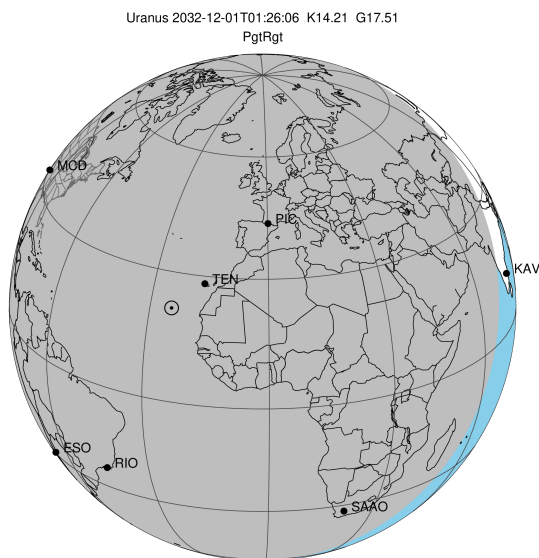


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-01T01:26:06.030
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3424867291892404992
 2Mass ID (if available) : 05595747+2338533

ICRS Star Coord at Epoch: 05h 59m 57.48387s +23:38:53.24224s

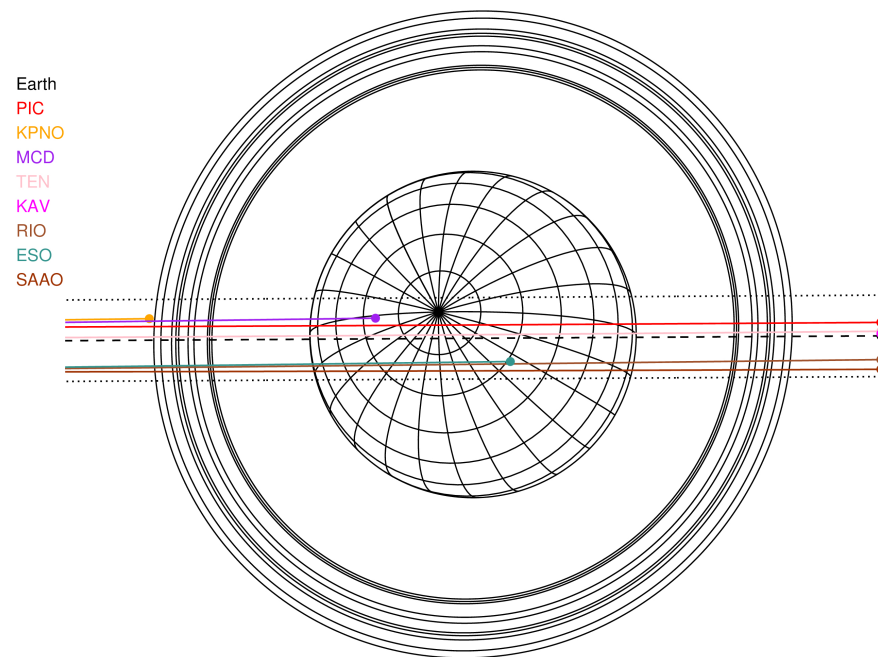
RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.205
 G magnitude : 17.511
 RP magnitude : 16.536
 BP magnitude : 18.543
 DUPflag : 0
 Distance (au) : 18.099
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.44
 Sun-Target sep (deg) : 158.95
 Sun-Moon sep (deg) : 136.96
 B (ring opening deg) : 75.36
 PA of pole (deg) : 56.94

#	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



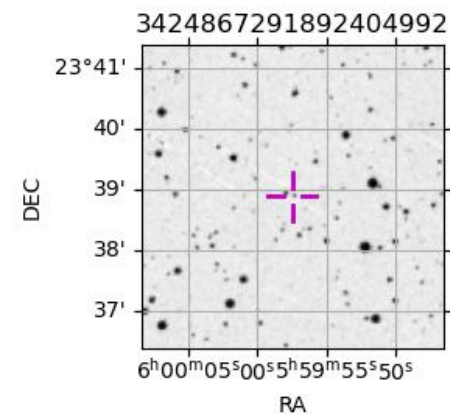
2032-12-01T01:26:06.0300 α: 05 59 57.4839 δ: +23 38 53.242 C/A 0.038° PA 0.33 deg v_sky -21.44 km/s D 18.10 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2032-12-01T01:26:06 K14.21 G17.51 PgtRgt

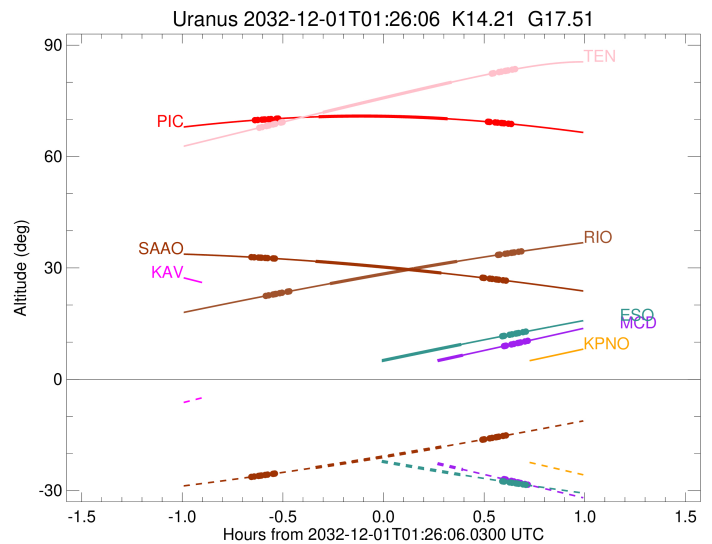
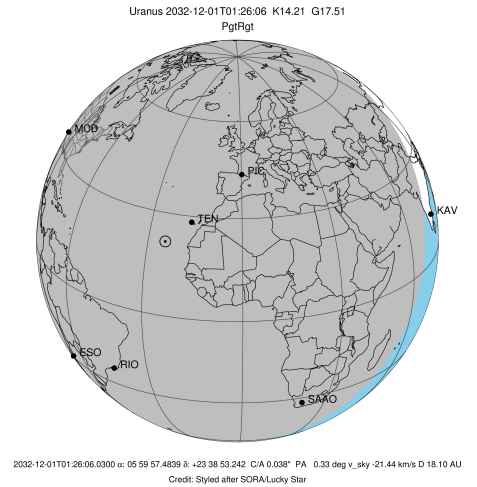


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	DEC 01 00:47 - DEC 01 02:04	PieRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4					PnnRnn
MCD	McDonald Obs. 2.7m	30.7	256.0		+	+++++	DEC 01 01:49 - DEC 01 02:09	PneRne
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+ +	+++++	DEC 01 00:48 - DEC 01 02:05	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	+++++	+ +	+++++	DEC 01 00:50 - DEC 01 02:07	PieRie
ESO	European Southern Obs	-29.3	289.3		+	+++++	DEC 01 01:49 - DEC 01 02:08	PneRne
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++	+ +	+++++	DEC 01 00:46 - DEC 01 02:02	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

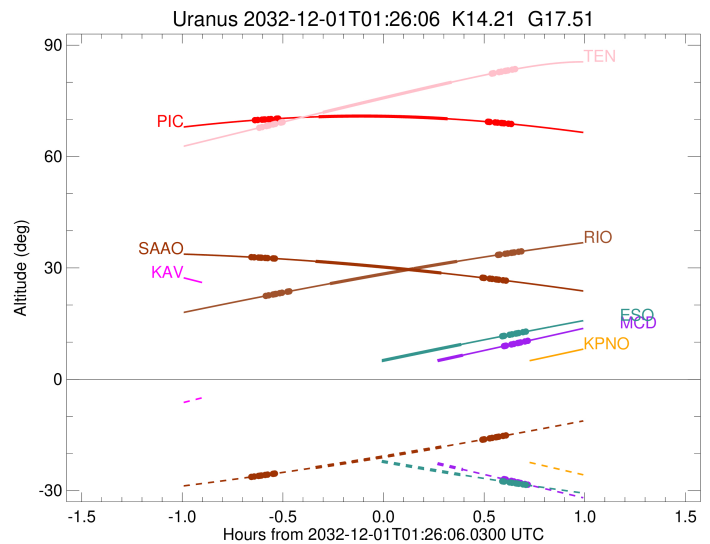
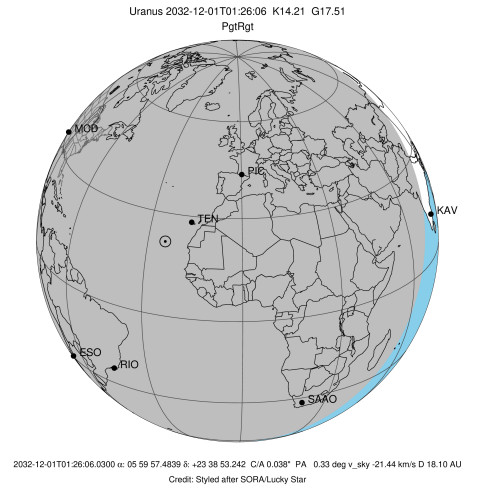


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-01T01:26:00.740
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3424867291892404992
