

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-08-27T08:30:25.390
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3416310308289710208
 2Mass ID (if available) : 05251517+2316026

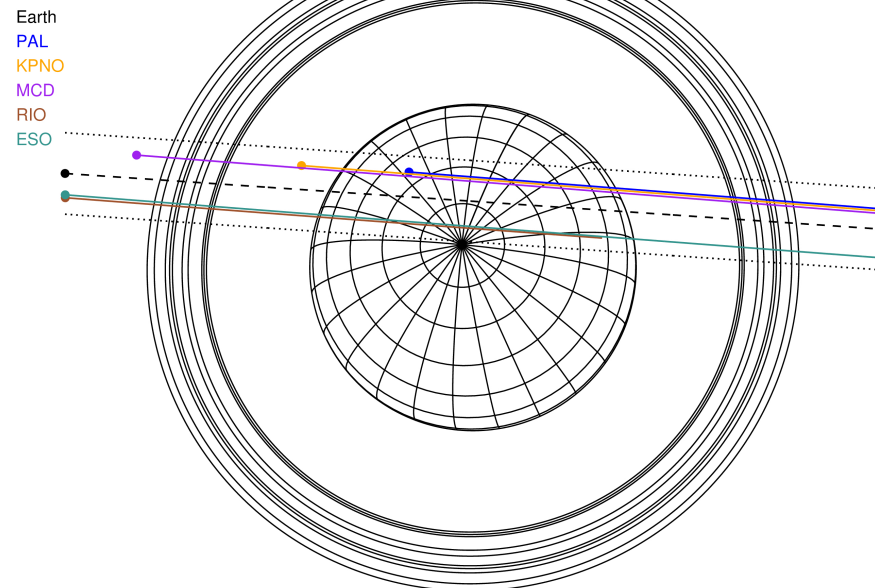
Uranus 2030-08-27T08:30:25 K14.72 G17.95 PgtRgt

ICRS Star Coord at Epoch: 05h 25m 15.17963s +23:16:02.56716s

RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.722
 G magnitude : 17.951
 RP magnitude : 16.990
 BP magnitude : 18.908
 DUPflag : 0
 Distance (au) : 19.469
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 15.70
 Sun-Target sep (deg) : 71.68
 Sun-Moon sep (deg) : 52.26
 B (ring opening deg) : 81.07
 PA of pole (deg) : 25.72



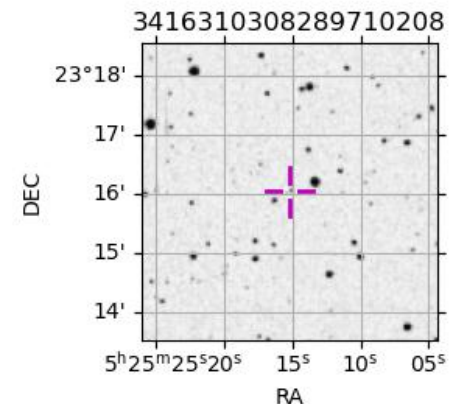
2030-08-27T08:30:25.3900 ex: 05 25 15.1796 s: +23 16 02.567 C/A 0.7377 PA 176.10 deg v_sky +15.70 km/s D 19.47 AU
 Credit: Styled after SORA/Lucky Star



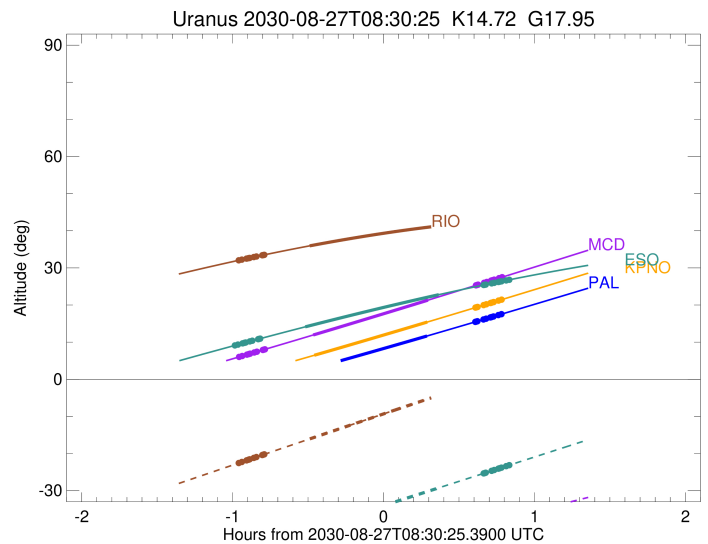
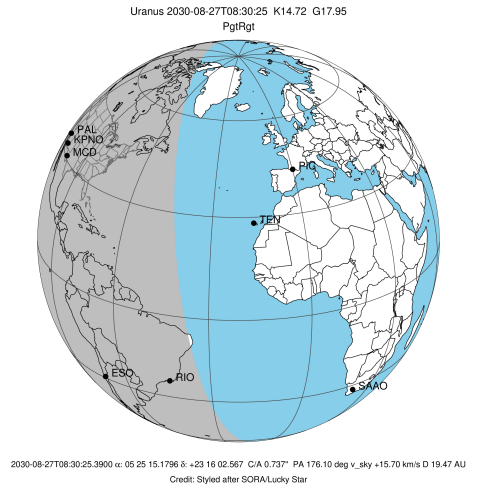
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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		+	+++++	AUG 27 08:47 - AUG 27 09:17	PneRne
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4		+	+++++	AUG 27 08:02 - AUG 27 09:17	PieRne
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+	+++++	AUG 27 07:33 - AUG 27 09:18	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	+++++	+		AUG 27 07:33 - AUG 27 08:01	PinRin
ESO	European Southern Obs	-29.3	289.3	+++++	+	+++++	AUG 27 07:31 - AUG 27 09:20	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



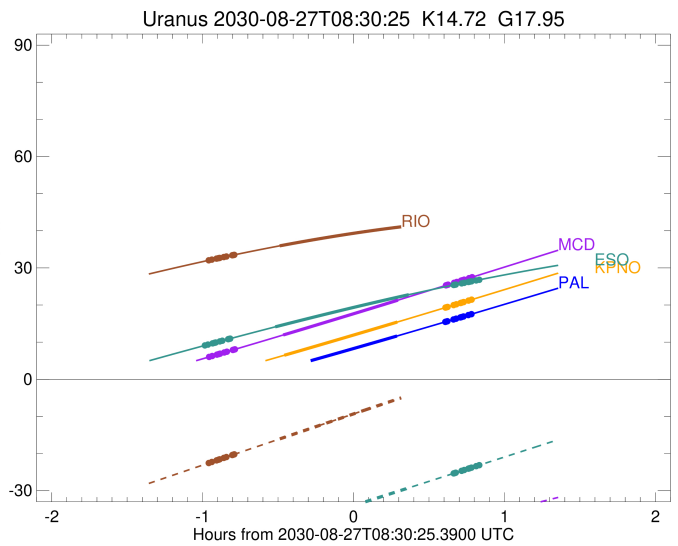
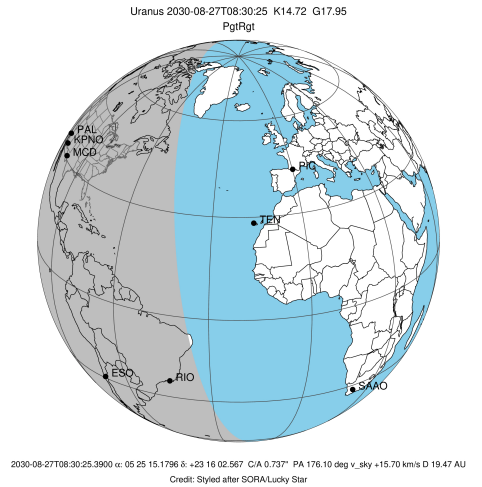
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-08-27T08:25:11.540
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3416310308289710208
 2Mass ID (if available) : 05251517+2316026
