

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-19T07:33:34.800
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3382600729188099072
 2Mass ID (if available) : 06312512+2334356

Uranus 2035-01-19T07:33:34 K13.16 G16.63 PgtRgt

ICRS Star Coord at Epoch: 06h 31m 25.16315s +23:34:34.58506s

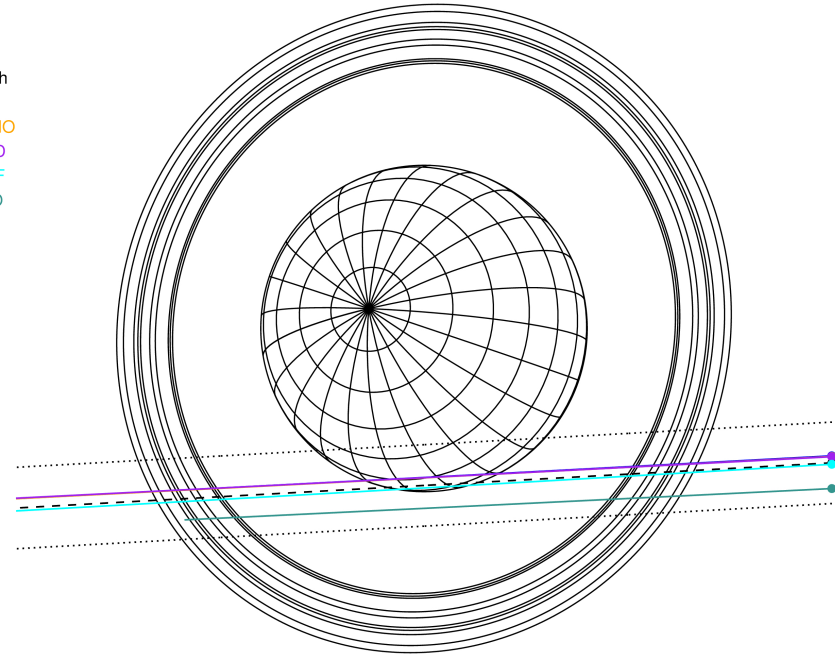
RUWE (>1.4 is poor) : 1.03
 K magnitude : 13.161
 G magnitude : 16.634
 RP magnitude : 15.496
 BP magnitude : 17.854
 DUPflag : 0
 Distance (au) : 17.966
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.32
 Sun-Target sep (deg) : 158.64
 Sun-Moon sep (deg) : 41.09
 B (ring opening deg) : 68.91
 PA of pole (deg) : 70.26

Uranus 2035-01-19T07:33:34 K13.16 G16.63
 PgtRgt



2035-01-19T07:33:34.8000 α: 06 31 25.1632 δ: +23 34 34.585 C/A 1.876° PA 3.17 deg v_sky -21.32 km/s D 17.97 AU
 Credit: Styled after SORA/Lucky Star

