

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-10T07:05:47.880
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3427673352942582016
 2Mass ID (if available) : 05495393+2338014

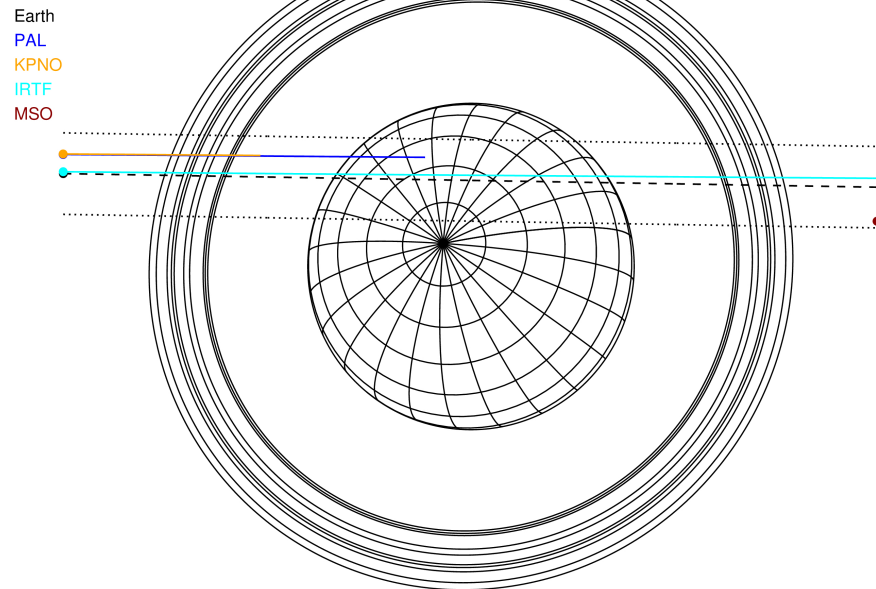
Uranus 2033-04-10T07:05:47 K14.33 G16.95 PgtRgt

ICRS Star Coord at Epoch: 05h 49m 53.93809s +23:38:01.32996s

RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.331
 G magnitude : 16.948
 RP magnitude : 16.164
 BP magnitude : 17.610
 DUPflag : 0
 Distance (au) : 19.362
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.80
 Sun-Target sep (deg) : 67.41
 Sun-Moon sep (deg) : 63.70
 B (ring opening deg) : 77.23
 PA of pole (deg) : 50.37



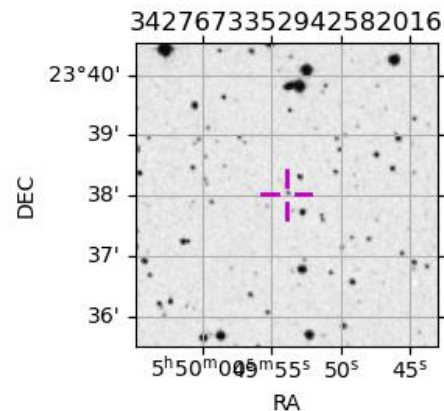
2033-04-10T07:05:47.8800 ex: 05 49 53.9381 s: +23 38 01.330 C/A 0.966° PA 179.04 deg v_sky +17.80 km/s D 19.36 AU
 Credit: Styled after SORA/Lucky Star



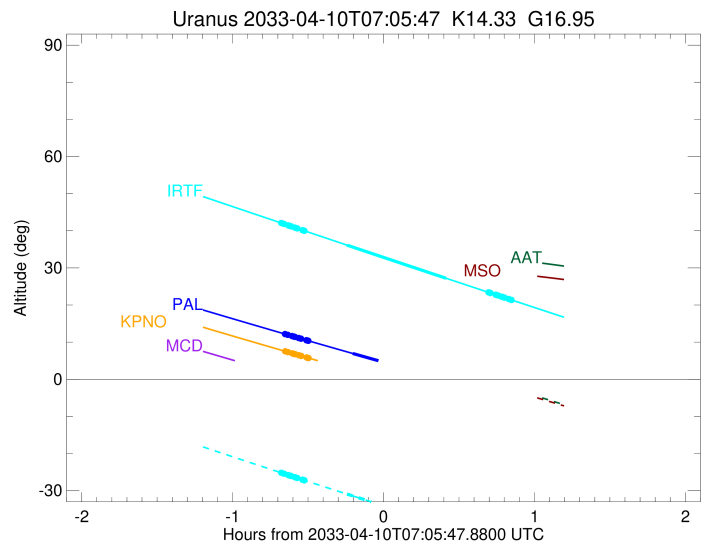
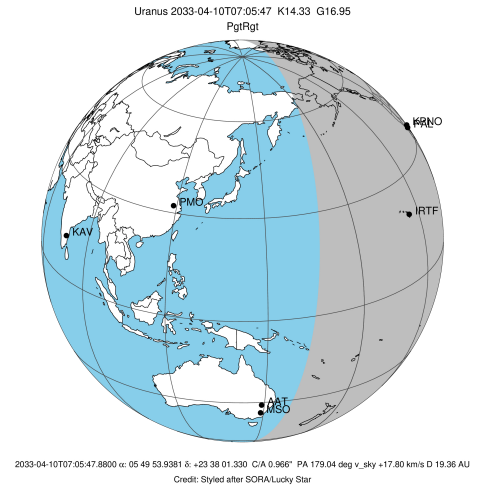
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	+++++	+		APR 10 06:26 - APR 10 06:53	PinRin
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++			APR 10 06:26 - APR 10 06:35	PnnRin
MCD	McDonald Obs. 2.7m	30.7	256.0					PnnRnn
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++	+	+++++	APR 10 06:25 - APR 10 07:56	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					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