 ICRS Star Coord at Epoch: 05h 25m 15.17963s +23:16:02.56716s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.722
 G magnitude : 17.951
 RP magnitude : 16.990
 BP magnitude : 18.908
 DUPflag : 0
 Distance (au) : 19.469
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 15.70
 Sun-Target sep (deg) : 71.68
 Sun-Moon sep (deg) : 52.85
 B (ring opening deg) : 81.07
 PA of pole (deg) : 25.72
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.001
 C/A sky separation (km) : 14132.4
 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	2030-08-27T07:34:05.031	-2.33x	-46.67	50839.57	-15.29			
lambda	I	2030-08-27T07:34:58.321	-2.17x	-46.69	50026.71	-15.24			
delta	I	2030-08-27T07:36:51.780	-1.82x	-46.72	48300.35	-15.19			
gamma	I	2030-08-27T07:37:36.529	-1.68x	-46.73	47621.17	-15.17			
eta	I	2030-08-27T07:38:05.888	-1.59x	-46.74	47176.12	-15.15			
beta	I	2030-08-27T07:39:45.296	-1.29x	-46.76	45672.76	-15.10			
alpha	I	2030-08-27T07:40:50.833	-1.09x	-46.78	44685.20	-15.06			
4	I	2030-08-27T07:43:13.547	-0.65x	-46.80	42544.43	-14.96			
5	I	2030-08-27T07:43:38.919	-0.58x	-46.80	42157.70	-14.94			
6	I	2030-08-27T07:44:03.507	-0.50x	-46.81	41798.00	-14.93			
Uranus	I	2030-08-27T08:03:17.808	3.09x	-46.69	25090.81	8.05	8.43		
Uranus	E	2030-08-27T08:47:44.664	11.66	-44.63	25556.92	0.53	0.55		
6	E	2030-08-27T09:06:57.303	15.47	-43.02	41877.86	14.78			
5	E	2030-08-27T09:07:24.627	15.56	-42.98	42281.27	14.79			
4	E	2030-08-27T09:07:43.997	15.62	-42.95	42569.02	14.80			
alpha	E	2030-08-27T09:10:10.774	16.11	-42.71	44748.90	14.89			
beta	E	2030-08-27T09:11:12.003	16.31	-42.61	45661.45	14.93			
eta	E	2030-08-27T09:12:53.339	16.65	-42.45	47176.12	14.97			
gamma	E	2030-08-27T09:13:23.615	16.75	-42.40	47629.60	14.98			
delta	E	2030-08-27T09:14:08.348	16.90	-42.32	48300.35	15.00			
