex: 06 40 41.6404 s: +23 24 01.768 C/A 1.548° PA 183.41 deg v_sky +20.35 km/s D 19.36 AU
 Credit: Styled after SORA/Lucky Star

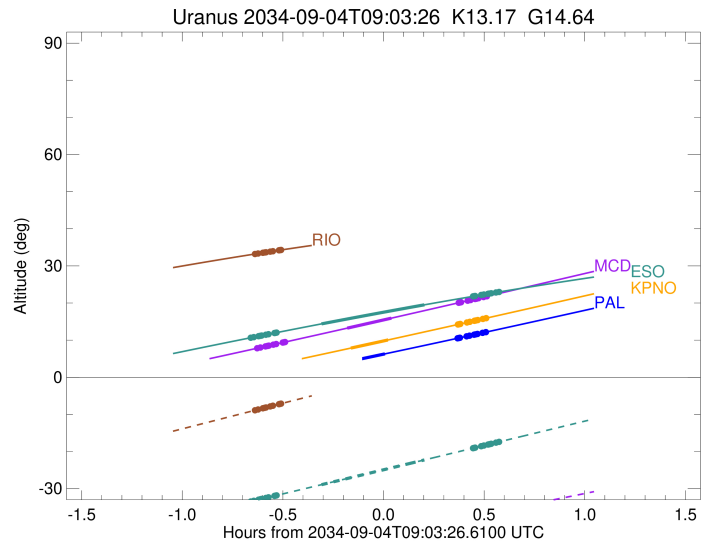
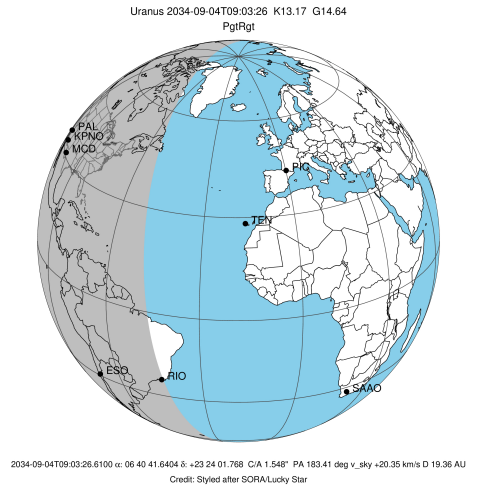


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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 04 09:03 - SEP 04 09:33	PneRne
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4		+	+++++	SEP 04 08:53 - SEP 04 09:33	PieRne
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+	+++++	SEP 04 08:25 - SEP 04 09:33	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 04 08:25 - SEP 04 08:32	PnnRin
ESO	European Southern Obs	-29.3	289.3	+++++	+	+++++	SEP 04 08:23 - SEP 04 09:37	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



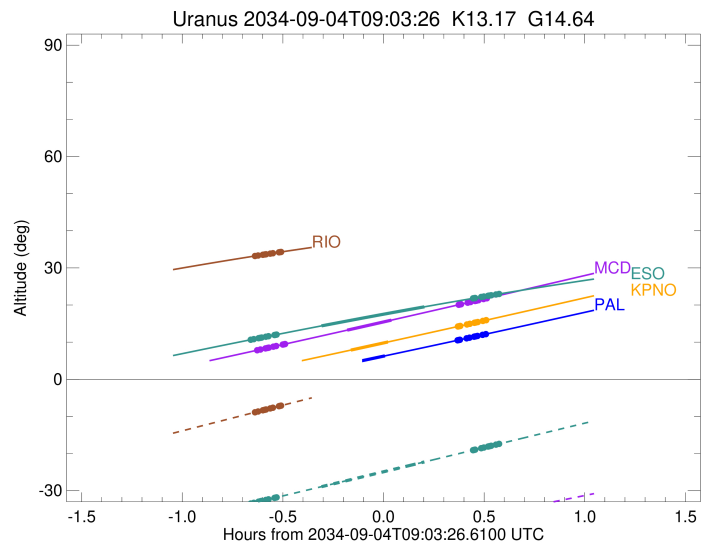
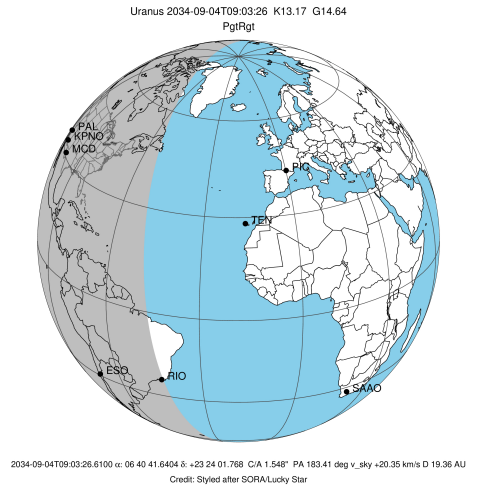
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-09-04T08:59:06.790
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3379768146717003264
 2Mass ID (if available) : 06404163+2324017
 ICRS Star Coord at Epoch: 06h 40m 41.64040s +23:24:01.76805s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 13.174
 G magnitude : 14.643
 RP magnitude : 14.121
 BP magnitude : 14.999
 DUPflag : 0
 Distance (au) : 19.360
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.35
 Sun-Target sep (deg) : 62.12
 Sun-Moon sep (deg) : 42.35
 B (ring opening deg) : 66.94
 PA of pole (deg) : 73.24
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.772
 C/A sky separation (km) : 24879.0
 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	2034-09-04T08:26:19.246	-0.76x	-48.63	51240.36	-19.13			
lambda	I	2034-09-04T08:27:22.646	-0.56x	-48.57	50026.71	-19.07			
delta	I	2034-09-04T08:28:53.753	-0.28x	-48.49	48300.35	-18.83			
gamma	I	2034-09-04T08:29:29.831	-0.17x	-48.45	47622.91	-18.73			
eta	I	2034-09-04T08:29:53.734	-0.10x	-48.43	47176.12	-18.66			
beta	I	2034-09-04T08:31:15.093	0.15x	-48.35	45669.97	-18.40			