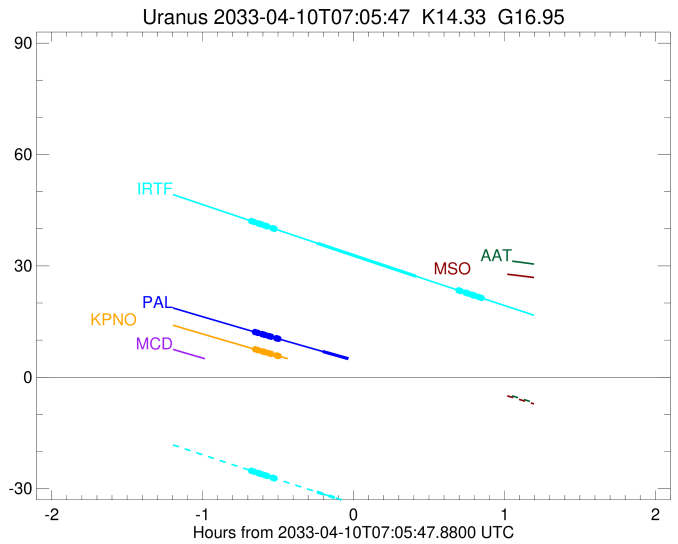
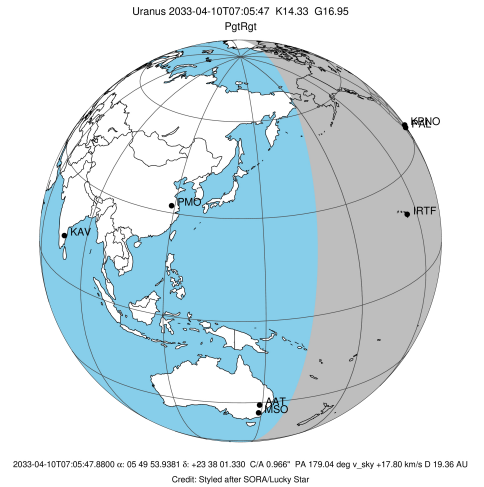


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-10T07:10:35.780
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3427673352942582016
 2Mass ID (if available) : 05495393+2338014
 ICRS Star Coord at Epoch: 05h 49m 53.93809s +23:38:01.32996s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.331
 G magnitude : 16.948
 RP magnitude : 16.164
 BP magnitude : 17.610
 DUPflag : 0
 Distance (au) : 19.362
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.80
 Sun-Target sep (deg) : 67.41
 Sun-Moon sep (deg) : 63.45
 B (ring opening deg) : 77.23
 PA of pole (deg) : 50.37
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.213
 C/A sky separation (km) : 17037.9
 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	2033-04-10T06:26:38.963		12.18	-44.35	51166.48	-16.96		
lambda	I	2033-04-10T06:27:46.080		11.96	-44.47	50026.71	-16.96		
delta	I	2033-04-10T06:29:28.123		11.63	-44.64	48300.35	-16.88		
gamma	I	2033-04-10T06:30:07.868		11.50	-44.70	47630.23	-16.84		
eta	I	2033-04-10T06:30:34.848		11.41	-44.74	47176.12	-16.82		
beta	I	2033-04-10T06:32:05.193		11.11	-44.89	45660.73	-16.73		
alpha	I	2033-04-10T06:33:02.604		10.93	-44.98	44699.34	-16.67		
4	I	2033-04-10T06:35:11.443		10.51	-45.18	42567.06	-16.52		
5	I	2033-04-10T06:35:35.231		10.43	-45.22	42161.73	-16.50		
6	I	2033-04-10T06:35:52.570		10.37	-45.25	41873.46	-16.48		
Uranus	I	2033-04-10T06:53:31.175		6.96	-46.69	25004.32		12.75	13.33
Uranus	E	2033-04-10T07:28:19.316		0.40x	-48.44	25544.90		-1.98	-2.08
6	E	2033-04-10T07:45:54.410		-2.81x	-48.71	41829.79	16.61		
5	E	2033-04-10T07:46:23.034		-2.90x	-48.71	42308.31	16.63		
4	E	2033-04-10T07:46:36.843		-2.94x	-48.71	42540.70	16.65		
alpha	E	2033-04-10T07:48:46.680		-3.33x	-48.71	44712.18	16.81		
beta	E	2033-04-10T07:49:42.198		-3.49x	-48.71	45647.44	16.88		
eta	E	2033-04-10T07:51:12.511		-3.76x	-48.71	47176.12	16.97		
gamma	E	2033-04-10T07:51:38.705		-3.84x	-48.71	47620.96	17.00		
delta	E	2033-04-10T07:52:18.636		-3.96x	-48.71	48300.35	17.03		
lambda	E	2033-04-10T07:53:59.730		-4.26x	-48.69	50026.71	17.12		
epsilon	E	2033-04-10T07:54:49.225		-4.41x	-48.69	50875.04	17.12		

