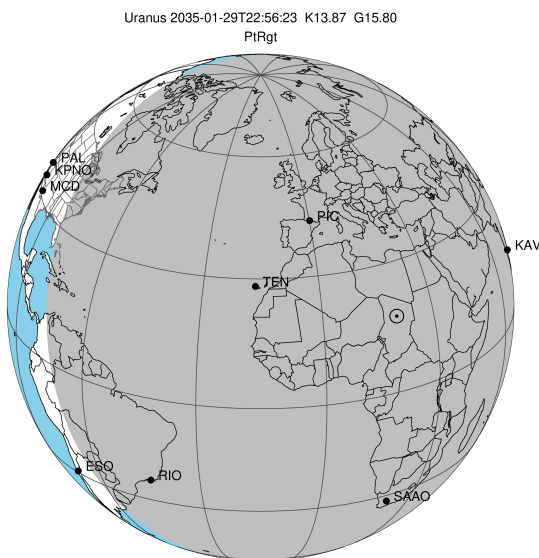


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-29T22:56:23.610
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3382589214377543552
 2Mass ID (if available) : 06294241+2335535

ICRS Star Coord at Epoch: 06h 29m 42.41948s +23:35:53.80845s

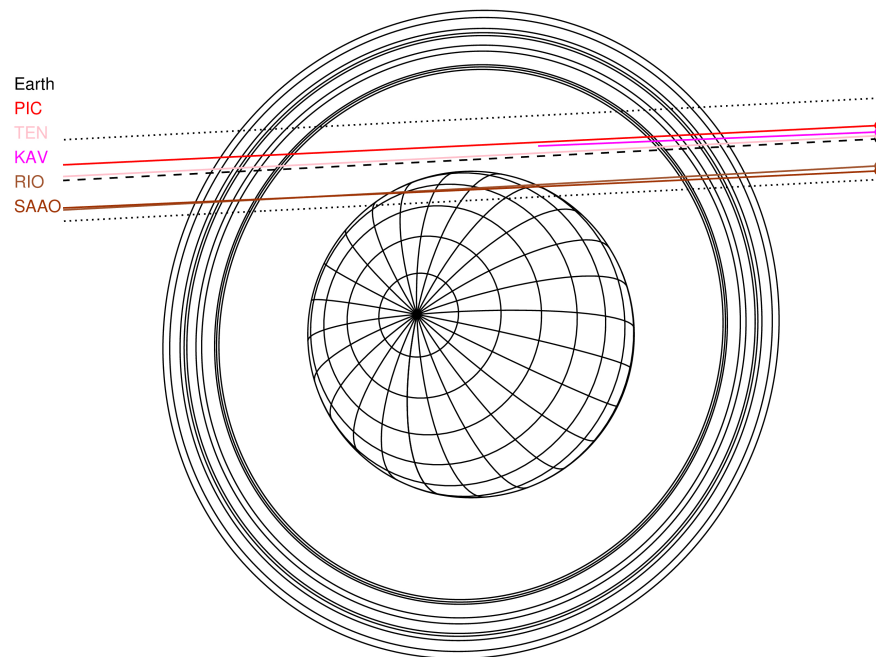
RUWE (>1.4 is poor) : 1.01
 K magnitude : 13.874
 G magnitude : 15.795
 RP magnitude : 15.149
 BP magnitude : 16.291
 DUPflag : 0
 Distance (au) : 18.046
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.70
 Sun-Target sep (deg) : 147.43
 Sun-Moon sep (deg) : 108.12
 B (ring opening deg) : 69.27
 PA of pole (deg) : 69.68

#	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



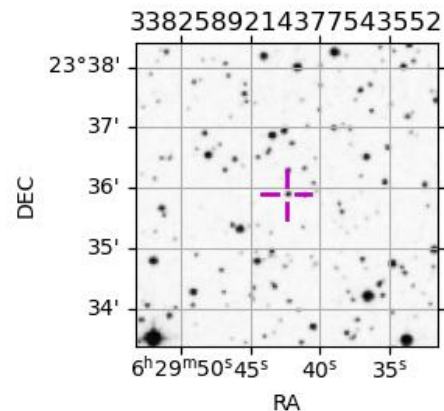
2035-01-29T22:56:23.6100 ra: 06 29 42.4195 s: +23 35 53.808 C/A 2.096° PA 182.92 deg v_sky -18.70 km/s D 18.05 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2035-01-29T22:56:23 K13.87 G15.80 PtRgt



