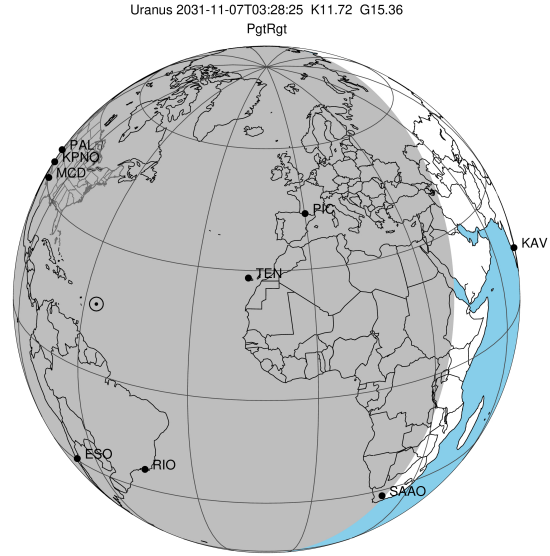


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-11-07T03:28:25.810
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3428374429044668800
 2Mass ID (if available) : 05435043+2331509

ICRS Star Coord at Epoch: 05h 43m 50.43864s +23:31:50.90028s

RUWE (>1.4 is poor) : 1.07
 K magnitude : 11.716
 G magnitude : 15.360
 RP magnitude : 14.337
 BP magnitude : 16.439
 DUPflag : 0
 Distance (au) : 18.349
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.70
 Sun-Target sep (deg) : 137.77
 Sun-Moon sep (deg) : 46.40
 B (ring opening deg) : 78.33
 PA of pole (deg) : 45.84

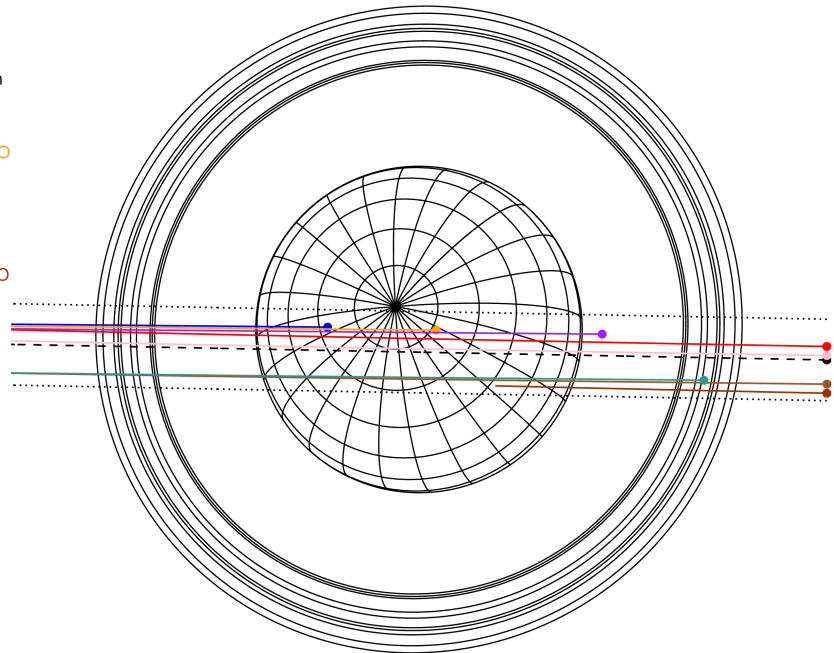
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2031-11-07T03:28:25.8100 cc: 05 43 50.4386 s: +23 31 50.9000 C/A 0.259° PA 358.91 deg v_sky -15.70 km/s D 18.35 AU
 Credit: Styled after SORA/Lucky Star

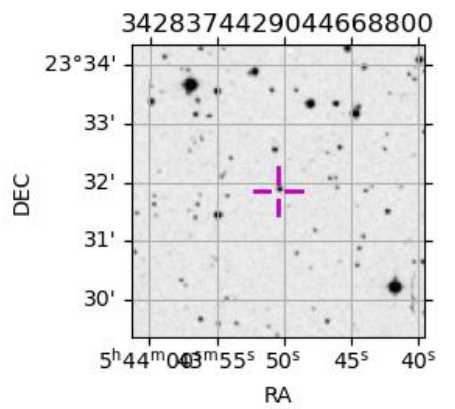
Uranus 2031-11-07T03:28:25 K11.72 G15.36 PgtRgt

