

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-11-05T04:53:33.570
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3418300394271866752
 2Mass ID (if available) : 05051111+2251543

Uranus 2029-11-05T04:53:33 K14.41 G16.48 PgtRgt

ICRS Star Coord at Epoch: 05h 05m 11.11126s +22:51:54.17722s

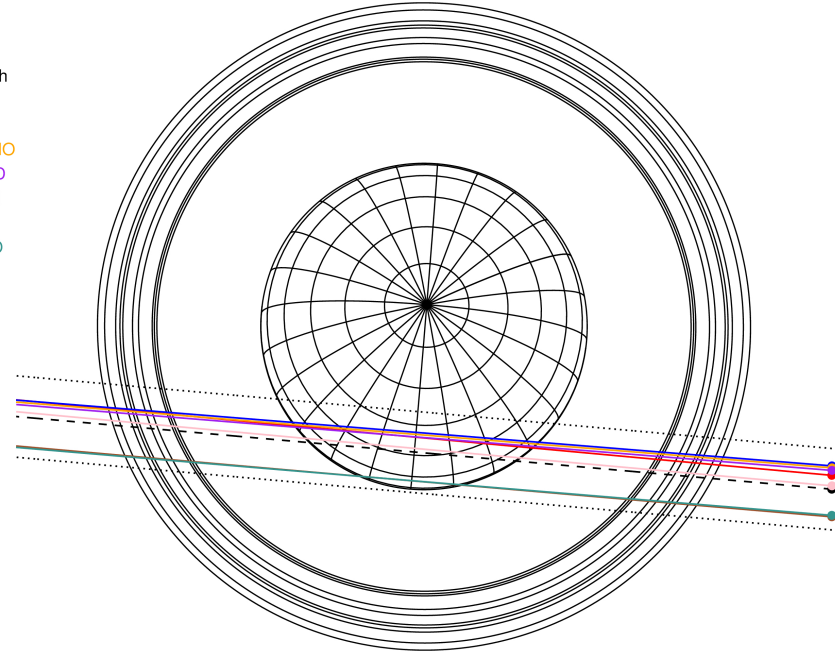
RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.415
 G magnitude : 16.479
 RP magnitude : 15.797
 BP magnitude : 17.010
 DUPflag : 0
 Distance (au) : 18.408
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.15
 Sun-Target sep (deg) : 145.25
 Sun-Moon sep (deg) : 131.11
 B (ring opening deg) : 82.25
 PA of pole (deg) : -7.28

Uranus 2029-11-05T04:53:33 K14.41 G16.48
 PgtRgt



2029-11-05T04:53:33.5700 ex: 05 05 11.1113 s: +22 51 54.177 C/A 1.471" PA 354.91 deg v_sky -18.15 km/s D 18.41 AU
 Credit: Styled after SORA/Lucky Star

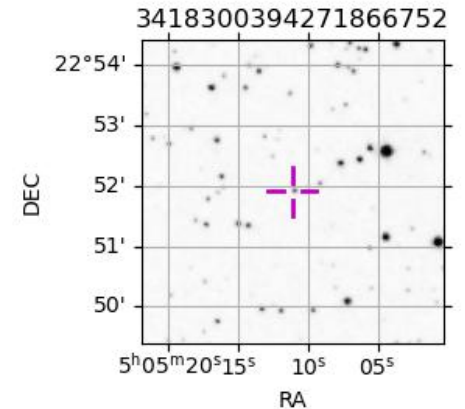
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 RIO
 ESO



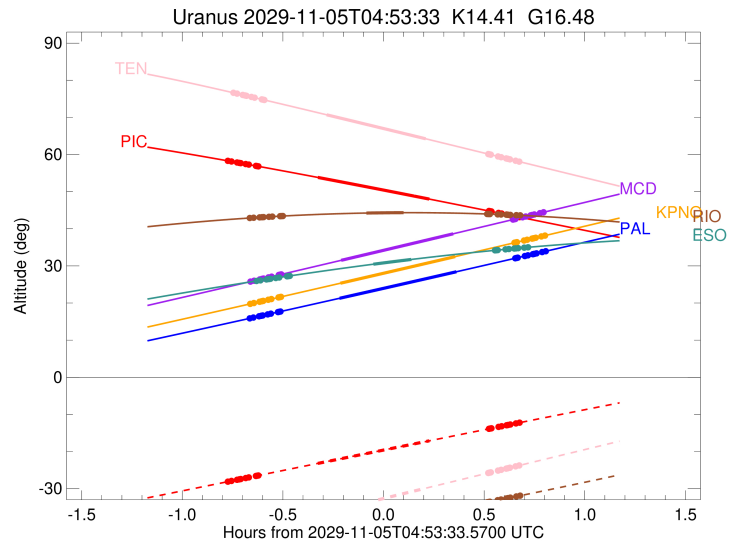
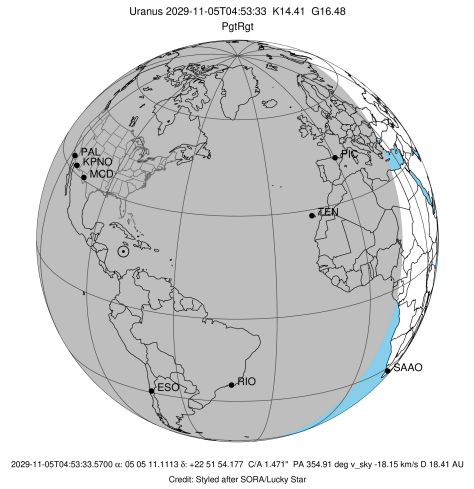
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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	+++++	+ +	+++++	NOV 05 04:06 - NOV 05 05:33	PieRie
PAL	Palomar Mt (200")	33.4	243.1	+++++	+ +	+++++	NOV 05 04:13 - NOV 05 05:41	PieRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	NOV 05 04:13 - NOV 05 05:41	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	NOV 05 04:13 - NOV 05 05:40	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+ +	+++++	NOV 05 04:08 - NOV 05 05:33	PieRie
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	+++++	+ +	+++++	NOV 05 04:13 - NOV 05 05:34	PieRie
ESO	European Southern Obs	-29.3	289.3	+++++	+ +	+++++	NOV 05 04:15 - NOV 05 05:36	PieRie
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

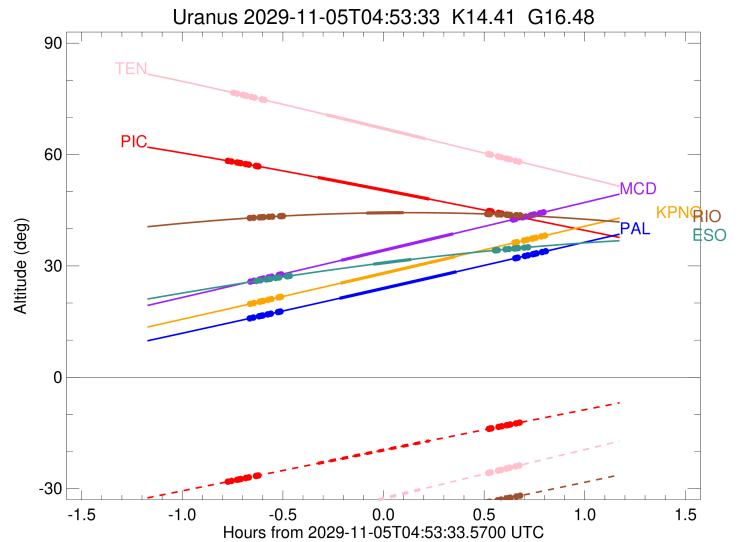
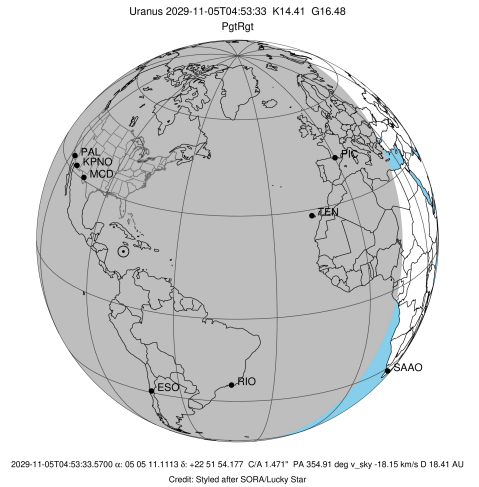


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-11-05T04:50:36.980
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3418300394271866752
 2Mass ID (if available) : 05051111+2251543
 ICRS Star Coord at Epoch: 05h 05m 11.11126s +22:51:54.17722s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.415