alpha	I	2034-09-04T08:32:08.698	0.32x	-48.29	44684.67	-18.22			
4	I	2034-09-04T08:34:03.220	0.67x	-48.17	42616.57	-17.80			
5	I	2034-09-04T08:34:28.307	0.75x	-48.15	42168.40	-17.67			
6	I	2034-09-04T08:34:45.149	0.80x	-48.13	41868.32	-17.63			
Uranus	I	2034-09-04T08:54:51.162	4.58x	-46.58	25420.26	11.84	12.38		
Uranus	E	2034-09-04T09:03:52.399	6.30	-45.74	25552.36	2.56	2.68		
6	E	2034-09-04T09:25:32.431	10.50	-43.37	41856.24	17.54			
5	E	2034-09-04T09:25:52.635	10.57	-43.33	42211.65	17.59			
4	E	2034-09-04T09:26:11.541	10.63	-43.30	42557.68	17.71			
alpha	E	2034-09-04T09:28:12.738	11.03	-43.05	44729.18	18.13			
beta	E	2034-09-04T09:29:02.903	11.19	-42.95	45641.08	18.30			
eta	E	2034-09-04T09:30:26.227	11.46	-42.78	47176.12	18.55			
gamma	E	2034-09-04T09:30:50.729	11.54	-42.73	47631.45	18.62			
delta	E	2034-09-04T09:31:26.562	11.66	-42.65	48300.35	18.72			
lambda	E	2034-09-04T09:32:58.228	11.96	-42.46	50026.71	18.95			
epsilon	E	2034-09-04T09:33:36.965	12.09	-42.38	50762.41	19.01			

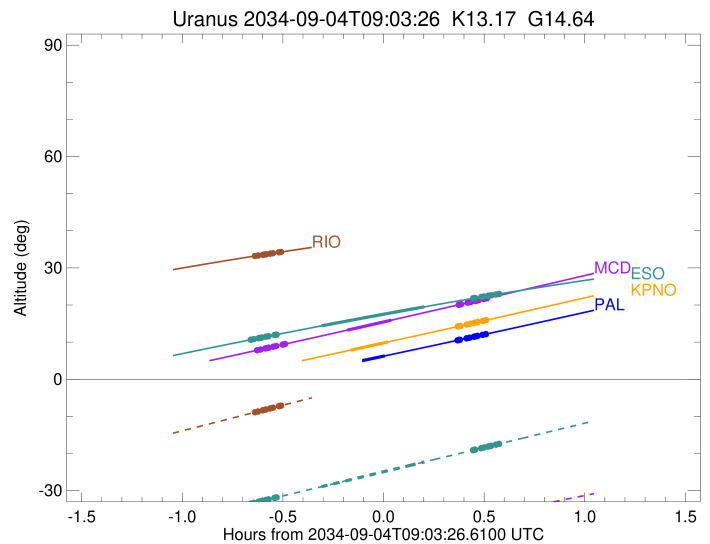
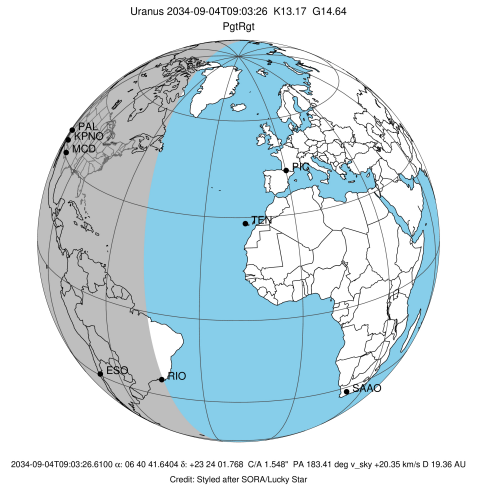
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2034-09-04T08:59:00.900
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       : 3379768146717003264
2Mass ID (if available) : 06404163+2324017
ICRS Star Coord at Epoch: 06h 40m 41.64040s +23:24:01.76805s
RUWE (>1.4 is poor) : 1.03
K magnitude          : 13.174
G magnitude          : 14.643
RP magnitude         : 14.121
BP magnitude         : 14.999
DUPflag             : 0
Distance (au)        : 19.360
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 20.35
Sun-Target sep (deg) : 62.12
Sun-Moon sep (deg)   : 42.37
B (ring opening deg) : 66.94
PA of pole (deg)     : 73.24
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.749
C/A sky separation (km) : 24561.9
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl.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
    
```



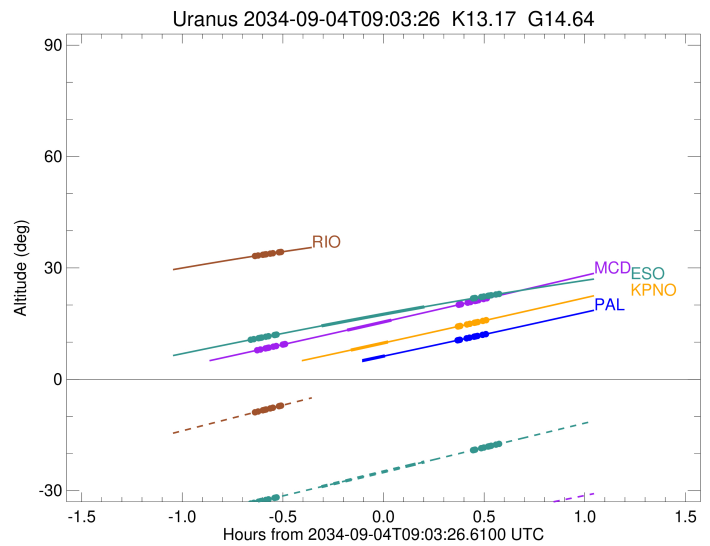