 2Mass ID (if available) : 05595747+2338533
 ICRS Star Coord at Epoch: 05h 59m 57.48387s +23:38:53.24224s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.205
 G magnitude : 17.511
 RP magnitude : 16.536
 BP magnitude : 18.543
 DUPflag : 0
 Distance (au) : 18.099
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.44
 Sun-Target sep (deg) : 158.95
 Sun-Moon sep (deg) : 137.58
 B (ring opening deg) : 75.36
 PA of pole (deg) : 56.94
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.114
 C/A sky separation (km) : 1492.1
 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	2032-12-01T00:47:39.477		69.79	-65.73	51295.77	-22.28		
lambda	I	2032-12-01T00:48:36.454		69.85	-65.63	50026.71	-22.27		
delta	I	2032-12-01T00:49:53.965		69.94	-65.49	48300.35	-22.27		
gamma	I	2032-12-01T00:50:24.023		69.97	-65.43	47630.91	-22.27		
eta	I	2032-12-01T00:50:44.443		69.99	-65.40	47176.12	-22.27		
beta	I	2032-12-01T00:51:51.567		70.06	-65.27	45680.34	-22.27		
alpha	I	2032-12-01T00:52:33.371		70.10	-65.20	44752.32	-22.27		
4	I	2032-12-01T00:54:11.353		70.19	-65.01	42572.16	-22.27		
5	I	2032-12-01T00:54:22.654		70.20	-64.99	42314.00	-22.27		
6	I	2032-12-01T00:54:44.813		70.22	-64.95	41814.29	-22.26		
Uranus	I	2032-12-01T01:06:45.819		70.72	-63.49	25203.43		-11.68	-12.22
Uranus	E	2032-12-01T01:45:12.854		70.17	-57.97	25144.33		12.65	13.23
6	E	2032-12-01T01:57:14.490		69.36	-56.05	41862.76	22.27		
5	E	2032-12-01T01:57:27.434		69.34	-56.01	42157.33	22.27		
4	E	2032-12-01T01:57:45.479		69.32	-55.96	42566.91	22.28		
alpha	E	2032-12-01T01:59:20.646		69.19	-55.70	44684.62	22.28		
beta	E	2032-12-01T02:00:03.738		69.13	-55.59	45641.59	22.28		
eta	E	2032-12-01T02:01:12.578		69.03	-55.40	47176.12	22.28		
gamma	E	2032-12-01T02:01:32.567		69.00	-55.34	47621.47	22.28		
delta	E	2032-12-01T02:02:03.038		68.96	-55.26	48300.35	22.28		
lambda	E	2032-12-01T02:03:20.523		68.85	-55.05	50026.71	22.28		