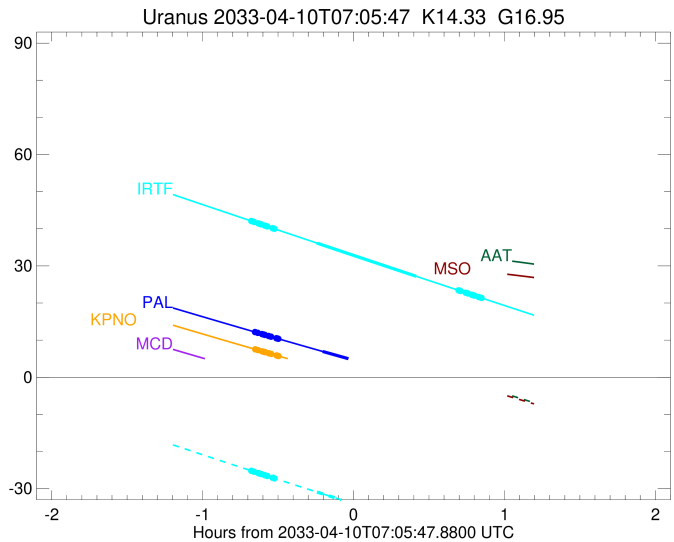
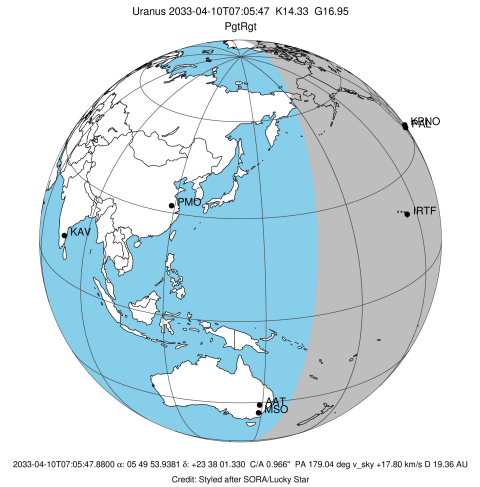
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-10T07:10:33.580
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 3427673352942582016
 2Mass ID (if available) : 05495393+2338014
 ICRS Star Coord at Epoch: 05h 49m 53.93809s +23:38:01.32996s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.331
 G magnitude : 16.948
 RP magnitude : 16.164
 BP magnitude : 17.610
 DUPflag : 0
 Distance (au) : 19.362
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.80
 Sun-Target sep (deg) : 67.41
 Sun-Moon sep (deg) : 63.39
 B (ring opening deg) : 77.23
 PA of pole (deg) : 50.37
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.219
 C/A sky separation (km) : 17119.2
 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	2033-04-10T06:26:43.849		7.53	-47.55	51165.79	-16.98		
lambda	I	2033-04-10T06:27:50.833		7.31	-47.64	50026.71	-16.98		
delta	I	2033-04-10T06:29:32.738		6.98	-47.77	48300.35	-16.90		
gamma	I	2033-04-10T06:30:12.431		6.85	-47.83	47630.22	-16.86		
eta	I	2033-04-10T06:30:39.376		6.76	-47.86	47176.12	-16.84		
beta	I	2033-04-10T06:32:09.610		6.47	-47.97	45660.69	-16.75		
alpha	I	2033-04-10T06:33:06.952		6.28	-48.05	44699.28	-16.69		
4	I	2033-04-10T06:35:15.648		5.86	-48.20	42566.96	-16.54		
5	I	2033-04-10T06:35:39.399		5.79	-48.23	42161.79	-16.52		
6	I	2033-04-10T06:35:56.722		5.73	-48.25	41873.51	-16.49		
Uranus	I	2033-04-10T06:53:35.266	2.34x	-49.29	25004.65			12.74	13.33
Uranus	E	2033-04-10T07:28:10.985	-4.12x	-50.11	25545.63			-1.93	-2.02
6	E	2033-04-10T07:45:46.107	-7.28x	-49.87	41829.87		16.62		
5	E	2033-04-10T07:46:14.695	-7.37x	-49.86	42308.24		16.65		
4	E	2033-04-10T07:46:28.491	-7.41x	-49.85	42540.64		16.67		
alpha	E	2033-04-10T07:48:38.190	-7.79x	-49.79	44712.12		16.83		
beta	E	2033-04-10T07:49:33.649	-7.95x	-49.76	45647.41		16.90		
eta	E	2033-04-10T07:51:03.859	-8.22x	-49.71	47176.12		16.99		
gamma	E	2033-04-10T07:51:30.021	-8.29x	-49.70	47620.96		17.02		
delta	E	2033-04-10T07:52:09.903	-8.41x	-49.68	48300.35		17.05		
lambda	E	2033-04-10T07:53:50.871	-8.70x	-49.61	50026.71		17.14		
epsilon	E	2033-04-10T07:54:40.274	-8.85x	-49.58	50874.56		17.15		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2033-04-10T07:10:42.280
