

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-01-22T19:18:51.440  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 3425434163152369920  
 2Mass ID (if available) : 06103869+2341332

Uranus 2034-01-22T19:18:51 K13.78 G15.81 PgtRgt

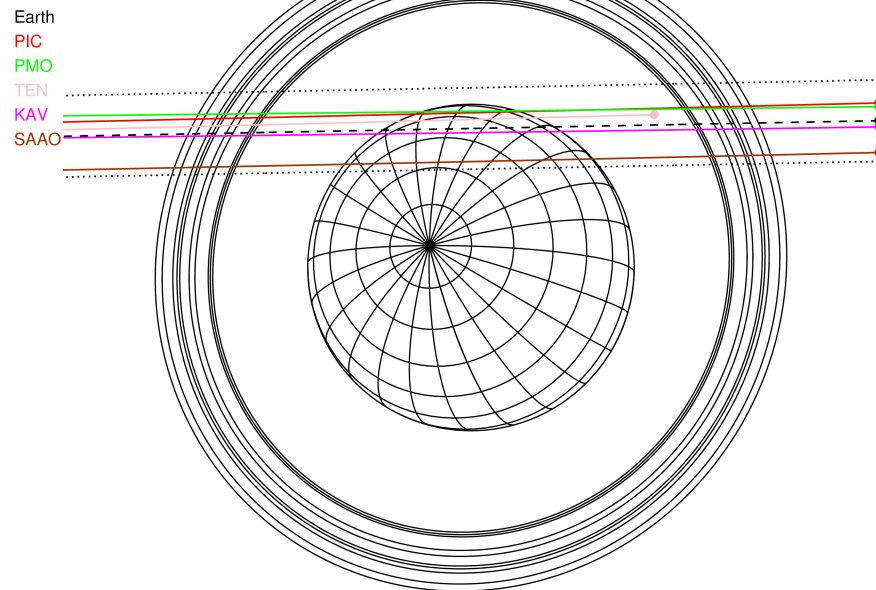
ICRS Star Coord at Epoch: 06h 10m 38.68646s +23:41:33.25809s

RUWE (>1.4 is poor) : 0.94  
 K magnitude : 13.780  
 G magnitude : 15.807  
 RP magnitude : 15.112  
 BP magnitude : 16.342  
 DUPflag : 0  
 Distance (au) : 18.089  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -19.44  
 Sun-Target sep (deg) : 150.07  
 Sun-Moon sep (deg) : 119.53  
 B (ring opening deg) : 73.22  
 PA of pole (deg) : 62.28

Uranus 2034-01-22T19:18:51 K13.78 G15.81  
 PgtRgt



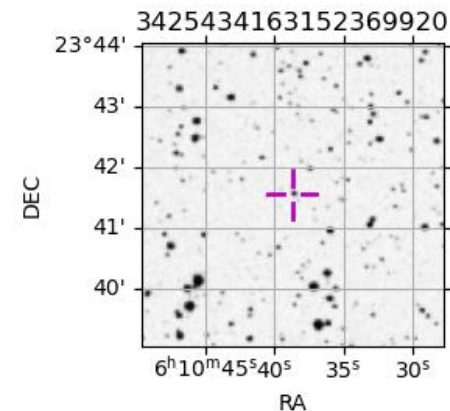
2034-01-22T19:18:51.4400 ra: 06 10 38.6865 s: +23 41 33.258 C/A 1.666" PA 181.10 deg v\_sky -19.44 km/s D 18.09 AU  
 Credit: Styled after SORA/Lucky Star



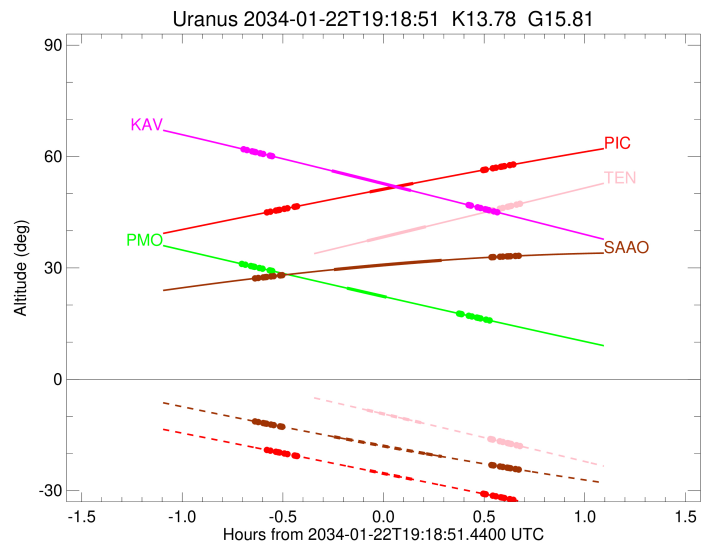
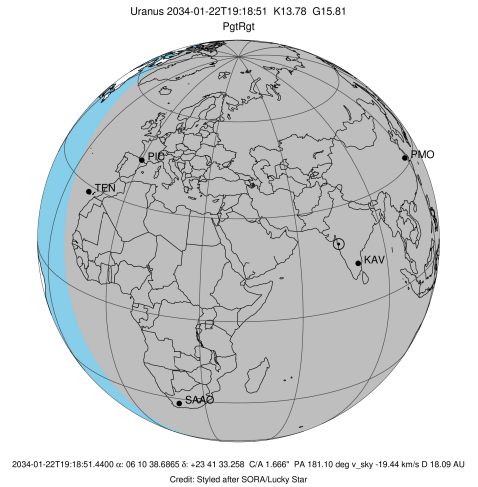
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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 22 18:44 - JAN 22 19:57	PieRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	JAN 22 18:36 - JAN 22 19:50	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		+ +	+++++	JAN 22 19:13 - JAN 22 19:59	PieRne
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++	+ +	+++++	JAN 22 18:37 - JAN 22 19:52	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	+++++	+ +	+++++	JAN 22 18:40 - JAN 22 19:58	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

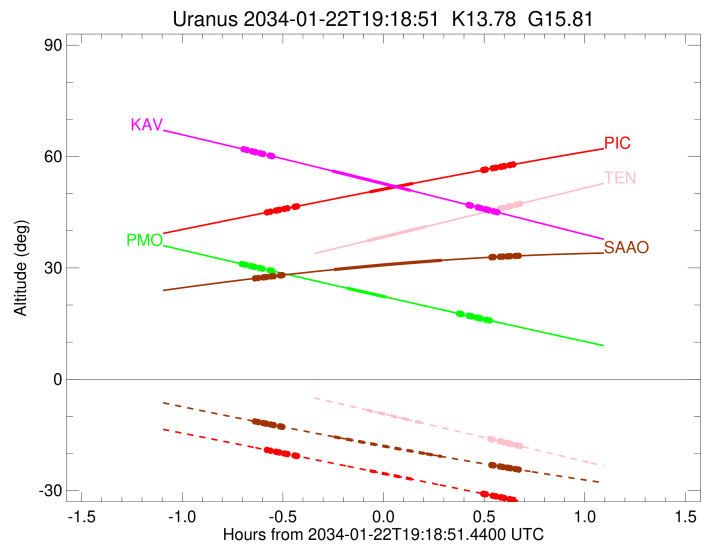
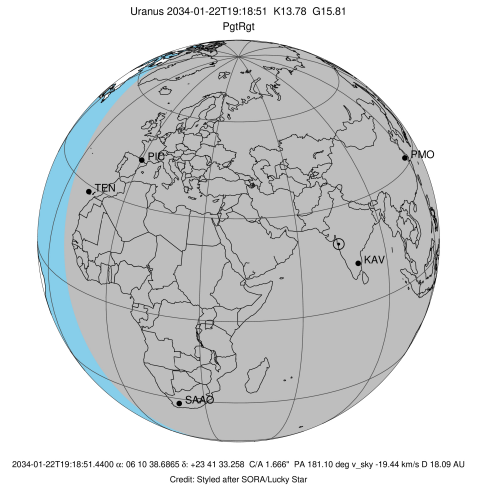


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-01-22T19:21:35.650  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PIC  
 Location : Pic du Midi  
 Latitude (deg) : 42.93656  