epsilon	E	2032-12-01T02:04:05.135		68.78	-54.92	51020.71	22.29		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-01T01:30:19.490
 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 : 3424867291892404992
 2Mass ID (if available) : 05595747+2338533
 ICRS Star Coord at Epoch: 05h 59m 57.48387s +23:38:53.24224s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.205
 G magnitude : 17.511
 RP magnitude : 16.536
 BP magnitude : 18.543
 DUPflag : 0
 Distance (au) : 18.099
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.44
 Sun-Target sep (deg) : 158.95
 Sun-Moon sep (deg) : 136.42
 B (ring opening deg) : 75.36
 PA of pole (deg) : 56.94
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.210
 C/A sky separation (km) : 2756.1
 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

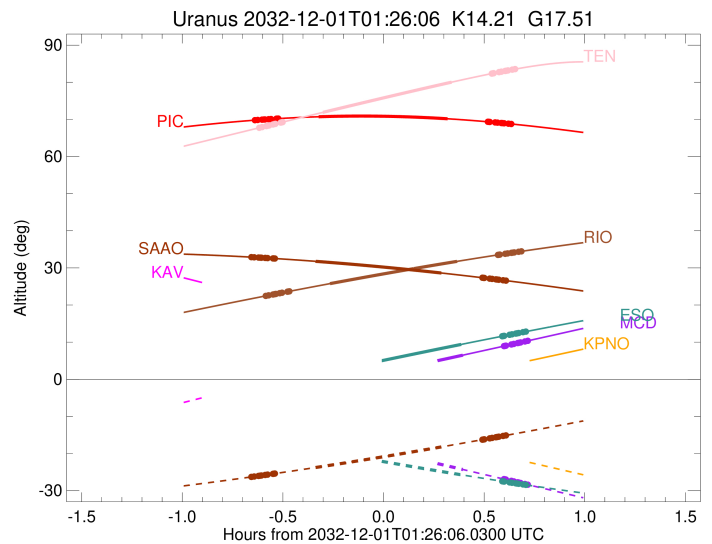
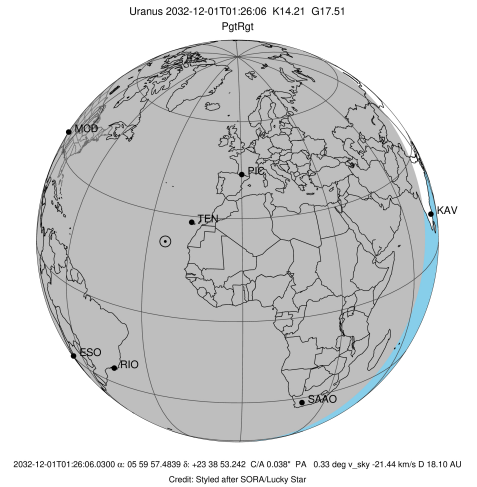


b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-12-01T00:51:09.167	-4.75x	-12.13	51307.78	-21.76			
lambda	I	2032-12-01T00:52:08.057	-4.57x	-12.33	50026.71	-21.75			
delta	I	2032-12-01T00:53:27.417	-4.32x	-12.60	48300.35	-21.75			
gamma	I	2032-12-01T00:53:58.196	-4.23x	-12.70	47630.82	-21.75			
eta	I	2032-12-01T00:54:19.098	-4.16x	-12.78	47176.12	-21.75			
beta	I	2032-12-01T00:55:27.834	-3.95x	-13.01	45680.12	-21.75			
alpha	I	2032-12-01T00:56:10.630	-3.82x	-13.16	44752.21	-21.75			
4	I	2032-12-01T00:57:51.012	-3.51x	-13.50	42570.48	-21.75			
5	I	2032-12-01T00:58:02.512	-3.47x	-13.54	42314.47	-21.75			
6	I	2032-12-01T00:58:25.160	-3.40x	-13.62	41815.65	-21.74			
Uranus	I	2032-12-01T01:10:44.595	-1.08x	-16.16	25233.93			-11.15	-11.66
Uranus	E	2032-12-01T01:49:47.265	6.50	-24.31	25125.02			12.95	13.54
6	E	2032-12-01T02:02:03.027	8.94	-26.90	41863.52	21.86			
5	E	2032-12-01T02:02:16.200	8.98	-26.95	42157.80	21.87			
4	E	2032-12-01T02:02:34.497	9.04	-27.01	42565.91	21.87			
