

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-01-27T04:26:07.790  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 3379576453735484928  
 2Mass ID (if available) : 06502552+2319322

ICRS Star Coord at Epoch: 06h 50m 25.53143s +23:19:32.16666s

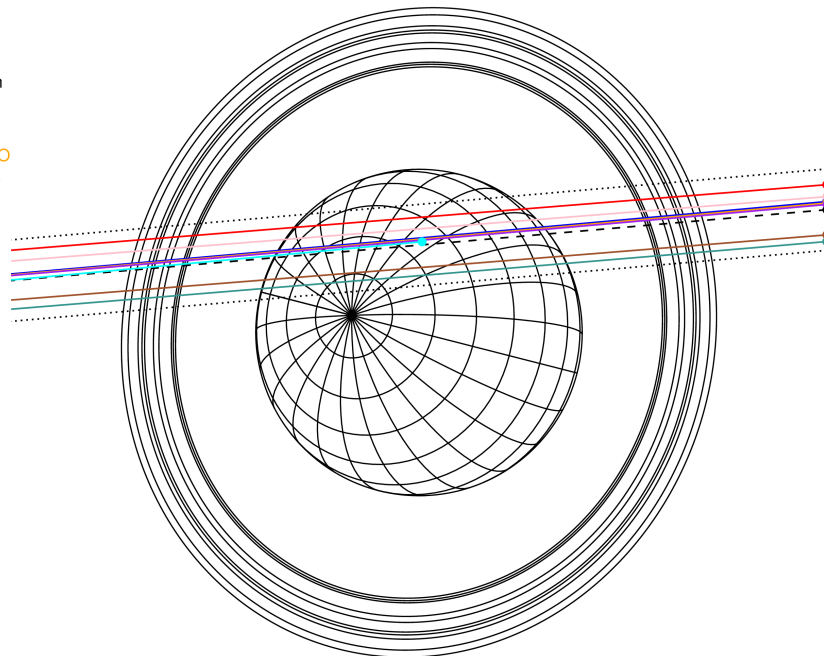
RUWE (>1.4 is poor) : 1.10  
 K magnitude : 13.595  
 G magnitude : 15.265  
 RP magnitude : 14.719  
 BP magnitude : 15.637  
 DUPflag : 0  
 Distance (au) : 17.923  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -20.63  
 Sun-Target sep (deg) : 155.26  
 Sun-Moon sep (deg) : 168.26  
 B (ring opening deg) : 64.81  
 PA of pole (deg) : 75.70

#	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



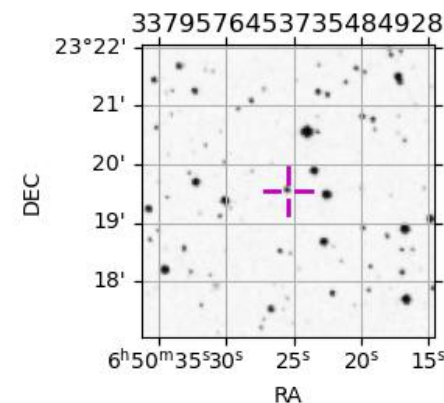
2036-01-27T04:26:07.7900 α: 06 50 25.5314 α: +23 19 32.167 C/A 1.056° PA 184.97 deg v\_sky -20.63 km/s D 17.92 AU  
 Credit: Styled after SORA/Lucky Star

Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO

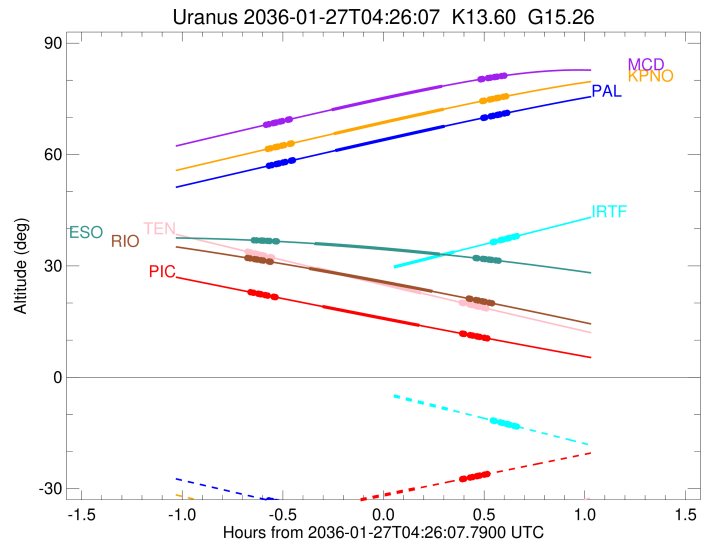
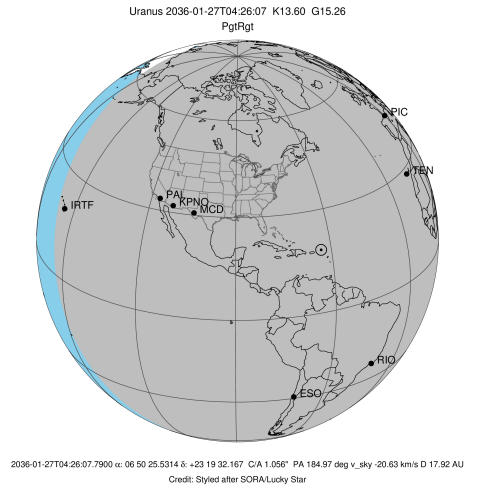


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	JAN 27 03:46 - JAN 27 04:57	PieRie
PAL	Palomar Mt (200")	33.4	243.1	+++++	+ +	+++++	JAN 27 03:52 - JAN 27 05:03	PieRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	JAN 27 03:51 - JAN 27 05:02	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	JAN 27 03:51 - JAN 27 05:02	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+ +	+++++	JAN 27 03:45 - JAN 27 04:57	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5		+	+++++	JAN 27 04:47 - JAN 27 05:06	PneRne
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++	+ +	+++++	JAN 27 03:45 - JAN 27 04:58	PieRie
ESO	European Southern Obs	-29.3	289.3	+++++	+ +	+++++	JAN 27 03:47 - JAN 27 05:00	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

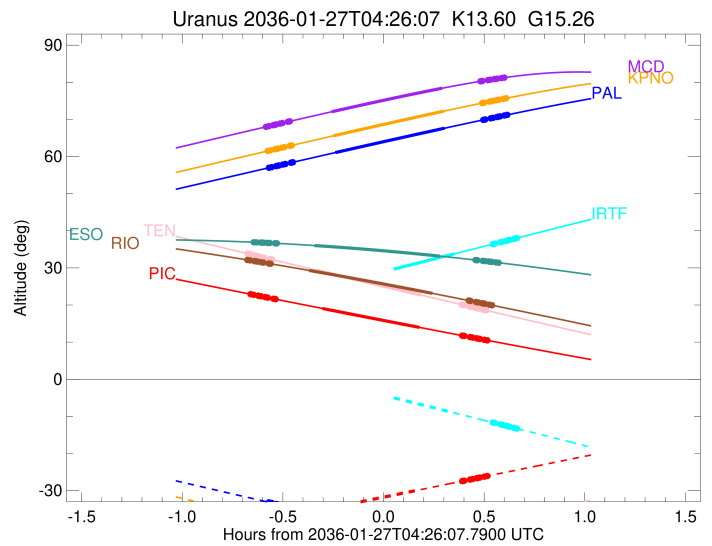
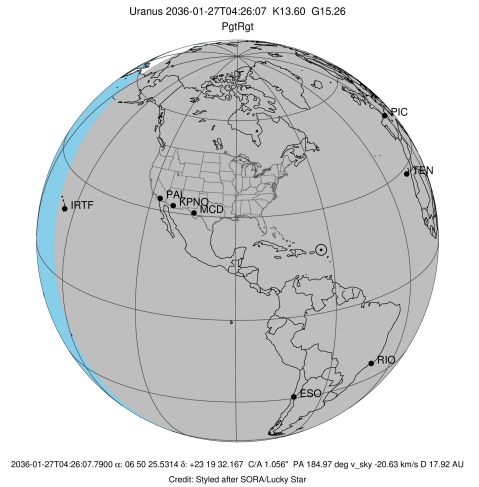