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 RIO
 ESO
 SAAO



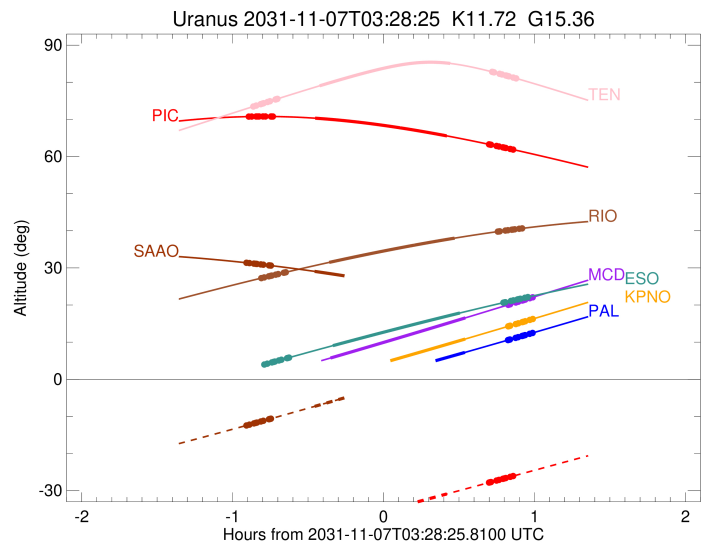
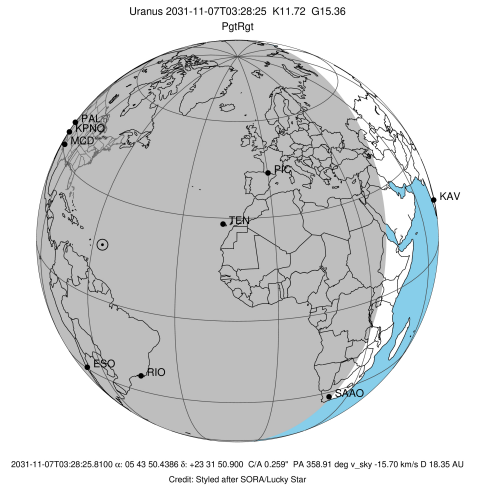
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1	+++++	+	+++++	NOV 07 02:34 - NOV 07 04:20	PieRie
PAL	Palomar Mt (200")	33.4	243.1		+	+++++	NOV 07 04:00 - NOV 07 04:27	PneRne
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4		+	+++++	NOV 07 04:00 - NOV 07 04:27	PneRne
MCD	McDonald Obs. 2.7m	30.7	256.0		+	+++++	NOV 07 03:07 - NOV 07 04:27	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+	+++++	NOV 07 02:36 - NOV 07 04:21	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 07 02:39 - NOV 07 04:23	PieRie
ESO	European Southern Obs	-29.3	289.3	++++	+	+++++	NOV 07 02:46 - NOV 07 04:25	PieRie
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++	+		NOV 07 02:33 - NOV 07 03:01	PinRin
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



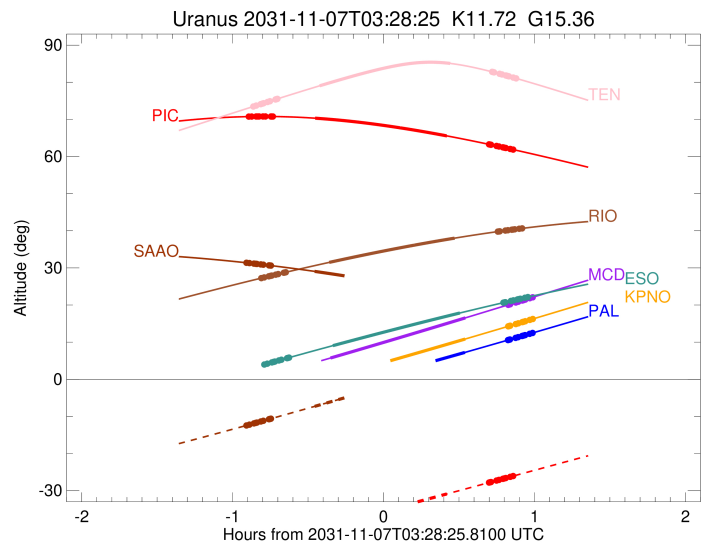
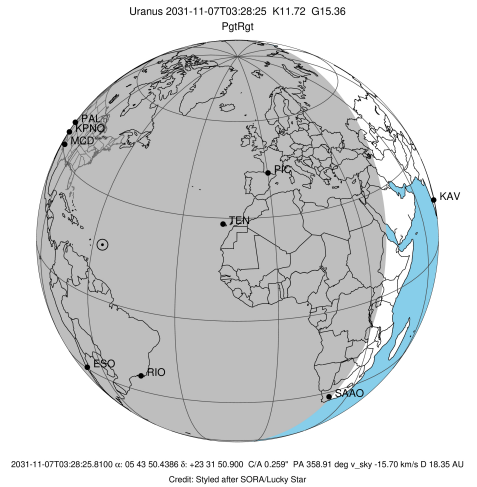
```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2031-11-07T03:27:23.420
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       : 3428374429044668800
2Mass ID (if available) : 05435043+2331509
ICRS Star Coord at Epoch: 05h 43m 50.43864s +23:31:50.90028s
RUWE (>1.4 is poor) : 1.07
K magnitude           : 11.716
G magnitude           : 15.360
RP magnitude          : 14.337
BP magnitude          : 16.439
DUPflag              : 0
Distance (au)        : 18.349
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -15.70
Sun-Target sep (deg) : 137.77
Sun-Moon sep (deg)   : 46.94
B (ring opening deg) : 78.33
PA of pole (deg)     : 45.84
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.108
C/A sky separation (km) : 1430.6
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl1.spk
ural11.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.ural11.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
  