alpha	E	2032-12-01T02:04:11.460	9.37	-27.35	44684.62	21.88			
beta	E	2032-12-01T02:04:55.329	9.51	-27.51	45641.50	21.88			
eta	E	2032-12-01T02:06:05.409	9.75	-27.76	47176.12	21.89			
gamma	E	2032-12-01T02:06:25.754	9.81	-27.83	47621.43	21.89			
delta	E	2032-12-01T02:06:56.768	9.92	-27.94	48300.35	21.89			
lambda	E	2032-12-01T02:08:15.618	10.18	-28.22	50026.71	21.90			
epsilon	E	2032-12-01T02:09:01.308	10.34	-28.38	51027.24	21.91			

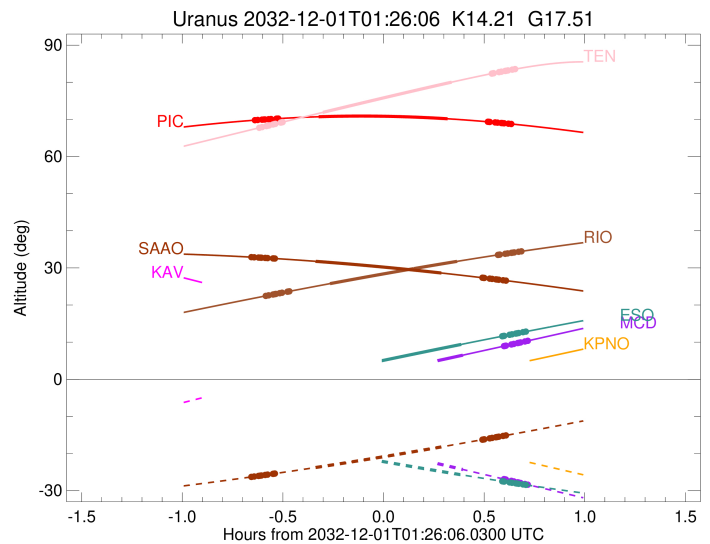
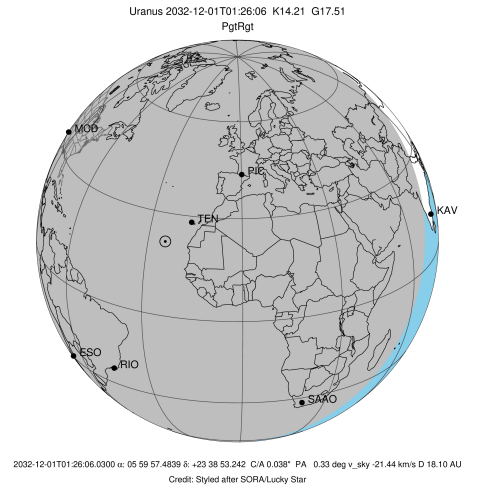
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2032-12-01T01:27:12.870
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       : 3424867291892404992
2Mass ID (if available) : 05595747+2338533
ICRS Star Coord at Epoch: 05h 59m 57.48387s +23:38:53.24224s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 14.205
G magnitude           : 17.511
RP magnitude          : 16.536
BP magnitude          : 18.543
DUPflag              : 0
Distance (au)        : 18.099
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -21.44
Sun-Target sep (deg) : 158.95
Sun-Moon sep (deg)   : 137.42
B (ring opening deg) : 75.36
PA of pole (deg)     : 56.94
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.003
C/A sky separation (km) : 40.0
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_itrfr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
```



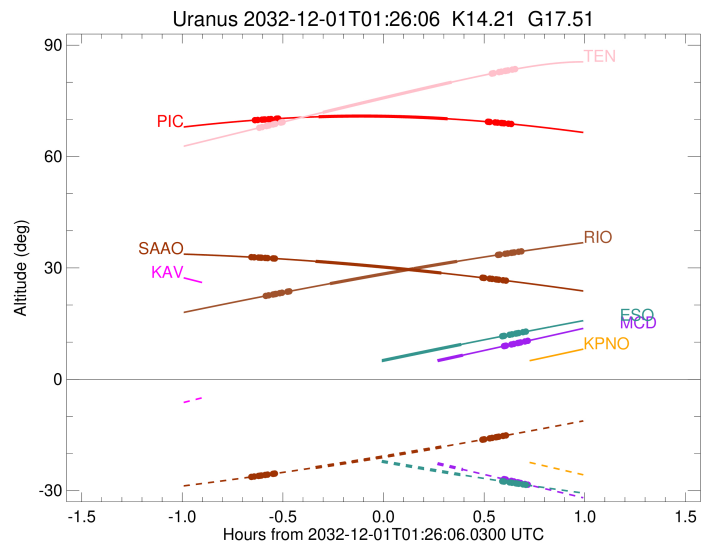
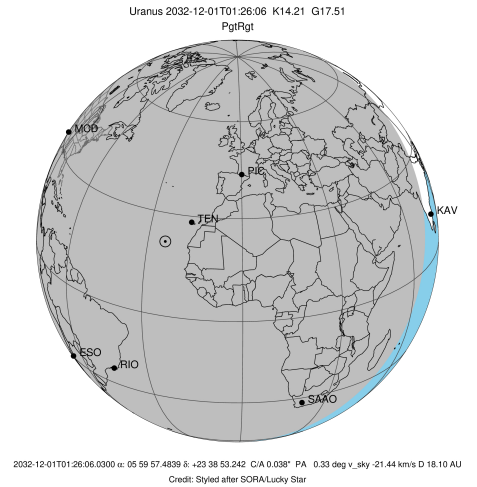
Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-12-01T00:48:57.947	67.72	-83.57	51285.10	-22.32		
lambda	I	2032-12-01T00:49:54.330	67.93	-83.62	50026.71	-22.32		
delta	I	2032-12-01T00:51:11.679	68.21	-83.66	48300.35	-22.32		
gamma	I	2032-12-01T00:51:41.669	68.32	-83.68	47630.98	-22.32		
eta	I	2032-12-01T00:52:02.048	68.40	-83.68	47176.12	-22.32		
beta	I	2032-12-01T00:53:09.016	68.64	-83.71	45680.52	-22.32		
alpha	I	2032-12-01T00:53:50.731	68.79	-83.71	44752.39	-22.32		