 E. Longitude (deg) : 0.14231  
 Altitude (km) : 2.890  
 Gaia source ID : 3425434163152369920  
 2Mass ID (if available) : 06103869+2341332  
 ICRS Star Coord at Epoch: 06h 10m 38.68646s +23:41:33.25809s  
 RUWE (>1.4 is poor) : 0.94  
 K magnitude : 13.780  
 G magnitude : 15.807  
 RP magnitude : 15.112  
 BP magnitude : 16.342  
 DUPflag : 0  
 Distance (au) : 18.089  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -19.44  
 Sun-Target sep (deg) : 150.07  
 Sun-Moon sep (deg) : 120.45  
 B (ring opening deg) : 73.22  
 PA of pole (deg) : 62.28  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.846  
 C/A sky separation (km) : 24223.4  
 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\_itrfr93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



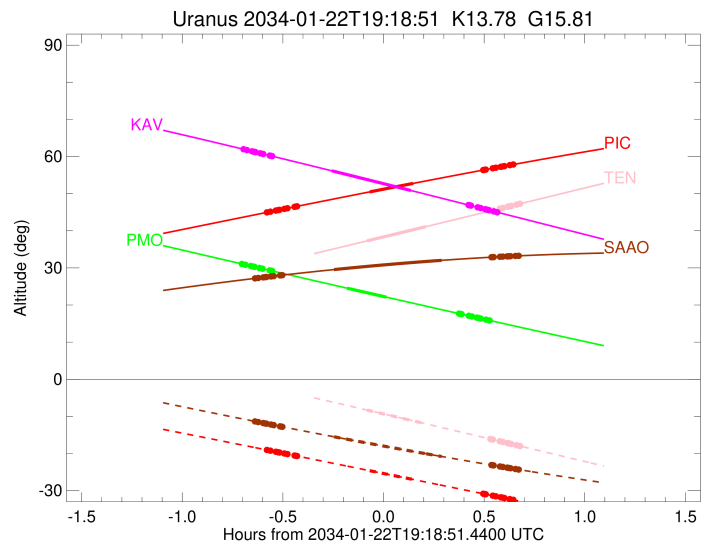
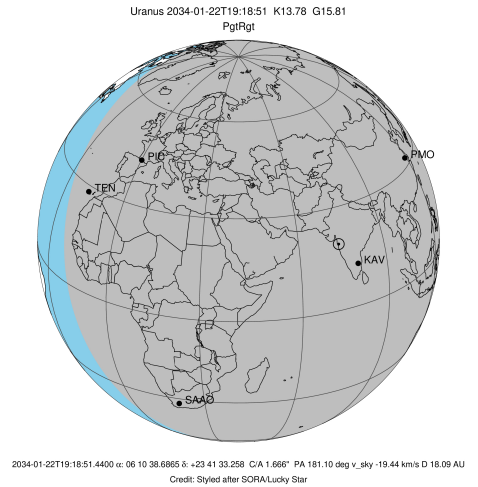
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-01-22T18:44:13.606		44.98	-19.07	51015.07	-17.77		
lambda	I	2034-01-22T18:45:09.150		45.15	-19.24	50026.71	-17.74		
delta	I	2034-01-22T18:46:47.013		45.44	-19.54	48300.35	-17.54		
gamma	I	2034-01-22T18:47:25.336		45.56	-19.65	47629.92	-17.45		
eta	I	2034-01-22T18:47:51.384		45.64	-19.73	47176.12	-17.39		
beta	I	2034-01-22T18:49:18.879		45.90	-19.99	45664.35	-17.18		
alpha	I	2034-01-22T18:50:15.886		46.08	-20.17	44687.27	-17.02		
4	I	2034-01-22T18:52:22.914		46.46	-20.55	42551.03	-16.63		
5	I	2034-01-22T18:52:37.433		46.50	-20.60	42313.20	-16.60		
6	I	2034-01-22T18:53:08.618		46.60	-20.69	41796.65	-16.50		
Uranus	I	2034-01-22T19:14:44.798		50.48	-24.63	25540.31		3.04	3.18
Uranus	E	2034-01-22T19:27:42.603		52.76	-27.00	25280.02		11.92	12.47
6	E	2034-01-22T19:48:36.658		56.36	-30.84	41861.87	16.53		
5	E	2034-01-22T19:48:58.451		56.42	-30.90	42226.33	16.64		
4	E	2034-01-22T19:49:16.601		56.47	-30.96	42539.78	16.67		
