

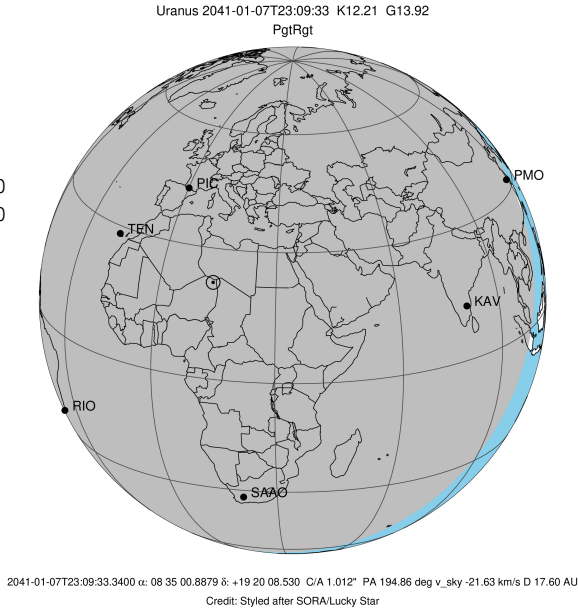
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2041-01-07T23:09:33.340
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 662763142251433472
 2Mass ID (if available) : 08350087+1920085

ICRS Star Coord at Epoch: 08h 35m 00.88794s +19:20:08.53039s

RUWE (>1.4 is poor) : 2.25
 K magnitude : 12.211
 G magnitude : 13.919
 RP magnitude : 13.345
 BP magnitude : 14.318
 DUPflag : 0
 Distance (au) : 17.603
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.63
 Sun-Target sep (deg) : 161.25
 Sun-Moon sep (deg) : 127.20
 B (ring opening deg) : 40.87
 PA of pole (deg) : 93.63

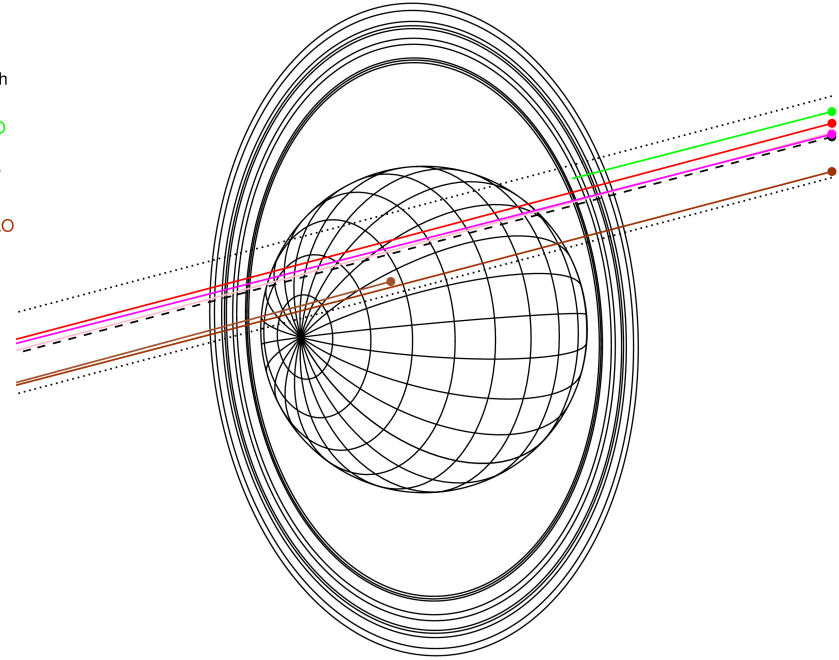
a(km) ring

- 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



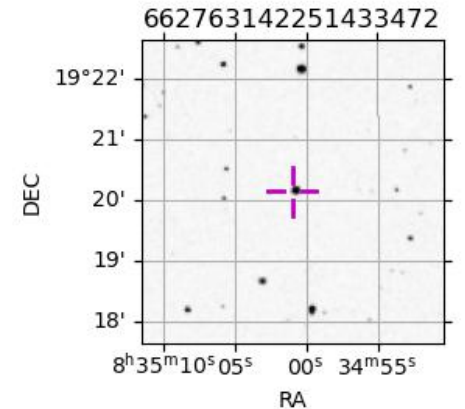
Uranus 2041-01-07T23:09:33 K12.21 G13.92 PgtRgt

Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 SAAO



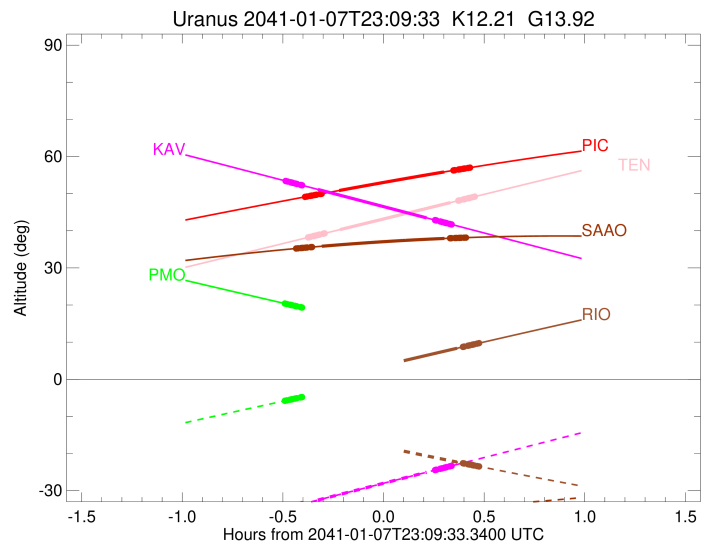
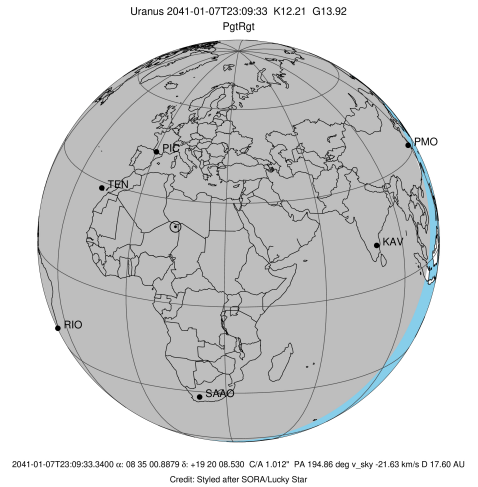
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	JAN 07 22:46 - JAN 07 23:35	PieRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++			JAN 07 22:40 - JAN 07 22:43	PnnRin
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 07 22:47 - JAN 07 23:36	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++	+ +	+++++	JAN 07 22:40 - JAN 07 23:30	PieRie
RIO	Rio de Janeiro	-22.9	316.8		+	+++++	JAN 07 23:31 - JAN 07 23:38	PneRne
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 07 22:43 - JAN 07 23:34	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



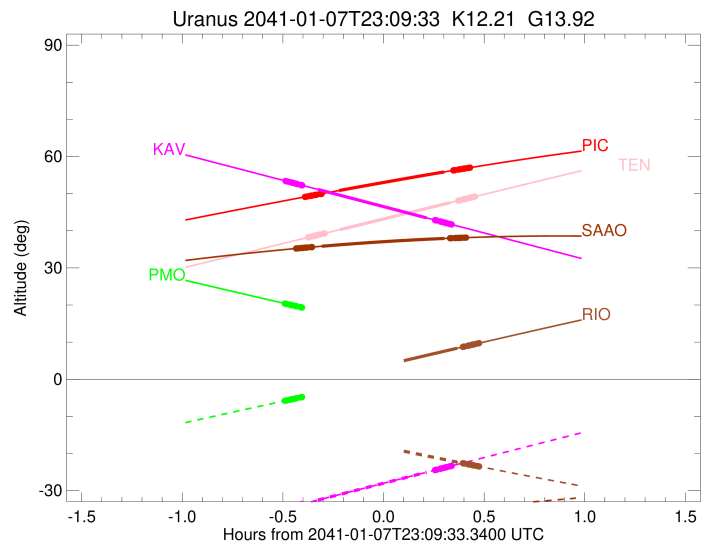
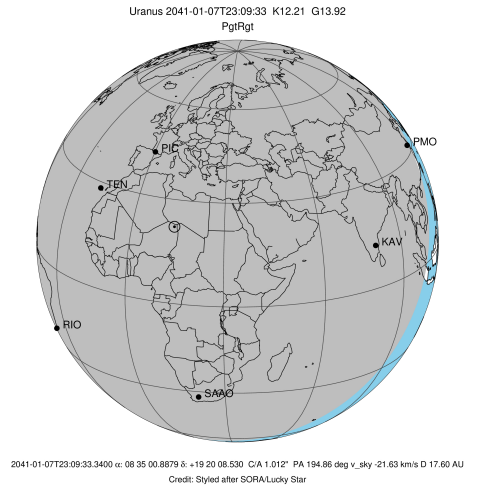
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target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2041-01-07T23:12:01.110
Event type          : PgtRgt
: Uranus occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code       : PIC
Location            : Pic du Midi