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       : 3427673352942582016
2Mass ID (if available) : 05495393+2338014
ICRS Star Coord at Epoch: 05h 49m 53.93809s +23:38:01.32996s
RUWE (>1.4 is poor) : 1.10
K magnitude           : 14.331
G magnitude           : 16.948
RP magnitude          : 16.164
BP magnitude          : 17.610
DUPflag              : 0
Distance (au)         : 19.362
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : 17.80
Sun-Target sep (deg) : 67.41
Sun-Moon sep (deg)   : 63.82
B (ring opening deg) : 77.23
PA of pole (deg)     : 50.37
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.018
C/A sky separation (km) : 14288.8
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_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	2033-04-10T06:25:08.488		42.10	-25.19	51189.47	-17.02		
lambda	I	2033-04-10T06:26:16.711		41.84	-25.44	50026.71	-17.03		
delta	I	2033-04-10T06:27:58.261		41.45	-25.81	48300.35	-16.97		
gamma	I	2033-04-10T06:28:37.756		41.30	-25.96	47630.44	-16.95		
eta	I	2033-04-10T06:29:04.572		41.20	-26.06	47176.12	-16.93		
beta	I	2033-04-10T06:30:34.151		40.86	-26.39	45662.02	-16.87		
alpha	I	2033-04-10T06:31:31.021		40.64	-26.60	44701.22	-16.83		
4	I	2033-04-10T06:33:38.343		40.16	-27.07	42570.23	-16.74		
5	I	2033-04-10T06:34:02.175		40.07	-27.15	42159.61	-16.72		
6	I	2033-04-10T06:34:19.234		40.00	-27.22	41871.78	-16.71		
Uranus	I	2033-04-10T06:51:15.404		36.14	-30.92	25005.01		12.74	13.32
Uranus	E	2033-04-10T07:30:41.351		27.21	-39.26	25511.28		-3.65	-3.83
6	E	2033-04-10T07:47:32.807		23.42	-42.67	41826.83	16.85		
5	E	2033-04-10T07:48:01.316		23.31	-42.77	42310.42	16.86		
4	E	2033-04-10T07:48:14.911		23.26	-42.81	42543.11	16.88		
alpha	E	2033-04-10T07:50:23.246		22.78	-43.24	44714.39	16.99		
beta	E	2033-04-10T07:51:18.150		22.57	-43.42	45648.41	17.03		
eta	E	2033-04-10T07:52:47.665		22.24	-43.71	47176.12	17.10		
gamma	E	2033-04-10T07:53:13.672		22.14	-43.80	47620.97	17.11		
delta	E	2033-04-10T07:53:53.339		21.99	-43.92	48300.35	17.14		
lambda	E	2033-04-10T07:55:33.881		21.62	-44.25	50026.71	17.20		
epsilon	E	2033-04-10T07:56:24.167		21.43	-44.42	50892.37	17.20		