

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2041-02-04T19:35:18.700
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 662940812162384000
 2Mass ID (if available) : 08300585+1938013

ICRS Star Coord at Epoch: 08h 30m 05.80994s +19:38:00.86968s

RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.919
 G magnitude : 18.206
 RP magnitude : 17.117
 BP magnitude : 19.425
 DUPflag : 0
 Distance (au) : 17.564
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.69
 Sun-Target sep (deg) : 169.20
 Sun-Moon sep (deg) : 119.07
 B (ring opening deg) : 42.04
 PA of pole (deg) : 93.01

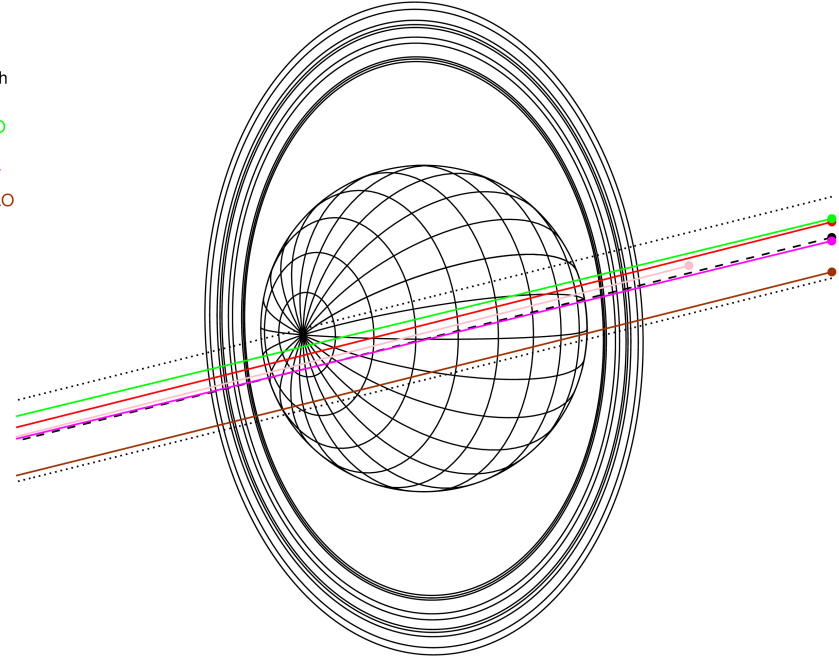
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2041-02-04T19:35:18.7000 α: 08 30 05.8099 s; +19 38 00.870 C/A 0.121° PA 14.00 deg v_sky -22.69 km/s D 17.56 AU
 Credit: Styled after SORA/Lucky Star

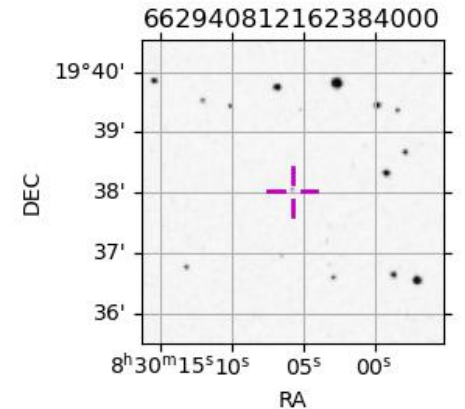
Uranus 2041-02-04T19:35:18 K14.92 G18.21 PgtRgt