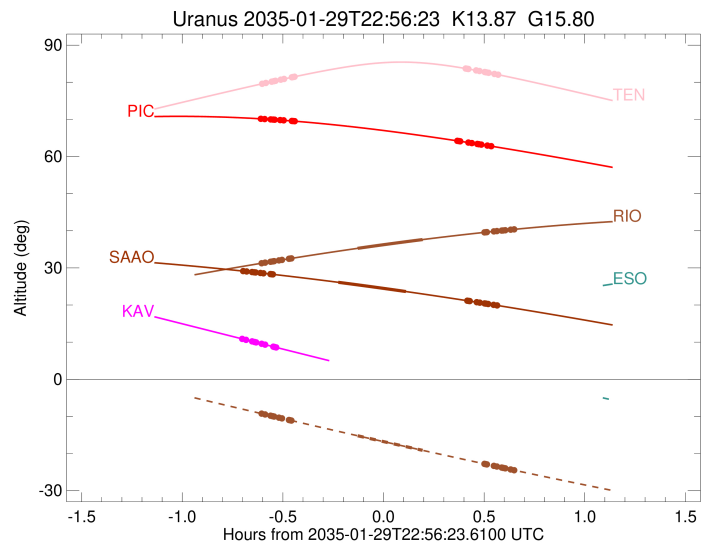
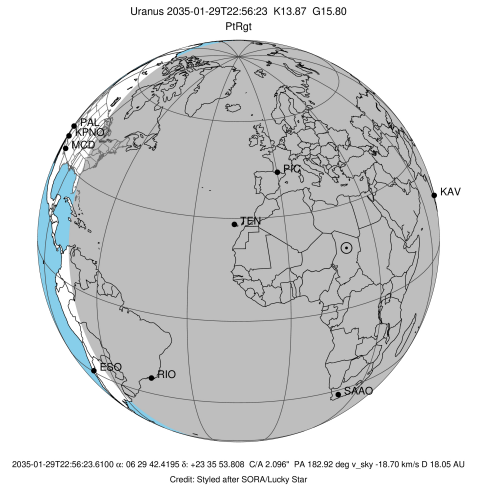
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++		+++++	JAN 29 22:19 - JAN 29 23:28	PnnRie
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					PnnRnn
TEN	Teide Obs./Tenerife	28.3	343.5	+++++		+++++	JAN 29 22:19 - JAN 29 23:30	PnnRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++			JAN 29 22:13 - JAN 29 22:24	PnnRin
RIO	Rio de Janeiro	-22.9	316.8	+++++	+ +	+++++	JAN 29 22:19 - JAN 29 23:35	PieRie
ESO	European Southern Obs	-29.3	289.3					PnnRnn
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++	+ +	+++++	JAN 29 22:14 - JAN 29 23:30	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2035-01-29T22:55:20.610
Event type          : PtRgt
: Uranus occs: topocentric, not geocentric
: 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      : 3382589214377543552
2Mass ID (if available) : 06294241+2335535
ICRS Star Coord at Epoch: 06h 29m 42.41948s +23:35:53.80845s
RUWE (>1.4 is poor) : 1.01
K magnitude         : 13.874
G magnitude         : 15.795
RP magnitude        : 15.149
BP magnitude        : 16.291
DUPflag            : 0
Distance (au)       : 18.046
f0 (km)            : 0.000
g0 (km)            : 0.000
skyplane vel. (km/s) : -18.70
Sun-Target sep (deg) : 147.43
Sun-Moon sep (deg)  : 108.98
B (ring opening deg) : 69.27
PA of pole (deg)    : 69.68
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.259
C/A sky separation (km) : 29564.4
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
  
```



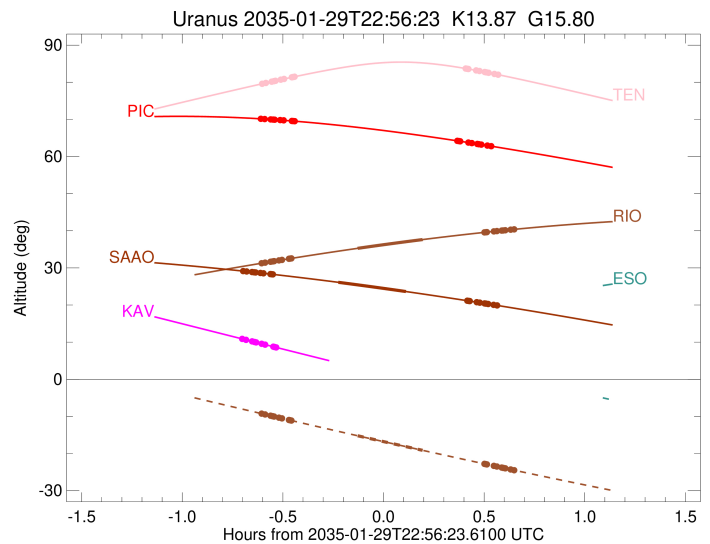
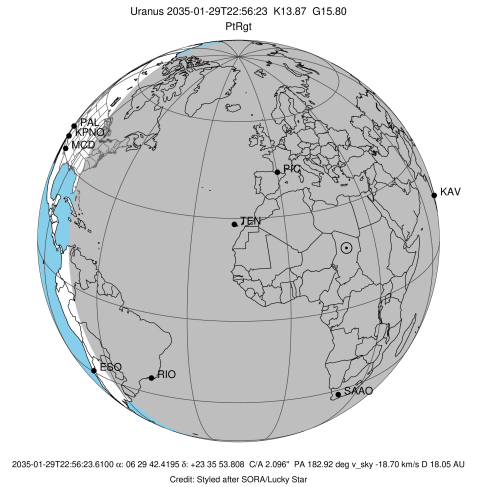
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-01-29T22:19:29.330		70.18	-55.41	51491.91	-16.48		
lambda	I	2035-01-29T22:20:59.182		70.10	-55.63	50026.71	-16.18		
delta	I	2035-01-29T22:22:46.960		69.99	-55.89	48300.35	-15.85		
gamma	I	2035-01-29T22:23:29.858		69.95	-55.99	47623.44	-15.71		
