

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-01-05T08:49:40.520
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3413211373420938752
 2Mass ID (if available) : 04544389+2237336

Uranus 2030-01-05T08:49:40 K14.06 G16.53 PgtRgt

ICRS Star Coord at Epoch: 04h 54m 43.92603s +22:37:33.56583s

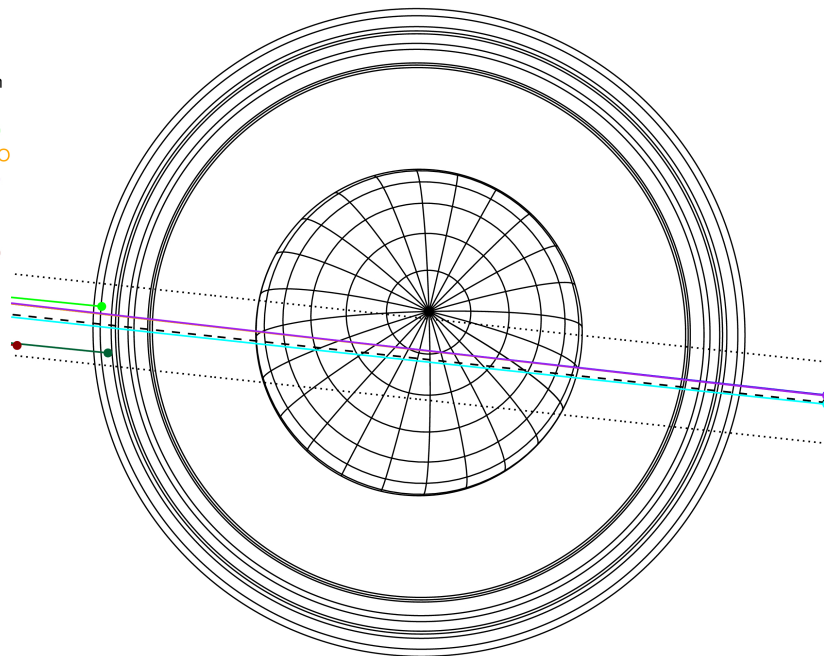
RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.061
 G magnitude : 16.528
 RP magnitude : 15.757
 BP magnitude : 17.156
 DUPflag : 0
 Distance (au) : 18.359
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.57
 Sun-Target sep (deg) : 150.33
 Sun-Moon sep (deg) : 133.83
 B (ring opening deg) : 81.80
 PA of pole (deg) : -25.35

Uranus 2030-01-05T08:49:40 K14.06 G16.53
 PgtRgt



2030-01-05T08:49:40.5200 ra: 04 54 43.9260 s: +22 37 33.566 C/A 0.299° PA 353.82 deg v_sky -19.57 km/s D 18.36 AU
 Credit: Styled after SORA/Lucky Star

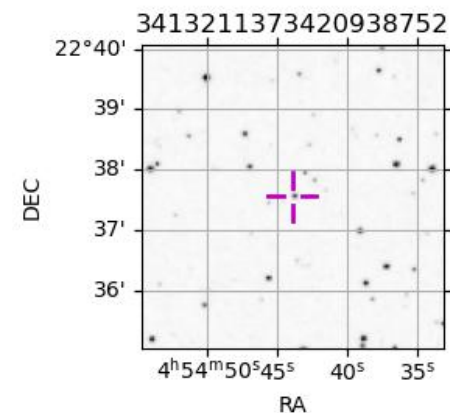
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 AAT
 MSO



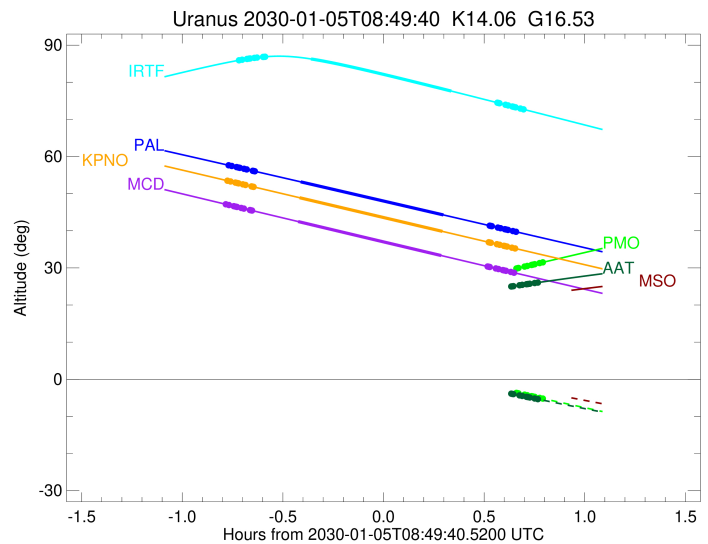
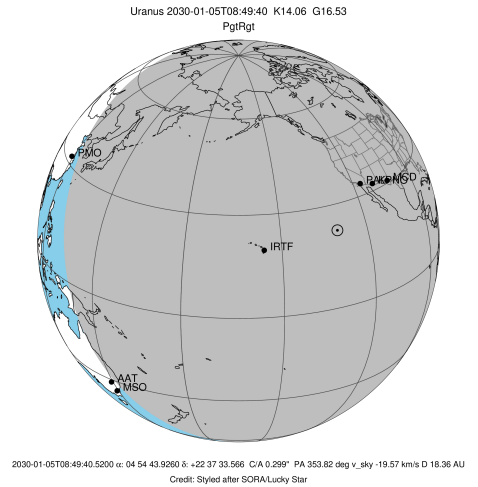
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	+++++	+ +	+++++	JAN 05 08:03 - JAN 05 09:29	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8			++	JAN 05 09:36 - JAN 05 09:37	PnnRne
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	JAN 05 08:03 - JAN 05 09:28	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	JAN 05 08:02 - JAN 05 09:28	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++	+ +	+++++	JAN 05 08:06 - JAN 05 09:31	PieRie
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			++	JAN 05 09:34 - JAN 05 09:35	PnnRne
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

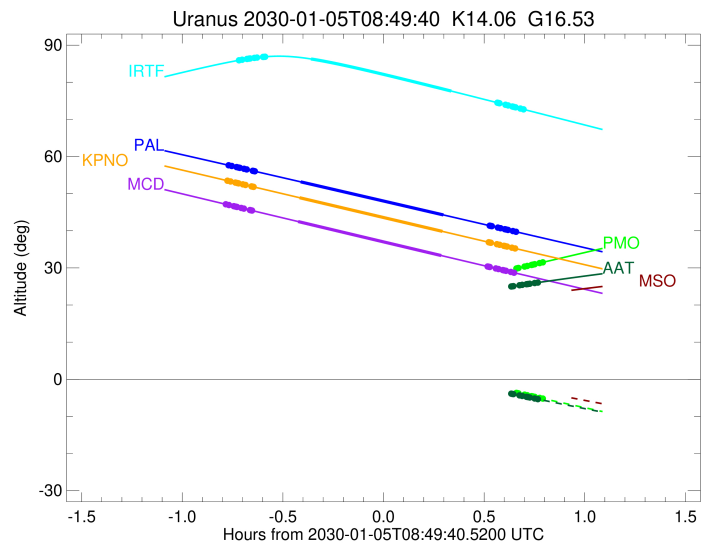
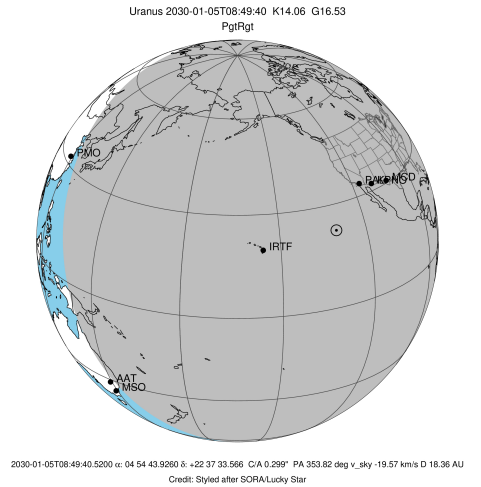


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-01-05T08:46:17.930