alpha	E	2034-01-22T19:51:27.651		56.84	-31.36	44743.04	17.07		
beta	E	2034-01-22T19:52:22.048		56.99	-31.53	45677.74	17.22		
eta	E	2034-01-22T19:53:48.514		57.23	-31.79	47176.12	17.44		
gamma	E	2034-01-22T19:54:13.993		57.30	-31.87	47621.15	17.50		
delta	E	2034-01-22T19:54:52.713		57.41	-31.99	48300.35	17.59		
lambda	E	2034-01-22T19:56:30.304		57.68	-32.28	50026.71	17.79		
epsilon	E	2034-01-22T19:57:18.925		57.81	-32.43	50894.07	17.83		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-01-22T19:14:13.950  
 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 : 3425434163152369920  
 2Mass ID (if available) : 06103869+2341332  
 ICRS Star Coord at Epoch: 06h 10m 38.68646s +23:41:33.25809s  
 RUWE (>1.4 is poor) : 0.94  
 K magnitude : 13.780  
 G magnitude : 15.807  
 RP magnitude : 15.112  
 BP magnitude : 16.342  
 DUPflag : 0  
 Distance (au) : 18.089  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -19.44  
 Sun-Target sep (deg) : 150.07  
 Sun-Moon sep (deg) : 119.47  
 B (ring opening deg) : 73.22  
 PA of pole (deg) : 62.28  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.864  
 C/A sky separation (km) : 24456.5  
 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



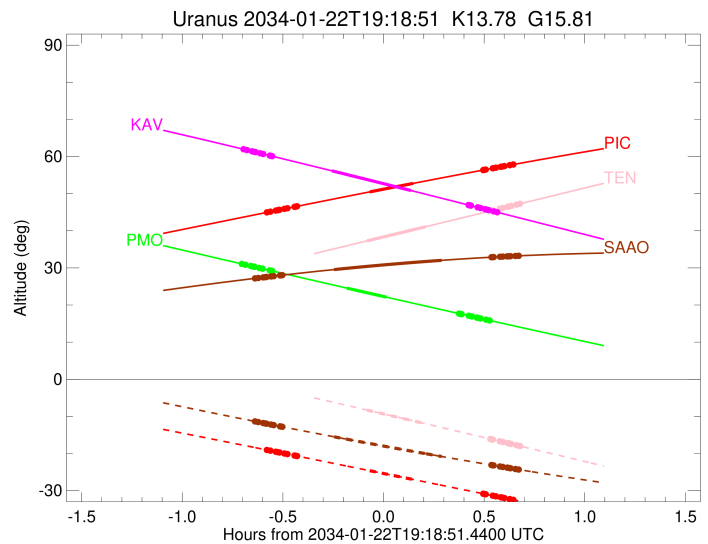
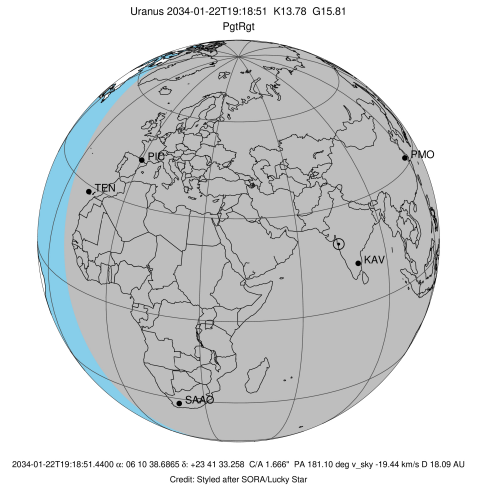
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-01-22T18:36:44.989		31.05	-56.22	51017.77	-17.67		
lambda	I	2034-01-22T18:37:41.028		30.85	-56.03	50026.71	-17.63		
delta	I	2034-01-22T18:39:19.532		30.51	-55.69	48300.35	-17.42		
gamma	I	2034-01-22T18:39:58.118		30.37	-55.56	47629.95	-17.33		
eta	I	2034-01-22T18:40:24.353		30.28	-55.47	47176.12	-17.27		
beta	I	2034-01-22T18:41:52.507		29.97	-55.16	45664.23	-17.05		
alpha	I	2034-01-22T18:42:49.960		29.77	-54.96	44687.19	-16.89		
4	I	2034-01-22T18:44:58.057		29.33	-54.52	42551.25	-16.48		
5	I	2034-01-22T18:45:12.727		29.28	-54.47	42313.10	-16.45		