lambda	E	2030-08-27T09:16:03.231	17.29	-42.13	50026.71	15.05			
epsilon	E	2030-08-27T09:17:44.393	17.63	-41.95	51550.96	15.09			

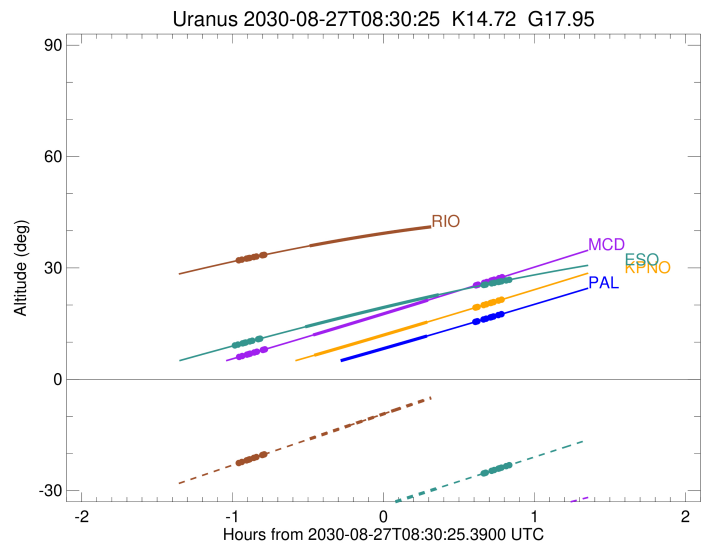
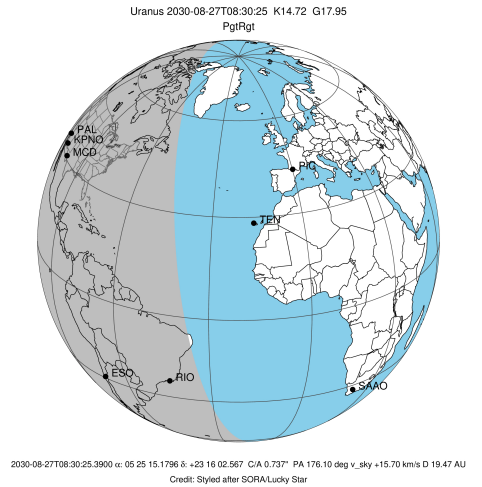
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2030-08-27T08:25:02.870
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       : 3416310308289710208
2Mass ID (if available) : 05251517+2316026
ICRS Star Coord at Epoch: 05h 25m 15.17963s +23:16:02.56716s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 14.722
G magnitude           : 17.951
RP magnitude          : 16.990
BP magnitude          : 18.908
DUPflag              : 0
Distance (au)         : 19.469
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : 15.70
Sun-Target sep (deg) : 71.68
Sun-Moon sep (deg)   : 52.90
B (ring opening deg) : 81.07
PA of pole (deg)     : 25.72
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.979
C/A sky separation (km) : 13830.5
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_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```



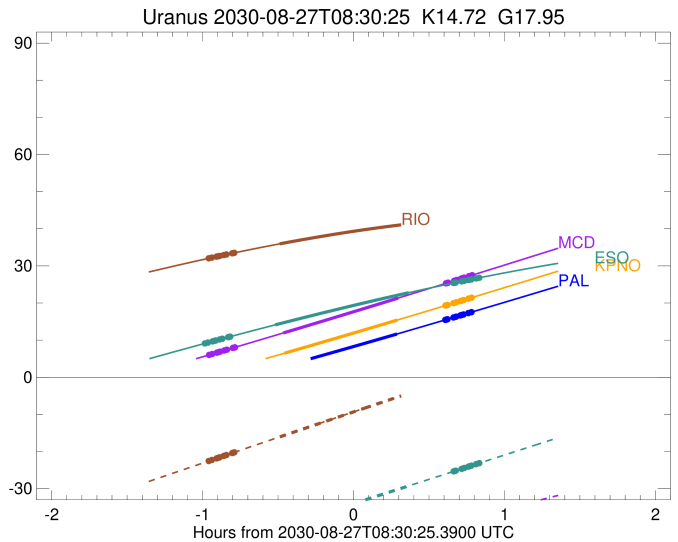
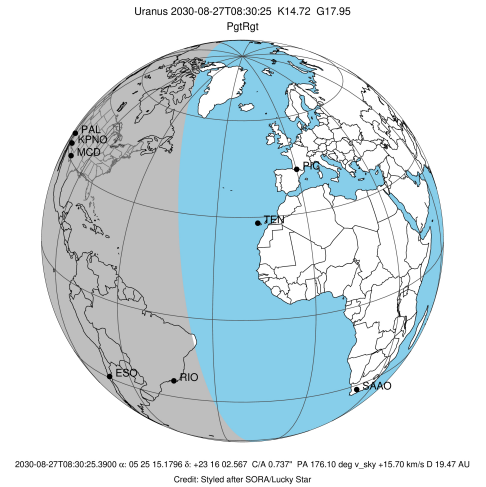
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-08-27T07:33:44.343	0.85x	-48.19	50838.07	-15.28			
lambda	I	2030-08-27T07:34:37.541	1.02x	-48.18	50026.71	-15.24			
delta	I	2030-08-27T07:36:31.002	1.37x	-48.16	48300.35	-15.19			
gamma	I	2030-08-27T07:37:15.746	1.52x	-48.15	47621.18	-15.17			
eta	I	2030-08-27T07:37:45.103	1.61x	-48.14	47176.12	-15.15			
beta	I	2030-08-27T07:39:24.495	1.93x	-48.12	45672.65	-15.10			
alpha	I	2030-08-27T07:40:30.004	2.13x	-48.10	44685.16	-15.07			
4	I	2030-08-27T07:42:52.619	2.59x	-48.06	42544.69	-14.97			
5	I	2030-08-27T07:43:17.984	2.67x	-48.05	42157.85	-14.95			
6	I	2030-08-27T07:43:42.566	2.75x	-48.04	41797.88	-14.94			