```



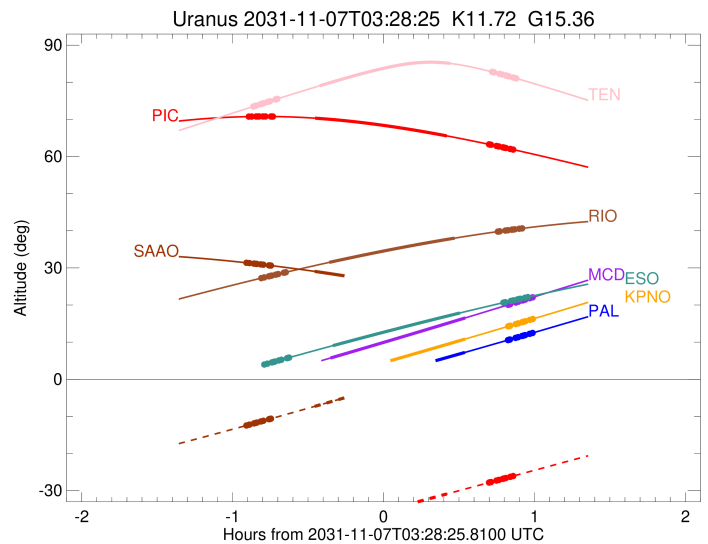
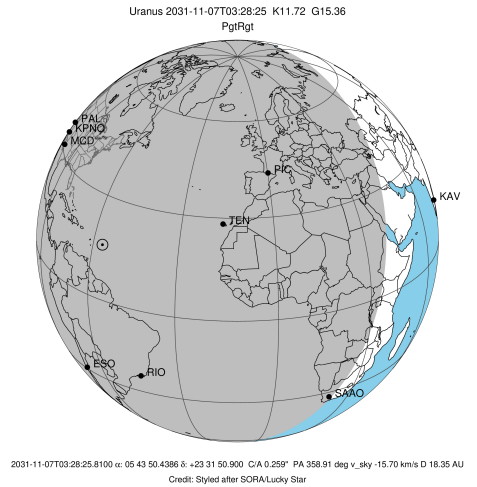
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-11-07T02:34:57.957		70.76	-44.84	51075.43	-16.21		
lambda	I	2031-11-07T02:36:02.688		70.77	-44.66	50026.71	-16.20		
delta	I	2031-11-07T02:37:49.248		70.79	-44.36	48300.35	-16.20		
gamma	I	2031-11-07T02:38:30.535		70.79	-44.24	47631.47	-16.20		
eta	I	2031-11-07T02:38:58.642		70.79	-44.16	47176.12	-16.20		
beta	I	2031-11-07T02:40:32.048		70.80	-43.89	45662.73	-16.20		
alpha	I	2031-11-07T02:41:31.658		70.80	-43.72	44695.38	-16.20		
4	I	2031-11-07T02:43:40.182		70.79	-43.36	42614.34	-16.20		
5	I	2031-11-07T02:44:00.762		70.78	-43.30	42284.03	-16.20		
6	I	2031-11-07T02:44:29.488		70.78	-43.21	41810.15	-16.20		
Uranus	I	2031-11-07T03:01:13.181		70.33	-40.30	25222.55		-8.95	-9.36
Uranus	E	2031-11-07T03:53:37.693		65.56	-30.89	25285.23		8.05	8.43
6	E	2031-11-07T04:10:24.479		63.28	-27.82	41862.12	16.19		
5	E	2031-11-07T04:10:43.717		63.23	-27.76	42181.91	16.20		
4	E	2031-11-07T04:11:05.371		63.18	-27.70	42529.13	16.20		
alpha	E	2031-11-07T04:13:22.108		62.85	-27.28	44743.10	16.20		
beta	E	2031-11-07T04:14:18.670		62.71	-27.11	45660.73	16.20		
eta	E	2031-11-07T04:15:52.216		62.48	-26.82	47176.12	16.20		
gamma	E	2031-11-07T04:16:19.683		62.41	-26.74	47621.01	16.20		
delta	E	2031-11-07T04:17:01.624		62.31	-26.61	48300.35	16.20		
lambda	E	2031-11-07T04:18:48.206		62.05	-26.29	50026.71	16.20		
epsilon	E	2031-11-07T04:20:03.000		61.86	-26.06	51238.20	16.20		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-11-07T03:33:52.250
 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 : 3428374429044668800
 2Mass ID (if available) : 05435043+2331509
 ICRS Star Coord at Epoch: 05h 43m 50.43864s +23:31:50.90028s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 11.716
 G magnitude : 15.360
 RP magnitude : 14.337
 BP magnitude : 16.439
 DUPflag : 0
 Distance (au) : 18.348
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.70
 Sun-Target sep (deg) : 137.77
 Sun-Moon sep (deg) : 46.95
 B (ring opening deg) : 78.33
 PA of pole (deg) : 45.84
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.017
 C/A sky separation (km) : 232.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ural11.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ural11.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