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3413211373420938752
 2Mass ID (if available) : 04544389+2237336
 ICRS Star Coord at Epoch: 04h 54m 43.92603s +22:37:33.56583s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.061
 G magnitude : 16.528
 RP magnitude : 15.757
 BP magnitude : 17.156
 DUPflag : 0
 Distance (au) : 18.359
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.57
 Sun-Target sep (deg) : 150.33
 Sun-Moon sep (deg) : 133.93
 B (ring opening deg) : 81.80
 PA of pole (deg) : -25.35
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.202
 C/A sky separation (km) : 2688.5
 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



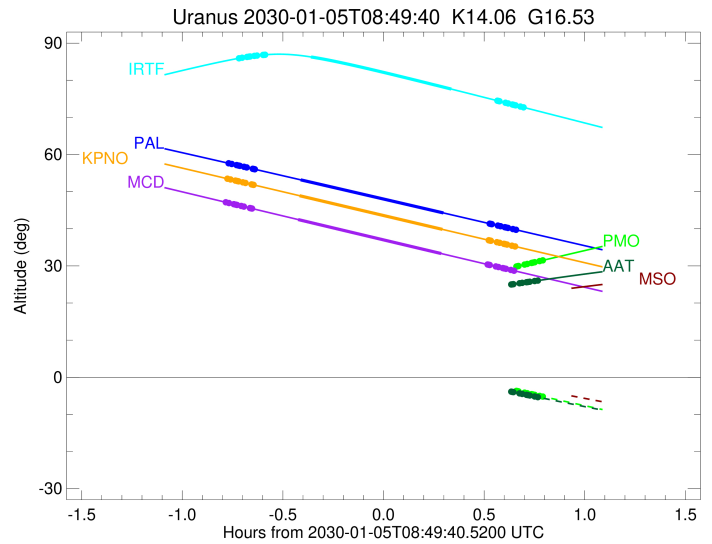
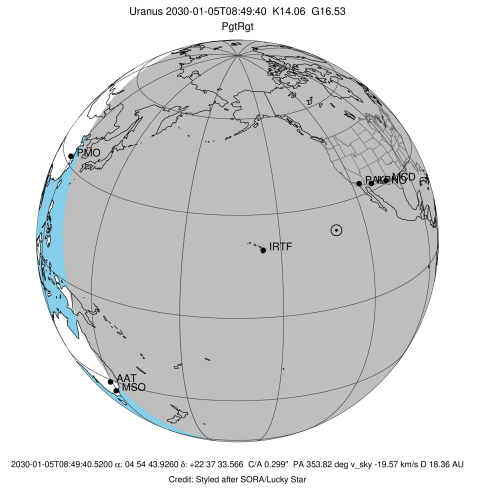
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-01-05T08:03:22.923		57.67	-79.16	51303.82	-19.88		
lambda	I	2030-01-05T08:04:27.139		57.45	-79.10	50026.71	-19.89		
delta	I	2030-01-05T08:05:53.959		57.15	-79.02	48300.35	-19.88		
gamma	I	2030-01-05T08:06:27.825		57.03	-78.99	47627.05	-19.88		
eta	I	2030-01-05T08:06:50.508		56.96	-78.97	47176.12	-19.88		
beta	I	2030-01-05T08:08:05.726		56.70	-78.89	45681.13	-19.88		
alpha	I	2030-01-05T08:08:55.746		56.52	-78.83	44687.35	-19.87		
4	I	2030-01-05T08:10:40.556		56.16	-78.70	42605.25	-19.87		
5	I	2030-01-05T08:10:57.244		56.10	-78.68	42272.11	-19.86		
6	I	2030-01-05T08:11:18.846		56.03	-78.65	41845.28	-19.86		
Uranus	I	2030-01-05T08:24:59.751		53.18	-77.25	25529.37		1.83	1.91
Uranus	E	2030-01-05T09:07:34.114		44.26	-70.43	25453.67		-3.46	-3.62
6	E	2030-01-05T09:21:19.147		41.38	-67.83	41823.93	19.77		
5	E	2030-01-05T09:21:37.809		41.31	-67.77	42189.15	19.77		
4	E	2030-01-05T09:21:55.106		41.25	-67.71	42533.76	19.77		
alpha	E	2030-01-05T09:23:47.283		40.86	-67.35	44751.05	19.77		
beta	E	2030-01-05T09:24:32.341		40.70	-67.21	45641.51	19.77		
eta	E	2030-01-05T09:25:49.962		40.43	-66.95	47176.12	19.77		