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-01-27T04:22:33.500  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PIC  
 Location : Pic du Midi  
 Latitude (deg) : 42.93656  
 E. Longitude (deg) : 0.14231  
 Altitude (km) : 2.890  
 Gaia source ID : 3379576453735484928  
 2Mass ID (if available) : 06502552+2319322  
 ICRS Star Coord at Epoch: 06h 50m 25.53143s +23:19:32.16666s  
 RUWE (>1.4 is poor) : 1.10  
 K magnitude : 13.595  
 G magnitude : 15.265  
 RP magnitude : 14.719  
 BP magnitude : 15.637  
 DUPflag : 0  
 Distance (au) : 17.923  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -20.63  
 Sun-Target sep (deg) : 155.26  
 Sun-Moon sep (deg) : 167.88  
 B (ring opening deg) : 64.81  
 PA of pole (deg) : 75.70  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.382  
 C/A sky separation (km) : 17965.5  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLvl1.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



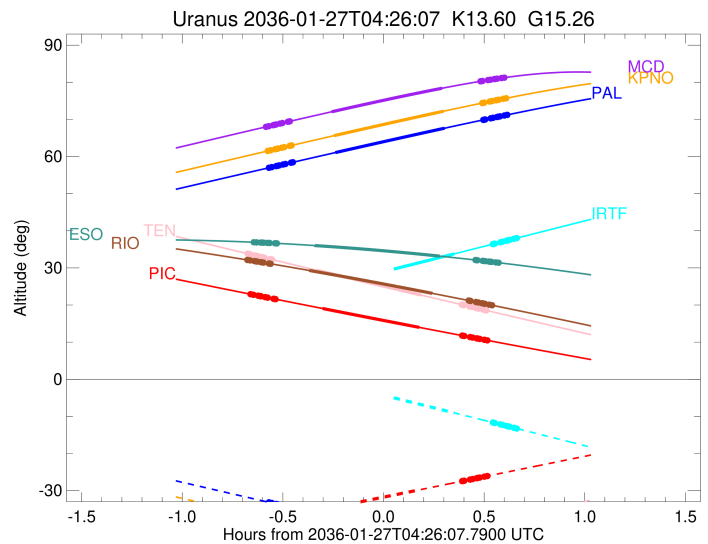
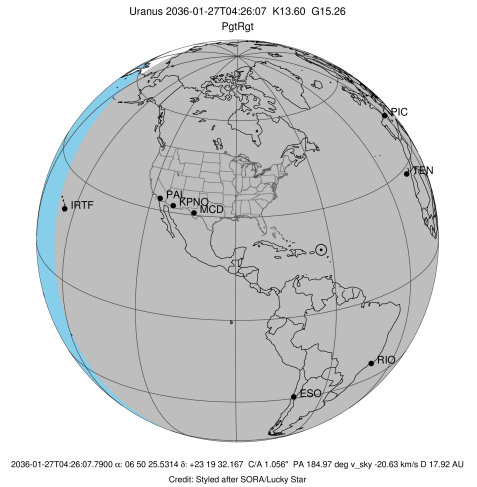
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-01-27T03:46:48.981		22.86	-38.91	50743.55	-21.14		
lambda	I	2036-01-27T03:47:22.928		22.76	-38.81	50026.71	-21.09		
delta	I	2036-01-27T03:48:45.001		22.51	-38.56	48300.35	-20.97		
gamma	I	2036-01-27T03:49:17.427		22.41	-38.47	47621.06	-20.92		
eta	I	2036-01-27T03:49:38.710		22.35	-38.40	47176.12	-20.89		
beta	I	2036-01-27T03:50:52.276		22.13	-38.18	45645.33	-20.77		
alpha	I	2036-01-27T03:51:35.685		22.00	-38.05	44748.46	-20.68		
4	I	2036-01-27T03:53:18.705		21.69	-37.74	42616.53	-20.46		
5	I	2036-01-27T03:53:41.454		21.62	-37.67	42155.19	-20.42		
