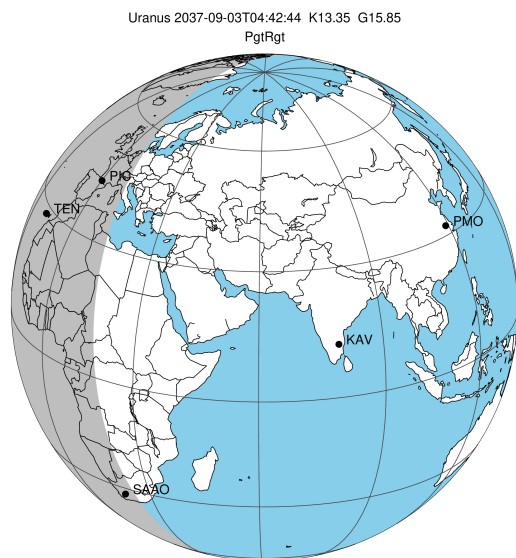


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-09-03T04:42:44.600
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 865486251457562752
 2Mass ID (if available) : 07363830+2201351

ICRS Star Coord at Epoch: 07h 36m 38.28506s +22:01:34.83471s

RUWE (>1.4 is poor) : 1.07
 K magnitude : 13.347
 G magnitude : 15.850
 RP magnitude : 15.057
 BP magnitude : 16.525
 DUPflag : 0
 Distance (au) : 19.382
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 26.35
 Sun-Target sep (deg) : 48.23
 Sun-Moon sep (deg) : 38.70
 B (ring opening deg) : 54.50
 PA of pole (deg) : 85.36

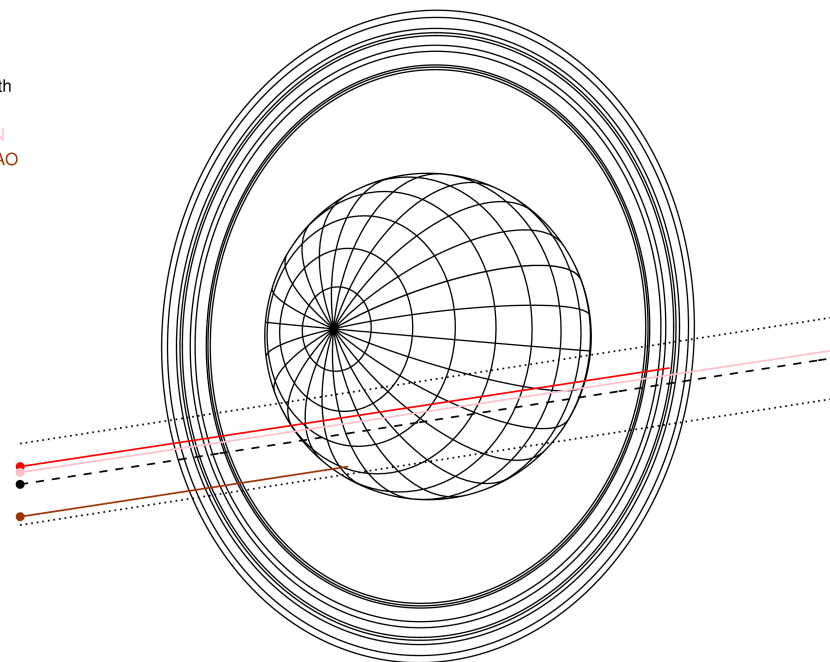
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2037-09-03T04:42:44.6000 α: 07 36 38.2851 δ: +22 01 34.835 C/A 0.925° PA 8.83 deg v_sky +26.35 km/s D 19.38 AU
 Credit: Styled after SORA/Lucky Star