 G magnitude : 16.479
 RP magnitude : 15.797
 BP magnitude : 17.010
 DUPflag : 0
 Distance (au) : 18.408
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.15
 Sun-Target sep (deg) : 145.25
 Sun-Moon sep (deg) : 132.03
 B (ring opening deg) : 82.25
 PA of pole (deg) : -7.28
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.302
 C/A sky separation (km) : 17379.2
 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	2029-11-05T04:06:46.568		58.36	-28.19	51555.27	-17.34		
lambda	I	2029-11-05T04:08:14.919		58.12	-27.92	50026.71	-17.26		
delta	I	2029-11-05T04:09:55.168		57.85	-27.62	48300.35	-17.18		
gamma	I	2029-11-05T04:10:34.763		57.75	-27.50	47621.03	-17.14		
eta	I	2029-11-05T04:11:00.745		57.68	-27.42	47176.12	-17.11		
beta	I	2029-11-05T04:12:29.948		57.43	-27.14	45654.01	-17.02		
alpha	I	2029-11-05T04:13:25.018		57.28	-26.98	44719.06	-16.95		
4	I	2029-11-05T04:15:32.662		56.93	-26.59	42565.71	-16.80		
5	I	2029-11-05T04:15:51.449		56.88	-26.53	42248.44	-16.78		
6	I	2029-11-05T04:16:15.256		56.82	-26.46	41852.50	-16.74		
Uranus	I	2029-11-05T04:33:58.646		53.84	-23.21	25302.83		-5.11	-5.36
Uranus	E	2029-11-05T05:07:12.903		48.00	-17.12	25262.01		-5.51	-5.77
6	E	2029-11-05T05:25:00.810		44.79	-13.88	41857.36	16.69		
5	E	2029-11-05T05:25:26.141		44.71	-13.81	42285.59	16.73		
4	E	2029-11-05T05:25:45.654		44.66	-13.75	42608.55	16.75		
alpha	E	2029-11-05T05:27:49.516		44.28	-13.37	44693.72	16.90		
beta	E	2029-11-05T05:28:47.698		44.10	-13.20	45679.46	16.97		
eta	E	2029-11-05T05:30:15.662		43.84	-12.93	47176.12	17.06		
gamma	E	2029-11-05T05:30:42.289		43.76	-12.85	47630.70	17.08		
delta	E	2029-11-05T05:31:21.443		43.64	-12.73	48300.35	17.12		
lambda	E	2029-11-05T05:33:02.014		43.33	-12.43	50026.71	17.21		
epsilon	E	2029-11-05T05:33:48.888		43.19	-12.29	50834.20	17.28		

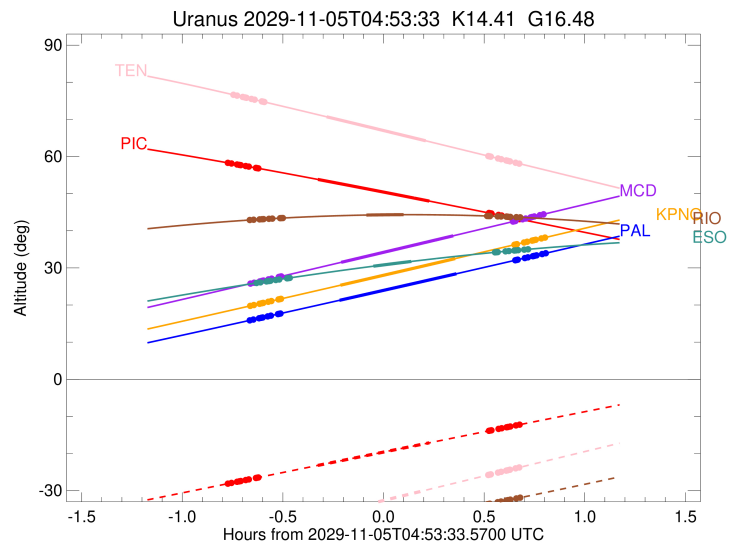
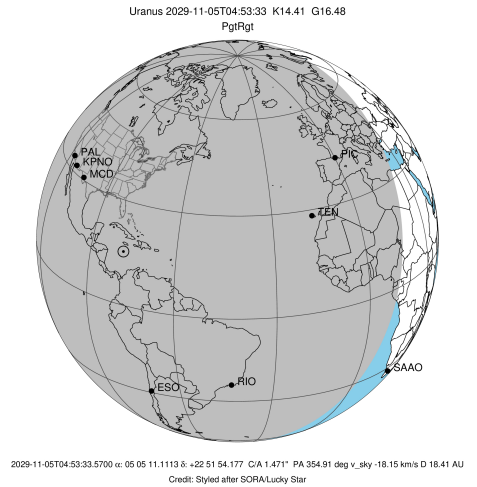
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-11-05T04:57:55.280
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3418300394271866752
 2Mass ID (if available) : 05051111+2251543