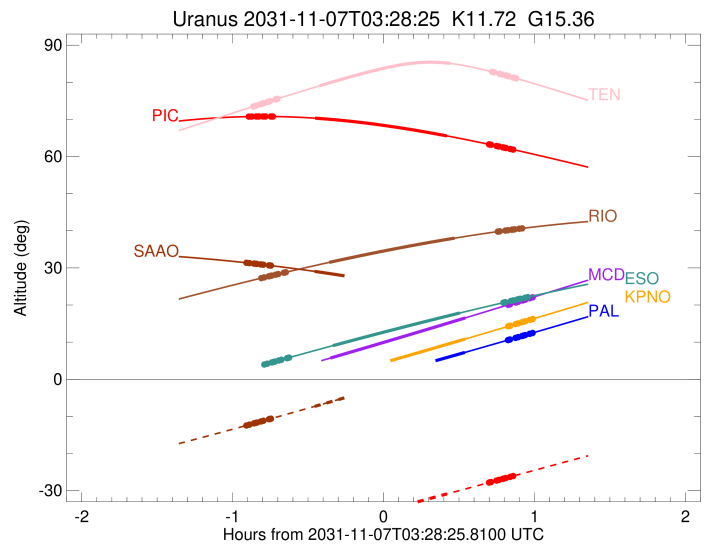
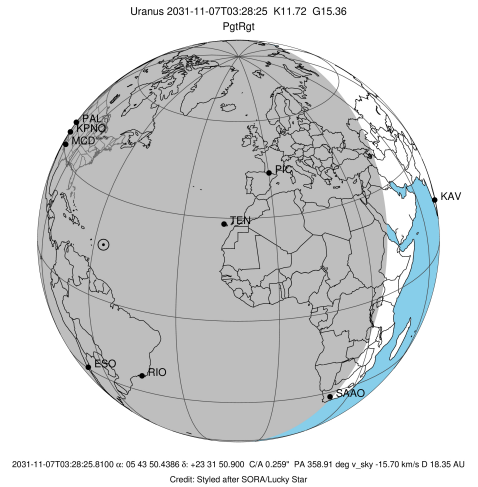
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-11-07T02:39:47.752	-7.62x	-22.95	51058.60	-15.68			
lambda	I	2031-11-07T02:40:53.557	-7.43x	-23.18	50026.71	-15.68			
delta	I	2031-11-07T02:42:43.633	-7.12x	-23.57	48300.35	-15.68			
gamma	I	2031-11-07T02:43:26.274	-6.99x	-23.71	47631.52	-15.69			
eta	I	2031-11-07T02:43:55.306	-6.91x	-23.81	47176.12	-15.69			
beta	I	2031-11-07T02:45:31.820	-6.63x	-24.15	45661.80	-15.69			
alpha	I	2031-11-07T02:46:33.388	-6.45x	-24.37	44694.23	-15.69			
4	I	2031-11-07T02:48:46.023	-6.06x	-24.83	42613.59	-15.69			
5	I	2031-11-07T02:49:07.041	-6.00x	-24.90	42287.11	-15.70			
6	I	2031-11-07T02:49:36.794	-5.91x	-25.00	41811.81	-15.69			
Uranus	I	2031-11-07T03:06:51.266	-2.84x	-28.61	25264.95	-8.35		-8.74	
Uranus	E	2031-11-07T04:00:47.277	7.23	-39.88	25254.79	8.50		8.89	
6	E	2031-11-07T04:17:56.175	10.56	-43.44	41863.09	15.86			
5	E	2031-11-07T04:18:15.852	10.62	-43.50	42183.62	15.87			
4	E	2031-11-07T04:18:37.812	10.70	-43.58	42528.68	15.86			
alpha	E	2031-11-07T04:20:57.377	11.15	-44.06	44742.49	15.87			
beta	E	2031-11-07T04:21:55.101	11.34	-44.26	45660.23	15.87			
eta	E	2031-11-07T04:23:30.581	11.65	-44.59	47176.12	15.88			
gamma	E	2031-11-07T04:23:58.605	11.74	-44.68	47621.03	15.88			
delta	E	2031-11-07T04:24:41.389	11.88	-44.83	48300.35	15.88			
lambda	E	2031-11-07T04:26:30.099	12.24	-45.20	50026.71	15.88			
epsilon	E	2031-11-07T04:27:45.850	12.49	-45.46	51229.92	15.88			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-11-07T03:34:03.660
 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 : 3428374429044668800
 2Mass ID (if available) : 05435043+2331509
 ICRS Star Coord at Epoch: 05h 43m 50.43864s +23:31:50.90028s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 11.716
 G magnitude : 15.360
 RP magnitude : 14.337
 BP magnitude : 16.439
 DUPflag : 0
 Distance (au) : 18.348
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.70
 Sun-Target sep (deg) : 137.77
 Sun-Moon sep (deg) : 47.00
 B (ring opening deg) : 78.33
 PA of pole (deg) : 45.84
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.005
 C/A sky separation (km) : 72.7
 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