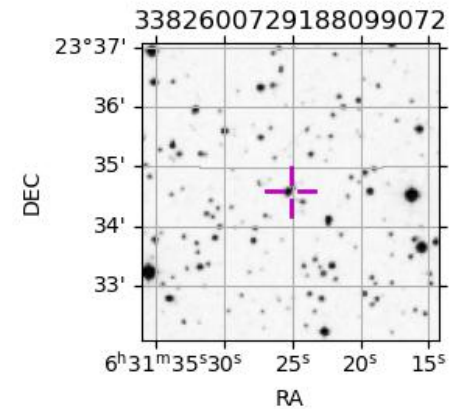
Earth
 PAL
 KPNO
 MCD
 IRTF
 ESO



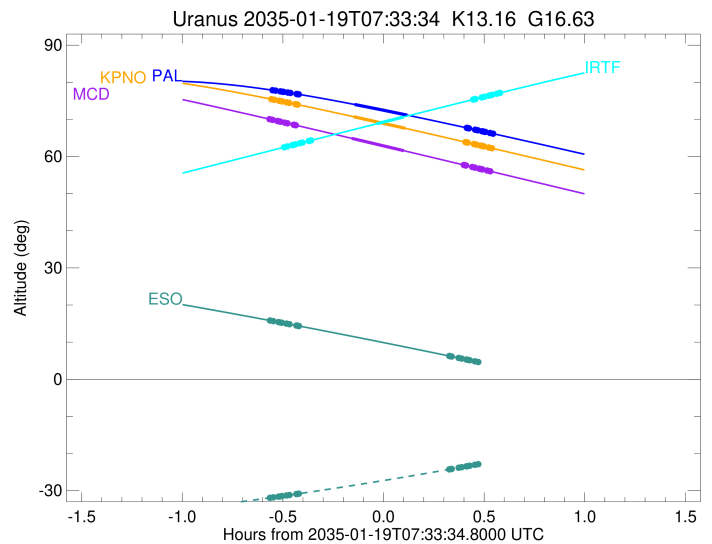
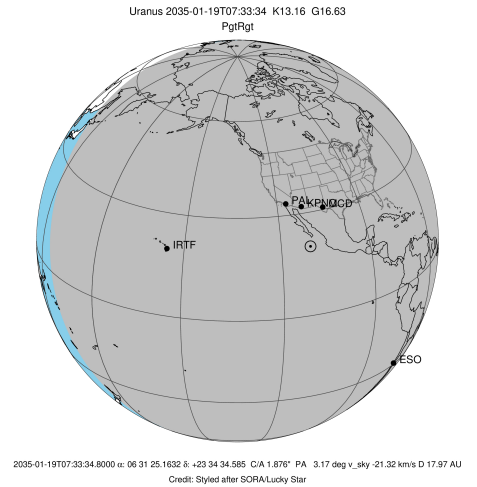
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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 19 07:00 - JAN 19 08:05	PieRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	JAN 19 07:00 - JAN 19 08:05	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	JAN 19 06:59 - JAN 19 08:05	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++	+ +	+++++	JAN 19 07:03 - JAN 19 08:08	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	+++++		+++++	JAN 19 06:59 - JAN 19 07:59	PnnRie
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