Latitude (deg)      : 42.93656
E. Longitude (deg)  : 0.14231
Altitude (km)       : 2.890
Gaia source ID      : 662763142251433472
2Mass ID (if available) : 08350087+1920085
ICRS Star Coord at Epoch: 08h 35m 00.88794s +19:20:08.53039s
RUWE (>1.4 is poor) : 2.25
K magnitude          : 12.211
G magnitude          : 13.919
RP magnitude         : 13.345
BP magnitude         : 14.318
DUPflag             : 0
Distance (au)       : 17.603
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -21.63
Sun-Target sep (deg) : 161.25
Sun-Moon sep (deg)  : 128.11
B (ring opening deg) : 40.87
PA of pole (deg)    : 93.63
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.161
C/A sky separation (km) : 14820.7
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
  
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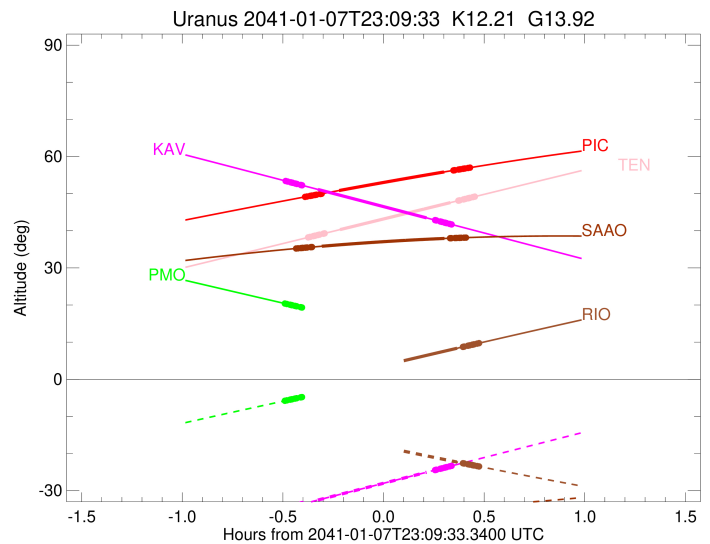
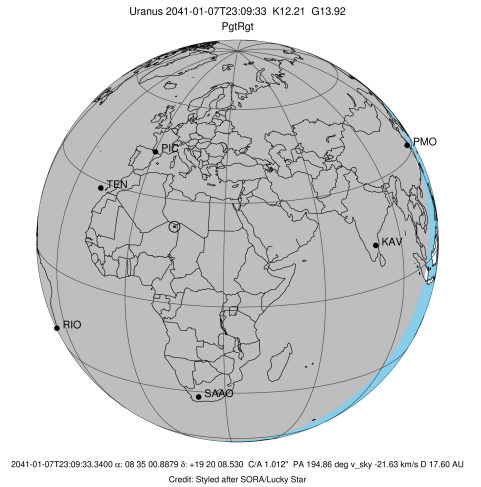
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2041-01-07T22:46:18.480		49.16	-63.62	50891.34	-31.69		
lambda	I	2041-01-07T22:46:45.840		49.24	-63.68	50026.71	-31.58		
delta	I	2041-01-07T22:47:40.609		49.39	-63.80	48300.35	-31.46		
gamma	I	2041-01-07T22:48:02.076		49.45	-63.85	47625.46	-31.42		
eta	I	2041-01-07T22:48:16.387		49.49	-63.88	47176.12	-31.38		
beta	I	2041-01-07T22:49:05.287		49.63	-63.98	45645.11	-31.26		
alpha	I	2041-01-07T22:49:34.332		49.71	-64.04	44746.82	-31.19		
4	I	2041-01-07T22:50:41.908		49.90	-64.19	42612.87	-30.97		
5	I	2041-01-07T22:50:51.848		49.93	-64.21	42310.20	-30.92		
6	I	2041-01-07T22:51:06.110		49.97	-64.24	41879.75	-30.91		
Uranus	I	2041-01-07T22:56:17.704		50.84	-64.87	25441.46		-31.15	-32.33
Uranus	E	2041-01-07T23:27:38.969		55.85	-67.98	25352.43		43.44	44.76
6	E	2041-01-07T23:30:20.975		56.26	-68.17	41805.46	30.95		
5	E	2041-01-07T23:30:34.667		56.29	-68.19	42160.26	30.96		
4	E	2041-01-07T23:30:46.487		56.32	-68.20	42551.77	31.01		
alpha	E	2041-01-07T23:31:54.379		56.49	-68.28	44684.79	31.23		