 ICRS Star Coord at Epoch: 05h 05m 11.11126s +22:51:54.17722s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.415
 G magnitude : 16.479
 RP magnitude : 15.797
 BP magnitude : 17.010
 DUPflag : 0
 Distance (au) : 18.408
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.15
 Sun-Target sep (deg) : 145.25
 Sun-Moon sep (deg) : 130.88
 B (ring opening deg) : 82.25
 PA of pole (deg) : -7.28
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.245
 C/A sky separation (km) : 16627.0
 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	2029-11-05T04:13:17.771		15.79	-42.25	51555.24	-17.17		
lambda	I	2029-11-05T04:14:46.948		16.09	-42.56	50026.71	-17.11		
delta	I	2029-11-05T04:16:28.072		16.43	-42.91	48300.35	-17.03		
gamma	I	2029-11-05T04:17:07.994		16.56	-43.05	47621.01	-17.00		
eta	I	2029-11-05T04:17:34.181		16.65	-43.14	47176.12	-16.98		
beta	I	2029-11-05T04:19:04.085		16.95	-43.44	45653.47	-16.90		
alpha	I	2029-11-05T04:19:59.440		17.13	-43.63	44720.06	-16.84		
4	I	2029-11-05T04:22:07.995		17.57	-44.08	42564.33	-16.71		
5	I	2029-11-05T04:22:26.952		17.63	-44.14	42245.98	-16.69		
6	I	2029-11-05T04:22:50.801		17.71	-44.22	41851.26	-16.66		
Uranus	I	2029-11-05T04:40:26.935		21.27	-47.82	25332.92		-4.80	-5.03
Uranus	E	2029-11-05T05:15:17.829		28.42	-54.78	25278.51		-5.36	-5.61
6	E	2029-11-05T05:32:51.393		32.06	-58.15	41857.07	16.77		
5	E	2029-11-05T05:33:16.600		32.15	-58.23	42285.12	16.81		
4	E	2029-11-05T05:33:36.038		32.21	-58.29	42608.36	16.83		
alpha	E	2029-11-05T05:35:39.403		32.64	-58.68	44693.86	16.97		
beta	E	2029-11-05T05:36:37.357		32.84	-58.86	45679.42	17.03		
eta	E	2029-11-05T05:38:05.018		33.15	-59.13	47176.12	17.12		
gamma	E	2029-11-05T05:38:31.559		33.24	-59.21	47630.71	17.14		
delta	E	2029-11-05T05:39:10.587		33.37	-59.33	48300.35	17.17		
lambda	E	2029-11-05T05:40:50.858		33.72	-59.64	50026.71	17.26		
epsilon	E	2029-11-05T05:41:37.548		33.88	-59.78	50833.32	17.32		

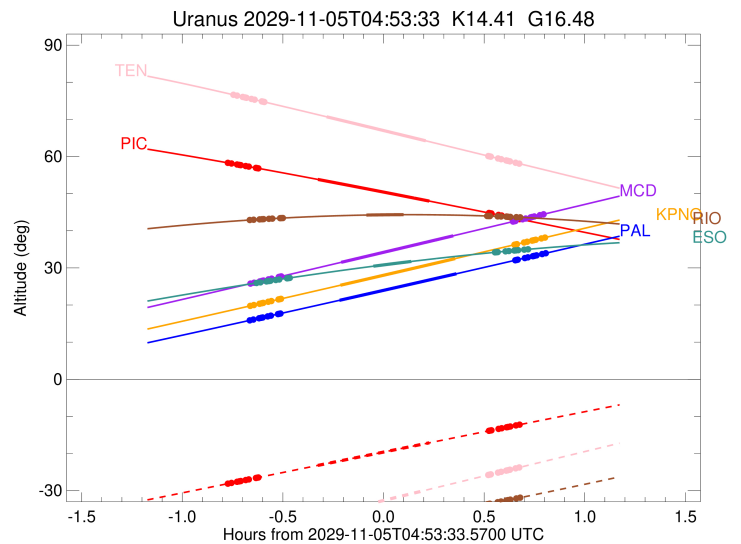
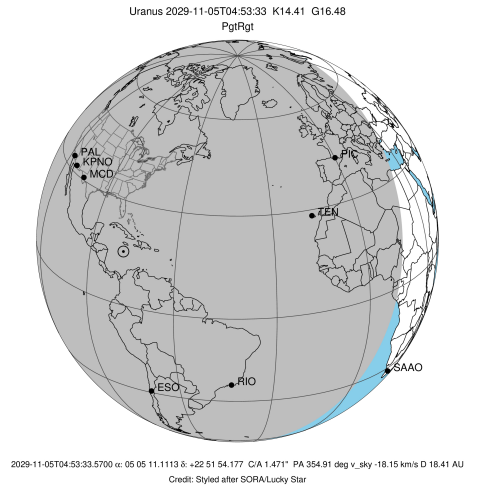
```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2029-11-05T04:57:52.480
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        : 3418300394271866752
2Mass ID (if available) : 05051111+2251543