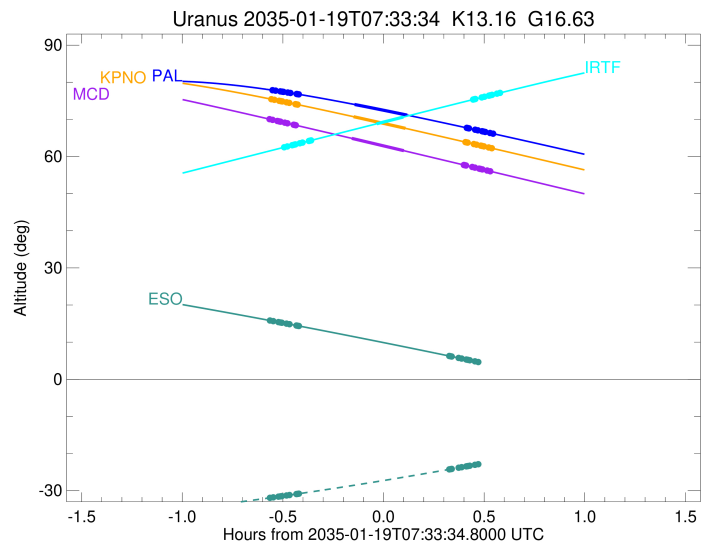
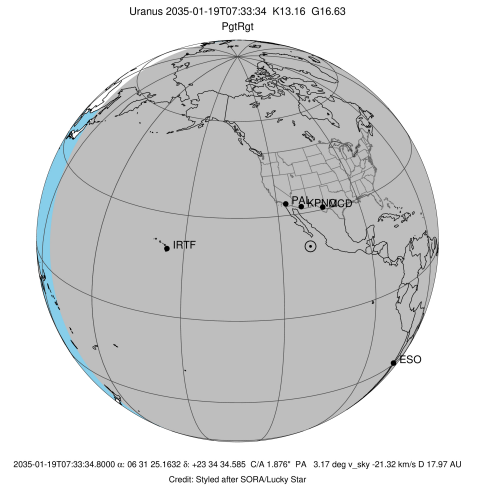
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-19T07:32:30.720
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3382600729188099072
 2Mass ID (if available) : 06312512+2334356
 ICRS Star Coord at Epoch: 06h 31m 25.16315s +23:34:34.58506s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 13.161
 G magnitude : 16.634
 RP magnitude : 15.496
 BP magnitude : 17.854
 DUPflag : 0
 Distance (au) : 17.966
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.32
 Sun-Target sep (deg) : 158.64
 Sun-Moon sep (deg) : 41.92
 B (ring opening deg) : 68.91
 PA of pole (deg) : 70.26
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.788
 C/A sky separation (km) : 23301.1
 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	2035-01-19T07:00:26.782		77.88	-71.88	51213.59	-20.37		
lambda	I	2035-01-19T07:01:24.996		77.75	-72.03	50026.71	-20.32		
delta	I	2035-01-19T07:02:50.389		77.55	-72.25	48300.35	-20.11		
gamma	I	2035-01-19T07:03:23.906		77.47	-72.34	47627.87	-20.02		
eta	I	2035-01-19T07:03:46.507		77.42	-72.40	47176.12	-19.96		
beta	I	2035-01-19T07:05:03.820		77.24	-72.59	45642.41	-19.73		
alpha	I	2035-01-19T07:05:49.910		77.12	-72.70	44731.51	-19.59		
4	I	2035-01-19T07:07:43.579		76.84	-72.98	42526.38	-19.17		
5	I	2035-01-19T07:07:54.995		76.82	-73.01	42303.28	-19.14		
6	I	2035-01-19T07:08:21.161		76.75	-73.07	41799.78	-19.01		
Uranus	I	2035-01-19T07:24:56.932		74.02	-75.21	25294.73		-14.91	-15.58
Uranus	E	2035-01-19T07:40:35.031		71.17	-76.59	25558.63		0.55	0.58
6	E	2035-01-19T07:58:23.916		67.72	-77.16	41832.34	18.99		
5	E	2035-01-19T07:58:45.779		67.65	-77.16	42247.70	19.11		
4	E	2035-01-19T07:59:02.769		67.60	-77.16	42582.87	19.15		
alpha	E	2035-01-19T08:00:54.363		67.23	-77.14	44740.67	19.56		
beta	E	2035-01-19T08:01:41.296		67.07	-77.13	45663.54	19.70		
eta	E	2035-01-19T08:02:57.683		66.82	-77.11	47176.12	19.92		
gamma	E	2035-01-19T08:03:20.417		66.74	-77.11	47629.79	19.99		
delta	E	2035-01-19T08:03:53.894		66.63	-77.09	48300.35	20.07		
lambda	E	2035-01-19T08:05:19.436		66.35	-77.06	50026.71	20.28		
epsilon	E	2035-01-19T08:05:56.628		66.22	-77.04	50782.74	20.33		