6	I	2036-01-27T03:53:54.986		21.58	-37.63	41868.80	-20.38		
Uranus	I	2036-01-27T04:07:59.203		19.06	-35.07	25463.29		-10.84	-11.34
Uranus	E	2036-01-27T04:36:48.912		13.98	-29.79	25174.23		22.36	23.31
6	E	2036-01-27T04:49:35.331		11.77	-27.45	41839.80	20.29		
5	E	2036-01-27T04:49:56.098		11.71	-27.38	42279.18	20.32		
4	E	2036-01-27T04:50:09.872		11.67	-27.34	42543.78	20.37		
alpha	E	2036-01-27T04:51:54.183		11.37	-27.02	44686.65	20.58		
beta	E	2036-01-27T04:52:42.427		11.23	-26.87	45681.00	20.66		
eta	E	2036-01-27T04:53:54.659		11.03	-26.65	47176.12	20.78		
gamma	E	2036-01-27T04:54:16.516		10.96	-26.59	47630.68	20.81		
delta	E	2036-01-27T04:54:48.653		10.87	-26.49	48300.35	20.86		
lambda	E	2036-01-27T04:56:11.175		10.64	-26.24	50026.71	20.98		
epsilon	E	2036-01-27T04:57:18.755		10.44	-26.03	51447.20	21.02		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-01-27T04:28:11.390  
 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 : 3379576453735484928  
 2Mass ID (if available) : 06502552+2319322  
 ICRS Star Coord at Epoch: 06h 50m 25.53143s +23:19:32.16666s  
 RUWE (>1.4 is poor) : 1.10  
 K magnitude : 13.595  
 G magnitude : 15.265  
 RP magnitude : 14.719  
 BP magnitude : 15.637  
 DUPflag : 0  
 Distance (au) : 17.923  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -20.63  
 Sun-Target sep (deg) : 155.26  
 Sun-Moon sep (deg) : 168.80  
 B (ring opening deg) : 64.81  
 PA of pole (deg) : 75.70  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.133  
 C/A sky separation (km) : 14729.5  
 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