Uranus	I	2030-08-27T08:02:53.003	6.46	-47.39	25097.08			7.99	8.37
Uranus	E	2030-08-27T08:47:51.662	15.42	-44.06	25557.82			0.40	0.42
6	E	2030-08-27T09:07:01.012	19.32	-41.98	41877.96	14.78			
5	E	2030-08-27T09:07:28.355	19.41	-41.92	42281.79	14.79			
4	E	2030-08-27T09:07:47.702	19.48	-41.89	42569.38	14.81			
alpha	E	2030-08-27T09:10:14.429	19.98	-41.59	44749.01	14.89			
beta	E	2030-08-27T09:11:15.640	20.19	-41.47	45661.30	14.93			
eta	E	2030-08-27T09:12:56.996	20.54	-41.26	47176.12	14.97			
gamma	E	2030-08-27T09:13:27.280	20.64	-41.20	47629.62	14.98			
delta	E	2030-08-27T09:14:12.022	20.79	-41.11	48300.35	15.00			
lambda	E	2030-08-27T09:16:06.947	21.19	-40.87	50026.71	15.04			
epsilon	E	2030-08-27T09:17:48.133	21.53	-40.66	51550.57	15.08			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-08-27T08:24:58.380
 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 : 3416310308289710208
 2Mass ID (if available) : 05251517+2316026
 ICRS Star Coord at Epoch: 05h 25m 15.17963s +23:16:02.56716s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.722
 G magnitude : 17.951
 RP magnitude : 16.990
 BP magnitude : 18.908
 DUPflag : 0
 Distance (au) : 19.469
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 15.70
 Sun-Target sep (deg) : 71.68
 Sun-Moon sep (deg) : 52.98
 B (ring opening deg) : 81.07
 PA of pole (deg) : 25.72
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.952
 C/A sky separation (km) : 13436.5
 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



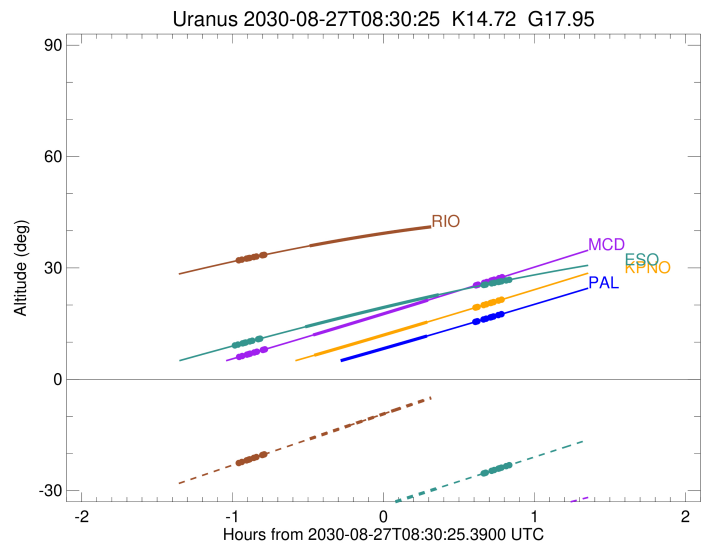
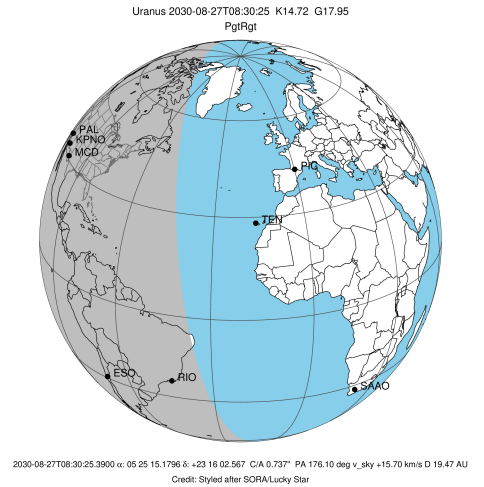
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-08-27T07:33:22.773		6.09	-48.60	50836.10	-15.27		
lambda	I	2030-08-27T07:34:15.882		6.27	-48.55	50026.71	-15.23		
delta	I	2030-08-27T07:36:09.414		6.64	-48.45	48300.35	-15.18		