eta	I	2035-01-29T22:23:58.423		69.92	-56.06	47176.12	-15.61		
beta	I	2035-01-29T22:25:37.037		69.82	-56.29	45654.73	-15.26		
alpha	I	2035-01-29T22:26:39.962		69.75	-56.44	44702.69	-14.99		
4	I	2035-01-29T22:29:06.845		69.58	-56.78	42547.56	-14.37		
5	I	2035-01-29T22:29:27.492		69.56	-56.83	42246.11	-14.23		
6	I	2035-01-29T22:29:57.052		69.52	-56.90	41828.79	-14.13		

No planet occultations

6	E	2035-01-29T23:18:26.622		64.22	-62.51	41878.72	14.11		
5	E	2035-01-29T23:18:45.971		64.17	-62.54	42155.65	14.21		
4	E	2035-01-29T23:19:17.202		64.10	-62.59	42610.22	14.35		
alpha	E	2035-01-29T23:21:38.949		63.77	-62.79	44690.35	14.97		
beta	E	2035-01-29T23:22:44.221		63.62	-62.88	45680.90	15.23		
eta	E	2035-01-29T23:24:21.306		63.39	-63.01	47176.12	15.58		
gamma	E	2035-01-29T23:24:49.864		63.32	-63.05	47622.47	15.68		
delta	E	2035-01-29T23:25:32.908		63.22	-63.11	48300.35	15.82		
lambda	E	2035-01-29T23:27:20.906		62.96	-63.24	50026.71	16.15		
epsilon	E	2035-01-29T23:28:35.600		62.77	-63.34	51240.56	16.44		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2035-01-29T22:56:30.440
Event type           : PtRgt
: Uranus occs: topocentric, not geocentric
: 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       : 3382589214377543552
2Mass ID (if available) : 06294241+2335535
ICRS Star Coord at Epoch: 06h 29m 42.41948s +23:35:53.80845s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 13.874
G magnitude           : 15.795
RP magnitude          : 15.149
BP magnitude          : 16.291
DUPflag              : 0
Distance (au)        : 18.046
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -18.70
Sun-Target sep (deg) : 147.43
Sun-Moon sep (deg)   : 108.98
B (ring opening deg) : 69.27
PA of pole (deg)     : 69.68
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.127
C/A sky separation (km) : 27844.3
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
  
