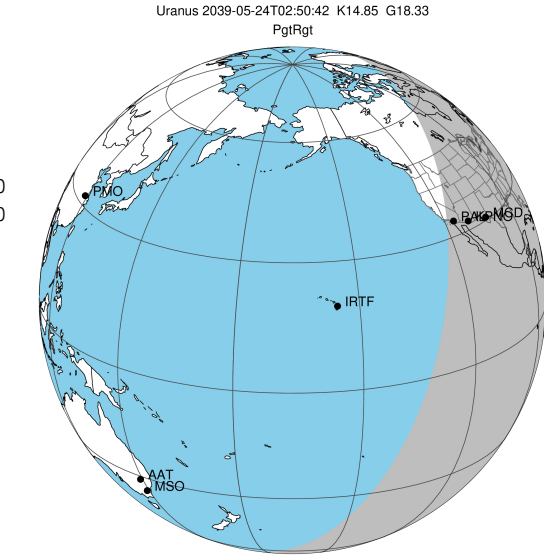


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2039-05-24T02:50:42.240
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 674561069519930112
 2Mass ID (if available) : 07492499+2135138

ICRS Star Coord at Epoch: 07h 49m 24.96912s +21:35:13.44559s

RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.848
 G magnitude : 18.332
 RP magnitude : 17.237
 BP magnitude : 19.498
 DUPflag : 0
 Distance (au) : 19.217
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.45
 Sun-Target sep (deg) : 53.00
 Sun-Moon sep (deg) : 41.65
 B (ring opening deg) : 51.57
 PA of pole (deg) : 87.38

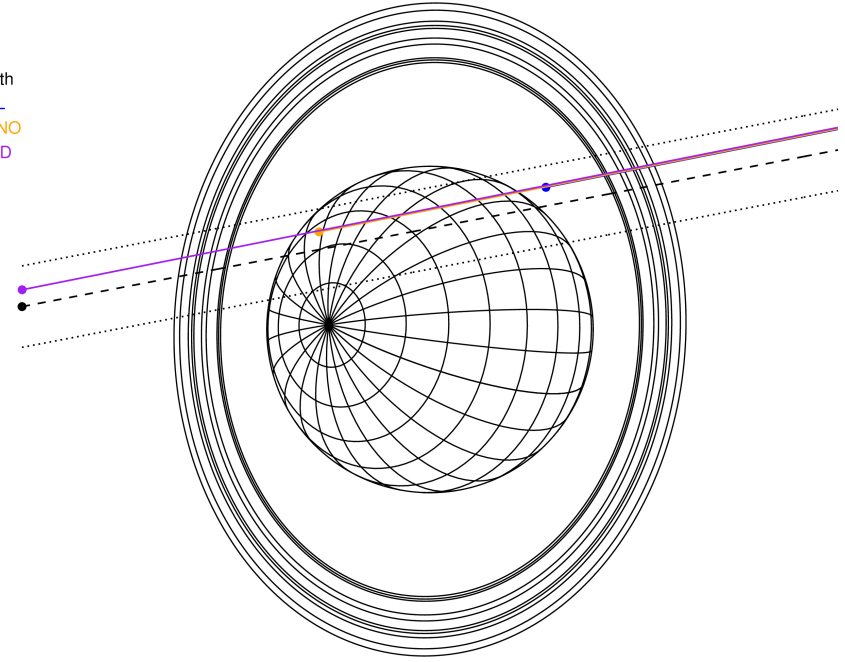
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2039-05-24T02:50:42.2400 ex: 07 49 24.9691 8: +21 35 13.446 C/A 1.125° PA 190.86 deg v_sky +24.45 km/s D 19.22 AU
 Credit: Styled after SORA/Lucky Star