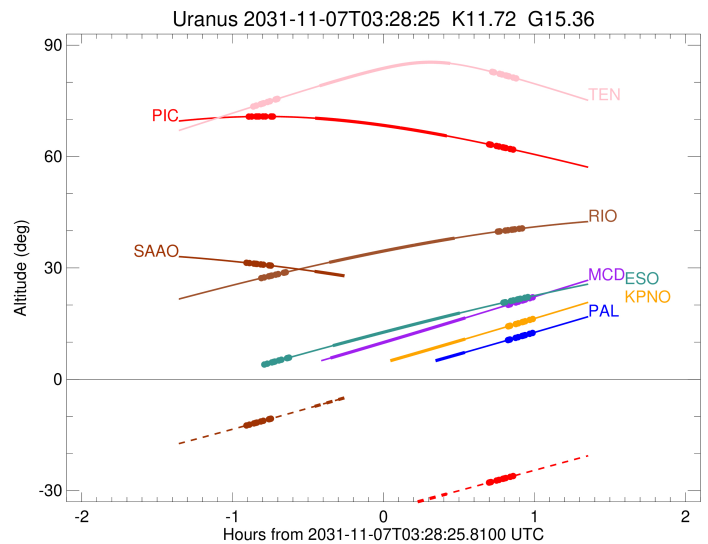
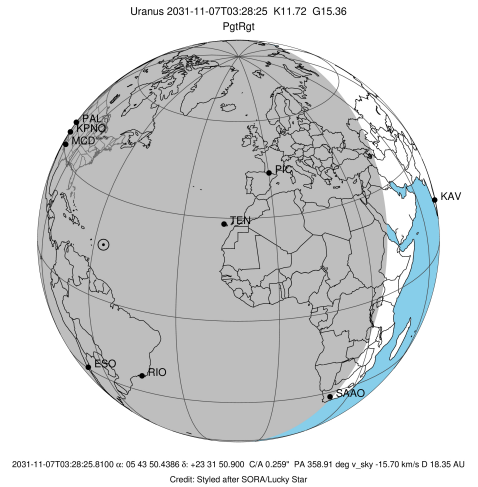
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-11-07T02:40:06.199	-4.60x	-27.36	51060.81	-15.71			
lambda	I	2031-11-07T02:41:12.014	-4.40x	-27.59	50026.71	-15.71			
delta	I	2031-11-07T02:43:01.872	-4.07x	-27.98	48300.35	-15.72			
gamma	I	2031-11-07T02:43:44.428	-3.94x	-28.13	47631.51	-15.72			
eta	I	2031-11-07T02:44:13.401	-3.85x	-28.23	47176.12	-15.72			
beta	I	2031-11-07T02:45:49.714	-3.56x	-28.57	45661.92	-15.72			
alpha	I	2031-11-07T02:46:51.155	-3.37x	-28.79	44694.39	-15.72			
4	I	2031-11-07T02:49:03.527	-2.96x	-29.26	42613.70	-15.73			
5	I	2031-11-07T02:49:24.533	-2.90x	-29.33	42286.69	-15.73			
6	I	2031-11-07T02:49:54.212	-2.81x	-29.44	41811.58	-15.73			
Uranus	I	2031-11-07T03:07:06.541	0.40x	-33.10	25258.40			-8.44	-8.84
Uranus	E	2031-11-07T04:00:55.574	10.84	-44.49	25261.72			8.40	8.79
6	E	2031-11-07T04:18:02.051	14.27	-48.07	41862.83	15.90			
5	E	2031-11-07T04:18:21.671	14.33	-48.14	42183.15	15.90			
4	E	2031-11-07T04:18:43.620	14.41	-48.22	42528.80	15.90			
alpha	E	2031-11-07T04:21:02.863	14.87	-48.70	44742.66	15.91			
beta	E	2031-11-07T04:22:00.453	15.07	-48.90	45660.37	15.91			
eta	E	2031-11-07T04:23:35.703	15.39	-49.23	47176.12	15.91			
gamma	E	2031-11-07T04:24:03.661	15.48	-49.33	47621.02	15.91			
delta	E	2031-11-07T04:24:46.347	15.63	-49.47	48300.35	15.92			
lambda	E	2031-11-07T04:26:34.805	15.99	-49.85	50026.71	15.92			
epsilon	E	2031-11-07T04:27:50.537	16.25	-50.11	51232.41	15.92			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-11-07T03:34:12.190
 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 : 3428374429044668800
 2Mass ID (if available) : 05435043+2331509
 ICRS Star Coord at Epoch: 05h 43m 50.43864s +23:31:50.90028s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 11.716
 G magnitude : 15.360
 RP magnitude : 14.337
 BP magnitude : 16.439
 DUPflag : 0
 Distance (au) : 18.348
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.70
 Sun-Target sep (deg) : 137.77
 Sun-Moon sep (deg) : 47.07
 B (ring opening deg) : 78.33
 PA of pole (deg) : 45.84
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.035
 C/A sky separation (km) : 468.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ural11.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ural11.bsp
 ural61.bsp
 vgr2.ural61.bsp
 peph.ural60.bsp
 earthstns_itr93_040916.bsp
 earth_720101_070426.bpc