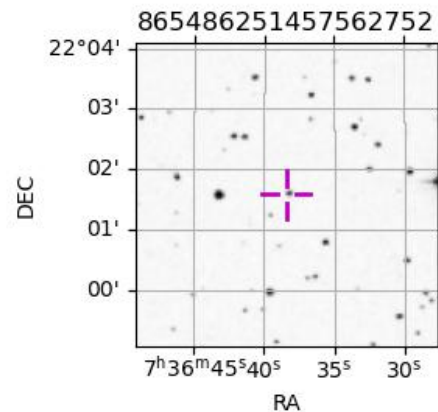
Uranus 2037-09-03T04:42:44 K13.35 G15.85 PgtRgt

Earth
 PIC
 TEN
 SAAO

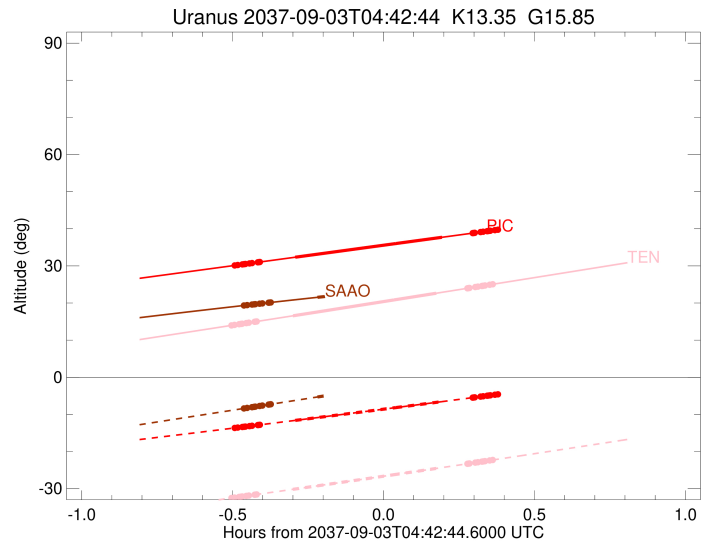
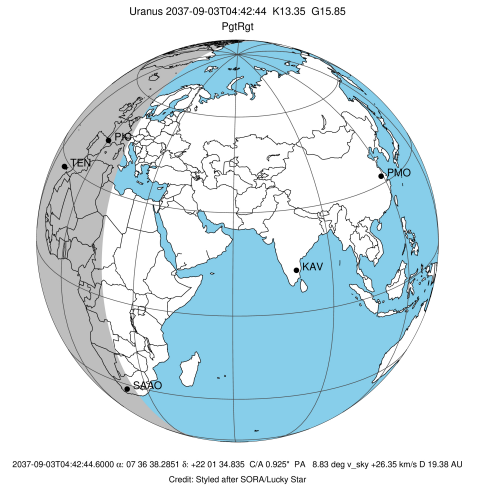


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	++++	SEP 03 04:13 - SEP 03 05:02	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					PnnRnn
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+ +	+++++	SEP 03 04:12 - SEP 03 05:04	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					PnnRnn
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	+++++	+		SEP 03 04:14 - SEP 03 04:29	PinRin
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