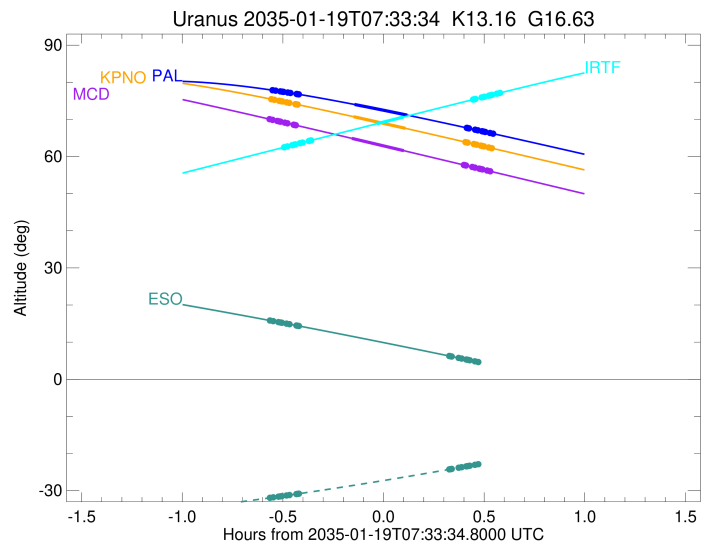
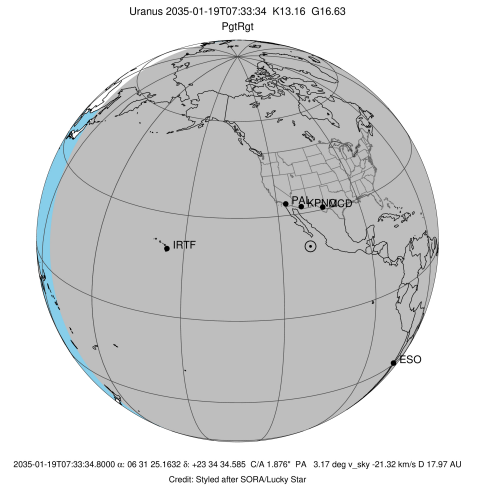
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2035-01-19T07:32:08.440
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      : 3382600729188099072
2Mass ID (if available) : 06312512+2334356
ICRS Star Coord at Epoch: 06h 31m 25.16315s +23:34:34.58506s
RUWE (>1.4 is poor) : 1.03
K magnitude          : 13.161
G magnitude          : 16.634
RP magnitude         : 15.496
BP magnitude         : 17.854
DUPflag             : 0
Distance (au)       : 17.966
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -21.32
Sun-Target sep (deg) : 158.64
Sun-Moon sep (deg)  : 41.96
B (ring opening deg) : 68.91
PA of pole (deg)    : 70.26
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.793
C/A sky separation (km) : 23359.9
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.bsp
earthstns_itrff93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```



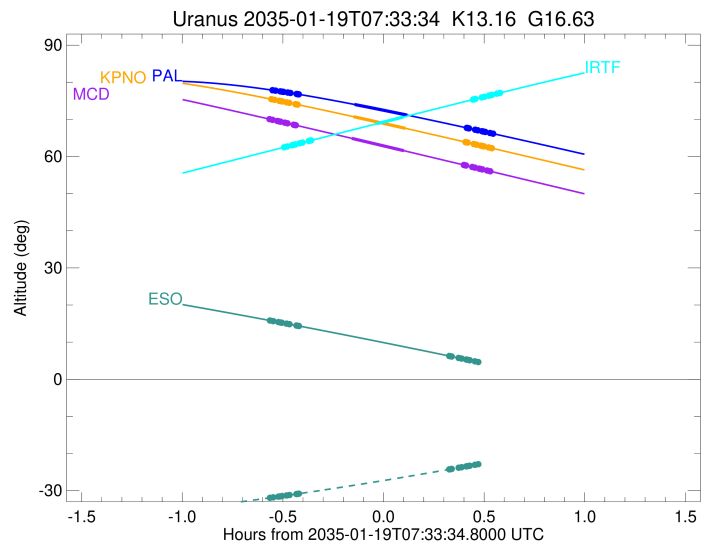
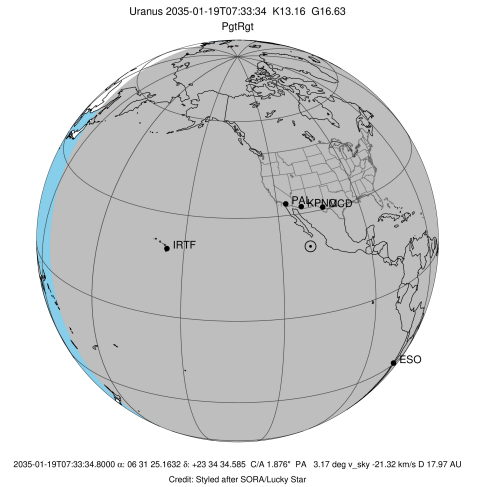
Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-01-19T07:00:05.635	75.46	-75.89	51212.82	-20.36		
lambda	I	2035-01-19T07:01:03.854	75.28	-76.02	50026.71	-20.31		
delta	I	2035-01-19T07:02:29.315	75.02	-76.20	48300.35	-20.09		
gamma	I	2035-01-19T07:03:02.859	74.91	-76.27	47627.88	-20.00		
eta	I	2035-01-19T07:03:25.481	74.84	-76.32	47176.12	-19.94		
beta	I	2035-01-19T07:04:42.866	74.60	-76.47	45642.39	-19.71		
alpha	I	2035-01-19T07:05:28.998	74.46	-76.56	44731.57	-19.57		
4	I	2035-01-19T07:07:22.796	74.10	-76.78	42526.36	-19.15		