Earth
 PIC
 PMO
 TEN
 KAV
 SAAO

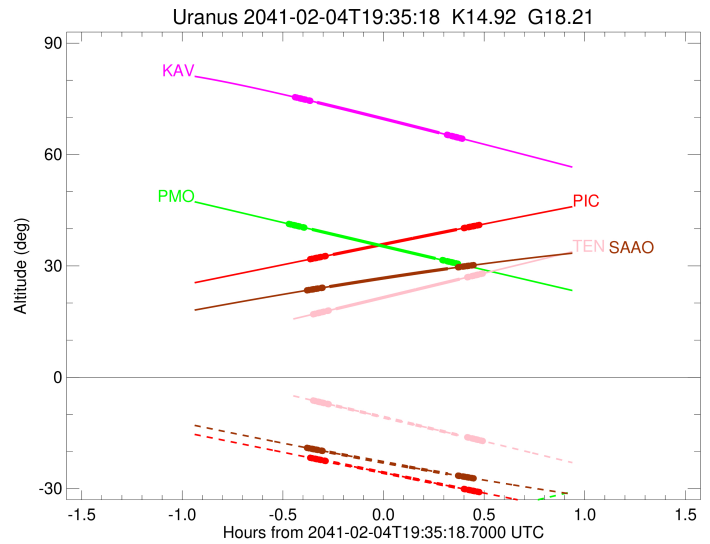
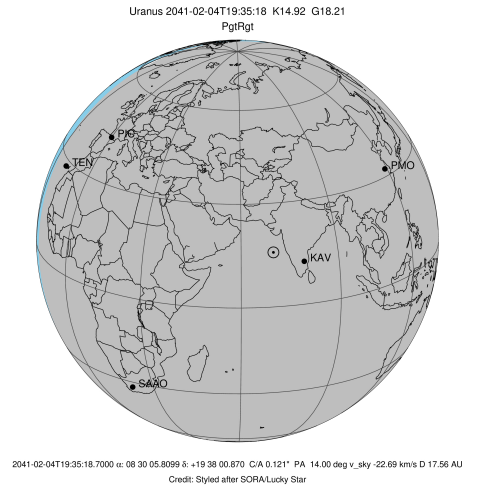


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	FEB 04 19:13 - FEB 04 20:04	PieRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	FEB 04 19:07 - FEB 04 19:57	PieRie
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	+++++	+ +	+++++	FEB 04 19:14 - FEB 04 20:05	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++	+ +	+++++	FEB 04 19:09 - FEB 04 19:58	PieRie
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	+++++	+ +	+++++	FEB 04 19:12 - FEB 04 20:02	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

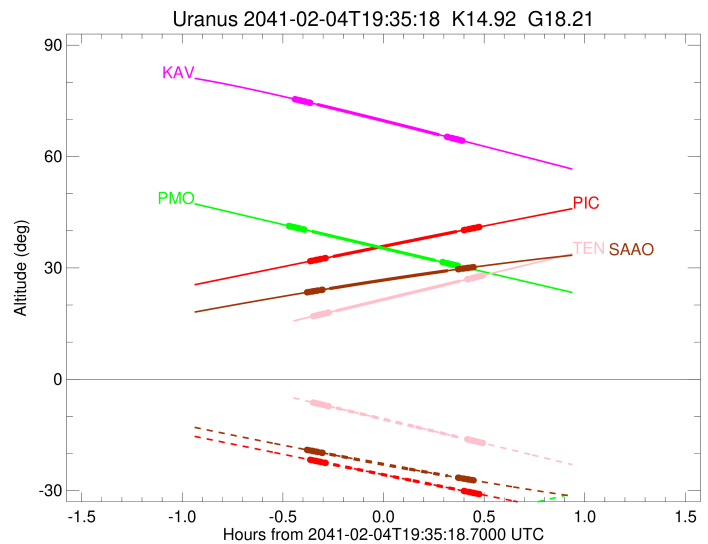
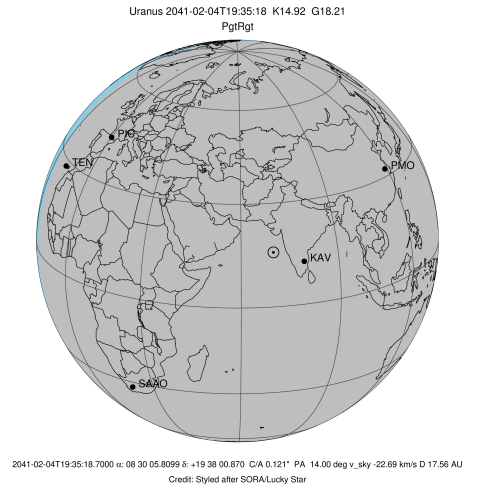