ICRS Star Coord at Epoch: 05h 05m 11.11126s +22:51:54.17722s
RUWE (>1.4 is poor)  : 1.04
K magnitude           : 14.415
G magnitude           : 16.479
RP magnitude          : 15.797
BP magnitude          : 17.010
DUPflag              : 0
Distance (au)         : 18.408
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -18.15
Sun-Target sep (deg) : 145.25
Sun-Moon sep (deg)   : 130.94
B (ring opening deg) : 82.25
PA of pole (deg)     : -7.28
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.269
C/A sky separation (km) : 16944.2
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_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```



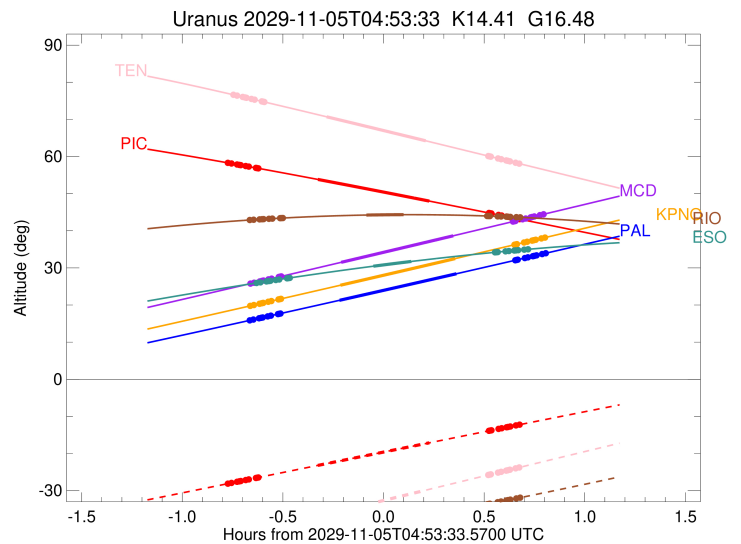
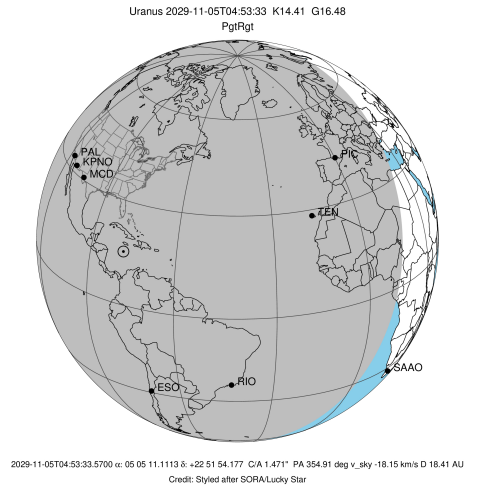
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2029-11-05T04:13:26.338		19.69	-46.90	51555.27	-17.17		
lambda	I	2029-11-05T04:14:55.551		20.00	-47.21	50026.71	-17.10		
delta	I	2029-11-05T04:16:36.732		20.34	-47.56	48300.35	-17.02		
gamma	I	2029-11-05T04:17:16.682		20.48	-47.70	47621.02	-16.99		
eta	I	2029-11-05T04:17:42.890		20.57	-47.79	47176.12	-16.96		
beta	I	2029-11-05T04:19:12.868		20.88	-48.10	45653.61	-16.88		
alpha	I	2029-11-05T04:20:08.308		21.07	-48.29	44719.81	-16.82		
4	I	2029-11-05T04:22:17.003		21.51	-48.74	42564.69	-16.68		
5	I	2029-11-05T04:22:35.971		21.58	-48.80	42246.63	-16.66		
6	I	2029-11-05T04:22:59.881		21.66	-48.88	41851.59	-16.63		
Uranus	I	2029-11-05T04:40:42.271		25.33	-52.52	25323.31		-4.90	-5.13
Uranus	E	2029-11-05T05:14:56.908		32.51	-59.34	25268.65		-5.45	-5.71
6	E	2029-11-05T05:32:36.863		36.24	-62.68	41857.38	16.74		
5	E	2029-11-05T05:33:02.123		36.33	-62.75	42285.64	16.78		
4	E	2029-11-05T05:33:21.579		36.40	-62.81	42608.58	16.80		
alpha	E	2029-11-05T05:35:25.105		36.83	-63.19	44693.68	16.94		
beta	E	2029-11-05T05:36:23.144		37.04	-63.36	45679.48	17.01		
eta	E	2029-11-05T05:37:50.894		37.35	-63.63	47176.12	17.10		
gamma	E	2029-11-05T05:38:17.458		37.44	-63.71	47630.69	17.12		
delta	E	2029-11-05T05:38:56.521		37.58	-63.83	48300.35	17.16		
lambda	E	2029-11-05T05:40:36.862		37.93	-64.12	50026.71	17.25		
epsilon	E	2029-11-05T05:41:23.676		38.10	-64.26	50835.01	17.32		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-11-05T04:57:41.550