beta	E	2041-01-07T23:32:25.725		56.57	-68.32	45666.16	31.31		
eta	E	2041-01-07T23:33:13.960		56.69	-68.37	47176.12	31.43		
gamma	E	2041-01-07T23:33:28.394		56.73	-68.39	47630.06	31.47		
delta	E	2041-01-07T23:33:49.679		56.78	-68.41	48300.35	31.52		
lambda	E	2041-01-07T23:34:44.354		56.91	-68.47	50026.71	31.63		
epsilon	E	2041-01-07T23:35:32.055		57.03	-68.52	51537.79	31.75		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2041-01-07T23:06:04.100
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 662763142251433472
 2Mass ID (if available) : 08350087+1920085
 ICRS Star Coord at Epoch: 08h 35m 00.88794s +19:20:08.53039s
 RUWE (>1.4 is poor) : 2.25
 K magnitude : 12.211
 G magnitude : 13.919
 RP magnitude : 13.345
 BP magnitude : 14.318
 DUPflag : 0
 Distance (au) : 17.603
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.63
 Sun-Target sep (deg) : 161.25
 Sun-Moon sep (deg) : 126.95
 B (ring opening deg) : 40.87
 PA of pole (deg) : 93.63
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.337
 C/A sky separation (km) : 17070.3
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



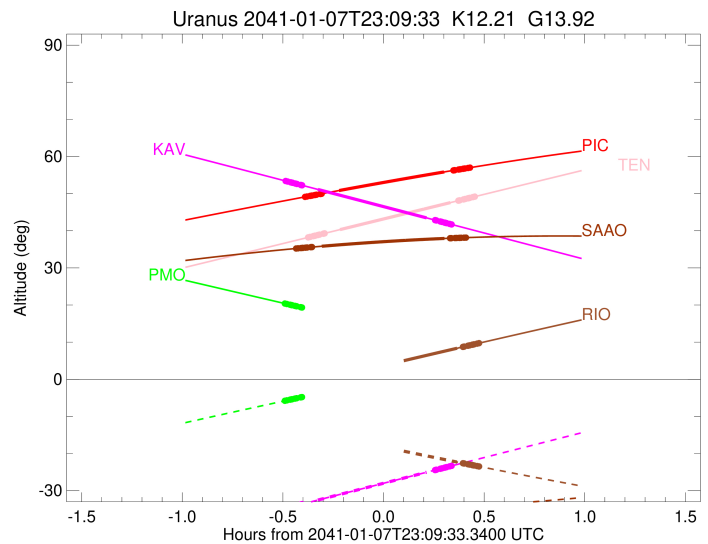
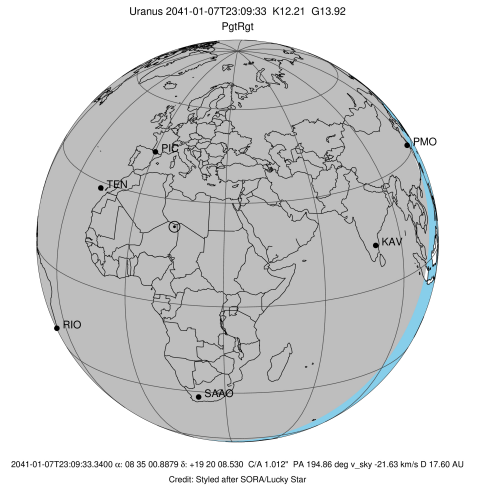
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2041-01-07T22:40:17.768		20.37	-5.77	50904.91	-30.91		
lambda	I	2041-01-07T22:40:46.275		20.27	-5.68	50026.71	-30.77		
delta	I	2041-01-07T22:41:42.521		20.07	-5.49	48300.35	-30.61		
gamma	I	2041-01-07T22:42:04.581		20.00	-5.42	47625.70	-30.55		
eta	I	2041-01-07T22:42:19.308		19.94	-5.37	47176.12	-30.50		
beta	I	2041-01-07T22:43:09.665		19.77	-5.21	45644.54	-30.34		
alpha	I	2041-01-07T22:43:39.631		19.66	-5.11	44745.84	-30.24		
4	I	2041-01-07T22:44:49.370		19.42	-4.88x	42613.77	-29.95		
5	I	2041-01-07T22:44:59.800		19.39	-4.85x	42308.57	-29.88		
6	I	2041-01-07T22:45:14.352		19.34	-4.80x	41879.66	-29.86		