6	I	2034-01-22T18:45:44.198		29.17	-54.36	41796.58	-16.34		
Uranus	I	2034-01-22T19:07:57.877		24.55	-49.70	25536.46		3.34	3.50
Uranus	E	2034-01-22T19:19:46.317		22.11	-47.21	25303.02		11.40	11.93
6	E	2034-01-22T19:41:23.871		17.69	-42.63	41861.24	16.26		
5	E	2034-01-22T19:41:46.161		17.61	-42.55	42227.76	16.36		
4	E	2034-01-22T19:42:04.484		17.55	-42.48	42539.20	16.39		
alpha	E	2034-01-22T19:44:17.731		17.10	-42.01	44742.63	16.79		
beta	E	2034-01-22T19:45:13.066		16.91	-41.82	45677.94	16.94		
eta	E	2034-01-22T19:46:40.935		16.62	-41.51	47176.12	17.16		
gamma	E	2034-01-22T19:47:06.830		16.53	-41.41	47621.17	17.22		
delta	E	2034-01-22T19:47:46.179		16.40	-41.28	48300.35	17.30		
lambda	E	2034-01-22T19:49:25.351		16.06	-40.92	50026.71	17.51		
epsilon	E	2034-01-22T19:50:14.464		15.90	-40.75	50888.90	17.54		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-01-22T19:23:02.890  
 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 : 3425434163152369920  
 2Mass ID (if available) : 06103869+2341332  
 ICRS Star Coord at Epoch: 06h 10m 38.68646s +23:41:33.25809s  
 RUWE (>1.4 is poor) : 0.94  
 K magnitude : 13.780  
 G magnitude : 15.807  
 RP magnitude : 15.112  
 BP magnitude : 16.342  
 DUPflag : 0  
 Distance (au) : 18.089  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -19.44  
 Sun-Target sep (deg) : 150.07  
 Sun-Moon sep (deg) : 120.44  
 B (ring opening deg) : 73.22  
 PA of pole (deg) : 62.28  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.766  
 C/A sky separation (km) : 23169.4  
 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\_itr93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



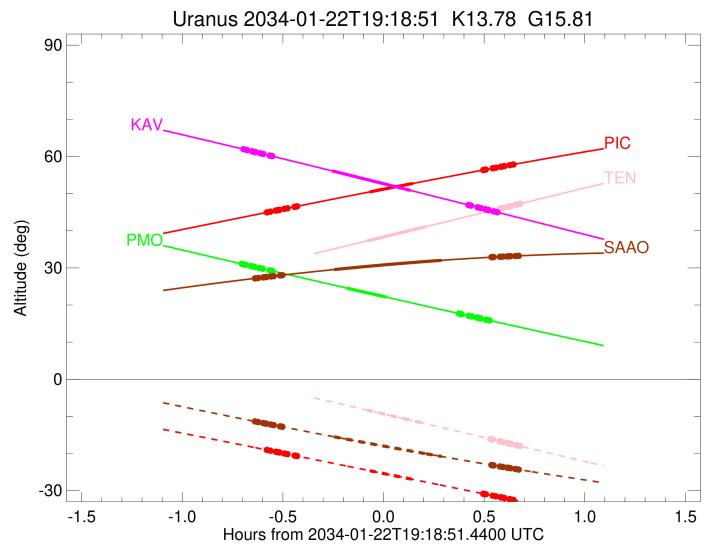
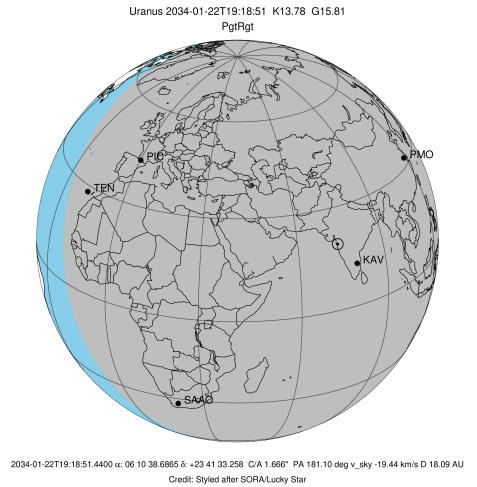
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-01-22T18:45:09.183		31.02	-2.31x	51023.21	-17.95		
lambda	I	2034-01-22T18:46:04.627		31.22	-2.50x	50026.71	-17.92		