5	I	2035-01-19T07:07:34.223	74.06	-76.80	42303.38	-19.11		
6	I	2035-01-19T07:08:00.428	73.98	-76.85	41799.73	-18.99		
Uranus	I	2035-01-19T07:24:40.614	70.73	-78.23	25297.95		-14.82	-15.48
Uranus	E	2035-01-19T07:40:06.859	67.60	-78.53	25558.75		0.45	0.47
6	E	2035-01-19T07:58:00.505	63.89	-77.62	41832.29	18.96		
5	E	2035-01-19T07:58:22.409	63.81	-77.59	42247.79	19.08		
4	E	2035-01-19T07:58:39.420	63.76	-77.56	42582.82	19.12		
alpha	E	2035-01-19T08:00:31.183	63.37	-77.39	44740.69	19.53		
beta	E	2035-01-19T08:01:18.180	63.20	-77.32	45663.52	19.67		
eta	E	2035-01-19T08:02:34.669	62.93	-77.19	47176.12	19.90		
gamma	E	2035-01-19T08:02:57.433	62.86	-77.15	47629.79	19.96		
delta	E	2035-01-19T08:03:30.953	62.74	-77.10	48300.35	20.05		
lambda	E	2035-01-19T08:04:56.600	62.44	-76.95	50026.71	20.26		
epsilon	E	2035-01-19T08:05:33.830	62.31	-76.88	50782.62	20.31		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-19T07:31:37.840
 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 : 3382600729188099072
 2Mass ID (if available) : 06312512+2334356
 ICRS Star Coord at Epoch: 06h 31m 25.16315s +23:34:34.58506s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 13.161
 G magnitude : 16.634
 RP magnitude : 15.496
 BP magnitude : 17.854
 DUPflag : 0
 Distance (au) : 17.966
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.32
 Sun-Target sep (deg) : 158.64
 Sun-Moon sep (deg) : 42.01
 B (ring opening deg) : 68.91
 PA of pole (deg) : 70.26
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.791
 C/A sky separation (km) : 23338.3
 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