Uranus	I	2041-01-07T22:51:30.998		18.03	-3.58x	25467.70	-30.91	-27.10	-28.19
Uranus	E	2041-01-07T23:20:32.452		12.02	1.96x	25376.69	-30.77	40.21	41.51
6	E	2041-01-07T23:24:00.945		11.31	2.61x	41807.26	-30.61		
5	E	2041-01-07T23:24:15.263		11.26	2.65x	42162.18	-30.55		
4	E	2041-01-07T23:24:27.506		11.22	2.69x	42554.30	-30.50		
alpha	E	2041-01-07T23:25:37.951		10.98	2.91x	44685.05	-30.34		
beta	E	2041-01-07T23:26:10.346		10.87	3.01x	45665.06	-30.24		
eta	E	2041-01-07T23:27:00.296		10.70	3.17x	47176.12	-30.14		
gamma	E	2041-01-07T23:27:15.224		10.64	3.21x	47630.25	-30.04		
delta	E	2041-01-07T23:27:37.212		10.57	3.28x	48300.35	-29.95		
lambda	E	2041-01-07T23:28:33.661		10.38	3.45x	50026.71	-29.88		
epsilon	E	2041-01-07T23:29:23.032		10.21	3.61x	51543.19	-29.86		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2041-01-07T23:13:05.220
 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 : 662763142251433472
 2Mass ID (if available) : 08350087+1920085
 ICRS Star Coord at Epoch: 08h 35m 00.88794s +19:20:08.53039s
 RUWE (>1.4 is poor) : 2.25
 K magnitude : 12.211
 G magnitude : 13.919
 RP magnitude : 13.345
 BP magnitude : 14.318
 DUPflag : 0
 Distance (au) : 17.603
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.63
 Sun-Target sep (deg) : 161.25
 Sun-Moon sep (deg) : 128.17
 B (ring opening deg) : 40.87
 PA of pole (deg) : 93.63
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.039
 C/A sky separation (km) : 13258.8
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



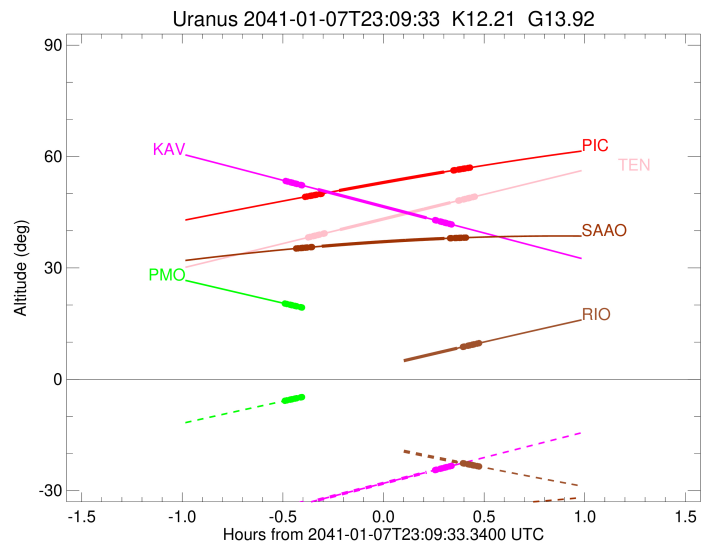
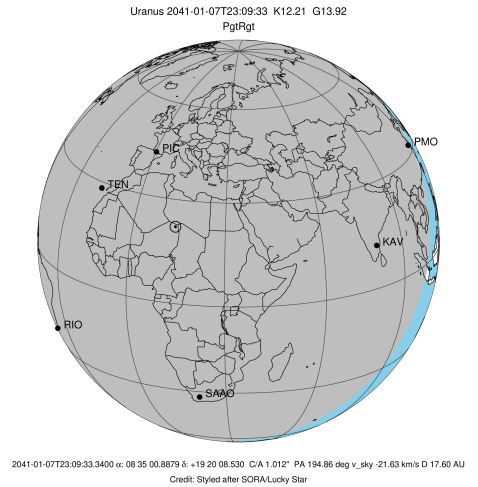
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2041-01-07T22:47:14.932		38.25	-56.73	50881.87	-31.94		
lambda	I	2041-01-07T22:47:41.769		38.35	-56.83	50026.71	-31.84		
delta	I	2041-01-07T22:48:36.057		38.55	-57.03	48300.35	-31.76		
gamma	I	2041-01-07T22:48:57.328		38.63	-57.11	47625.28	-31.72		
eta	I	2041-01-07T22:49:11.495		38.68	-57.16	47176.12	-31.69		