 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 : 3418300394271866752
 2Mass ID (if available) : 05051111+2251543
 ICRS Star Coord at Epoch: 05h 05m 11.11126s +22:51:54.17722s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.415
 G magnitude : 16.479
 RP magnitude : 15.797
 BP magnitude : 17.010
 DUPflag : 0
 Distance (au) : 18.408
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.15
 Sun-Target sep (deg) : 145.25
 Sun-Moon sep (deg) : 131.03
 B (ring opening deg) : 82.25
 PA of pole (deg) : -7.28
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.299
 C/A sky separation (km) : 17341.0
 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



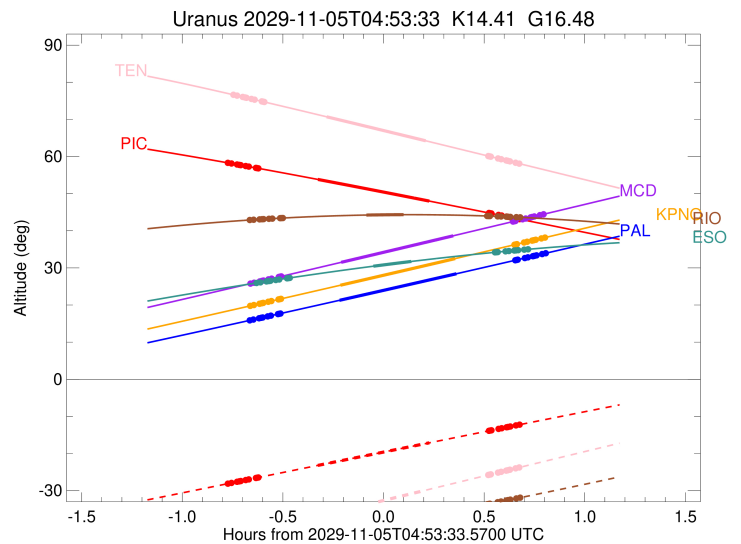
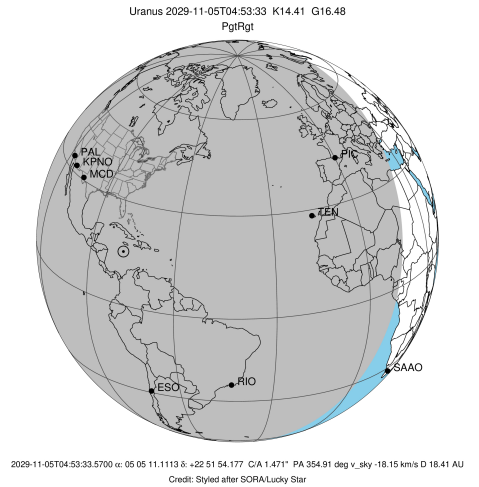
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2029-11-05T04:13:30.588		25.69	-53.52	51555.30	-17.16		
lambda	I	2029-11-05T04:14:59.820		26.00	-53.83	50026.71	-17.10		
delta	I	2029-11-05T04:16:41.045		26.36	-54.18	48300.35	-17.01		
gamma	I	2029-11-05T04:17:21.020		26.50	-54.31	47621.02	-16.98		
eta	I	2029-11-05T04:17:47.247		26.59	-54.40	47176.12	-16.95		
beta	I	2029-11-05T04:19:17.296		26.91	-54.71	45653.78	-16.86		
alpha	I	2029-11-05T04:20:12.831		27.10	-54.91	44719.47	-16.80		
4	I	2029-11-05T04:22:21.671		27.56	-55.35	42565.16	-16.65		
5	I	2029-11-05T04:22:40.650		27.63	-55.41	42247.46	-16.63		
6	I	2029-11-05T04:23:04.632		27.71	-55.49	41852.01	-16.60		
Uranus	I	2029-11-05T04:40:55.025		31.50	-59.12	25310.87		-5.03	-5.27
Uranus	E	2029-11-05T05:14:22.371		38.65	-65.55	25256.21		-5.57	-5.83
6	E	2029-11-05T05:32:10.617		42.48	-68.66	41857.76	16.71		
5	E	2029-11-05T05:32:35.941		42.57	-68.73	42286.27	16.75		
4	E	2029-11-05T05:32:55.420		42.64	-68.78	42608.83	16.77		
alpha	E	2029-11-05T05:34:59.143		43.09	-69.12	44693.46	16.92		
beta	E	2029-11-05T05:35:57.286		43.30	-69.27	45679.55	16.99		
eta	E	2029-11-05T05:37:25.141		43.61	-69.51	47176.12	17.08		
gamma	E	2029-11-05T05:37:51.733		43.71	-69.58	47630.67	17.11		
delta	E	2029-11-05T05:38:30.836		43.85	-69.68	48300.35	17.14		
lambda	E	2029-11-05T05:40:11.258		44.21	-69.94	50026.71	17.24		