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 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



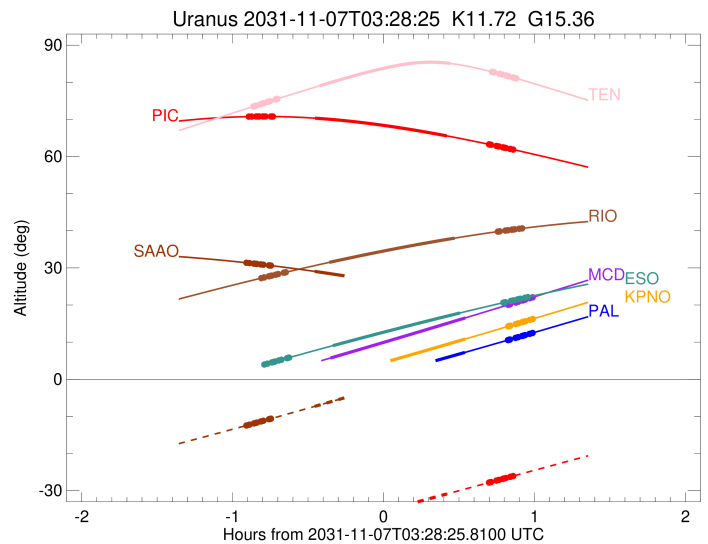
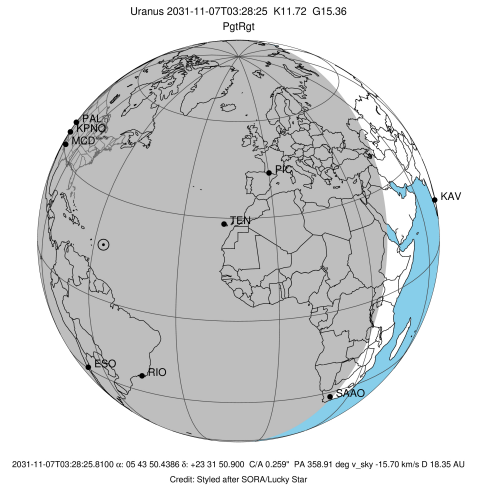
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-11-07T02:40:25.688		0.48x	-33.88	51063.75	-15.76		
lambda	I	2031-11-07T02:41:31.487		0.69x	-34.12	50026.71	-15.76		
delta	I	2031-11-07T02:43:21.005		1.04x	-34.51	48300.35	-15.76		
gamma	I	2031-11-07T02:44:03.429		1.18x	-34.66	47631.50	-15.77		
eta	I	2031-11-07T02:44:32.313		1.27x	-34.77	47176.12	-15.77		
beta	I	2031-11-07T02:46:08.316		1.58x	-35.11	45662.09	-15.77		
alpha	I	2031-11-07T02:47:09.564		1.78x	-35.33	44694.59	-15.77		
4	I	2031-11-07T02:49:21.531		2.20x	-35.81	42613.84	-15.77		
5	I	2031-11-07T02:49:42.512		2.27x	-35.88	42286.13	-15.78		
6	I	2031-11-07T02:50:12.080		2.37x	-35.99	41811.27	-15.77		
Uranus	I	2031-11-07T03:07:21.216		5.72	-39.68	25249.82		-8.57	-8.97
Uranus	E	2031-11-07T04:00:59.004		16.54	-51.11	25270.61		8.27	8.65
6	E	2031-11-07T04:18:02.086		20.06	-54.68	41862.50	15.95		
5	E	2031-11-07T04:18:21.630		20.13	-54.75	42182.57	15.95		
4	E	2031-11-07T04:18:43.556		20.20	-54.82	42528.95	15.95		
alpha	E	2031-11-07T04:21:02.343		20.68	-55.30	44742.87	15.96		
beta	E	2031-11-07T04:21:59.742		20.88	-55.50	45660.55	15.96		
eta	E	2031-11-07T04:23:34.668		21.21	-55.82	47176.12	15.97		
gamma	E	2031-11-07T04:24:02.533		21.31	-55.92	47621.02	15.97		
delta	E	2031-11-07T04:24:45.079		21.46	-56.07	48300.35	15.97		
lambda	E	2031-11-07T04:26:33.180		21.83	-56.44	50026.71	15.97		
epsilon	E	2031-11-07T04:27:48.859		22.09	-56.70	51235.56	15.98		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-11-07T03:28:53.570
 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 : 3428374429044668800
 2Mass ID (if available) : 05435043+2331509
 ICRS Star Coord at Epoch: 05h 43m 50.43864s +23:31:50.90028s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 11.716
 G magnitude : 15.360
 RP magnitude : 14.337
 BP magnitude : 16.439
 DUPflag : 0
 Distance (au) : 18.349
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.70
 Sun-Target sep (deg) : 137.77
 Sun-Moon sep (deg) : 47.11
 B (ring opening deg) : 78.33
 PA of pole (deg) : 45.84
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.227
 C/A sky separation (km) : 3025.6
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ural11.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ural11.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