beta	I	2041-01-07T22:49:59.888		38.86	-57.34	45645.55	-31.60		
alpha	I	2041-01-07T22:50:28.601		38.96	-57.44	44747.47	-31.54		
4	I	2041-01-07T22:51:35.414		39.21	-57.69	42612.16	-31.37		
5	I	2041-01-07T22:51:45.125		39.25	-57.72	42311.21	-31.32		
6	I	2041-01-07T22:51:59.344		39.30	-57.78	41879.72	-31.33		
Uranus	I	2041-01-07T22:56:34.989		40.31	-58.79	25423.75		-33.73	-34.95
Uranus	E	2041-01-07T23:29:29.943		47.59	-66.00	25339.27		45.19	46.50
6	E	2041-01-07T23:31:49.945		48.10	-66.51	41804.32	31.40		
5	E	2041-01-07T23:32:03.383		48.15	-66.56	42159.14	31.40		
4	E	2041-01-07T23:32:15.066		48.20	-66.60	42550.13	31.44		
alpha	E	2041-01-07T23:33:22.081		48.44	-66.84	44684.68	31.62		
beta	E	2041-01-07T23:33:53.098		48.56	-66.96	45666.89	31.68		
eta	E	2041-01-07T23:34:40.762		48.73	-67.13	47176.12	31.78		
gamma	E	2041-01-07T23:34:55.035		48.79	-67.18	47629.92	31.81		
delta	E	2041-01-07T23:35:16.100		48.86	-67.26	48300.35	31.85		
lambda	E	2041-01-07T23:36:10.228		49.06	-67.45	50026.71	31.94		
epsilon	E	2041-01-07T23:36:57.354		49.24	-67.62	51533.64	32.04		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2041-01-07T23:06:12.990
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 662763142251433472
 2Mass ID (if available) : 08350087+1920085
 ICRS Star Coord at Epoch: 08h 35m 00.88794s +19:20:08.53039s
 RUWE (>1.4 is poor) : 2.25
 K magnitude : 12.211
 G magnitude : 13.919
 RP magnitude : 13.345
 BP magnitude : 14.318
 DUPflag : 0
 Distance (au) : 17.603
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.63
 Sun-Target sep (deg) : 161.25
 Sun-Moon sep (deg) : 127.36
 B (ring opening deg) : 40.87
 PA of pole (deg) : 93.63
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.076
 C/A sky separation (km) : 13742.6
 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



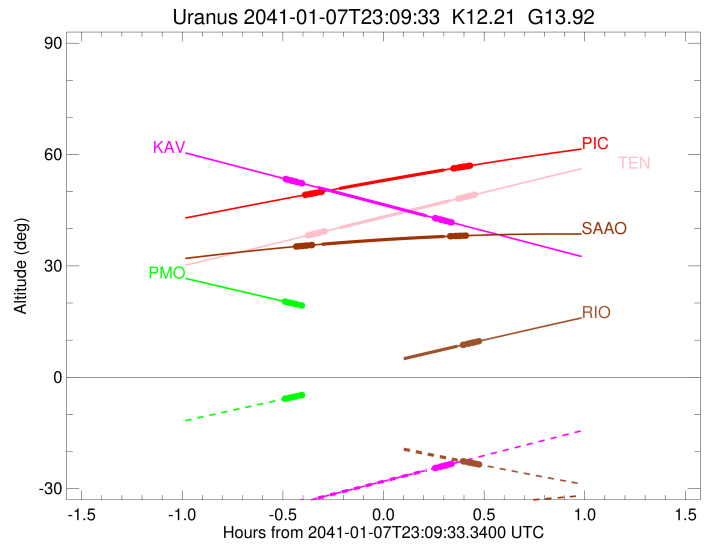
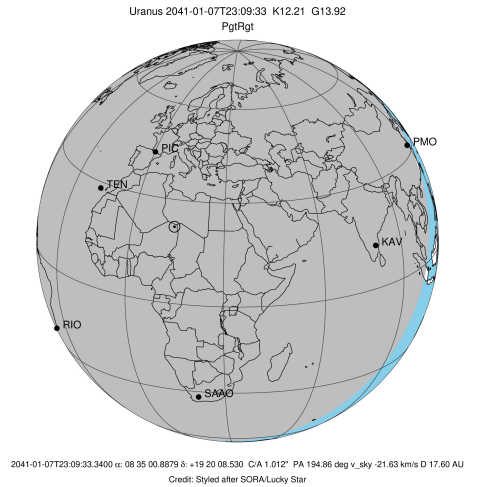