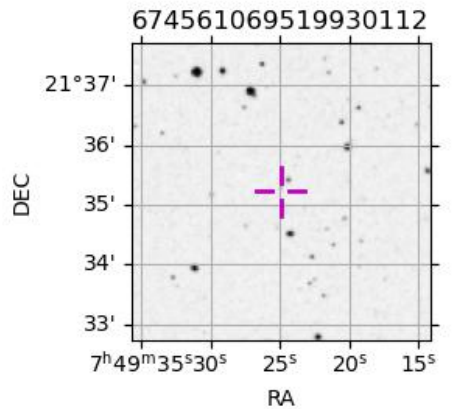
Uranus 2039-05-24T02:50:42 K14.85 G18.33 PgtRgt

Earth
 PAL
 KPNO
 MCD

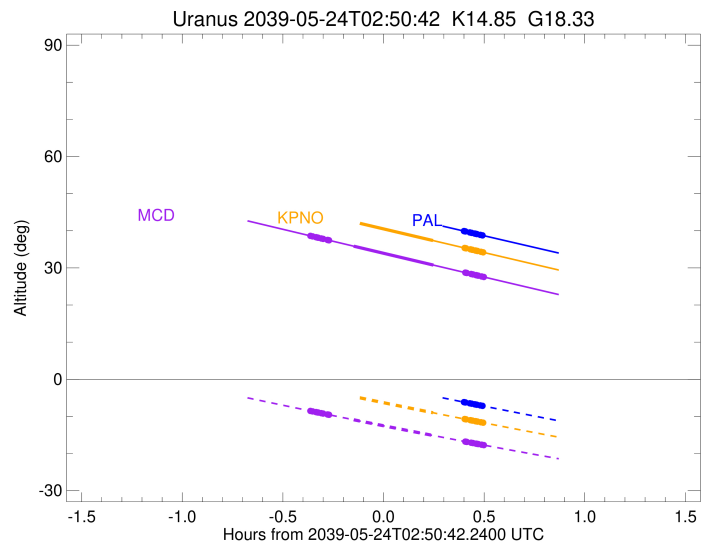
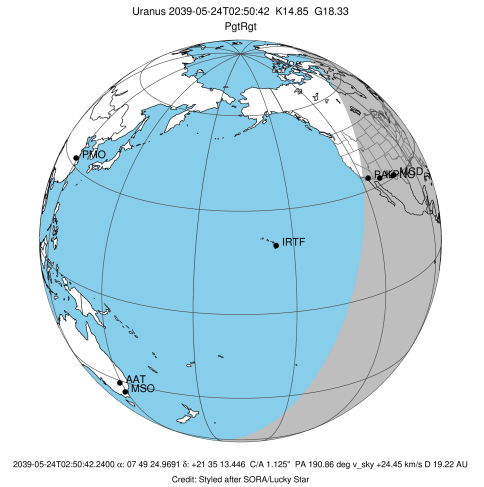


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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			+++++	MAY 24 03:14 - MAY 24 03:20	PnnRne
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4		+	+++++	MAY 24 03:05 - MAY 24 03:20	PneRne
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+	+++++	MAY 24 02:28 - MAY 24 03:20	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
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