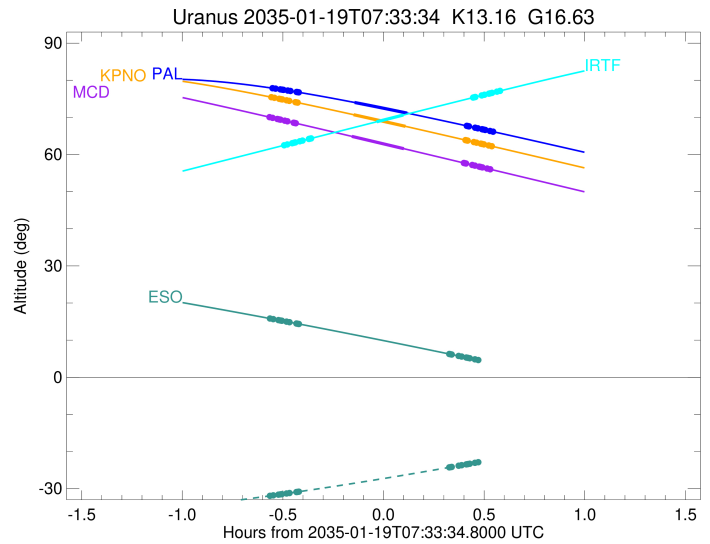
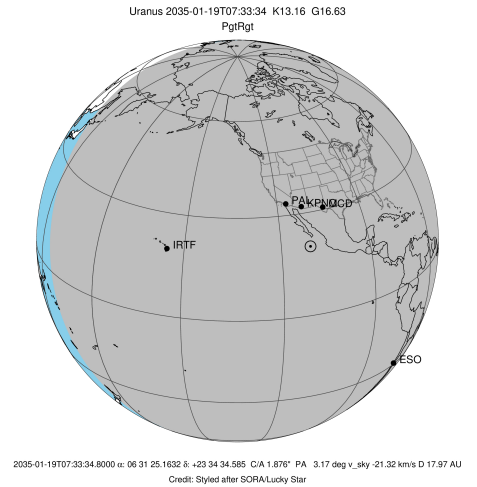
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-01-19T06:59:33.193		70.08	-79.72	51212.69	-20.35		
lambda	I	2035-01-19T07:00:31.417		69.88	-79.75	50026.71	-20.30		
delta	I	2035-01-19T07:01:56.894		69.58	-79.79	48300.35	-20.09		
gamma	I	2035-01-19T07:02:30.444		69.46	-79.80	47627.88	-20.00		
eta	I	2035-01-19T07:02:53.069		69.39	-79.81	47176.12	-19.94		
beta	I	2035-01-19T07:04:10.467		69.11	-79.83	45642.39	-19.70		
alpha	I	2035-01-19T07:04:56.606		68.95	-79.84	44731.58	-19.56		
4	I	2035-01-19T07:06:50.419		68.56	-79.85	42526.36	-19.15		
5	I	2035-01-19T07:07:01.847		68.52	-79.84	42303.38	-19.11		
6	I	2035-01-19T07:07:28.055		68.42	-79.84	41799.73	-18.99		
Uranus	I	2035-01-19T07:24:07.342		64.90	-79.11	25297.30		-14.83	-15.51
Uranus	E	2035-01-19T07:39:38.912		61.58	-77.41	25558.68		0.51	0.53
6	E	2035-01-19T07:57:31.865		57.73	-74.68	41832.35	18.94		
5	E	2035-01-19T07:57:53.773		57.65	-74.62	42247.67	19.07		
4	E	2035-01-19T07:58:10.802		57.59	-74.57	42582.88	19.10		
alpha	E	2035-01-19T08:00:02.633		57.19	-74.26	44740.66	19.52		
beta	E	2035-01-19T08:00:49.665		57.02	-74.12	45663.55	19.65		
eta	E	2035-01-19T08:02:06.209		56.74	-73.90	47176.12	19.88		
gamma	E	2035-01-19T08:02:28.991		56.66	-73.83	47629.79	19.95		
delta	E	2035-01-19T08:03:02.536		56.54	-73.73	48300.35	20.03		
lambda	E	2035-01-19T08:04:28.252		56.23	-73.48	50026.71	20.24		
epsilon	E	2035-01-19T08:05:05.525		56.10	-73.37	50782.84	20.29		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-19T07:35:14.990
 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 : 3382600729188099072
 2Mass ID (if available) : 06312512+2334356
 ICRS Star Coord at Epoch: 06h 31m 25.16315s +23:34:34.58506s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 13.161
 G magnitude : 16.634
 RP magnitude : 15.496
 BP magnitude : 17.854
 DUPflag : 0
 Distance (au) : 17.966
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.32
 Sun-Target sep (deg) : 158.64
 Sun-Moon sep (deg) : 41.45
 B (ring opening deg) : 68.91
 PA of pole (deg) : 70.26
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.913
 C/A sky separation (km) : 24931.5
 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_itrff93_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	2035-01-19T07:03:55.899	62.49	-41.24	51200.64	-19.96		
lambda	I	2035-01-19T07:04:54.679	62.72	-41.46	50026.71	-19.89		
delta	I	2035-01-19T07:06:21.986	63.05	-41.80	48300.35	-19.65		
gamma	I	2035-01-19T07:06:56.294	63.18	-41.93	47628.05	-19.54		
eta	I	2035-01-19T07:07:19.461	63.27	-42.02	47176.12	-19.47		
beta	I	2035-01-19T07:08:38.804	63.58	-42.33	45642.15	-19.20		
alpha	I	2035-01-19T07:09:26.114	63.76	-42.51	44732.73	-19.04		
4	I	2035-01-19T07:11:23.383	64.21	-42.97	42526.15	-18.55		