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2041-01-07T22:40:32.008		53.37	-34.73	50882.77	-32.00		
lambda	I	2041-01-07T22:40:58.827		53.27	-34.63	50026.71	-31.90		
delta	I	2041-01-07T22:41:53.034		53.05	-34.42	48300.35	-31.80		
gamma	I	2041-01-07T22:42:14.277		52.97	-34.34	47625.30	-31.76		
eta	I	2041-01-07T22:42:28.429		52.91	-34.28	47176.12	-31.73		
beta	I	2041-01-07T22:43:16.778		52.72	-34.09	45645.49	-31.62		
alpha	I	2041-01-07T22:43:45.474		52.61	-33.98	44747.39	-31.56		
4	I	2041-01-07T22:44:52.263		52.35	-33.73	42612.26	-31.37		
5	I	2041-01-07T22:45:01.988		52.31	-33.69	42311.08	-31.32		
6	I	2041-01-07T22:45:16.191		52.25	-33.63	41879.73	-31.32		
Uranus	I	2041-01-07T22:49:57.533		51.15	-32.55	25426.82		-33.29	-34.51
Uranus	E	2041-01-07T23:22:24.963		43.47	-25.05	25344.59		44.49	45.80
6	E	2041-01-07T23:24:53.549		42.88	-24.48	41804.81	31.24		
5	E	2041-01-07T23:25:07.086		42.83	-24.42	42159.62	31.24		
4	E	2041-01-07T23:25:18.816		42.78	-24.38	42550.85	31.28		
alpha	E	2041-01-07T23:26:26.163		42.52	-24.12	44684.73	31.47		
beta	E	2041-01-07T23:26:57.306		42.39	-24.00	45666.56	31.53		
eta	E	2041-01-07T23:27:45.204		42.21	-23.82	47176.12	31.64		
gamma	E	2041-01-07T23:27:59.545		42.15	-23.76	47629.99	31.66		
delta	E	2041-01-07T23:28:20.703		42.07	-23.68	48300.35	31.70		
lambda	E	2041-01-07T23:29:15.072		41.85	-23.47	50026.71	31.80		
epsilon	E	2041-01-07T23:30:02.467		41.66	-23.29	51535.67	31.90		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2041-01-07T23:13:16.870
 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 : 662763142251433472
 2Mass ID (if available) : 08350087+1920085
 ICRS Star Coord at Epoch: 08h 35m 00.88794s +19:20:08.53039s
 RUWE (>1.4 is poor) : 2.25
 K magnitude : 12.211
 G magnitude : 13.919
 RP magnitude : 13.345
 BP magnitude : 14.318
 DUPflag : 0
 Distance (au) : 17.603
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.63
 Sun-Target sep (deg) : 161.25