4	I	2032-12-01T00:55:28.428	69.15	-83.72	42573.71	-22.32		
5	I	2032-12-01T00:55:39.771	69.19	-83.72	42313.46	-22.32		
6	I	2032-12-01T00:56:01.909	69.27	-83.72	41813.06	-22.32		
Uranus	I	2032-12-01T01:07:59.985	71.89	-83.07	25173.58		-12.18	-12.74
Uranus	E	2032-12-01T01:46:25.208	80.04	-76.78	25174.68		12.16	12.72
6	E	2032-12-01T01:58:24.588	82.35	-74.34	41861.43	22.35		
5	E	2032-12-01T01:58:37.509	82.39	-74.30	42156.63	22.36		
4	E	2032-12-01T01:58:55.622	82.44	-74.24	42568.63	22.36		
alpha	E	2032-12-01T02:00:30.341	82.73	-73.91	44684.65	22.36		
beta	E	2032-12-01T02:01:13.276	82.85	-73.76	45641.76	22.36		
eta	E	2032-12-01T02:02:21.849	83.05	-73.52	47176.12	22.36		
gamma	E	2032-12-01T02:02:41.767	83.11	-73.45	47621.55	22.36		
delta	E	2032-12-01T02:03:12.120	83.20	-73.35	48300.35	22.36		
lambda	E	2032-12-01T02:04:29.313	83.41	-73.08	50026.71	22.36		
epsilon	E	2032-12-01T02:05:13.209	83.53	-72.92	51008.44	22.36		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-01T01:29:02.920
 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 : 3424867291892404992
 2Mass ID (if available) : 05595747+2338533
 ICRS Star Coord at Epoch: 05h 59m 57.48387s +23:38:53.24224s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.205
 G magnitude : 17.511
 RP magnitude : 16.536
 BP magnitude : 18.543
 DUPflag : 0
 Distance (au) : 18.099
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.44
 Sun-Target sep (deg) : 158.95
 Sun-Moon sep (deg) : 136.83
 B (ring opening deg) : 75.36
 PA of pole (deg) : 56.94
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.356
 C/A sky separation (km) : 4670.0
 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



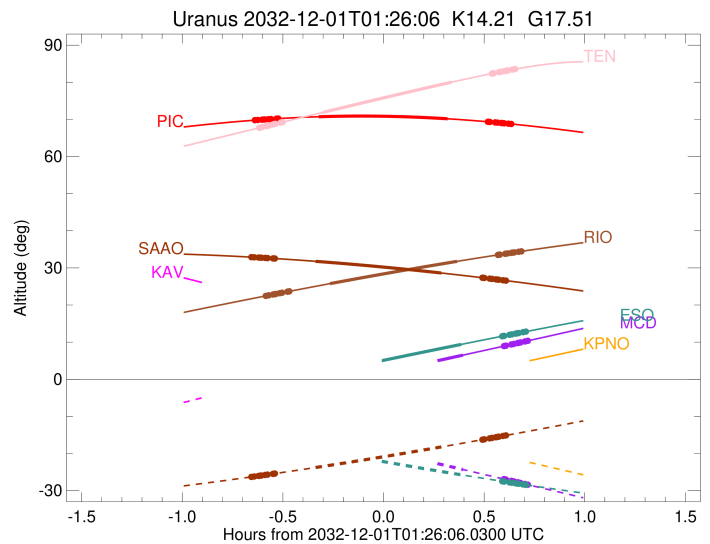
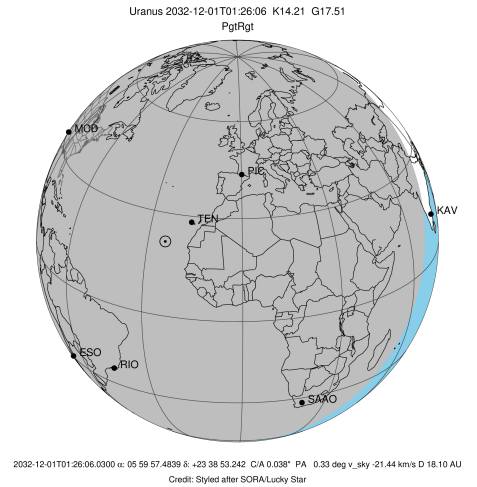
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-12-01T00:50:56.279		22.45	-37.85	51250.71	-22.10		
lambda	I	2032-12-01T00:51:51.621		22.61	-37.96	50026.71	-22.12		