delta	I	2034-01-22T18:47:41.422		31.57	-2.84x	48300.35	-17.74		
gamma	I	2034-01-22T18:48:19.284		31.71	-2.97x	47630.01	-17.66		
eta	I	2034-01-22T18:48:45.017		31.80	-3.05x	47176.12	-17.61		
beta	I	2034-01-22T18:50:11.383		32.11	-3.35x	45663.86	-17.42		
alpha	I	2034-01-22T18:51:07.548		32.32	-3.55x	44686.94	-17.28		
4	I	2034-01-22T18:53:12.428		32.77	-3.98x	42552.16	-16.93		
5	I	2034-01-22T18:53:26.785		32.82	-4.03x	42312.66	-16.91		
6	I	2034-01-22T18:53:57.380		32.93	-4.13x	41796.31	-16.81		
Uranus	I	2034-01-22T19:13:54.569		37.27	-8.29	25555.95		1.23	1.29
Uranus	E	2034-01-22T19:31:28.796		41.11	-12.00	25217.67		13.23	13.83
6	E	2034-01-22T19:50:44.419		45.33	-16.10	41863.02	16.88		
5	E	2034-01-22T19:51:05.552		45.41	-16.17	42223.71	16.97		
4	E	2034-01-22T19:51:23.586		45.48	-16.24	42540.86	17.00		
alpha	E	2034-01-22T19:53:32.263		45.95	-16.70	44743.74	17.36		
beta	E	2034-01-22T19:54:25.712		46.15	-16.89	45677.40	17.50		
eta	E	2034-01-22T19:55:50.899		46.46	-17.19	47176.12	17.69		
gamma	E	2034-01-22T19:56:16.013		46.55	-17.28	47621.11	17.75		
delta	E	2034-01-22T19:56:54.204		46.69	-17.42	48300.35	17.83		
lambda	E	2034-01-22T19:58:30.540		47.04	-17.76	50026.71	18.01		
epsilon	E	2034-01-22T19:59:19.036		47.22	-17.94	50902.37	18.04		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-01-22T19:15:32.510  
 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 : 3425434163152369920  
 2Mass ID (if available) : 06103869+2341332  
 ICRS Star Coord at Epoch: 06h 10m 38.68646s +23:41:33.25809s  
 RUWE (>1.4 is poor) : 0.94  
 K magnitude : 13.780  
 G magnitude : 15.807  
 RP magnitude : 15.112  
 BP magnitude : 16.342  
 DUPflag : 0  
 Distance (au) : 18.089  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -19.44  
 Sun-Target sep (deg) : 150.07  
 Sun-Moon sep (deg) : 119.92  
 B (ring opening deg) : 73.22  