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2041-02-04T19:38:43.270
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 662940812162384000
 2Mass ID (if available) : 08300585+1938013
 ICRS Star Coord at Epoch: 08h 30m 05.80994s +19:38:00.86968s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.919
 G magnitude : 18.206
 RP magnitude : 17.117
 BP magnitude : 19.425
 DUPflag : 0
 Distance (au) : 17.564
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.69
 Sun-Target sep (deg) : 169.20
 Sun-Moon sep (deg) : 119.93
 B (ring opening deg) : 42.04
 PA of pole (deg) : 93.01
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.042
 C/A sky separation (km) : 538.6
 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



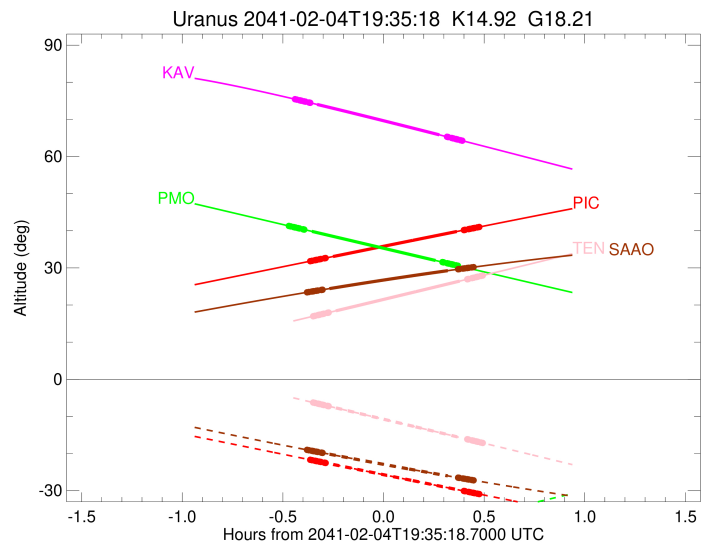
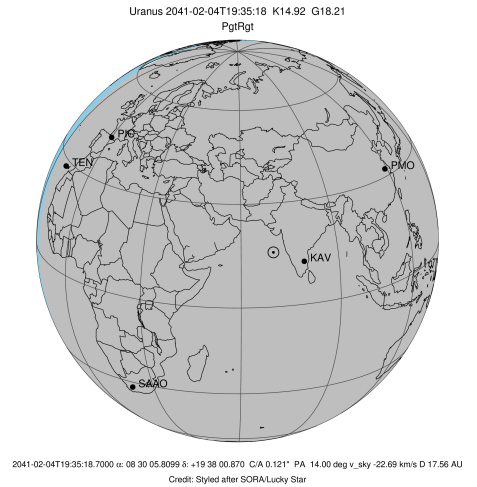
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2041-02-04T19:13:40.743		31.85	-21.73	50744.39	-33.76		
lambda	I	2041-02-04T19:14:01.999		31.92	-21.80	50026.71	-33.76		
delta	I	2041-02-04T19:14:53.129		32.07	-21.96	48300.35	-33.76		
gamma	I	2041-02-04T19:15:13.245		32.13	-22.02	47621.13	-33.76		
eta	I	2041-02-04T19:15:26.425		32.18	-22.06	47176.12	-33.76		
beta	I	2041-02-04T19:16:11.008		32.31	-22.19	45668.76	-33.76		
alpha	I	2041-02-04T19:16:38.915		32.40	-22.28	44741.84	-33.77		
4	I	2041-02-04T19:17:42.853		32.59	-22.47	42551.57	-33.75		
5	I	2041-02-04T19:17:52.741		32.62	-22.50	42256.74	-33.78		
6	I	2041-02-04T19:18:03.370		32.66	-22.54	41832.13	-33.73		
Uranus	I	2041-02-04T19:20:17.342		33.07	-22.95	25309.68		-46.51	-47.82
Uranus	E	2041-02-04T19:57:08.040		39.80	-29.70	25305.48		47.02	48.33
6	E	2041-02-04T19:59:17.181		40.19	-30.09	41843.45	33.80		
5	E	2041-02-04T19:59:26.263		40.22	-30.12	42215.18	33.85		
4	E	2041-02-04T19:59:38.540		40.25	-30.15	42591.96	33.82		
alpha	E	2041-02-04T20:00:39.771		40.44	-30.34	44695.82	33.85		
beta	E	2041-02-04T20:01:08.510		40.52	-30.43	45653.04	33.84		
eta	E	2041-02-04T20:01:53.458		40.66	-30.56	47176.12	33.84		
gamma	E	2041-02-04T20:02:06.912		40.70	-30.60	47631.44	33.84		
delta	E	2041-02-04T20:02:26.677		40.76	-30.66	48300.35	33.84		
lambda	E	2041-02-04T20:03:17.682		40.91	-30.82	50026.71	33.85		
epsilon	E	2041-02-04T20:04:02.793		41.05	-30.96	51553.67	33.85		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2041-02-04T19:32:24.040
 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 : 662940812162384000
 2Mass ID (if available) : 08300585+1938013
 ICRS Star Coord at Epoch: 08h 30m 05.80994s +19:38:00.86968s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.919
 G magnitude : 18.206
 RP magnitude : 17.117
 BP magnitude : 19.425
 DUPflag : 0
 Distance (au) : 17.564
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.69
 Sun-Target sep (deg) : 169.20
 Sun-Moon sep (deg) : 119.25
 B (ring opening deg) : 42.04
 PA of pole (deg) : 93.01
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.132
 C/A sky separation (km) : 1683.6
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