delta	I	2032-12-01T00:53:09.693		22.84	-38.13	48300.35	-22.11		
gamma	I	2032-12-01T00:53:39.960		22.93	-38.19	47631.19	-22.11		
eta	I	2032-12-01T00:54:00.546		22.99	-38.23	47176.12	-22.11		
beta	I	2032-12-01T00:55:08.151		23.18	-38.37	45680.95	-22.10		
alpha	I	2032-12-01T00:55:50.308		23.31	-38.46	44752.38	-22.10		
4	I	2032-12-01T00:57:28.838		23.59	-38.66	42578.54	-22.09		
5	I	2032-12-01T00:57:40.547		23.63	-38.68	42311.19	-22.08		
6	I	2032-12-01T00:58:02.999		23.69	-38.72	41809.40	-22.07		
Uranus	I	2032-12-01T01:10:09.695		25.77	-40.11	25092.14		-13.46	-14.07
Uranus	E	2032-12-01T01:48:03.306		31.76	-43.50	25274.03		10.42	10.90
6	E	2032-12-01T02:00:14.178		33.51	-44.25	41857.24	22.16		
5	E	2032-12-01T02:00:27.337		33.54	-44.26	42155.21	22.17		
4	E	2032-12-01T02:00:45.983		33.58	-44.27	42573.77	22.18		
alpha	E	2032-12-01T02:02:21.231		33.80	-44.36	44685.01	22.19		
beta	E	2032-12-01T02:03:04.507		33.90	-44.39	45642.43	22.19		
eta	E	2032-12-01T02:04:13.561		34.06	-44.45	47176.12	22.20		
gamma	E	2032-12-01T02:04:33.633		34.10	-44.47	47621.82	22.21		
delta	E	2032-12-01T02:05:04.187		34.17	-44.49	48300.35	22.21		
lambda	E	2032-12-01T02:06:21.901		34.34	-44.55	50026.71	22.22		
epsilon	E	2032-12-01T02:07:04.485		34.44	-44.59	50972.96	22.21		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-01T01:30:04.260
 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 : 3424867291892404992
 2Mass ID (if available) : 05595747+2338533
 ICRS Star Coord at Epoch: 05h 59m 57.48387s +23:38:53.24224s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.205
 G magnitude : 17.511
 RP magnitude : 16.536
 BP magnitude : 18.543
 DUPflag : 0
 Distance (au) : 18.099
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.44
 Sun-Target sep (deg) : 158.95
 Sun-Moon sep (deg) : 136.45
 B (ring opening deg) : 75.36
 PA of pole (deg) : 56.94
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.328