```

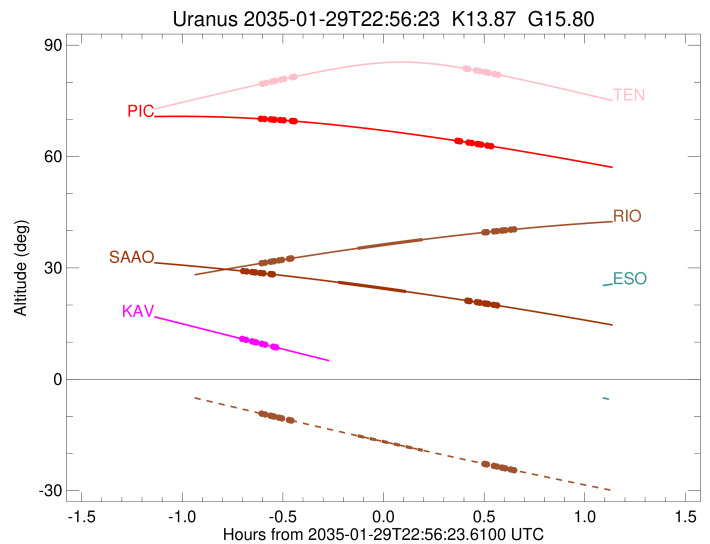
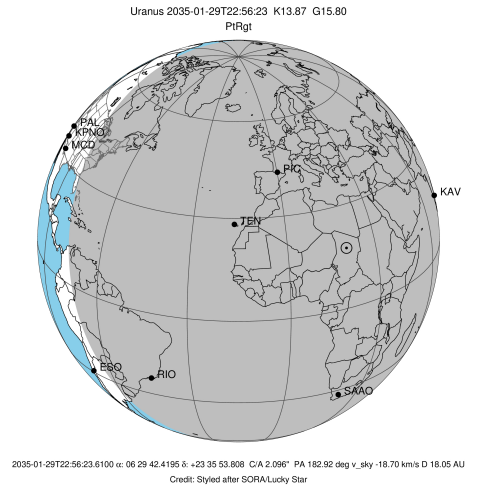


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-01-29T22:19:53.595		79.53	-47.72	51483.16	-17.00		
lambda	I	2035-01-29T22:21:20.062		79.82	-48.04	50026.71	-16.73		
delta	I	2035-01-29T22:23:04.088		80.17	-48.42	48300.35	-16.45		
gamma	I	2035-01-29T22:23:45.374		80.31	-48.57	47623.64	-16.33		
eta	I	2035-01-29T22:24:12.850		80.40	-48.67	47176.12	-16.25		
beta	I	2035-01-29T22:25:47.476		80.71	-49.02	45653.84	-15.94		
alpha	I	2035-01-29T22:26:47.440		80.91	-49.24	44704.18	-15.72		
4	I	2035-01-29T22:29:07.244		81.36	-49.75	42545.52	-15.19		
5	I	2035-01-29T22:29:26.276		81.42	-49.82	42250.43	-15.07		
6	I	2035-01-29T22:29:54.620		81.51	-49.92	41826.48	-14.98		

No planet occultations

6	E	2035-01-29T23:20:56.441		83.70	-61.00	41879.19	14.98		
5	E	2035-01-29T23:21:14.624		83.65	-61.06	42155.12	15.06		
4	E	2035-01-29T23:21:44.162		83.58	-61.17	42611.47	15.19		
alpha	E	2035-01-29T23:23:58.699		83.21	-61.64	44691.38	15.71		
beta	E	2035-01-29T23:25:00.929		83.03	-61.86	45681.06	15.94		
eta	E	2035-01-29T23:26:33.903		82.77	-62.19	47176.12	16.24		
gamma	E	2035-01-29T23:27:01.334		82.69	-62.29	47622.65	16.32		
delta	E	2035-01-29T23:27:42.704		82.56	-62.43	48300.35	16.44		
lambda	E	2035-01-29T23:29:26.791		82.25	-62.80	50026.71	16.73		
epsilon	E	2035-01-29T23:30:37.976		82.03	-63.05	51223.69	16.99		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-29T22:50:40.510
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 3382589214377543552
 2Mass ID (if available) : 06294241+2335535
 ICRS Star Coord at Epoch: 06h 29m 42.41948s +23:35:53.80845s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 13.874
 G magnitude : 15.795
 RP magnitude : 15.149
 BP magnitude : 16.291
 DUPflag : 0
 Distance (au) : 18.046
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.70
 Sun-Target sep (deg) : 147.43
 Sun-Moon sep (deg) : 108.42
 B (ring opening deg) : 69.27
 PA of pole (deg) : 69.68
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.220
 C/A sky separation (km) : 29059.8
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