 Sun-Moon sep (deg) : 127.74
 B (ring opening deg) : 40.87
 PA of pole (deg) : 93.63
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.675
 C/A sky separation (km) : 8612.4
 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_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	2041-01-07T22:47:07.059	-1.11x	-13.90	50855.03	-32.34			
lambda	I	2041-01-07T22:47:32.703	-1.02x	-13.99	50026.71	-32.29			
delta	I	2041-01-07T22:48:26.193	-0.83x	-14.16	48300.35	-32.26			
gamma	I	2041-01-07T22:48:47.141	-0.75x	-14.23	47624.77	-32.24			
eta	I	2041-01-07T22:49:01.059	-0.70x	-14.27	47176.12	-32.23			
beta	I	2041-01-07T22:49:48.571	-0.53x	-14.43	45646.94	-32.19			
alpha	I	2041-01-07T22:50:16.692	-0.43x	-14.52	44749.18	-32.17			
4	I	2041-01-07T22:51:22.227	-0.19x	-14.73	42609.73	-32.09			
5	I	2041-01-07T22:51:31.419	-0.16x	-14.76	42313.56	-32.07			
6	I	2041-01-07T22:51:45.719	-0.11x	-14.81	41879.30	-32.09			
Uranus	I	2041-01-07T22:54:59.378	0.59x	-15.44	25376.58	-40.22		-41.52	
Uranus	E	2041-01-07T23:31:29.670	8.35	-22.30	25315.02	48.43		49.73	
6	E	2041-01-07T23:33:11.980	8.71	-22.61	41801.36	32.20			
5	E	2041-01-07T23:33:24.883	8.76	-22.65	42156.62	32.18			
4	E	2041-01-07T23:33:36.357	8.80	-22.69	42545.61	32.20			
alpha	E	2041-01-07T23:34:41.895	9.03	-22.88	44684.65	32.29			
beta	E	2041-01-07T23:35:12.406	9.13	-22.97	45668.94	32.32			
eta	E	2041-01-07T23:35:59.103	9.29	-23.11	47176.12	32.36			
gamma	E	2041-01-07T23:36:13.111	9.34	-23.16	47629.50	32.37			
delta	E	2041-01-07T23:36:33.829	9.41	-23.22	48300.35	32.39			
lambda	E	2041-01-07T23:37:27.096	9.60	-23.38	50026.71	32.43			
epsilon	E	2041-01-07T23:38:13.097	9.76	-23.52	51519.27	32.48			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2041-01-07T23:09:28.200
 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 : 662763142251433472
 2Mass ID (if available) : 08350087+1920085
 ICRS Star Coord at Epoch: 08h 35m 00.88794s +19:20:08.53039s