 C/A sky separation (km) : 4312.1
 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_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	2032-12-01T00:51:36.397	-1.54x	-16.46	51254.13	-21.93			
lambda	I	2032-12-01T00:52:32.340	-1.36x	-16.62	50026.71	-21.94			
delta	I	2032-12-01T00:53:51.034	-1.10x	-16.84	48300.35	-21.94			
gamma	I	2032-12-01T00:54:21.542	-1.00x	-16.93	47631.17	-21.93			
eta	I	2032-12-01T00:54:42.289	-0.93x	-16.99	47176.12	-21.93			
beta	I	2032-12-01T00:55:50.427	-0.71x	-17.19	45680.92	-21.93			
alpha	I	2032-12-01T00:56:32.910	-0.57x	-17.31	44752.39	-21.93			
4	I	2032-12-01T00:58:12.220	-0.25x	-17.59	42578.08	-21.92			
5	I	2032-12-01T00:58:23.994	-0.21x	-17.62	42311.44	-21.91			
6	I	2032-12-01T00:58:46.612	-0.14x	-17.69	41809.73	-21.91			
Uranus	I	2032-12-01T01:10:58.498	2.22x	-19.74	25098.53	-13.36		-13.97	
Uranus	E	2032-12-01T01:49:16.148	9.39	-25.73	25267.30	10.54		11.03	
6	E	2032-12-01T02:01:31.166	11.59	-27.48	41857.49	22.02			
5	E	2032-12-01T02:01:44.400	11.63	-27.51	42155.26	22.03			
4	E	2032-12-01T02:02:03.144	11.69	-27.55	42573.48	22.04			
alpha	E	2032-12-01T02:03:39.013	11.97	-27.78	44684.98	22.05			
beta	E	2032-12-01T02:04:22.567	12.10	-27.88	45642.39	22.05			
eta	E	2032-12-01T02:05:32.067	12.31	-28.03	47176.12	22.06			
gamma	E	2032-12-01T02:05:52.269	12.37	-28.08	47621.81	22.06			
delta	E	2032-12-01T02:06:23.020	12.46	-28.15	48300.35	22.07			
lambda	E	2032-12-01T02:07:41.237	12.69	-28.33	50026.71	22.08			
epsilon	E	2032-12-01T02:08:24.180	12.81	-28.42	50974.80	22.07			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-01T01:24:30.660
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : SAAO
 Location : So. Afr. Astro. Obs. (Sutherland)
 Latitude (deg) : -32.37953
 E. Longitude (deg) : 20.81070
 Altitude (km) : 1.768
 Gaia source ID : 3424867291892404992
 2Mass ID (if available) : 05595747+2338533