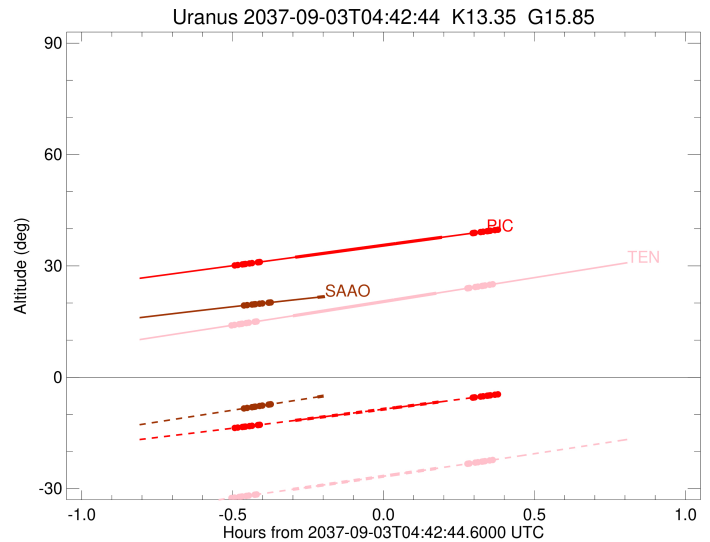
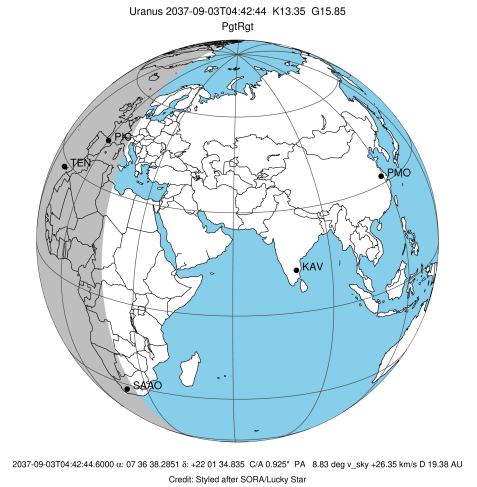


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-09-03T04:39:49.560
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 865486251457562752
 2Mass ID (if available) : 07363830+2201351
 ICRS Star Coord at Epoch: 07h 36m 38.28506s +22:01:34.83471s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 13.347
 G magnitude : 15.850
 RP magnitude : 15.057
 BP magnitude : 16.525
 DUPflag : 0
 Distance (au) : 19.382
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 26.35
 Sun-Target sep (deg) : 48.23
 Sun-Moon sep (deg) : 38.55
 B (ring opening deg) : 54.50
 PA of pole (deg) : 85.36
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.752
 C/A sky separation (km) : 10570.9
 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	2037-09-03T04:13:10.309		30.13	-13.65	51162.40	-31.26		
lambda	I	2037-09-03T04:13:46.722		30.24	-13.55	50026.71	-31.17		
delta	I	2037-09-03T04:14:42.154		30.41	-13.39	48300.35	-31.11		
gamma	I	2037-09-03T04:15:03.733		30.48	-13.33	47629.18	-31.09		
eta	I	2037-09-03T04:15:18.309		30.52	-13.29	47176.12	-31.07		
beta	I	2037-09-03T04:16:06.963		30.67	-13.16	45664.56	-31.02		
alpha	I	2037-09-03T04:16:36.180		30.76	-13.07	44752.43	-30.97		
4	I	2037-09-03T04:17:46.592		30.97	-12.88	42573.67	-30.86		
5	I	2037-09-03T04:17:59.136		31.01	-12.84	42173.91	-30.85		
6	I	2037-09-03T04:18:10.576		31.05	-12.81	41865.06	-30.86		
Uranus	I	2037-09-03T04:25:11.167		32.34	-11.62	25316.42		27.25	28.34
Uranus	E	2037-09-03T04:54:23.266		37.71	-6.56	25187.23		-34.68	-35.92
6	E	2037-09-03T05:00:27.217		38.82	-5.49	41828.87	30.78		
5	E	2037-09-03T05:00:44.321		38.87	-5.44	42313.75	30.76		
4	E	2037-09-03T05:00:51.446		38.90	-5.42	42547.05	30.78		
alpha	E	2037-09-03T05:02:00.605		39.11	-5.21	44688.73	30.89		
beta	E	2037-09-03T05:02:32.051		39.20	-5.12	45667.10	30.93		
eta	E	2037-09-03T05:03:20.802		39.35	-4.98x	47176.12	30.98		
gamma	E	2037-09-03T05:03:35.180		39.40	-4.93x	47621.71	31.00		
delta	E	2037-09-03T05:03:57.064		39.46	-4.87x	48300.35	31.02		
lambda	E	2037-09-03T05:04:52.665		39.63	-4.70x	50026.71	31.08		
epsilon	E	2037-09-03T05:05:33.528		39.76	-4.58x	51297.25	31.16		