 PA of pole (deg) : 62.28  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.609  
 C/A sky separation (km) : 21108.9  
 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\_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	2034-01-22T18:37:14.610		61.94	-81.61	51045.68	-18.59		
lambda	I	2034-01-22T18:38:09.342		61.74	-81.73	50026.71	-18.58		
delta	I	2034-01-22T18:39:42.654		61.40	-81.92	48300.35	-18.42		
gamma	I	2034-01-22T18:40:19.090		61.27	-81.99	47630.24	-18.36		
eta	I	2034-01-22T18:40:43.855		61.18	-82.04	47176.12	-18.31		
beta	I	2034-01-22T18:42:06.892		60.88	-82.19	45662.57	-18.16		
alpha	I	2034-01-22T18:43:00.696		60.68	-82.28	44686.19	-18.04		
4	I	2034-01-22T18:44:59.911		60.24	-82.47	42555.08	-17.75		
5	I	2034-01-22T18:45:13.851		60.19	-82.49	42311.05	-17.74		
6	I	2034-01-22T18:45:42.942		60.09	-82.53	41795.60	-17.65		
Uranus	I	2034-01-22T19:03:25.789		56.16	-82.77	25553.33		-1.67	-1.75
Uranus	E	2034-01-22T19:27:02.355		50.84	-79.81	25142.50		14.68	15.34
6	E	2034-01-22T19:44:14.225		46.94	-76.52	41864.57	17.58		
5	E	2034-01-22T19:44:34.225		46.86	-76.45	42220.06	17.66		
4	E	2034-01-22T19:44:51.887		46.79	-76.39	42542.42	17.68		
alpha	E	2034-01-22T19:46:55.910		46.32	-75.96	44744.67	17.96		
beta	E	2034-01-22T19:47:47.519		46.12	-75.78	45676.91	18.08		
eta	E	2034-01-22T19:49:10.126		45.81	-75.49	47176.12	18.23		
gamma	E	2034-01-22T19:49:34.508		45.72	-75.41	47621.07	18.27		
delta	E	2034-01-22T19:50:11.623		45.58	-75.28	48300.35	18.33		
lambda	E	2034-01-22T19:51:45.403		45.22	-74.95	50026.71	18.48		
epsilon	E	2034-01-22T19:52:33.281		45.04	-74.78	50913.24	18.50		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-01-22T19:20:22.480  
 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 : 3425434163152369920  
 2Mass ID (if available) : 06103869+2341332  
 ICRS Star Coord at Epoch: 06h 10m 38.68646s +23:41:33.25809s  