 ICRS Star Coord at Epoch: 05h 59m 57.48387s +23:38:53.24224s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.205
 G magnitude : 17.511
 RP magnitude : 16.536
 BP magnitude : 18.543
 DUPflag : 0
 Distance (au) : 18.099
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.44
 Sun-Target sep (deg) : 158.95
 Sun-Moon sep (deg) : 137.48
 B (ring opening deg) : 75.36
 PA of pole (deg) : 56.94
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.434
 C/A sky separation (km) : 5694.0
 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_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	2032-12-01T00:46:38.889		32.90	-26.31	51239.67	-22.17		
lambda	I	2032-12-01T00:47:33.565		32.86	-26.20	50026.71	-22.18		
delta	I	2032-12-01T00:48:51.417		32.79	-26.03	48300.35	-22.17		
gamma	I	2032-12-01T00:49:21.602		32.76	-25.97	47631.25	-22.16		
eta	I	2032-12-01T00:49:42.138		32.74	-25.92	47176.12	-22.16		
beta	I	2032-12-01T00:50:49.578		32.68	-25.78	45681.04	-22.15		
alpha	I	2032-12-01T00:51:31.651		32.65	-25.69	44752.31	-22.14		
4	I	2032-12-01T00:53:09.939		32.56	-25.47	42579.97	-22.13		
5	I	2032-12-01T00:53:21.709		32.55	-25.45	42310.33	-22.11		
6	I	2032-12-01T00:53:44.139		32.52	-25.40	41808.37	-22.10		
Uranus	I	2032-12-01T01:05:51.116		31.77	-23.77	25073.95		-13.73	-14.35
Uranus	E	2032-12-01T01:43:20.983		28.62	-18.23	25292.30		10.07	10.54
6	E	2032-12-01T01:55:36.163		27.35	-16.27	41856.59	22.07		
5	E	2032-12-01T01:55:49.397		27.33	-16.23	42155.09	22.08		
4	E	2032-12-01T01:56:08.165		27.29	-16.18	42574.53	22.09		
alpha	E	2032-12-01T01:57:43.728		27.12	-15.92	44685.10	22.11		
beta	E	2032-12-01T01:58:27.160		27.04	-15.81	45642.54	22.12		
eta	E	2032-12-01T01:59:36.451		26.91	-15.62	47176.12	22.13		
gamma	E	2032-12-01T01:59:56.595		26.87	-15.56	47621.86	22.13		
delta	E	2032-12-01T02:00:27.253		26.82	-15.48	48300.35	22.13		
lambda	E	2032-12-01T02:01:45.232		26.67	-15.26	50026.71	22.14		
epsilon	E	2032-12-01T02:02:27.751		26.59	-15.15	50968.36	22.13		