gamma	E	2030-01-05T09:26:12.717		40.35	-66.88	47626.07	19.77		
delta	E	2030-01-05T09:26:46.816		40.23	-66.77	48300.35	19.77		
lambda	E	2030-01-05T09:28:14.120		39.93	-66.48	50026.71	19.77		
epsilon	E	2030-01-05T09:29:00.910		39.76	-66.33	50951.95	19.77		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-01-05T08:53:53.890
 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 : 3413211373420938752
 2Mass ID (if available) : 04544389+2237336
 ICRS Star Coord at Epoch: 04h 54m 43.92603s +22:37:33.56583s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.061
 G magnitude : 16.528
 RP magnitude : 15.757
 BP magnitude : 17.156
 DUPflag : 0
 Distance (au) : 18.359
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.57
 Sun-Target sep (deg) : 150.33
 Sun-Moon sep (deg) : 134.64
 B (ring opening deg) : 81.80
 PA of pole (deg) : -25.35
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.067
 C/A sky separation (km) : 891.9
 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



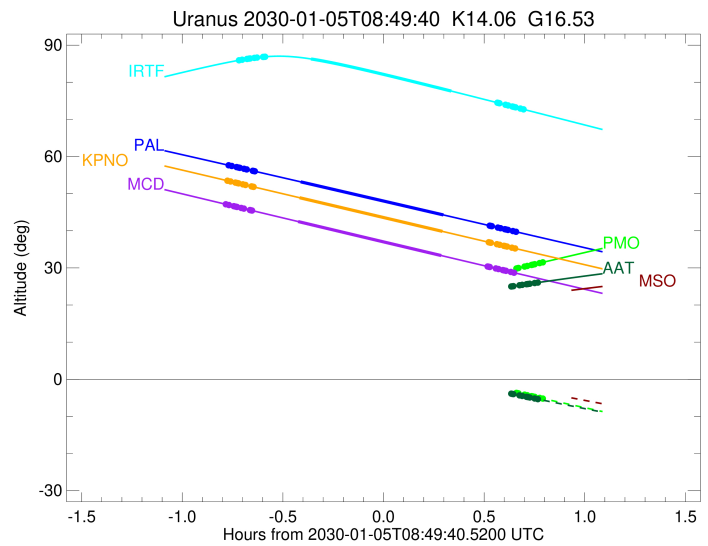
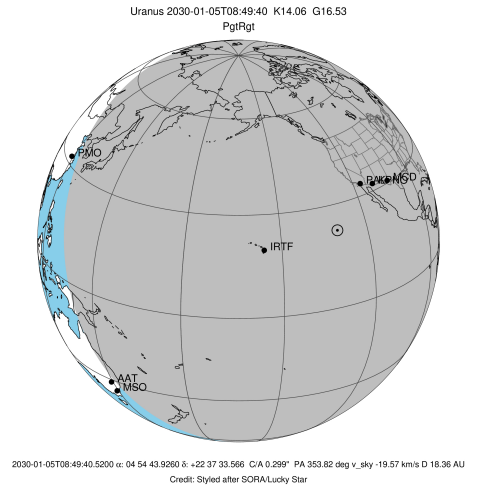
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-01-05T08:10:20.238		13.55	10.85x	51321.17	-19.59		
lambda	I	2030-01-05T08:11:26.320		13.77	10.66x	50026.71	-19.59		
delta	I	2030-01-05T08:12:54.444		14.07	10.40x	48300.35	-19.59		
gamma	I	2030-01-05T08:13:28.824		14.19	10.30x	47626.79	-19.59		
eta	I	2030-01-05T08:13:51.827		14.26	10.23x	47176.12	-19.59		
beta	I	2030-01-05T08:15:08.146		14.52	10.01x	45681.01	-19.59		
alpha	I	2030-01-05T08:15:58.911		14.69	9.87x	44686.70	-19.59		
4	I	2030-01-05T08:17:45.081		15.05	9.56x	42606.81	-19.60		
5	I	2030-01-05T08:18:01.864		15.11	9.51x	42275.91	-19.59		
6	I	2030-01-05T08:18:23.870		15.18	9.44x	41847.55	-19.60		
Uranus	I	2030-01-05T08:32:14.979		18.01	6.98x	25504.74		2.48	2.59
Uranus	E	2030-01-05T09:15:29.320		26.95	-1.03x	25478.67		-3.01	-3.16