gamma	I	2030-08-27T07:36:54.179		6.79	-48.41	47621.20	-15.16		
eta	I	2030-08-27T07:37:23.549		6.89	-48.39	47176.12	-15.15		
beta	I	2030-08-27T07:39:02.982		7.22	-48.29	45672.51	-15.10		
alpha	I	2030-08-27T07:40:08.496		7.44	-48.23	44685.11	-15.06		
4	I	2030-08-27T07:42:31.069		7.91	-48.09	42545.04	-14.97		
5	I	2030-08-27T07:42:56.441		7.99	-48.06	42158.06	-14.96		
6	I	2030-08-27T07:43:21.031		8.08	-48.04	41797.73	-14.95		
Uranus	I	2030-08-27T08:02:27.314		11.92	-46.61	25105.46		7.92	8.29
Uranus	E	2030-08-27T08:48:07.668		21.32	-41.60	25558.59		0.23	0.24
6	E	2030-08-27T09:07:13.475		25.31	-38.94	41878.08	14.79		
5	E	2030-08-27T09:07:40.855		25.41	-38.88	42282.45	14.79		
4	E	2030-08-27T09:08:00.182		25.48	-38.83	42569.83	14.81		
alpha	E	2030-08-27T09:10:26.911		25.99	-38.47	44749.15	14.89		
beta	E	2030-08-27T09:11:28.124		26.21	-38.32	45661.12	14.92		
eta	E	2030-08-27T09:13:09.549		26.56	-38.07	47176.12	14.96		
gamma	E	2030-08-27T09:13:39.856		26.67	-37.99	47629.66	14.97		
delta	E	2030-08-27T09:14:24.629		26.83	-37.88	48300.35	14.99		
lambda	E	2030-08-27T09:16:19.655		27.23	-37.59	50026.71	15.03		
epsilon	E	2030-08-27T09:18:00.912		27.59	-37.33	51550.05	15.07		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-08-27T08:27:46.920
 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 : 3416310308289710208
 2Mass ID (if available) : 05251517+2316026
 ICRS Star Coord at Epoch: 05h 25m 15.17963s +23:16:02.56716s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.722
 G magnitude : 17.951
 RP magnitude : 16.990
 BP magnitude : 18.908
 DUPflag : 0
 Distance (au) : 19.469
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 15.70
 Sun-Target sep (deg) : 71.68
 Sun-Moon sep (deg) : 52.91
 B (ring opening deg) : 81.07
 PA of pole (deg) : 25.72