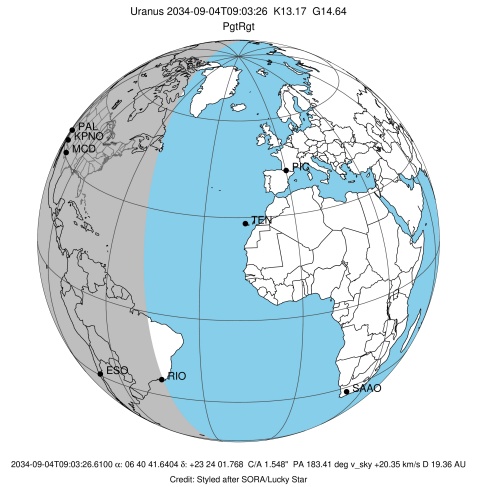
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-09-04T08:26:01.103		2.49x	-48.51	51243.15	-19.18		
lambda	I	2034-09-04T08:27:04.487		2.69x	-48.43	50026.71	-19.12		
delta	I	2034-09-04T08:28:35.332		2.98x	-48.30	48300.35	-18.89		
gamma	I	2034-09-04T08:29:11.297		3.09x	-48.25	47622.88	-18.79		
eta	I	2034-09-04T08:29:35.119		3.17x	-48.21	47176.12	-18.72		
beta	I	2034-09-04T08:30:56.175		3.43x	-48.09	45670.12	-18.47		
alpha	I	2034-09-04T08:31:49.573		3.60x	-48.01	44684.69	-18.30		
4	I	2034-09-04T08:33:43.567		3.97x	-47.84	42616.56	-17.89		
5	I	2034-09-04T08:34:08.489		4.05x	-47.80	42168.82	-17.77		
6	I	2034-09-04T08:34:25.278		4.10x	-47.78	41868.05	-17.72		
Uranus	I	2034-09-04T08:53:43.890		7.86	-45.78	25397.21		12.80	13.39
Uranus	E	2034-09-04T09:04:47.636		10.05	-44.47	25556.90		1.44	1.51
6	E	2034-09-04T09:25:39.324		14.22	-41.69	41855.87	17.63		
5	E	2034-09-04T09:25:59.484		14.29	-41.65	42212.38	17.68		
4	E	2034-09-04T09:26:18.222		14.35	-41.60	42557.28	17.80		
alpha	E	2034-09-04T09:28:18.914		14.76	-41.32	44729.46	18.20		
beta	E	2034-09-04T09:29:08.869		14.93	-41.20	45641.07	18.37		
eta	E	2034-09-04T09:30:31.907		15.21	-41.00	47176.12	18.61		
gamma	E	2034-09-04T09:30:56.332		15.29	-40.94	47631.46	18.68		
delta	E	2034-09-04T09:31:32.058		15.41	-40.85	48300.35	18.77		
lambda	E	2034-09-04T09:33:03.478		15.72	-40.63	50026.71	18.99		
epsilon	E	2034-09-04T09:33:42.169		15.85	-40.53	50763.30	19.06		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-09-04T08:58:58.190
 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 : 3379768146717003264
 2Mass ID (if available) : 06404163+2324017
 ICRS Star Coord at Epoch: 06h 40m 41.64040s +23:24:01.76805s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 13.174
 G magnitude : 14.643
 RP magnitude : 14.121
 BP magnitude : 14.999
 DUPflag : 0
 Distance (au) : 19.360
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.35
 Sun-Target sep (deg) : 62.12
 Sun-Moon sep (deg) : 42.43