6	E	2030-01-05T09:29:16.401		29.84	-3.67x	41825.19	19.70		
5	E	2030-01-05T09:29:35.148		29.90	-3.73x	42191.20	19.70		
4	E	2030-01-05T09:29:52.453		29.96	-3.79x	42534.56	19.70		
alpha	E	2030-01-05T09:31:44.948		30.36	-4.15x	44750.76	19.71		
beta	E	2030-01-05T09:32:30.161		30.52	-4.30x	45641.41	19.71		
eta	E	2030-01-05T09:33:48.034		30.79	-4.55x	47176.12	19.71		
gamma	E	2030-01-05T09:34:10.854		30.87	-4.62x	47625.93	19.71		
delta	E	2030-01-05T09:34:45.066		30.99	-4.73x	48300.35	19.71		
lambda	E	2030-01-05T09:36:12.633		31.30	-5.02	50026.71	19.72		
epsilon	E	2030-01-05T09:36:59.977		31.46	-5.17	50960.18	19.71		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-01-05T08:45:58.400
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 3413211373420938752
 2Mass ID (if available) : 04544389+2237336
 ICRS Star Coord at Epoch: 04h 54m 43.92603s +22:37:33.56583s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.061
 G magnitude : 16.528
 RP magnitude : 15.757
 BP magnitude : 17.156
 DUPflag : 0
 Distance (au) : 18.359
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.57
 Sun-Target sep (deg) : 150.33
 Sun-Moon sep (deg) : 133.86
 B (ring opening deg) : 81.80
 PA of pole (deg) : -25.35
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.205
 C/A sky separation (km) : 2730.6
 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



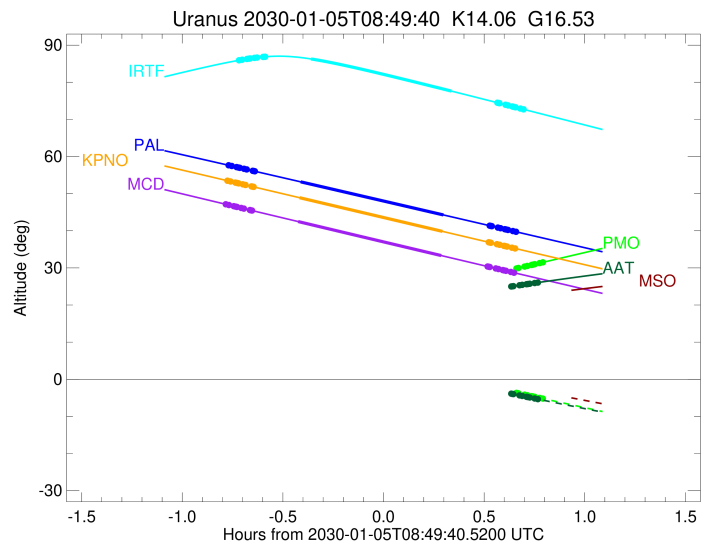
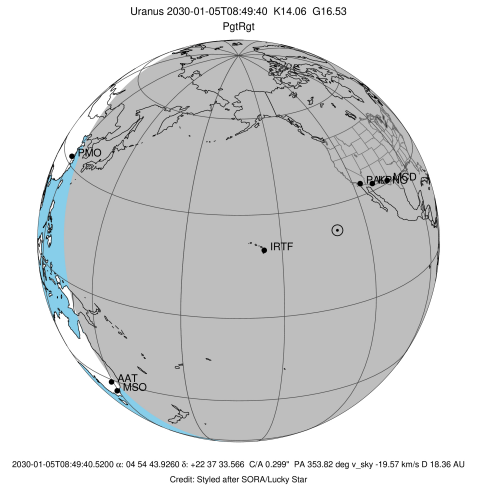
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-01-05T08:03:01.158		53.51	-78.47	51303.25	-19.87		
lambda	I	2030-01-05T08:04:05.397		53.28	-78.33	50026.71	-19.87		
delta	I	2030-01-05T08:05:32.290		52.98	-78.13	48300.35	-19.87		
gamma	I	2030-01-05T08:06:06.183		52.86	-78.05	47627.06	-19.86		
eta	I	2030-01-05T08:06:28.886		52.78	-78.00	47176.12	-19.86		
beta	I	2030-01-05T08:07:44.168		52.51	-77.82	45681.14	-19.86		