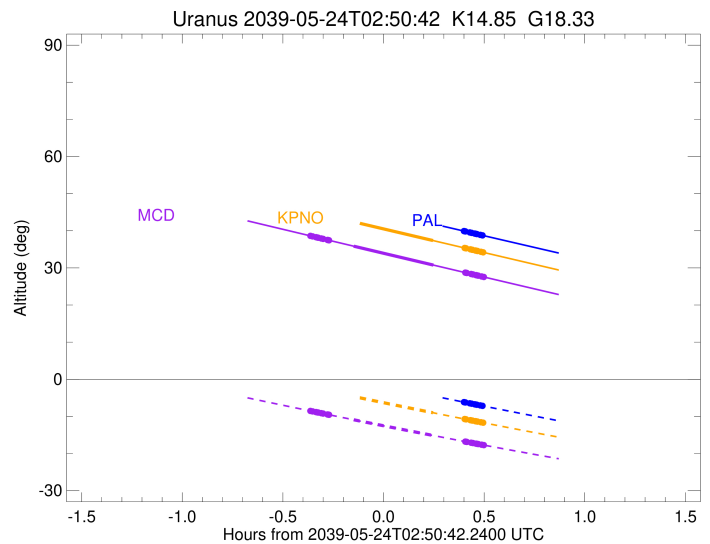
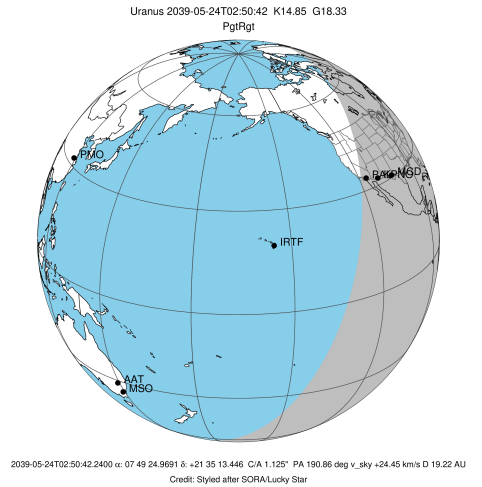
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2039-05-24T02:53:06.000
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 674561069519930112
 2Mass ID (if available) : 07492499+2135138
 ICRS Star Coord at Epoch: 07h 49m 24.96912s +21:35:13.44559s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.848
 G magnitude : 18.332
 RP magnitude : 17.237
 BP magnitude : 19.498
 DUPflag : 0
 Distance (au) : 19.217
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.45
 Sun-Target sep (deg) : 53.00
 Sun-Moon sep (deg) : 42.46
 B (ring opening deg) : 51.57
 PA of pole (deg) : 87.38
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.313
 C/A sky separation (km) : 18304.1
 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	2039-05-24T02:28:19.314	49.64	2.52x	51048.52	-28.53		
lambda	I	2039-05-24T02:28:55.298	49.51	2.40x	50026.71	-28.35		
delta	I	2039-05-24T02:29:56.362	49.30	2.21x	48300.35	-28.19		
gamma	I	2039-05-24T02:30:20.116	49.22	2.13x	47631.57	-28.12		
eta	I	2039-05-24T02:30:36.327	49.16	2.08x	47176.12	-28.07		
beta	I	2039-05-24T02:31:29.983	48.97	1.91x	45674.50	-27.91		
alpha	I	2039-05-24T02:32:03.439	48.86	1.80x	44747.95	-27.79		
4	I	2039-05-24T02:33:23.941	48.58	1.54x	42534.67	-27.48		
5	I	2039-05-24T02:33:33.374	48.54	1.51x	42278.99	-27.42		
6	I	2039-05-24T02:33:46.306	48.50	1.47x	41876.27	-27.36		
Uranus	I	2039-05-24T02:41:04.571	46.97	0.08x	25302.73		31.62	32.81
Uranus	E	2039-05-24T03:05:16.628	41.90	-4.44x	25467.02		-18.22	-19.02
6	E	2039-05-24T03:14:39.242	39.93	-6.16	41800.12	27.44		
5	E	2039-05-24T03:14:52.309	39.88	-6.20	42155.09	27.50		
4	E	2039-05-24T03:15:07.140	39.83	-6.24	42572.97	27.56		
alpha	E	2039-05-24T03:16:24.507	39.56	-6.47	44711.80	27.88		
beta	E	2039-05-24T03:16:58.427	39.44	-6.58	45663.26	27.99		
eta	E	2039-05-24T03:17:52.379	39.25	-6.74	47176.12	28.16		
gamma	E	2039-05-24T03:18:08.222	39.20	-6.79	47622.71	28.21		
delta	E	2039-05-24T03:18:32.211	39.11	-6.86	48300.35	28.28		
lambda	E	2039-05-24T03:19:33.066	38.90	-7.04	50026.71	28.45		
epsilon	E	2039-05-24T03:20:24.238	38.72	-7.20	51485.91	28.63		