 RUWE (>1.4 is poor) : 0.94  
 K magnitude : 13.780  
 G magnitude : 15.807  
 RP magnitude : 15.112  
 BP magnitude : 16.342  
 DUPflag : 0  
 Distance (au) : 18.089  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -19.44  
 Sun-Target sep (deg) : 150.07  
 Sun-Moon sep (deg) : 120.08  
 B (ring opening deg) : 73.22  
 PA of pole (deg) : 62.28  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.264  
 C/A sky separation (km) : 16577.0  
 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	2034-01-22T18:40:36.951		27.19	-11.37	51080.83	-19.28		
lambda	I	2034-01-22T18:41:31.542		27.29	-11.53	50026.71	-19.28		
delta	I	2034-01-22T18:43:01.265		27.45	-11.80	48300.35	-19.20		
gamma	I	2034-01-22T18:43:36.190		27.51	-11.90	47630.56	-19.16		
eta	I	2034-01-22T18:43:59.925		27.55	-11.97	47176.12	-19.13		
beta	I	2034-01-22T18:45:19.364		27.69	-12.21	45660.52	-19.04		
alpha	I	2034-01-22T18:46:10.511		27.78	-12.36	44685.30	-18.97		
4	I	2034-01-22T18:48:03.208		27.98	-12.69	42559.92	-18.81		
5	I	2034-01-22T18:48:16.770		28.00	-12.73	42307.66	-18.80		
6	I	2034-01-22T18:48:44.021		28.05	-12.81	41794.90	-18.75		
Uranus	I	2034-01-22T19:04:05.005		29.54	-15.49	25491.53		-5.79	-6.06
Uranus	E	2034-01-22T19:36:09.898		32.04	-20.80	25046.73		16.37	17.10
6	E	2034-01-22T19:51:03.821		32.88	-23.11	41868.58	18.78		
5	E	2034-01-22T19:51:21.821		32.90	-23.16	42210.05	18.83		
4	E	2034-01-22T19:51:39.269		32.91	-23.20	42547.12	18.83		
alpha	E	2034-01-22T19:53:36.002		33.00	-23.50	44747.08	19.00		
beta	E	2034-01-22T19:54:24.619		33.04	-23.62	45675.33	19.07		
eta	E	2034-01-22T19:55:43.146		33.10	-23.81	47176.12	19.16		
gamma	E	2034-01-22T19:56:06.347		33.12	-23.87	47620.98	19.19		
delta	E	2034-01-22T19:56:41.719		33.14	-23.96	48300.35	19.23		
lambda	E	2034-01-22T19:58:11.302		33.21	-24.18	50026.71	19.32		
epsilon	E	2034-01-22T19:58:58.995		33.24	-24.30	50948.97	19.31		