alpha	I	2030-01-05T08:08:34.229		52.33	-77.69	44687.37	-19.86		
4	I	2030-01-05T08:10:19.135		51.96	-77.43	42605.20	-19.85		
5	I	2030-01-05T08:10:35.842		51.90	-77.39	42271.99	-19.84		
6	I	2030-01-05T08:10:57.460		51.82	-77.34	41845.21	-19.85		
Uranus	I	2030-01-05T08:24:39.150		48.91	-75.09	25529.97		1.81	1.90
Uranus	E	2030-01-05T09:07:15.762		39.83	-66.92	25453.21		-3.46	-3.63
6	E	2030-01-05T09:21:01.917		36.91	-64.11	41823.91	19.74		
5	E	2030-01-05T09:21:20.604		36.85	-64.04	42189.13	19.74		
4	E	2030-01-05T09:21:37.925		36.78	-63.98	42533.76	19.74		
alpha	E	2030-01-05T09:23:30.254		36.39	-63.60	44751.05	19.75		
beta	E	2030-01-05T09:24:15.373		36.23	-63.44	45641.52	19.75		
eta	E	2030-01-05T09:25:33.098		35.95	-63.17	47176.12	19.75		
gamma	E	2030-01-05T09:25:55.884		35.87	-63.09	47626.07	19.75		
delta	E	2030-01-05T09:26:30.030		35.75	-62.98	48300.35	19.75		
lambda	E	2030-01-05T09:27:57.453		35.44	-62.67	50026.71	19.75		
epsilon	E	2030-01-05T09:28:44.303		35.28	-62.51	50951.88	19.74		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-01-05T08:45:33.940
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 3413211373420938752
 2Mass ID (if available) : 04544389+2237336
 ICRS Star Coord at Epoch: 04h 54m 43.92603s +22:37:33.56583s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.061
 G magnitude : 16.528
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 BP magnitude : 17.156
 DUPflag : 0
 Distance (au) : 18.359
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.57
 Sun-Target sep (deg) : 150.33
 Sun-Moon sep (deg) : 133.75
 B (ring opening deg) : 81.80
 PA of pole (deg) : -25.35
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.202
 C/A sky separation (km) : 2687.0
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



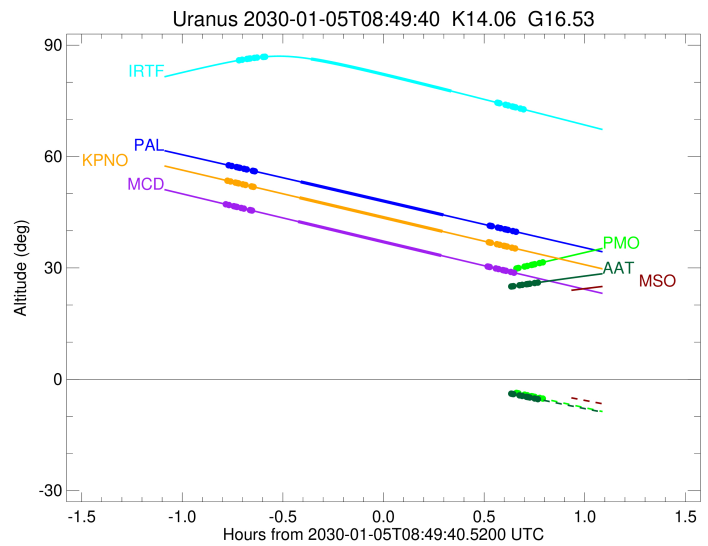
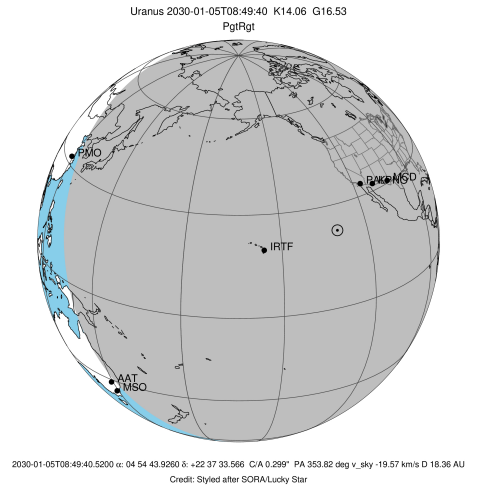