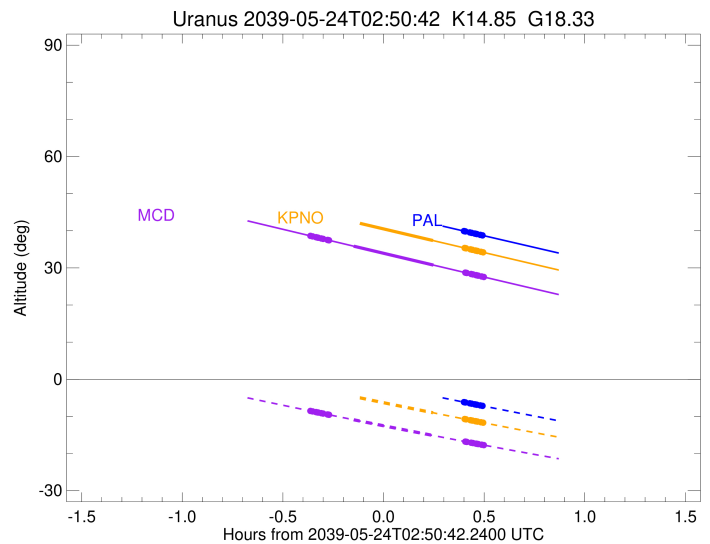
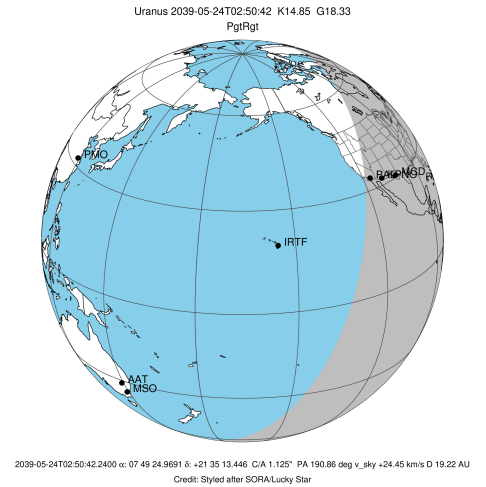
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2039-05-24T02:53:20.600
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      : 674561069519930112
2Mass ID (if available) : 07492499+2135138
ICRS Star Coord at Epoch: 07h 49m 24.96912s +21:35:13.44559s
RUWE (>1.4 is poor) : 1.05
K magnitude          : 14.848
G magnitude          : 18.332
RP magnitude         : 17.237
BP magnitude         : 19.498
DUPflag             : 0
Distance (au)       : 19.217
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : 24.45
Sun-Target sep (deg) : 53.00
Sun-Moon sep (deg)  : 42.47
B (ring opening deg) : 51.57
PA of pole (deg)    : 87.38
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.319
C/A sky separation (km) : 18381.1
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_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	2039-05-24T02:28:36.752		45.22	-2.15x	51049.10	-28.53		
lambda	I	2039-05-24T02:29:12.745		45.09	-2.27x	50026.71	-28.36		
delta	I	2039-05-24T02:30:13.793		44.87	-2.46x	48300.35	-28.19		
gamma	I	2039-05-24T02:30:37.542		44.79	-2.54x	47631.57	-28.13		
eta	I	2039-05-24T02:30:53.749		44.73	-2.59x	47176.12	-28.08		
beta	I	2039-05-24T02:31:47.394		44.54	-2.76x	45674.53	-27.91		
alpha	I	2039-05-24T02:32:20.847		44.42	-2.86x	44747.98	-27.79		
4	I	2039-05-24T02:33:41.347		44.13	-3.12x	42534.62	-27.48		
5	I	2039-05-24T02:33:50.785		44.10	-3.15x	42278.86	-27.42		
6	I	2039-05-24T02:34:03.711		44.05	-3.19x	41876.23	-27.36		
Uranus	I	2039-05-24T02:41:23.201		42.49	-4.57x	25304.07		31.53	32.72
Uranus	E	2039-05-24T03:05:27.203		37.37	-9.02	25468.43		-18.07	-18.87
6	E	2039-05-24T03:14:51.468		35.37	-10.71	41800.16	27.44		
5	E	2039-05-24T03:15:04.535		35.33	-10.75	42155.08	27.51		
4	E	2039-05-24T03:15:19.360		35.28	-10.79	42572.87	27.56		
alpha	E	2039-05-24T03:16:36.714		35.00	-11.02	44711.87	27.89		
beta	E	2039-05-24T03:17:10.621		34.88	-11.12	45663.30	28.00		
eta	E	2039-05-24T03:18:04.551		34.69	-11.28	47176.12	28.18		
gamma	E	2039-05-24T03:18:20.388		34.64	-11.33	47622.72	28.23		
delta	E	2039-05-24T03:18:44.366		34.55	-11.40	48300.35	28.30		
lambda	E	2039-05-24T03:19:45.191		34.34	-11.58	50026.71	28.47		