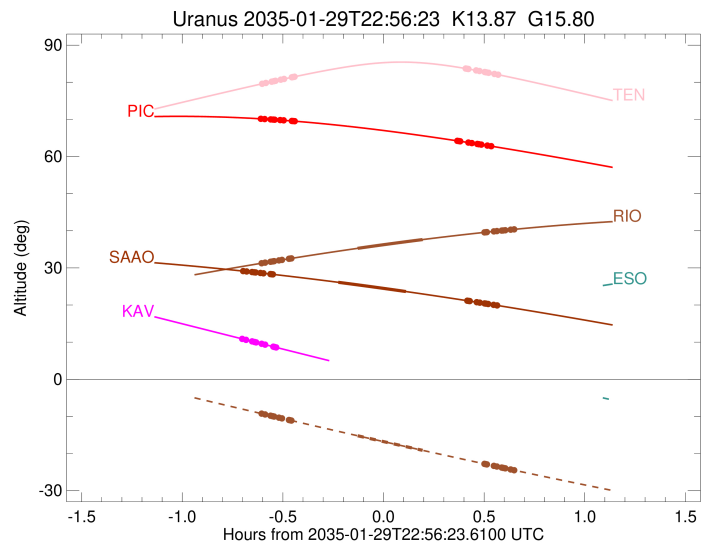
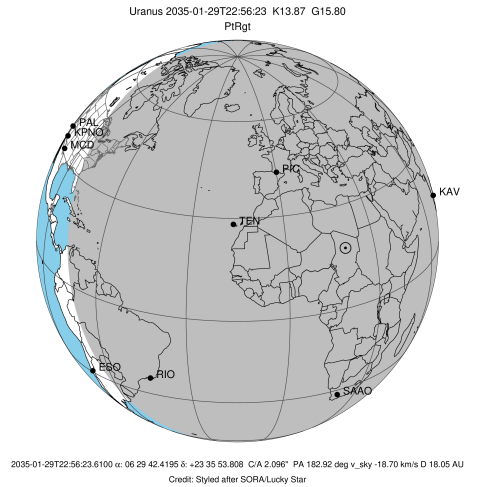


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-01-29T22:13:55.770		10.95	-42.49	51487.62	-16.37		
lambda	I	2035-01-29T22:15:25.952		10.61	-42.13	50026.71	-16.08		
delta	I	2035-01-29T22:17:14.356		10.20	-41.70	48300.35	-15.77		
gamma	I	2035-01-29T22:17:57.468		10.04	-41.53	47623.53	-15.63		
eta	I	2035-01-29T22:18:26.175		9.93	-41.42	47176.12	-15.54		
beta	I	2035-01-29T22:20:05.216		9.56	-41.03	45654.32	-15.21		
alpha	I	2035-01-29T22:21:08.253		9.32	-40.78	44703.36	-14.96		
4	I	2035-01-29T22:23:35.452		8.76	-40.19	42546.65	-14.37		
5	I	2035-01-29T22:23:55.868		8.69	-40.11	42248.01	-14.24		
6	I	2035-01-29T22:24:25.618		8.57	-39.99	41827.78	-14.14		