 RUWE (>1.4 is poor) : 2.25
 K magnitude : 12.211
 G magnitude : 13.919
 RP magnitude : 13.345
 BP magnitude : 14.318
 DUPflag : 0
 Distance (au) : 17.603
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.63
 Sun-Target sep (deg) : 161.25
 Sun-Moon sep (deg) : 127.70
 B (ring opening deg) : 40.87
 PA of pole (deg) : 93.63
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.603
 C/A sky separation (km) : 7699.3
 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_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	2041-01-07T22:43:40.419		35.24	-35.57	50848.48	-32.88		
lambda	I	2041-01-07T22:44:05.436		35.27	-35.57	50026.71	-32.84		
delta	I	2041-01-07T22:44:58.027		35.35	-35.57	48300.35	-32.81		
gamma	I	2041-01-07T22:45:18.625		35.37	-35.57	47624.64	-32.80		
eta	I	2041-01-07T22:45:32.302		35.39	-35.57	47176.12	-32.79		
beta	I	2041-01-07T22:46:18.993		35.46	-35.57	45647.32	-32.76		
alpha	I	2041-01-07T22:46:46.619		35.49	-35.57	44749.55	-32.74		
4	I	2041-01-07T22:47:51.044		35.58	-35.56	42609.05	-32.67		
5	I	2041-01-07T22:48:00.001		35.59	-35.56	42313.98	-32.65		
6	I	2041-01-07T22:48:14.146		35.61	-35.56	41879.11	-32.67		
Uranus	I	2041-01-07T22:51:09.882		35.83	-35.54	25366.73		-41.54	-42.85
Uranus	E	2041-01-07T23:27:43.631		37.93	-34.55	25313.10		48.69	49.98
6	E	2041-01-07T23:29:21.788		37.99	-34.47	41800.97	32.69		
5	E	2041-01-07T23:29:34.465		38.00	-34.46	42156.34	32.67		
4	E	2041-01-07T23:29:45.778		38.01	-34.46	42544.97	32.69		
alpha	E	2041-01-07T23:30:50.362		38.05	-34.40	44684.68	32.76		
beta	E	2041-01-07T23:31:20.453		38.06	-34.38	45669.22	32.78		
eta	E	2041-01-07T23:32:06.485		38.09	-34.34	47176.12	32.82		
gamma	E	2041-01-07T23:32:20.297		38.10	-34.33	47629.44	32.82		
delta	E	2041-01-07T23:32:40.733		38.11	-34.31	48300.35	32.84		
lambda	E	2041-01-07T23:33:33.280		38.14	-34.27	50026.71	32.87		
epsilon	E	2041-01-07T23:34:18.604		38.16	-34.23	51517.06	32.91		