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-01-05T08:02:32.211		47.17	-74.23	51303.22	-19.84		
lambda	I	2030-01-05T08:03:36.543		46.93	-74.03	50026.71	-19.84		
delta	I	2030-01-05T08:05:03.563		46.62	-73.74	48300.35	-19.84		
gamma	I	2030-01-05T08:05:37.507		46.50	-73.63	47627.06	-19.83		
eta	I	2030-01-05T08:06:00.243		46.42	-73.56	47176.12	-19.83		
beta	I	2030-01-05T08:07:15.637		46.15	-73.31	45681.14	-19.83		
alpha	I	2030-01-05T08:08:05.774		45.97	-73.15	44687.37	-19.83		
4	I	2030-01-05T08:09:50.837		45.59	-72.80	42605.20	-19.82		
5	I	2030-01-05T08:10:07.569		45.53	-72.75	42272.00	-19.81		
6	I	2030-01-05T08:10:29.220		45.45	-72.68	41845.22	-19.82		
Uranus	I	2030-01-05T08:24:12.173		42.49	-69.91	25529.76		1.82	1.90
Uranus	E	2030-01-05T09:06:54.110		33.32	-60.96	25454.37		-3.44	-3.61
6	E	2030-01-05T09:20:41.883		30.38	-58.01	41823.99	19.70		
5	E	2030-01-05T09:21:00.609		30.32	-57.94	42189.26	19.70		
4	E	2030-01-05T09:21:17.964		30.25	-57.88	42533.80	19.70		
alpha	E	2030-01-05T09:23:10.525		29.86	-57.48	44751.03	19.70		
beta	E	2030-01-05T09:23:55.740		29.70	-57.31	45641.51	19.70		
eta	E	2030-01-05T09:25:13.631		29.42	-57.04	47176.12	19.70		
gamma	E	2030-01-05T09:25:36.465		29.34	-56.95	47626.06	19.71		
delta	E	2030-01-05T09:26:10.684		29.22	-56.83	48300.35	19.71		
lambda	E	2030-01-05T09:27:38.295		28.91	-56.52	50026.71	19.70		
epsilon	E	2030-01-05T09:28:25.276		28.74	-56.35	50952.48	19.70		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-01-05T08:49:01.290
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 3413211373420938752
 2Mass ID (if available) : 04544389+2237336
 ICRS Star Coord at Epoch: 04h 54m 43.92603s +22:37:33.56583s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.061
 G magnitude : 16.528
 RP magnitude : 15.757
 BP magnitude : 17.156
 DUPflag : 0
 Distance (au) : 18.359
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.57