5	I	2035-01-19T07:11:35.119	64.25	-43.01	42305.04	-18.51		
6	I	2035-01-19T07:12:02.327	64.35	-43.12	41798.93	-18.36		
Uranus	I	2035-01-19T07:31:32.352	68.82	-47.64	25396.37		-11.61	-12.14
Uranus	E	2035-01-19T07:39:30.417	70.64	-49.50	25541.70		-3.75	-3.93
6	E	2035-01-19T08:00:17.269	75.35	-54.34	41830.10	18.39		
5	E	2035-01-19T08:00:40.178	75.43	-54.42	42251.83	18.53		
4	E	2035-01-19T08:00:57.387	75.50	-54.49	42580.58	18.58		
alpha	E	2035-01-19T08:02:52.303	75.92	-54.94	44741.89	19.06		
beta	E	2035-01-19T08:03:40.309	76.10	-55.12	45662.60	19.23		
eta	E	2035-01-19T08:04:58.495	76.40	-55.43	47176.12	19.50		
gamma	E	2035-01-19T08:05:21.726	76.48	-55.52	47629.96	19.57		
delta	E	2035-01-19T08:05:55.883	76.61	-55.65	48300.35	19.68		
lambda	E	2035-01-19T08:07:23.052	76.93	-55.99	50026.71	19.93		
epsilon	E	2035-01-19T08:08:00.553	77.07	-56.14	50775.86	19.99		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-01-19T07:29:43.540
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 3382600729188099072
 2Mass ID (if available) : 06312512+2334356
 ICRS Star Coord at Epoch: 06h 31m 25.16315s +23:34:34.58506s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 13.161
 G magnitude : 16.634
 RP magnitude : 15.496
 BP magnitude : 17.854
 DUPflag : 0
 Distance (au) : 17.966
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.32
 Sun-Target sep (deg) : 158.64
 Sun-Moon sep (deg) : 41.75
 B (ring opening deg) : 68.91
 PA of pole (deg) : 70.26
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.159
 C/A sky separation (km) : 28137.7
 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	2035-01-19T06:59:43.390		15.83	-31.94	51166.95	-18.92		
lambda	I	2035-01-19T07:00:43.643		15.66	-31.81	50026.71	-18.82		
delta	I	2035-01-19T07:02:16.154		15.40	-31.61	48300.35	-18.49		
gamma	I	2035-01-19T07:02:52.624		15.29	-31.54	47628.50	-18.35		
eta	I	2035-01-19T07:03:17.340		15.22	-31.48	47176.12	-18.25		
beta	I	2035-01-19T07:04:42.252		14.98	-31.30	45641.61	-17.89		
alpha	I	2035-01-19T07:05:32.950		14.84	-31.19	44735.70	-17.67		
4	I	2035-01-19T07:07:40.243		14.47	-30.91	42525.93	-17.00		
5	I	2035-01-19T07:07:52.933		14.43	-30.88	42308.84	-16.94		
6	I	2035-01-19T07:08:23.034		14.35	-30.82	41797.15	-16.75		

No planet occultations

6	E	2035-01-19T07:53:09.898		6.27	-24.28	41826.26	16.69		
5	E	2035-01-19T07:53:35.747		6.19	-24.21	42258.87	16.88		
4	E	2035-01-19T07:53:54.056		6.14	-24.16	42576.57	16.94		
alpha	E	2035-01-19T07:55:59.593		5.74	-23.83	44743.83	17.60		
beta	E	2035-01-19T07:56:51.322		5.58	-23.69	45661.00	17.82		
eta	E	2035-01-19T07:58:15.526		5.32	-23.46	47176.12	18.18		
gamma	E	2035-01-19T07:58:40.444		5.24	-23.40	47630.23	18.27		
delta	E	2035-01-19T07:59:16.978		5.12	-23.30	48300.35	18.41		
lambda	E	2035-01-19T08:00:49.910		4.83x	-23.05	50026.71	18.74		
epsilon	E	2035-01-19T08:01:29.240		4.71x	-22.94	50766.14	18.83		