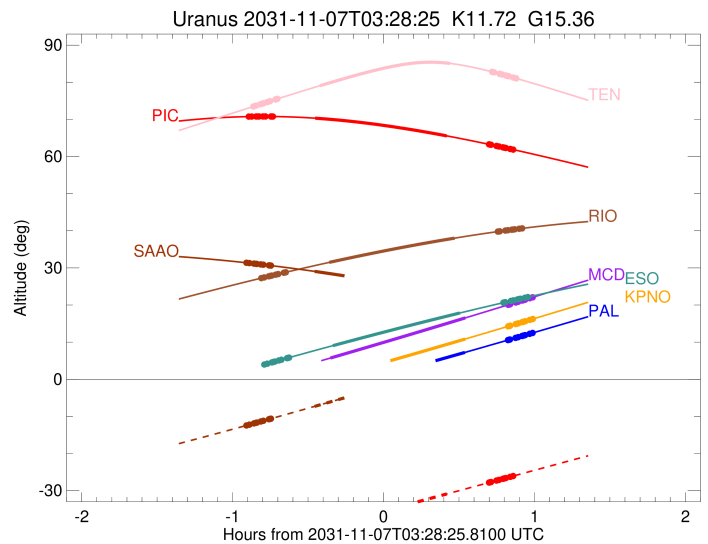
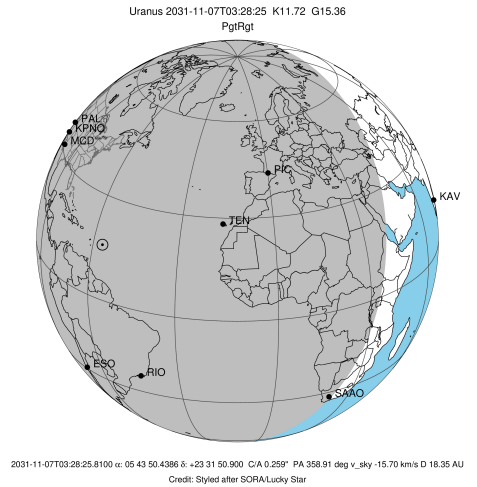
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-11-07T02:36:45.729		73.49	-62.55	51086.94	-16.23		
lambda	I	2031-11-07T02:37:51.067		73.73	-62.33	50026.71	-16.23		
delta	I	2031-11-07T02:39:37.464		74.11	-61.96	48300.35	-16.23		
gamma	I	2031-11-07T02:40:18.691		74.26	-61.81	47631.44	-16.22		
eta	I	2031-11-07T02:40:46.755		74.36	-61.72	47176.12	-16.22		
beta	I	2031-11-07T02:42:19.987		74.70	-61.39	45663.38	-16.22		
alpha	I	2031-11-07T02:43:19.498		74.91	-61.19	44696.22	-16.22		
4	I	2031-11-07T02:45:27.888		75.37	-60.74	42614.80	-16.22		
5	I	2031-11-07T02:45:48.595		75.44	-60.67	42281.74	-16.22		
6	I	2031-11-07T02:46:17.210		75.54	-60.57	41808.99	-16.21		
Uranus	I	2031-11-07T03:03:00.785		79.05	-57.02	25189.61		-9.39	-9.82
Uranus	E	2031-11-07T03:54:53.639		85.09	-45.76	25321.99		7.48	7.83
6	E	2031-11-07T04:11:38.237		82.81	-42.08	41860.68	16.25		
5	E	2031-11-07T04:11:57.361		82.76	-42.01	42179.51	16.25		
4	E	2031-11-07T04:12:19.141		82.69	-41.93	42529.84	16.26		
alpha	E	2031-11-07T04:14:35.364		82.29	-41.43	44743.98	16.26		
beta	E	2031-11-07T04:15:31.701		82.12	-41.22	45661.49	16.26		
eta	E	2031-11-07T04:17:04.821		81.83	-40.88	47176.12	16.26		
gamma	E	2031-11-07T04:17:32.172		81.74	-40.78	47620.99	16.27		
delta	E	2031-11-07T04:18:13.939		81.61	-40.63	48300.35	16.27		
lambda	E	2031-11-07T04:20:00.063		81.28	-40.24	50026.71	16.27		
epsilon	E	2031-11-07T04:21:15.348		81.03	-39.96	51251.56	16.28		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-11-07T03:31:37.800
 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 : 3428374429044668800
 2Mass ID (if available) : 05435043+2331509
 ICRS Star Coord at Epoch: 05h 43m 50.43864s +23:31:50.90028s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 11.716
 G magnitude : 15.360
 RP magnitude : 14.337
 BP magnitude : 16.439
 DUPflag : 0
 Distance (au) : 18.349
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.70
 Sun-Target sep (deg) : 137.77
 Sun-Moon sep (deg) : 47.03
 B (ring opening deg) : 78.33
 PA of pole (deg) : 45.84
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.585
 C/A sky separation (km) : 7784.2
 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