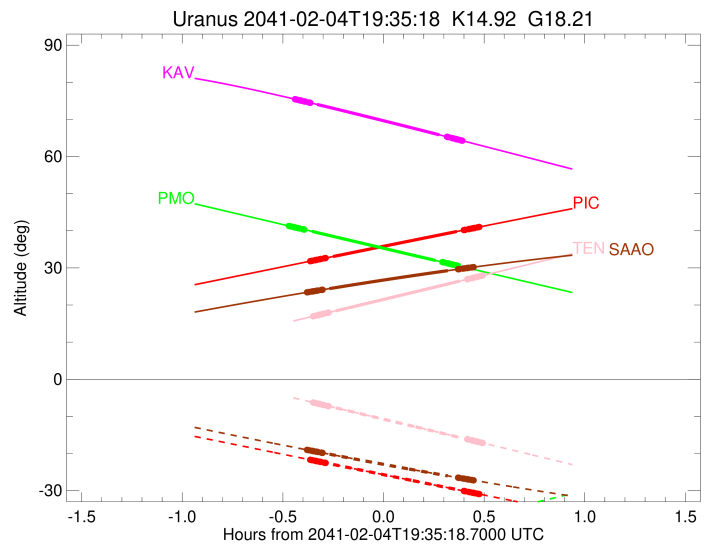
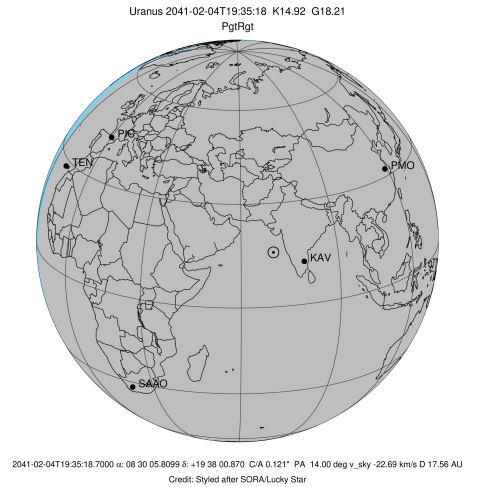
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2041-02-04T19:07:19.003		41.25	-48.59	50744.01	-33.84		
lambda	I	2041-02-04T19:07:40.203		41.18	-48.52	50026.71	-33.83		
delta	I	2041-02-04T19:08:31.230		41.00	-48.34	48300.35	-33.83		
gamma	I	2041-02-04T19:08:51.307		40.93	-48.27	47621.15	-33.83		
eta	I	2041-02-04T19:09:04.463		40.88	-48.23	47176.12	-33.83		
beta	I	2041-02-04T19:09:48.976		40.72	-48.07	45668.41	-33.82		
alpha	I	2041-02-04T19:10:16.812		40.62	-47.98	44742.32	-33.83		
4	I	2041-02-04T19:11:20.654		40.40	-47.76	42552.42	-33.80		
5	I	2041-02-04T19:11:30.514		40.36	-47.72	42258.37	-33.83		
6	I	2041-02-04T19:11:41.120		40.32	-47.68	41833.04	-33.77		
Uranus	I	2041-02-04T19:13:59.863		39.83	-47.20	25313.85		-45.99	-47.30
Uranus	E	2041-02-04T19:50:49.081		32.00	-39.47	25301.48		47.51	48.82
6	E	2041-02-04T19:52:54.040		31.56	-39.03	41844.85	33.68		
5	E	2041-02-04T19:53:03.245		31.53	-39.00	42217.77	33.73		
4	E	2041-02-04T19:53:15.509		31.48	-38.95	42593.28	33.70		
alpha	E	2041-02-04T19:54:16.926		31.27	-38.74	44696.63	33.73		
beta	E	2041-02-04T19:54:45.727		31.16	-38.64	45652.47	33.71		
eta	E	2041-02-04T19:55:30.862		31.00	-38.48	47176.12	33.72		
gamma	E	2041-02-04T19:55:44.367		30.96	-38.43	47631.47	33.72		
delta	E	2041-02-04T19:56:04.205		30.89	-38.36	48300.35	33.72		
lambda	E	2041-02-04T19:56:55.405		30.71	-38.18	50026.71	33.72		
epsilon	E	2041-02-04T19:57:40.654		30.55	-38.02	51552.47	33.72		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2041-02-04T19:39:35.050
 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 : 662940812162384000
 2Mass ID (if available) : 08300585+1938013
 ICRS Star Coord at Epoch: 08h 30m 05.80994s +19:38:00.86968s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.919
 G magnitude : 18.206
 RP magnitude : 17.117
 BP magnitude : 19.425
 DUPflag : 0
 Distance (au) : 17.564
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.69
 Sun-Target sep (deg) : 169.20
 Sun-Moon sep (deg) : 119.84
 B (ring opening deg) : 42.04
 PA of pole (deg) : 93.01
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.056
 C/A sky separation (km) : 708.8
 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