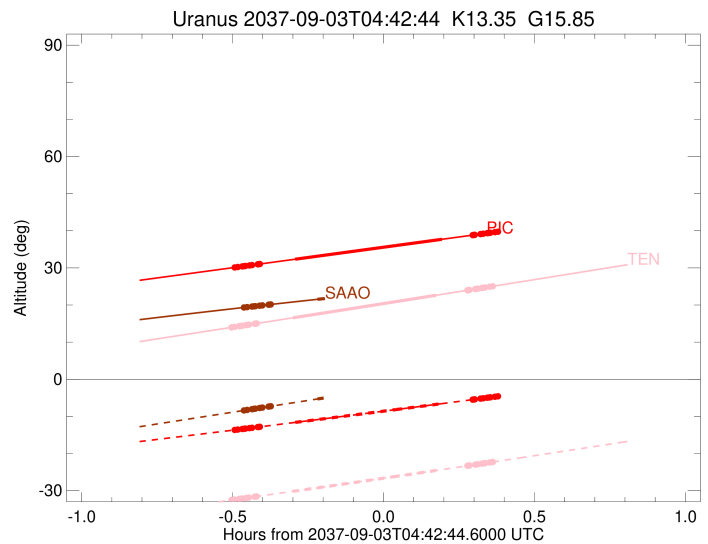
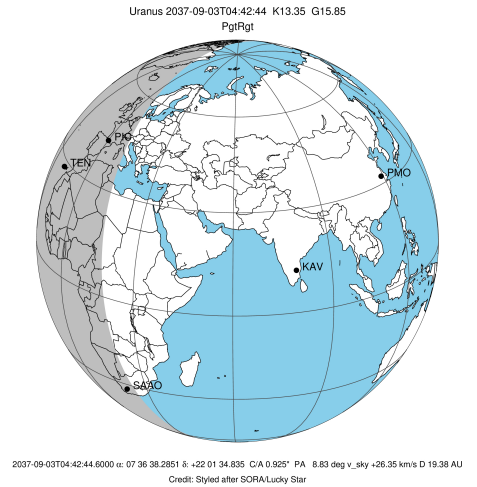
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-09-03T04:39:01.480
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 865486251457562752
 2Mass ID (if available) : 07363830+2201351
 ICRS Star Coord at Epoch: 07h 36m 38.28506s +22:01:34.83471s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 13.347
 G magnitude : 15.850
 RP magnitude : 15.057
 BP magnitude : 16.525
 DUPflag : 0
 Distance (au) : 19.382
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 26.35
 Sun-Target sep (deg) : 48.23
 Sun-Moon sep (deg) : 38.25
 B (ring opening deg) : 54.50
 PA of pole (deg) : 85.36
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.824
 C/A sky separation (km) : 11587.9
 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	2037-09-03T04:12:31.536		13.97	-32.52	51170.08	-31.23		
lambda	I	2037-09-03T04:13:08.243		14.10	-32.41	50026.71	-31.13		
delta	I	2037-09-03T04:14:03.764		14.30	-32.23	48300.35	-31.06		
gamma	I	2037-09-03T04:14:25.386		14.37	-32.16	47629.09	-31.03		
eta	I	2037-09-03T04:14:39.988		14.43	-32.12	47176.12	-31.01		
beta	I	2037-09-03T04:15:28.737		14.60	-31.96	45664.99	-30.94		
alpha	I	2037-09-03T04:15:58.047		14.70	-31.87	44752.43	-30.89		
4	I	2037-09-03T04:17:08.722		14.95	-31.65	42572.61	-30.75		
5	I	2037-09-03T04:17:21.243		14.99	-31.61	42175.15	-30.74		
6	I	2037-09-03T04:17:32.725		15.03	-31.57	41865.82	-30.75		
Uranus	I	2037-09-03T04:24:43.832		16.55	-30.19	25332.43		26.25	27.31
Uranus	E	2037-09-03T04:53:14.150		22.64	-24.56	25194.91		-34.26	-35.50
6	E	2037-09-03T04:59:24.121		23.96	-23.31	41829.99	30.64		
5	E	2037-09-03T04:59:41.250		24.02	-23.25	42314.13	30.63		
4	E	2037-09-03T04:59:48.363		24.05	-23.23	42546.04	30.65		
alpha	E	2037-09-03T05:00:57.823		24.30	-23.00	44689.15	30.78		
beta	E	2037-09-03T05:01:29.380		24.41	-22.89	45667.57	30.83		
eta	E	2037-09-03T05:02:18.267		24.59	-22.72	47176.12	30.90		
gamma	E	2037-09-03T05:02:32.683		24.64	-22.67	47621.64	30.91		
delta	E	2037-09-03T05:02:54.628		24.72	-22.60	48300.35	30.94		
lambda	E	2037-09-03T05:03:50.365		24.92	-22.41	50026.71	31.01		