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.431
 C/A sky separation (km) : 6086.2
 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	2030-08-27T07:33:16.674		32.11	-22.47	50800.86	-15.32		
lambda	I	2030-08-27T07:34:07.230		32.23	-22.28	50026.71	-15.31		
delta	I	2030-08-27T07:36:00.031		32.51	-21.85	48300.35	-15.30		
gamma	I	2030-08-27T07:36:44.410		32.61	-21.67	47621.52	-15.29		
eta	I	2030-08-27T07:37:13.536		32.68	-21.56	47176.12	-15.29		
beta	I	2030-08-27T07:38:52.113		32.92	-21.18	45669.54	-15.28		
alpha	I	2030-08-27T07:39:56.632		33.08	-20.94	44684.61	-15.27		
4	I	2030-08-27T07:42:16.416		33.41	-20.40	42552.20	-15.25		
5	I	2030-08-27T07:42:41.545		33.47	-20.30	42163.50	-15.25		
6	I	2030-08-27T07:43:06.021		33.52	-20.21	41795.52	-15.25		
Uranus	I	2030-08-27T08:01:06.496		35.95	-16.06	25279.03		6.18	6.47
Uranus	E	2030-08-27T08:54:46.175		41.50	-3.77x	25513.48		-2.47	-2.59
6	E	2030-08-27T09:12:50.500		42.70	0.33x	41879.52	15.15		
5	E	2030-08-27T09:13:17.928		42.72	0.43x	42293.04	15.15		
4	E	2030-08-27T09:13:36.541		42.74	0.50x	42577.71	15.15		
alpha	E	2030-08-27T09:15:59.906		42.87	1.04x	44751.13	15.17		
beta	E	2030-08-27T09:16:59.708		42.92	1.27x	45657.89	15.17		
eta	E	2030-08-27T09:18:39.755		43.00	1.65x	47176.12	15.18		
gamma	E	2030-08-27T09:19:09.668		43.02	1.76x	47630.25	15.18		
delta	E	2030-08-27T09:19:53.798		43.06	1.93x	48300.35	15.19		
lambda	E	2030-08-27T09:21:47.450		43.15	2.35x	50026.71	15.19		
epsilon	E	2030-08-27T09:23:26.818		43.22	2.73x	51536.77	15.20		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-08-27T08:25:38.480
 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 : 3416310308289710208
 2Mass ID (if available) : 05251517+2316026
 ICRS Star Coord at Epoch: 05h 25m 15.17963s +23:16:02.56716s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.722