 Sun-Target sep (deg) : 150.33
 Sun-Moon sep (deg) : 134.43
 B (ring opening deg) : 81.80
 PA of pole (deg) : -25.35
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.334
 C/A sky separation (km) : 4451.4
 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	2030-01-05T08:06:29.185		85.91	-57.13	51292.61	-19.93		
lambda	I	2030-01-05T08:07:32.655		86.08	-57.37	50026.71	-19.94		
delta	I	2030-01-05T08:08:59.233		86.29	-57.71	48300.35	-19.94		
gamma	I	2030-01-05T08:09:32.999		86.37	-57.84	47627.22	-19.93		
eta	I	2030-01-05T08:09:55.630		86.42	-57.92	47176.12	-19.93		
beta	I	2030-01-05T08:11:10.650		86.57	-58.21	45681.19	-19.93		
alpha	I	2030-01-05T08:12:00.523		86.66	-58.40	44687.83	-19.92		
4	I	2030-01-05T08:13:45.168		86.83	-58.81	42604.12	-19.91		
5	I	2030-01-05T08:14:01.911		86.85	-58.87	42269.44	-19.90		
6	I	2030-01-05T08:14:23.394		86.88	-58.95	41843.71	-19.90		
Uranus	I	2030-01-05T08:28:03.776		86.29	-62.11	25543.76		1.31	1.37
Uranus	E	2030-01-05T09:09:52.881		77.64	-71.74	25417.95		-4.00	-4.19
6	E	2030-01-05T09:23:36.465		74.51	-74.89	41822.02	19.88		
5	E	2030-01-05T09:23:54.992		74.44	-74.96	42186.10	19.88		
4	E	2030-01-05T09:24:12.267		74.37	-75.03	42532.61	19.88		
alpha	E	2030-01-05T09:26:03.864		73.94	-75.45	44751.44	19.89		
beta	E	2030-01-05T09:26:48.636		73.77	-75.62	45641.72	19.90		
eta	E	2030-01-05T09:28:05.751		73.48	-75.91	47176.12	19.90		
gamma	E	2030-01-05T09:28:28.368		73.39	-76.00	47626.29	19.91		
delta	E	2030-01-05T09:29:02.229		73.26	-76.13	48300.35	19.91		
lambda	E	2030-01-05T09:30:28.937		72.93	-76.46	50026.71	19.91		
epsilon	E	2030-01-05T09:31:14.699		72.75	-76.63	50938.00	19.90		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-01-05T08:53:23.470
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 3413211373420938752
 2Mass ID (if available) : 04544389+2237336