epsilon	E	2029-11-05T05:40:58.222		44.38	-70.06	50837.09	17.31		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-11-05T04:51:24.740
 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 : 3418300394271866752
 2Mass ID (if available) : 05051111+2251543
 ICRS Star Coord at Epoch: 05h 05m 11.11126s +22:51:54.17722s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.415
 G magnitude : 16.479
 RP magnitude : 15.797
 BP magnitude : 17.010
 DUPflag : 0
 Distance (au) : 18.408
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.15
 Sun-Target sep (deg) : 145.25
 Sun-Moon sep (deg) : 132.07
 B (ring opening deg) : 82.25
 PA of pole (deg) : -7.28
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.434
 C/A sky separation (km) : 19138.1
 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



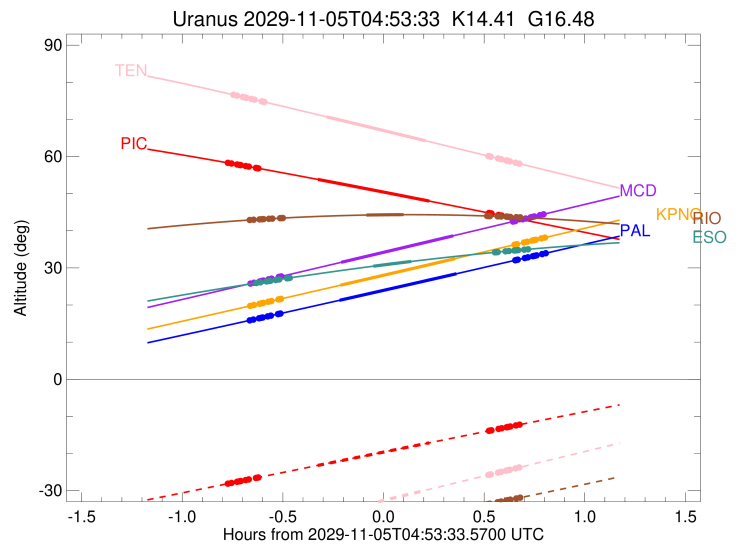
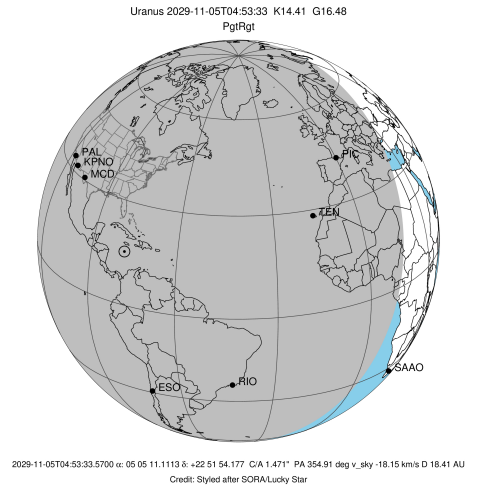
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2029-11-05T04:08:25.877		76.72	-42.59	51554.87	-17.18		
lambda	I	2029-11-05T04:09:55.029		76.41	-42.27	50026.71	-17.10		
delta	I	2029-11-05T04:11:36.327		76.05	-41.90	48300.35	-16.99		
gamma	I	2029-11-05T04:12:16.372		75.91	-41.75	47621.07	-16.94		
eta	I	2029-11-05T04:12:42.663		75.82	-41.65	47176.12	-16.91		
beta	I	2029-11-05T04:14:12.957		75.51	-41.32	45654.78	-16.79		
alpha	I	2029-11-05T04:15:08.927		75.31	-41.12	44717.64	-16.71		
4	I	2029-11-05T04:17:18.362		74.85	-40.64	42567.72	-16.52		
5	I	2029-11-05T04:17:37.371		74.79	-40.57	42251.98	-16.50		
6	I	2029-11-05T04:18:01.711		74.70	-40.48	41854.29	-16.45		
Uranus	I	2029-11-05T04:36:36.285		70.71	-36.39	25244.50		-5.68	-5.95
Uranus	E	2029-11-05T05:06:10.025		64.24	-29.88	25202.24		-6.06	-6.34
6	E	2029-11-05T05:24:48.809		60.13	-25.78	41859.16	16.42		
5	E	2029-11-05T05:25:14.600		60.03	-25.69	42288.53	16.47		
4	E	2029-11-05T05:25:34.340		59.96	-25.61	42609.74	16.49		
alpha	E	2029-11-05T05:27:39.868		59.50	-25.15	44692.70	16.68		
beta	E	2029-11-05T05:28:38.878		59.28	-24.94	45679.81	16.76		
eta	E	2029-11-05T05:30:07.842		58.95	-24.61	47176.12	16.87		
gamma	E	2029-11-05T05:30:34.747		58.85	-24.51	47630.57	16.91		
delta	E	2029-11-05T05:31:14.309		58.71	-24.37	48300.35	16.95		