No planet occultations

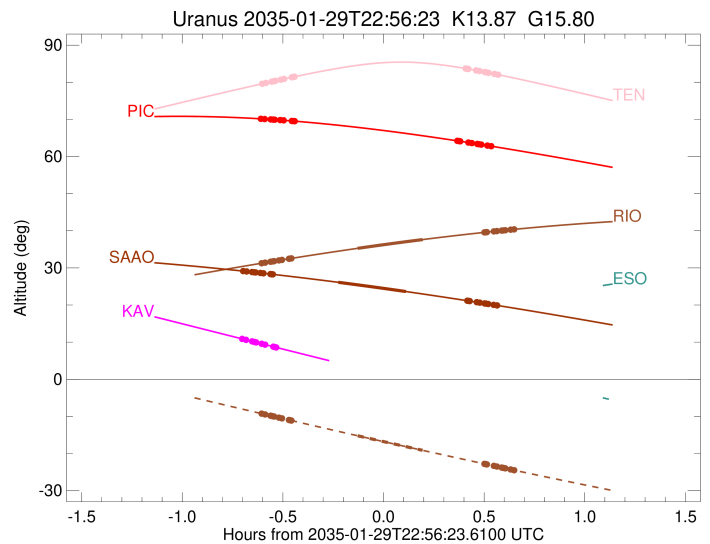
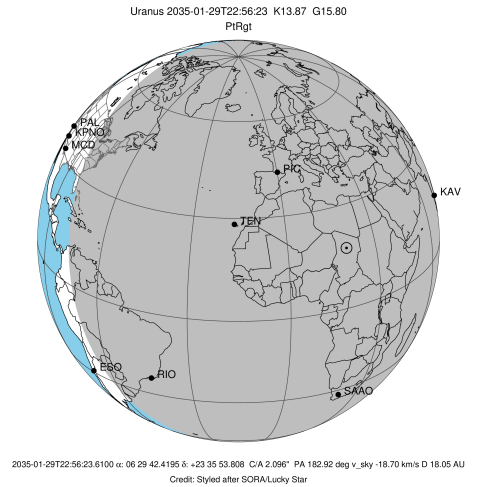
6	E	2035-01-29T23:14:42.971	-2.71x	-28.04	41878.82	14.06
5	E	2035-01-29T23:15:02.380	-2.78x	-27.97	42155.53	14.15
4	E	2035-01-29T23:15:33.760	-2.90x	-27.84	42610.47	14.28
alpha	E	2035-01-29T23:17:56.385	-3.43x	-27.28	44690.53	14.86
beta	E	2035-01-29T23:19:02.177	-3.67x	-27.02	45680.93	15.10
eta	E	2035-01-29T23:20:40.176	-4.03x	-26.63	47176.12	15.42
gamma	E	2035-01-29T23:21:09.031	-4.14x	-26.52	47622.50	15.51
delta	E	2035-01-29T23:21:52.538	-4.30x	-26.35	48300.35	15.65
lambda	E	2035-01-29T23:23:41.801	-4.70x	-25.91	50026.71	15.95
epsilon	E	2035-01-29T23:24:57.285	-4.98x	-25.62	51237.99	16.23