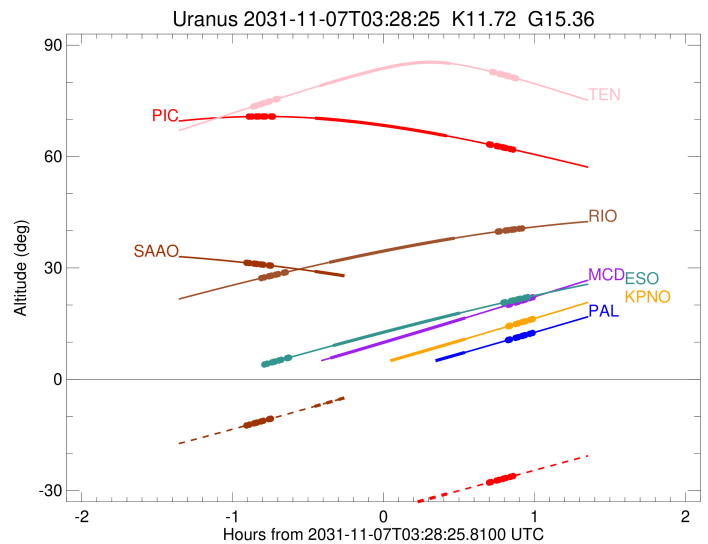
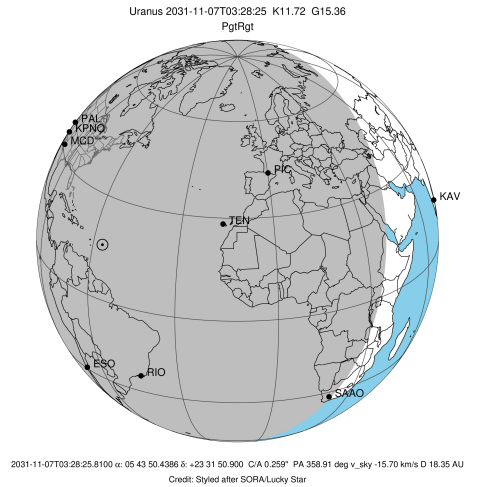
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-11-07T02:39:53.378		27.25	-51.05	51123.30	-16.00		
lambda	I	2031-11-07T02:41:02.016		27.44	-51.05	50026.71	-15.97		
delta	I	2031-11-07T02:42:50.137		27.74	-51.03	48300.35	-15.96		
gamma	I	2031-11-07T02:43:32.063		27.85	-51.02	47631.30	-15.96		
eta	I	2031-11-07T02:44:00.594		27.93	-51.02	47176.12	-15.95		
beta	I	2031-11-07T02:45:35.332		28.18	-51.00	45665.40	-15.94		
alpha	I	2031-11-07T02:46:35.859		28.34	-50.98	44698.99	-15.93		
4	I	2031-11-07T02:48:46.828		28.69	-50.95	42615.91	-15.91		
5	I	2031-11-07T02:49:08.424		28.75	-50.94	42274.26	-15.90		
6	I	2031-11-07T02:49:37.339		28.83	-50.93	41805.63	-15.89		
Uranus	I	2031-11-07T03:06:51.549		31.49	-50.36	25097.50		-10.53	-11.02
Uranus	E	2031-11-07T03:56:42.697		38.02	-46.39	25425.22		5.59	5.86
6	E	2031-11-07T04:13:53.407		39.78	-44.34	41856.25	15.99		
5	E	2031-11-07T04:14:12.762		39.81	-44.30	42173.01	16.00		
4	E	2031-11-07T04:14:35.462		39.85	-44.25	42532.30	16.01		
alpha	E	2031-11-07T04:16:53.641		40.06	-43.95	44746.34	16.04		
beta	E	2031-11-07T04:17:50.748		40.15	-43.82	45663.70	16.05		
eta	E	2031-11-07T04:19:24.916		40.29	-43.62	47176.12	16.07		
gamma	E	2031-11-07T04:19:52.599		40.33	-43.56	47620.96	16.07		
delta	E	2031-11-07T04:20:34.863		40.39	-43.46	48300.35	16.08		
lambda	E	2031-11-07T04:22:22.178		40.54	-43.22	50026.71	16.10		
epsilon	E	2031-11-07T04:23:40.635		40.66	-43.04	51289.93	16.13		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-11-07T03:33:25.320
 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 : 3428374429044668800
 2Mass ID (if available) : 05435043+2331509
 ICRS Star Coord at Epoch: 05h 43m 50.43864s +23:31:50.90028s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 11.716
 G magnitude : 15.360
 RP magnitude : 14.337
 BP magnitude : 16.439
 DUPflag : 0
 Distance (au) : 18.348
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.70
 Sun-Target sep (deg) : 137.77
 Sun-Moon sep (deg) : 46.97
 B (ring opening deg) : 78.33
 PA of pole (deg) : 45.84
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.564
 C/A sky separation (km) : 7508.3
 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	2031-11-07T02:41:05.901		3.98x	-38.06	51120.04	-15.84		
lambda	I	2031-11-07T02:42:15.037		4.20x	-38.19	50026.71	-15.81		
delta	I	2031-11-07T02:44:04.257		4.55x	-38.40	48300.35	-15.80		
gamma	I	2031-11-07T02:44:46.605		4.68x	-38.48	47631.31	-15.80		
eta	I	2031-11-07T02:45:15.424		4.77x	-38.54	47176.12	-15.79		
beta	I	2031-11-07T02:46:51.116		5.07	-38.72	45665.22	-15.78		
alpha	I	2031-11-07T02:47:52.248		5.26	-38.84	44698.74	-15.77		
4	I	2031-11-07T02:50:04.480		5.68	-39.08	42615.84	-15.75		
5	I	2031-11-07T02:50:26.244		5.75	-39.12	42274.92	-15.75		
6	I	2031-11-07T02:50:55.462		5.84	-39.17	41805.90	-15.74		
Uranus	I	2031-11-07T03:08:18.407		9.06	-40.93	25103.73		-10.46	-10.94
Uranus	E	2031-11-07T03:58:48.943		17.86	-44.22	25421.29		5.68	5.94
6	E	2031-11-07T04:16:05.928		20.64	-44.63	41856.38	15.89		
5	E	2031-11-07T04:16:25.411		20.69	-44.64	42173.18	15.90		
4	E	2031-11-07T04:16:48.245		20.75	-44.64	42532.23	15.90		
alpha	E	2031-11-07T04:19:07.340		21.11	-44.67	44746.28	15.93		
beta	E	2031-11-07T04:20:04.825		21.26	-44.68	45663.65	15.94		
eta	E	2031-11-07T04:21:39.622		21.50	-44.69	47176.12	15.96		
gamma	E	2031-11-07T04:22:07.489		21.57	-44.69	47620.96	15.97		
delta	E	2031-11-07T04:22:50.034		21.68	-44.69	48300.35	15.97		
lambda	E	2031-11-07T04:24:38.060		21.96	-44.70	50026.71	15.99		
epsilon	E	2031-11-07T04:25:56.987		22.16	-44.70	51289.13	16.02		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-11-07T03:25:31.920
 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 : 3428374429044668800
 2Mass ID (if available) : 05435043+2331509
 ICRS Star Coord at Epoch: 05h 43m 50.43864s +23:31:50.90028s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 11.716
 G magnitude : 15.360
 RP magnitude : 14.337
 BP magnitude : 16.439
 DUPflag : 0
 Distance (au) : 18.349
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.70
 Sun-Target sep (deg) : 137.77
 Sun-Moon sep (deg) : 46.36
 B (ring opening deg) : 78.33
 PA of pole (deg) : 45.84
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.642
 C/A sky separation (km) : 8537.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ural11.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ural11.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	2031-11-07T02:33:58.813		31.38	-12.44	51133.63	-16.03		
lambda	I	2031-11-07T02:35:07.994		31.29	-12.22	50026.71	-15.99		
delta	I	2031-11-07T02:36:55.990		31.16	-11.89	48300.35	-15.98		
gamma	I	2031-11-07T02:37:37.882		31.10	-11.76	47631.25	-15.97		
eta	I	2031-11-07T02:38:06.389		31.07	-11.67	47176.12	-15.96		
beta	I	2031-11-07T02:39:41.046		30.94	-11.37	45665.93	-15.94		
alpha	I	2031-11-07T02:40:41.544		30.86	-11.18	44699.76	-15.93		
4	I	2031-11-07T02:42:52.590		30.69	-10.77	42616.11	-15.90		
5	I	2031-11-07T02:43:14.320		30.66	-10.70	42272.23	-15.89		
6	I	2031-11-07T02:43:43.178		30.62	-10.61	41804.82	-15.88		
Uranus	I	2031-11-07T03:01:01.939		29.06	-7.31	25080.04		-10.74	-11.24
Uranus	E	2031-11-07T03:50:26.913		23.40	2.45x	25435.02		5.38	5.64
6	E	2031-11-07T04:07:50.046		21.04	5.98x	41855.94	15.83		
5	E	2031-11-07T04:08:09.602		20.99	6.05x	42172.61	15.83		
4	E	2031-11-07T04:08:32.577		20.94	6.13x	42532.49	15.84		
alpha	E	2031-11-07T04:10:52.185		20.61	6.60x	44746.47	15.87		
beta	E	2031-11-07T04:11:49.883		20.47	6.80x	45663.83	15.89		
eta	E	2031-11-07T04:13:25.012		20.25	7.12x	47176.12	15.90		
gamma	E	2031-11-07T04:13:52.980		20.18	7.22x	47620.96	15.91		
delta	E	2031-11-07T04:14:35.678		20.08	7.36x	48300.35	15.91		
lambda	E	2031-11-07T04:16:24.096		19.81	7.73x	50026.71	15.93		
epsilon	E	2031-11-07T04:17:43.471		19.62	8.01x	51291.69	15.96		