 G magnitude : 17.951
 RP magnitude : 16.990
 BP magnitude : 18.908
 DUPflag : 0
 Distance (au) : 19.469
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 15.70
 Sun-Target sep (deg) : 71.68
 Sun-Moon sep (deg) : 52.87
 B (ring opening deg) : 81.07
 PA of pole (deg) : 25.72
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.452
 C/A sky separation (km) : 6383.3
 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	2030-08-27T07:31:43.905		9.19	-46.54	50802.65	-15.48		
lambda	I	2030-08-27T07:32:34.059		9.34	-46.37	50026.71	-15.47		
delta	I	2030-08-27T07:34:25.715		9.68	-45.98	48300.35	-15.45		
gamma	I	2030-08-27T07:35:09.648		9.82	-45.83	47621.50	-15.45		
eta	I	2030-08-27T07:35:38.480		9.90	-45.73	47176.12	-15.45		
beta	I	2030-08-27T07:37:16.064		10.20	-45.39	45669.71	-15.43		
alpha	I	2030-08-27T07:38:19.956		10.39	-45.16	44684.61	-15.42		
4	I	2030-08-27T07:40:38.404		10.81	-44.68	42551.80	-15.40		
5	I	2030-08-27T07:41:03.281		10.88	-44.59	42163.15	-15.39		
6	I	2030-08-27T07:41:27.500		10.96	-44.51	41795.60	-15.39		
Uranus	I	2030-08-27T07:59:18.959		14.12	-40.72	25270.37		6.28	6.57
Uranus	E	2030-08-27T08:52:19.136		22.77	-29.27	25516.12		-2.40	-2.51
6	E	2030-08-27T09:10:17.050		25.40	-25.35	41879.50	15.24		
5	E	2030-08-27T09:10:44.295		25.46	-25.25	42292.83	15.24		
4	E	2030-08-27T09:11:02.798		25.51	-25.18	42577.55	15.25		
alpha	E	2030-08-27T09:13:25.290		25.84	-24.66	44751.10	15.26		
beta	E	2030-08-27T09:14:24.731		25.98	-24.45	45657.95	15.27		
eta	E	2030-08-27T09:16:04.161		26.21	-24.09	47176.12	15.27		
gamma	E	2030-08-27T09:16:33.890		26.27	-23.98	47630.24	15.28		
delta	E	2030-08-27T09:17:17.752		26.37	-23.82	48300.35	15.28		
lambda	E	2030-08-27T09:19:10.713		26.63	-23.41	50026.71	15.29		
epsilon	E	2030-08-27T09:20:49.498		26.85	-23.05	51537.03	15.30		