 B (ring opening deg) : 66.94
 PA of pole (deg) : 73.24
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.721
 C/A sky separation (km) : 24160.0
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



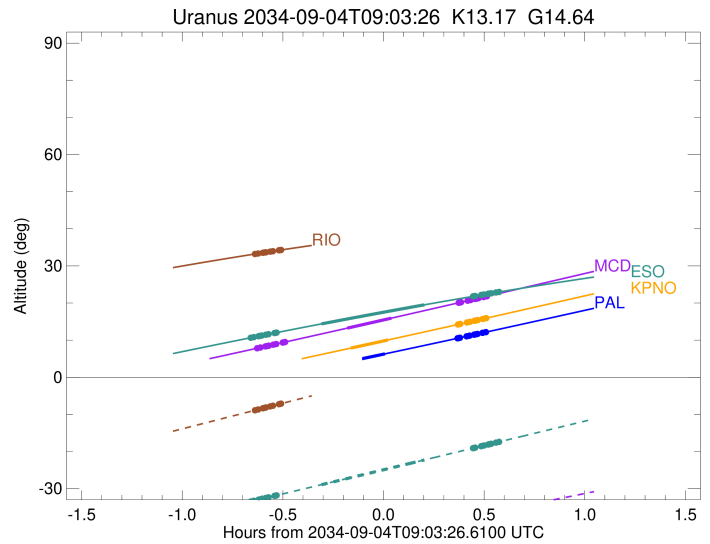
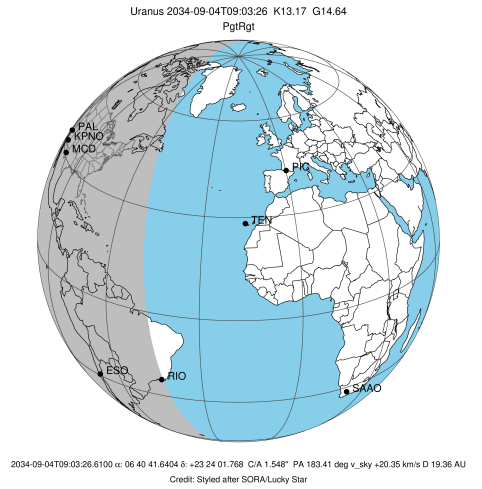
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-09-04T08:25:42.163		7.81	-46.59	51246.72	-19.23		
lambda	I	2034-09-04T08:26:45.564		8.02	-46.46	50026.71	-19.17		
delta	I	2034-09-04T08:28:16.132		8.32	-46.28	48300.35	-18.95		
gamma	I	2034-09-04T08:28:51.976		8.44	-46.20	47622.84	-18.85		
eta	I	2034-09-04T08:29:15.710		8.52	-46.16	47176.12	-18.79		
beta	I	2034-09-04T08:30:36.434		8.79	-45.99	45670.31	-18.55		
alpha	I	2034-09-04T08:31:29.604		8.96	-45.88	44684.72	-18.39		
4	I	2034-09-04T08:33:23.008		9.34	-45.64	42616.55	-17.99		
5	I	2034-09-04T08:33:47.739		9.43	-45.59	42169.36	-17.88		
6	I	2034-09-04T08:34:04.475		9.48	-45.55	41867.69	-17.83		
Uranus	I	2034-09-04T08:52:37.032		13.23	-43.04	25371.96		13.80	14.42
Uranus	E	2034-09-04T09:05:48.725		15.93	-41.08	25558.93		0.27	0.28
6	E	2034-09-04T09:25:53.178		20.07	-37.88	41855.42	17.74		
5	E	2034-09-04T09:26:13.292		20.14	-37.83	42213.28	17.78		
4	E	2034-09-04T09:26:31.835		20.21	-37.78	42556.78	17.90		
alpha	E	2034-09-04T09:28:31.959		20.62	-37.44	44729.81	18.28		
beta	E	2034-09-04T09:29:21.678		20.80	-37.30	45641.06	18.44		
eta	E	2034-09-04T09:30:44.398		21.08	-37.07	47176.12	18.68		
gamma	E	2034-09-04T09:31:08.738		21.17	-37.01	47631.47	18.74		
delta	E	2034-09-04T09:31:44.346		21.29	-36.91	48300.35	18.83		
lambda	E	2034-09-04T09:33:15.500		21.61	-36.65	50026.71	19.04		
epsilon	E	2034-09-04T09:33:54.151		21.74	-36.54	50764.44	19.10		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-09-04T09:01:40.650
 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 : 3379768146717003264
 2Mass ID (if available) : 06404163+2324017
 ICRS Star Coord at Epoch: 06h 40m 41.64040s +23:24:01.76805s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 13.174