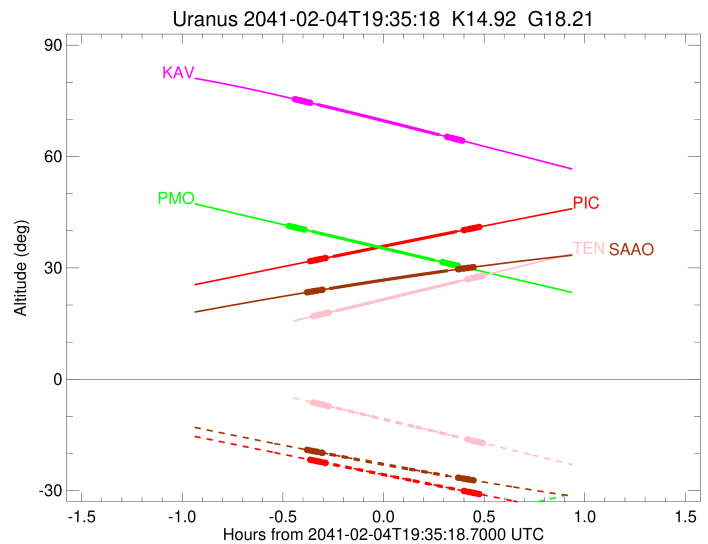
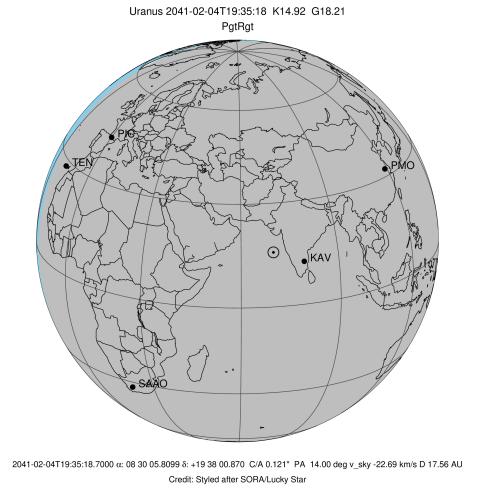
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2041-02-04T19:14:33.754		17.02	-6.31	50745.12	-33.65		
lambda	I	2041-02-04T19:14:55.104		17.10	-6.39	50026.71	-33.65		
delta	I	2041-02-04T19:15:46.408		17.28	-6.57	48300.35	-33.65		
gamma	I	2041-02-04T19:16:06.594		17.35	-6.64	47621.10	-33.65		
eta	I	2041-02-04T19:16:19.818		17.40	-6.69	47176.12	-33.65		
beta	I	2041-02-04T19:17:04.541		17.56	-6.85	45669.25	-33.65		
alpha	I	2041-02-04T19:17:32.575		17.66	-6.95	44741.18	-33.66		
4	I	2041-02-04T19:18:36.724		17.89	-7.18	42550.43	-33.63		
5	I	2041-02-04T19:18:46.662		17.93	-7.21	42254.55	-33.66		
6	I	2041-02-04T19:18:57.341		17.97	-7.25	41830.92	-33.61		
Uranus	I	2041-02-04T19:21:06.390		18.43	-7.71	25305.14		-47.06	-48.37
Uranus	E	2041-02-04T19:58:02.543		26.45	-15.67	25310.61		46.39	47.70
6	E	2041-02-04T20:00:17.994		26.94	-16.16	41842.11	33.71		
5	E	2041-02-04T20:00:27.018		26.98	-16.19	42212.76	33.77		
4	E	2041-02-04T20:00:39.375		27.02	-16.24	42590.70	33.74		
alpha	E	2041-02-04T20:01:40.791		27.24	-16.46	44695.08	33.77		
beta	E	2041-02-04T20:02:09.639		27.35	-16.56	45653.58	33.76		
eta	E	2041-02-04T20:02:54.676		27.51	-16.73	47176.12	33.76		
gamma	E	2041-02-04T20:03:08.161		27.56	-16.78	47631.40	33.76		
delta	E	2041-02-04T20:03:27.974		27.63	-16.85	48300.35	33.76		
lambda	E	2041-02-04T20:04:19.101		27.82	-17.03	50026.71	33.77		
epsilon	E	2041-02-04T20:05:04.341		27.99	-17.20	51554.48	33.77		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2041-02-04T19:33:43.280
 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 : 662940812162384000
 2Mass ID (if available) : 08300585+1938013
 ICRS Star Coord at Epoch: 08h 30m 05.80994s +19:38:00.86968s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.919
 G magnitude : 18.206
 RP magnitude : 17.117
 BP magnitude : 19.425
 DUPflag : 0
 Distance (au) : 17.564