 ICRS Star Coord at Epoch: 04h 54m 43.92603s +22:37:33.56583s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.061
 G magnitude : 16.528
 RP magnitude : 15.757
 BP magnitude : 17.156
 DUPflag : 0
 Distance (au) : 18.359
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.57
 Sun-Target sep (deg) : 150.33
 Sun-Moon sep (deg) : 134.51
 B (ring opening deg) : 81.80
 PA of pole (deg) : -25.35
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.608
 C/A sky separation (km) : 8100.7
 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	2030-01-05T08:10:48.285		13.09	11.10x	51266.76	-19.51		
lambda	I	2030-01-05T08:11:51.775		13.28	10.88x	50026.71	-19.53		
delta	I	2030-01-05T08:13:20.231		13.53	10.59x	48300.35	-19.51		
gamma	I	2030-01-05T08:13:54.725		13.63	10.47x	47627.60	-19.50		
eta	I	2030-01-05T08:14:17.881		13.69	10.39x	47176.12	-19.49		
beta	I	2030-01-05T08:15:34.605		13.91	10.14x	45681.23	-19.48		
alpha	I	2030-01-05T08:16:25.577		14.05	9.97x	44689.05	-19.46		
4	I	2030-01-05T08:18:12.941		14.35	9.61x	42601.45	-19.43		
5	I	2030-01-05T08:18:30.305		14.40	9.55x	42263.32	-19.42		
6	I	2030-01-05T08:18:52.152		14.46	9.48x	41840.18	-19.41		
Uranus	I	2030-01-05T08:32:59.961		16.80	6.67x	25558.78		0.16	0.16
Uranus	E	2030-01-05T09:13:33.666		23.02	-1.21x	25334.77		-5.06	-5.30
6	E	2030-01-05T09:27:44.193		24.99	-3.88x	41818.32	19.49		
5	E	2030-01-05T09:28:03.039		25.04	-3.93x	42180.33	19.49		
4	E	2030-01-05T09:28:20.802		25.08	-3.99x	42530.57	19.50		
alpha	E	2030-01-05T09:30:14.625		25.33	-4.34x	44752.04	19.54		
beta	E	2030-01-05T09:31:00.191		25.43	-4.48x	45642.25	19.56		
eta	E	2030-01-05T09:32:18.589		25.60	-4.73x	47176.12	19.58		
gamma	E	2030-01-05T09:32:41.600		25.65	-4.80x	47626.74	19.59		
delta	E	2030-01-05T09:33:15.985		25.73	-4.90x	48300.35	19.59		
lambda	E	2030-01-05T09:34:44.039		25.92	-5.17	50026.71	19.62		
epsilon	E	2030-01-05T09:35:29.125		26.02	-5.31	50911.34	19.61		