 G magnitude : 14.643
 RP magnitude : 14.121
 BP magnitude : 14.999
 DUPflag : 0
 Distance (au) : 19.360
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.35
 Sun-Target sep (deg) : 62.12
 Sun-Moon sep (deg) : 42.98
 B (ring opening deg) : 66.94
 PA of pole (deg) : 73.24
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.222
 C/A sky separation (km) : 17151.5
 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	2034-09-04T08:25:00.847		33.19	-8.92	51306.96	-20.23		
lambda	I	2034-09-04T08:26:04.083		33.34	-8.68	50026.71	-20.21		
delta	I	2034-09-04T08:27:29.717		33.54	-8.35	48300.35	-20.11		
gamma	I	2034-09-04T08:28:03.479		33.62	-8.22	47622.21	-20.06		
eta	I	2034-09-04T08:28:25.729		33.67	-8.14	47176.12	-20.03		
beta	I	2034-09-04T08:29:41.016		33.85	-7.85	45673.34	-19.93		
alpha	I	2034-09-04T08:30:30.542		33.96	-7.66	44685.77	-19.85		
4	I	2034-09-04T08:32:15.072		34.20	-7.26	42615.43	-19.67		
5	I	2034-09-04T08:32:36.858		34.25	-7.17	42179.70	-19.61		
6	I	2034-09-04T08:32:52.956		34.29	-7.11	41861.19	-19.60		
Uranus	I	2034-09-04T08:46:20.621		36.06	-4.02x	25137.51		21.13	22.04
Uranus	E	2034-09-04T09:17:22.767		39.56	3.08x	25450.42		-10.44	-10.93
6	E	2034-09-04T09:31:56.844		40.89	6.39x	41847.83	19.54		
5	E	2034-09-04T09:32:16.248		40.92	6.46x	42228.10	19.55		
4	E	2034-09-04T09:32:31.885		40.94	6.52x	42549.10	19.61		
alpha	E	2034-09-04T09:34:22.853		41.09	6.94x	44735.17	19.78		
beta	E	2034-09-04T09:35:08.649		41.16	7.12x	45641.25	19.86		
eta	E	2034-09-04T09:36:25.768		41.26	7.41x	47176.12	19.96		
gamma	E	2034-09-04T09:36:48.568		41.29	7.49x	47631.57	19.99		
delta	E	2034-09-04T09:37:21.986		41.33	7.62x	48300.35	20.03		
lambda	E	2034-09-04T09:38:47.947		41.44	7.94x	50026.71	20.13		
epsilon	E	2034-09-04T09:39:25.692		41.49	8.09x	50787.37	20.15		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-09-04T09:00:06.630
 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 : 3379768146717003264