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.69
 Sun-Target sep (deg) : 169.20
 Sun-Moon sep (deg) : 119.71
 B (ring opening deg) : 42.04
 PA of pole (deg) : 93.01
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.138
 C/A sky separation (km) : 1764.0
 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	2041-02-04T19:09:07.988		75.40	-85.71	50746.30	-34.15		
lambda	I	2041-02-04T19:09:29.061		75.33	-85.65	50026.71	-34.15		
delta	I	2041-02-04T19:10:19.622		75.15	-85.53	48300.35	-34.14		
gamma	I	2041-02-04T19:10:39.518		75.08	-85.48	47621.06	-34.14		
eta	I	2041-02-04T19:10:52.552		75.03	-85.44	47176.12	-34.14		
beta	I	2041-02-04T19:11:36.623		74.87	-85.32	45669.81	-34.13		
alpha	I	2041-02-04T19:12:04.296		74.78	-85.25	44740.38	-34.14		
4	I	2041-02-04T19:13:07.539		74.55	-85.07	42549.13	-34.11		
5	I	2041-02-04T19:13:17.356		74.51	-85.04	42251.99	-34.14		
6	I	2041-02-04T19:13:27.906		74.48	-85.01	41829.54	-34.09		
Uranus	I	2041-02-04T19:15:30.729		74.04	-84.64	25301.32		-47.53	-48.84
Uranus	E	2041-02-04T19:51:57.139		65.85	-76.61	25314.26		45.94	47.25
6	E	2041-02-04T19:54:15.508		65.32	-76.07	41841.35	34.04		
5	E	2041-02-04T19:54:24.403		65.28	-76.04	42211.37	34.09		
4	E	2041-02-04T19:54:36.668		65.24	-75.99	42589.97	34.06		
alpha	E	2041-02-04T19:55:37.518		65.00	-75.75	44694.68	34.09		
beta	E	2041-02-04T19:56:06.112		64.89	-75.64	45653.88	34.08		
eta	E	2041-02-04T19:56:50.711		64.72	-75.46	47176.12	34.08		
gamma	E	2041-02-04T19:57:04.068		64.67	-75.41	47631.38	34.09		
delta	E	2041-02-04T19:57:23.694		64.60	-75.33	48300.35	34.09		
lambda	E	2041-02-04T19:58:14.340		64.40	-75.13	50026.71	34.09		
epsilon	E	2041-02-04T19:58:59.166		64.23	-74.96	51554.78	34.09		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2041-02-04T19:36:49.660
 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 : 662940812162384000
 2Mass ID (if available) : 08300585+1938013