lambda	E	2029-11-05T05:32:55.814		58.33	-24.00	50026.71	17.06		
epsilon	E	2029-11-05T05:33:43.670		58.16	-23.82	50844.32	17.15		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-11-05T04:54:01.930
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 3418300394271866752
 2Mass ID (if available) : 05051111+2251543
 ICRS Star Coord at Epoch: 05h 05m 11.11126s +22:51:54.17722s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.415
 G magnitude : 16.479
 RP magnitude : 15.797
 BP magnitude : 17.010
 DUPflag : 0
 Distance (au) : 18.408
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.15
 Sun-Target sep (deg) : 145.25
 Sun-Moon sep (deg) : 131.63
 B (ring opening deg) : 82.25
 PA of pole (deg) : -7.28
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.816
 C/A sky separation (km) : 24238.4
 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	2029-11-05T04:13:17.553		42.88	-44.79	51550.55	-16.32		
lambda	I	2029-11-05T04:14:51.304		42.97	-44.59	50026.71	-16.18		
delta	I	2029-11-05T04:16:38.610		43.07	-44.36	48300.35	-15.99		
gamma	I	2029-11-05T04:17:21.176		43.11	-44.26	47621.24	-15.91		
eta	I	2029-11-05T04:17:49.192		43.14	-44.20	47176.12	-15.86		
beta	I	2029-11-05T04:19:25.567		43.23	-43.99	45657.20	-15.67		
alpha	I	2029-11-05T04:20:26.132		43.28	-43.85	44713.31	-15.52		
4	I	2029-11-05T04:22:45.475		43.39	-43.54	42573.94	-15.19		
5	I	2029-11-05T04:23:05.864		43.41	-43.49	42262.67	-15.14		
6	I	2029-11-05T04:23:32.778		43.43	-43.43	41859.58	-15.06		
Uranus	I	2029-11-05T04:48:25.623		44.24	-39.75	25030.23		-7.42	-7.77
Uranus	E	2029-11-05T04:59:33.279		44.34	-37.96	25007.60		-7.58	-7.94
6	E	2029-11-05T05:24:28.855		43.98	-33.67	41864.31	15.08		
5	E	2029-11-05T05:24:57.021		43.97	-33.59	42296.70	15.16		
4	E	2029-11-05T05:25:18.167		43.96	-33.53	42612.80	15.21		
alpha	E	2029-11-05T05:27:33.179		43.88	-33.12	44689.95	15.54		
beta	E	2029-11-05T05:28:36.604		43.84	-32.93	45680.63	15.69		
eta	E	2029-11-05T05:30:11.356		43.79	-32.65	47176.12	15.88		
gamma	E	2029-11-05T05:30:39.897		43.77	-32.56	47630.15	15.94		
delta	E	2029-11-05T05:31:21.849		43.74	-32.43	48300.35	16.01		
lambda	E	2029-11-05T05:33:09.014		43.67	-32.11	50026.71	16.20		