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-29T22:58:39.510
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 3382589214377543552
 2Mass ID (if available) : 06294241+2335535
 ICRS Star Coord at Epoch: 06h 29m 42.41948s +23:35:53.80845s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 13.874
 G magnitude : 15.795
 RP magnitude : 15.149
 BP magnitude : 16.291
 DUPflag : 0
 Distance (au) : 18.046
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.70
 Sun-Target sep (deg) : 147.43
 Sun-Moon sep (deg) : 108.51
 B (ring opening deg) : 69.27
 PA of pole (deg) : 69.68
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.746
 C/A sky separation (km) : 22857.0
 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	2035-01-29T22:19:47.142		31.22	-9.20	51455.94	-18.07		
lambda	I	2035-01-29T22:21:06.720		31.42	-9.48	50026.71	-17.89		
delta	I	2035-01-29T22:22:43.669		31.66	-9.82	48300.35	-17.72		
gamma	I	2035-01-29T22:23:21.911		31.75	-9.95	47624.22	-17.64		
eta	I	2035-01-29T22:23:47.347		31.81	-10.04	47176.12	-17.59		
beta	I	2035-01-29T22:25:14.530		32.03	-10.35	45651.48	-17.41		
alpha	I	2035-01-29T22:26:08.886		32.16	-10.54	44708.41	-17.27		
4	I	2035-01-29T22:28:15.777		32.47	-10.98	42540.41	-16.95		
5	I	2035-01-29T22:28:31.685		32.51	-11.04	42261.77	-16.87		
6	I	2035-01-29T22:28:58.010		32.57	-11.13	41820.52	-16.83		
Uranus	I	2035-01-29T22:48:40.475		35.27	-15.21	25557.41	-18.07	-1.11	-1.17
Uranus	E	2035-01-29T23:08:03.518		37.63	-19.14	25266.92	-18.07	15.40	16.10
6	E	2035-01-29T23:26:31.880		39.57	-22.79	41879.74	16.86		
5	E	2035-01-29T23:26:48.058		39.60	-22.85	42155.01	16.91		
4	E	2035-01-29T23:27:14.439		39.64	-22.93	42614.17	16.99		
alpha	E	2035-01-29T23:29:15.775		39.83	-23.33	44694.51	17.30		
beta	E	2035-01-29T23:30:12.282		39.92	-23.51	45681.23	17.45		
eta	E	2035-01-29T23:31:37.565		40.05	-23.78	47176.12	17.63		
gamma	E	2035-01-29T23:32:02.882		40.09	-23.86	47623.19	17.68		
delta	E	2035-01-29T23:32:41.092		40.15	-23.99	48300.35	17.76		
lambda	E	2035-01-29T23:34:17.801		40.29	-24.30	50026.71	17.94		
epsilon	E	2035-01-29T23:35:21.707		40.38	-24.50	51176.62	18.12		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-29T22:53:16.490
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 3382589214377543552
 2Mass ID (if available) : 06294241+2335535
 ICRS Star Coord at Epoch: 06h 29m 42.41948s +23:35:53.80845s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 13.874
 G magnitude : 15.795
 RP magnitude : 15.149
 BP magnitude : 16.291
 DUPflag : 0
 Distance (au) : 18.046
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.70
 Sun-Target sep (deg) : 147.43
 Sun-Moon sep (deg) : 108.62
 B (ring opening deg) : 69.27
 PA of pole (deg) : 69.68
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.730
 C/A sky separation (km) : 22646.1
 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	2035-01-29T22:14:17.285		29.16	-39.30	51452.38	-18.13		
lambda	I	2035-01-29T22:15:36.421		29.04	-39.35	50026.71	-17.95		
delta	I	2035-01-29T22:17:13.066		28.88	-39.41	48300.35	-17.77		
gamma	I	2035-01-29T22:17:51.182		28.82	-39.43	47624.29	-17.70		
eta	I	2035-01-29T22:18:16.539		28.78	-39.45	47176.12	-17.65		
beta	I	2035-01-29T22:19:43.448		28.63	-39.50	45651.24	-17.47		
alpha	I	2035-01-29T22:20:37.573		28.54	-39.53	44708.86	-17.33		
4	I	2035-01-29T22:22:44.061		28.33	-39.60	42539.94	-17.02		
5	I	2035-01-29T22:22:59.801		28.30	-39.61	42262.86	-16.94		
6	I	2035-01-29T22:23:26.124		28.26	-39.62	41819.95	-16.89		
Uranus	I	2035-01-29T22:42:54.136		26.12	-39.99	25555.48		-1.66	-1.73
Uranus	E	2035-01-29T23:03:05.176		23.63	-39.92	25261.82		15.54	16.24
6	E	2035-01-29T23:21:25.224		21.16	-39.46	41879.74	16.83		
5	E	2035-01-29T23:21:41.430		21.12	-39.45	42155.00	16.87		
4	E	2035-01-29T23:22:07.864		21.06	-39.43	42614.14	16.95		
alpha	E	2035-01-29T23:24:09.487		20.77	-39.36	44694.45	17.26		
beta	E	2035-01-29T23:25:06.158		20.64	-39.32	45681.23	17.39		
eta	E	2035-01-29T23:26:31.716		20.43	-39.26	47176.12	17.57		
gamma	E	2035-01-29T23:26:57.121		20.37	-39.25	47623.17	17.62		
delta	E	2035-01-29T23:27:35.469		20.28	-39.22	48300.35	17.69		
lambda	E	2035-01-29T23:29:12.555		20.05	-39.15	50026.71	17.87		
epsilon	E	2035-01-29T23:30:16.802		19.89	-39.10	51177.90	18.04		