 ICRS Star Coord at Epoch: 08h 30m 05.80994s +19:38:00.86968s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.919
 G magnitude : 18.206
 RP magnitude : 17.117
 BP magnitude : 19.425
 DUPflag : 0
 Distance (au) : 17.564
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.69
 Sun-Target sep (deg) : 169.20
 Sun-Moon sep (deg) : 119.64
 B (ring opening deg) : 42.04
 PA of pole (deg) : 93.01
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.544
 C/A sky separation (km) : 6930.6
 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_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	2041-02-04T19:12:43.842		23.46	-19.06	50752.88	-33.64		
lambda	I	2041-02-04T19:13:05.433		23.51	-19.12	50026.71	-33.63		
delta	I	2041-02-04T19:13:56.791		23.64	-19.27	48300.35	-33.60		
gamma	I	2041-02-04T19:14:17.012		23.69	-19.33	47620.98	-33.59		
eta	I	2041-02-04T19:14:30.257		23.72	-19.37	47176.12	-33.58		
beta	I	2041-02-04T19:15:15.026		23.83	-19.50	45671.75	-33.56		
alpha	I	2041-02-04T19:15:43.313		23.90	-19.58	44737.32	-33.55		
4	I	2041-02-04T19:16:47.697		24.06	-19.77	42544.59	-33.48		
5	I	2041-02-04T19:16:57.756		24.09	-19.80	42242.49	-33.49		
6	I	2041-02-04T19:17:08.611		24.12	-19.83	41824.55	-33.44		
Uranus	I	2041-02-04T19:19:11.884		24.42	-20.18	25299.74		-47.73	-49.03
Uranus	E	2041-02-04T19:54:29.044		29.26	-26.03	25350.54		41.49	42.80
6	E	2041-02-04T19:57:33.871		29.64	-26.51	41835.82	33.50		
5	E	2041-02-04T19:57:42.647		29.66	-26.53	42201.72	33.55		
4	E	2041-02-04T19:57:55.263		29.68	-26.56	42584.56	33.54		
alpha	E	2041-02-04T19:58:57.202		29.81	-26.72	44691.93	33.61		
beta	E	2041-02-04T19:59:26.342		29.87	-26.80	45656.16	33.62		
eta	E	2041-02-04T20:00:11.458		29.96	-26.92	47176.12	33.65		
gamma	E	2041-02-04T20:00:24.980		29.99	-26.95	47631.18	33.66		
delta	E	2041-02-04T20:00:44.859		30.03	-27.00	48300.35	33.67		
lambda	E	2041-02-04T20:01:36.115		30.13	-27.13	50026.71	33.69		
epsilon	E	2041-02-04T20:02:21.447		30.23	-27.25	51554.64	33.71		