 2Mass ID (if available) : 06404163+2324017
 ICRS Star Coord at Epoch: 06h 40m 41.64040s +23:24:01.76805s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 13.174
 G magnitude : 14.643
 RP magnitude : 14.121
 BP magnitude : 14.999
 DUPflag : 0
 Distance (au) : 19.360
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.35
 Sun-Target sep (deg) : 62.12
 Sun-Moon sep (deg) : 42.54
 B (ring opening deg) : 66.94
 PA of pole (deg) : 73.24
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.227
 C/A sky separation (km) : 17224.6
 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	2034-09-04T08:23:44.603		10.63	-33.50	51305.35	-20.38		
lambda	I	2034-09-04T08:24:47.286		10.81	-33.28	50026.71	-20.36		
delta	I	2034-09-04T08:26:12.283		11.07	-32.97	48300.35	-20.26		
gamma	I	2034-09-04T08:26:45.795		11.17	-32.85	47622.22	-20.21		
eta	I	2034-09-04T08:27:07.882		11.24	-32.77	47176.12	-20.18		
beta	I	2034-09-04T08:28:22.624		11.46	-32.51	45673.27	-20.07		
alpha	I	2034-09-04T08:29:11.788		11.61	-32.33	44685.73	-19.99		
4	I	2034-09-04T08:30:55.567		11.91	-31.96	42615.47	-19.81		
5	I	2034-09-04T08:31:17.220		11.98	-31.88	42179.43	-19.75		
6	I	2034-09-04T08:31:33.183		12.03	-31.82	41861.36	-19.74		
Uranus	I	2034-09-04T08:44:56.391		14.38	-28.94	25139.99		21.06	21.97
Uranus	E	2034-09-04T09:15:39.165		19.52	-22.26	25450.65		-10.43	-10.92
6	E	2034-09-04T09:30:09.202		21.80	-19.10	41847.78	19.64		
5	E	2034-09-04T09:30:28.511		21.85	-19.03	42228.20	19.65		
4	E	2034-09-04T09:30:44.057		21.89	-18.97	42549.05	19.72		
alpha	E	2034-09-04T09:32:34.444		22.17	-18.57	44735.21	19.89		
beta	E	2034-09-04T09:33:19.994		22.29	-18.41	45641.26	19.96		
eta	E	2034-09-04T09:34:36.705		22.48	-18.13	47176.12	20.07		
gamma	E	2034-09-04T09:34:59.383		22.54	-18.04	47631.57	20.10		
delta	E	2034-09-04T09:35:32.624		22.62	-17.92	48300.35	20.14		
lambda	E	2034-09-04T09:36:58.128		22.84	-17.61	50026.71	20.24		
epsilon	E	2034-09-04T09:37:35.689		22.93	-17.47	50787.68	20.25		