epsilon	E	2029-11-05T05:34:01.369		43.63	-31.95	50877.17	16.34		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-11-05T04:56:15.180
 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 : 3418300394271866752
 2Mass ID (if available) : 05051111+2251543
 ICRS Star Coord at Epoch: 05h 05m 11.11126s +22:51:54.17722s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.415
 G magnitude : 16.479
 RP magnitude : 15.797
 BP magnitude : 17.010
 DUPflag : 0
 Distance (au) : 18.408
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.15
 Sun-Target sep (deg) : 145.25
 Sun-Moon sep (deg) : 131.22
 B (ring opening deg) : 82.25
 PA of pole (deg) : -7.28
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.814
 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	2029-11-05T04:15:18.284		25.88	-45.07	51550.78	-16.23		
lambda	I	2029-11-05T04:16:52.565		26.11	-45.09	50026.71	-16.09		
delta	I	2029-11-05T04:18:40.452		26.36	-45.11	48300.35	-15.91		
gamma	I	2029-11-05T04:19:23.246		26.46	-45.12	47621.23	-15.83		
eta	I	2029-11-05T04:19:51.412		26.52	-45.12	47176.12	-15.78		
beta	I	2029-11-05T04:21:28.299		26.74	-45.14	45657.13	-15.58		
alpha	I	2029-11-05T04:22:29.166		26.88	-45.14	44713.43	-15.44		
4	I	2029-11-05T04:24:49.240		27.20	-45.15	42573.77	-15.12		
5	I	2029-11-05T04:25:09.739		27.25	-45.15	42262.38	-15.07		
6	I	2029-11-05T04:25:36.779		27.31	-45.15	41859.45	-14.99		
Uranus	I	2029-11-05T04:50:33.934		30.46	-44.77	25032.13		-7.40	-7.75
Uranus	E	2029-11-05T05:01:50.965		31.74	-44.34	25007.34		-7.58	-7.94
6	E	2029-11-05T05:26:48.858		34.19	-42.83	41864.41	15.04		
5	E	2029-11-05T05:27:17.095		34.23	-42.80	42296.86	15.12		
4	E	2029-11-05T05:27:38.286		34.27	-42.77	42612.85	15.17		
alpha	E	2029-11-05T05:29:53.611		34.46	-42.60	44689.89	15.50		
beta	E	2029-11-05T05:30:57.188		34.55	-42.52	45680.64	15.65		
eta	E	2029-11-05T05:32:32.157		34.68	-42.39	47176.12	15.84		
gamma	E	2029-11-05T05:33:00.762		34.72	-42.35	47630.14	15.90		
delta	E	2029-11-05T05:33:42.809		34.78	-42.29	48300.35	15.98		
lambda	E	2029-11-05T05:35:30.209		34.92	-42.14	50026.71	16.17		
epsilon	E	2029-11-05T05:36:22.739		34.99	-42.07	50878.16	16.30		