epsilon	E	2039-05-24T03:20:36.350		34.16	-11.73	51486.32	28.64		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2039-05-24T02:53:37.170
 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 : 674561069519930112
 2Mass ID (if available) : 07492499+2135138
 ICRS Star Coord at Epoch: 07h 49m 24.96912s +21:35:13.44559s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.848
 G magnitude : 18.332
 RP magnitude : 17.237
 BP magnitude : 19.498
 DUPflag : 0
 Distance (au) : 19.217
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.45
 Sun-Target sep (deg) : 53.00
 Sun-Moon sep (deg) : 42.45
 B (ring opening deg) : 51.57
 PA of pole (deg) : 87.38
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.332
 C/A sky separation (km) : 18564.2
 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	2039-05-24T02:28:58.951		38.61	-8.55	51050.58	-28.54		
lambda	I	2039-05-24T02:29:34.992		38.49	-8.66	50026.71	-28.36		
delta	I	2039-05-24T02:30:36.040		38.27	-8.85	48300.35	-28.19		
gamma	I	2039-05-24T02:30:59.791		38.18	-8.92	47631.58	-28.12		
eta	I	2039-05-24T02:31:16.001		38.12	-8.97	47176.12	-28.07		
beta	I	2039-05-24T02:32:09.656		37.93	-9.14	45674.60	-27.90		
alpha	I	2039-05-24T02:32:43.122		37.81	-9.24	44748.06	-27.78		
4	I	2039-05-24T02:34:03.672		37.52	-9.49	42534.50	-27.46		
5	I	2039-05-24T02:34:13.126		37.49	-9.52	42278.54	-27.40		
6	I	2039-05-24T02:34:26.048		37.44	-9.56	41876.15	-27.34		
Uranus	I	2039-05-24T02:41:48.898		35.85	-10.91	25307.41		31.30	32.48
Uranus	E	2039-05-24T03:05:34.710		30.76	-15.15	25471.66		-17.73	-18.52
6	E	2039-05-24T03:15:03.361		28.74	-16.79	41800.27	27.43		
5	E	2039-05-24T03:15:16.439		28.69	-16.83	42155.05	27.49		
4	E	2039-05-24T03:15:31.264		28.64	-16.87	42572.65	27.55		
alpha	E	2039-05-24T03:16:48.655		28.36	-17.09	44712.02	27.88		
beta	E	2039-05-24T03:17:22.563		28.24	-17.19	45663.39	28.00		
eta	E	2039-05-24T03:18:16.490		28.05	-17.34	47176.12	28.18		
gamma	E	2039-05-24T03:18:32.327		28.00	-17.39	47622.74	28.23		
delta	E	2039-05-24T03:18:56.301		27.91	-17.45	48300.35	28.30		
lambda	E	2039-05-24T03:19:57.111		27.69	-17.63	50026.71	28.47		
epsilon	E	2039-05-24T03:20:48.282		27.51	-17.77	51487.20	28.66		