epsilon	E	2037-09-03T05:04:31.582		25.07	-22.27	51305.54	31.10		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2037-09-03T04:40:58.610
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       : 865486251457562752
2Mass ID (if available) : 07363830+2201351
ICRS Star Coord at Epoch: 07h 36m 38.28506s +22:01:34.83471s
RUWE (>1.4 is poor) : 1.07
K magnitude          : 13.347
G magnitude          : 15.850
RP magnitude         : 15.057
BP magnitude         : 16.525
DUPflag              : 0
Distance (au)        : 19.382
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 26.35
Sun-Target sep (deg) : 48.23
Sun-Moon sep (deg)   : 38.56
B (ring opening deg) : 54.50
PA of pole (deg)     : 85.36
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.298
C/A sky separation (km) : 18241.3
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	2037-09-03T04:14:58.259		19.34	-8.40	51226.39	-29.70		
lambda	I	2037-09-03T04:15:38.843		19.44	-8.26	50026.71	-29.51		
delta	I	2037-09-03T04:16:37.519		19.59	-8.05	48300.35	-29.33		
gamma	I	2037-09-03T04:17:00.454		19.65	-7.97	47628.38	-29.26		
eta	I	2037-09-03T04:17:15.922		19.69	-7.92	47176.12	-29.21		
beta	I	2037-09-03T04:18:07.655		19.82	-7.74	45668.05	-29.04		
alpha	I	2037-09-03T04:18:39.075		19.90	-7.62	44751.95	-28.91		
4	I	2037-09-03T04:19:55.171		20.09	-7.36	42564.85	-28.58		
5	I	2037-09-03T04:20:08.095		20.12	-7.31	42185.24	-28.54		
6	I	2037-09-03T04:20:20.476		20.15	-7.27	41870.86	-28.51		
Uranus	I	2037-09-03T04:29:37.045		21.54	-5.31	25455.44		17.33	18.10
Uranus	E	2037-09-03T04:52:11.082		24.70	-0.57x	25283.84		-29.22	-30.36
6	E	2037-09-03T04:59:49.051		25.71	1.03x	41837.17	28.45		
5	E	2037-09-03T05:00:07.060		25.74	1.09x	42315.25	28.48		
4	E	2037-09-03T05:00:14.506		25.76	1.12x	42540.15	28.51		
alpha	E	2037-09-03T05:01:29.140		25.92	1.38x	44692.17	28.84		
beta	E	2037-09-03T05:02:02.791		25.99	1.49x	45670.40	28.97		
eta	E	2037-09-03T05:02:54.637		26.10	1.67x	47176.12	29.14		
gamma	E	2037-09-03T05:03:09.902		26.13	1.73x	47621.31	29.19		
delta	E	2037-09-03T05:03:33.136		26.18	1.81x	48300.35	29.26		
lambda	E	2037-09-03T05:04:31.964		26.31	2.01x	50026.71	29.43		
epsilon	E	2037-09-03T05:05:16.988		26.40	2.17x	51354.37	29.62		