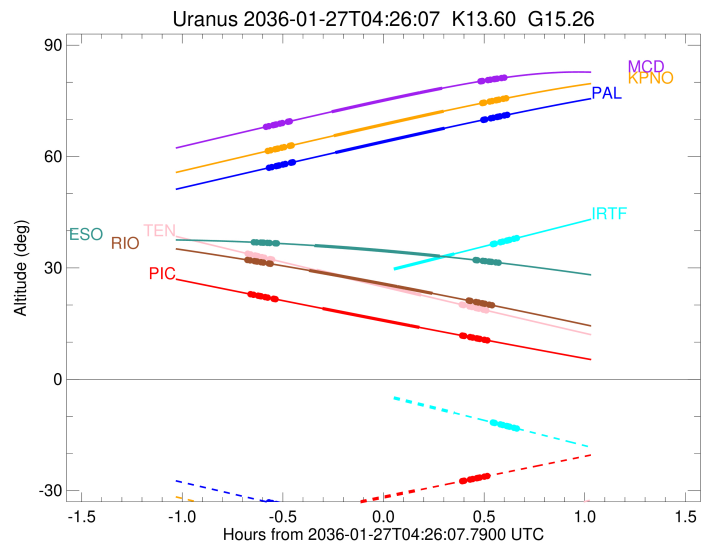
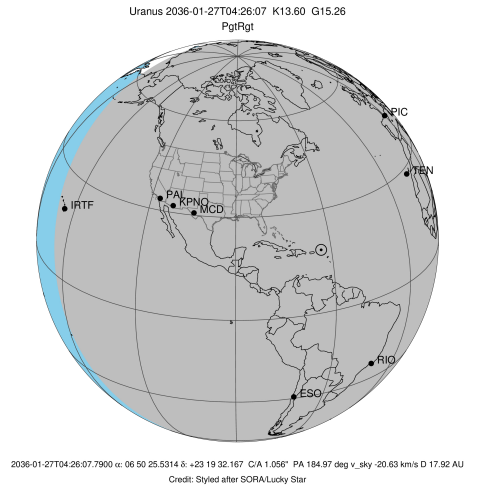
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-01-27T03:52:17.192		57.04	-33.22	50744.62	-21.91		
lambda	I	2036-01-27T03:52:49.971		57.15	-33.33	50026.71	-21.89		
delta	I	2036-01-27T03:54:08.984		57.43	-33.61	48300.35	-21.81		
gamma	I	2036-01-27T03:54:40.156		57.53	-33.71	47621.00	-21.78		
eta	I	2036-01-27T03:55:00.595		57.60	-33.79	47176.12	-21.75		
beta	I	2036-01-27T03:56:11.194		57.85	-34.03	45644.52	-21.68		
alpha	I	2036-01-27T03:56:52.662		57.99	-34.18	44749.51	-21.62		
4	I	2036-01-27T03:58:31.053		58.33	-34.52	42616.28	-21.48		
5	I	2036-01-27T03:58:52.723		58.41	-34.59	42156.00	-21.45		
6	I	2036-01-27T03:59:05.680		58.45	-34.64	41866.52	-21.43		
Uranus	I	2036-01-27T04:11:45.329		61.06	-37.29	25397.15		-14.19	-14.83
Uranus	E	2036-01-27T04:44:20.657		67.63	-44.09	25117.98		24.08	25.08
6	E	2036-01-27T04:55:52.757		69.87	-46.48	41835.90	21.46		
5	E	2036-01-27T04:56:12.835		69.94	-46.55	42285.09	21.48		
4	E	2036-01-27T04:56:25.426		69.98	-46.60	42540.64	21.51		
alpha	E	2036-01-27T04:58:04.406		70.29	-46.94	44685.78	21.66		
beta	E	2036-01-27T04:58:50.346		70.44	-47.10	45681.18	21.71		
eta	E	2036-01-27T04:59:59.144		70.65	-47.33	47176.12	21.79		
gamma	E	2036-01-27T05:00:20.000		70.72	-47.40	47630.90	21.82		
delta	E	2036-01-27T05:00:50.661		70.81	-47.51	48300.35	21.85		
lambda	E	2036-01-27T05:02:09.524		71.06	-47.78	50026.71	21.93		
epsilon	E	2036-01-27T05:03:15.108		71.27	-48.01	51466.90	21.96		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-01-27T04:27:50.230  
 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 : 3379576453735484928  
 2Mass ID (if available) : 06502552+2319322  
 ICRS Star Coord at Epoch: 06h 50m 25.53143s +23:19:32.16666s  
 RUWE (>1.4 is poor) : 1.10  
 K magnitude : 13.595  
 G magnitude : 15.265  
 RP magnitude : 14.719  
 BP magnitude : 15.637  
 DUPflag : 0  
 Distance (au) : 17.923  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -20.63  
 Sun-Target sep (deg) : 155.26  
 Sun-Moon sep (deg) : 168.74  
 B (ring opening deg) : 64.81  
 PA of pole (deg) : 75.70  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.118  
 C/A sky separation (km) : 14538.9  
 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	2036-01-27T03:51:56.325		61.57	-37.57	50744.76	-21.96		
lambda	I	2036-01-27T03:52:29.032		61.68	-37.68	50026.71	-21.94		
delta	I	2036-01-27T03:53:47.852		61.96	-37.96	48300.35	-21.86		
gamma	I	2036-01-27T03:54:18.945		62.07	-38.07	47621.00	-21.83		
eta	I	2036-01-27T03:54:39.332		62.14	-38.14	47176.12	-21.81		
beta	I	2036-01-27T03:55:49.750		62.38	-38.39	45644.47	-21.73		
alpha	I	2036-01-27T03:56:31.100		62.53	-38.54	44749.58	-21.68		
4	I	2036-01-27T03:58:09.216		62.87	-38.89	42616.25	-21.54		
5	I	2036-01-27T03:58:30.822		62.95	-38.96	42156.08	-21.51		
6	I	2036-01-27T03:58:43.748		62.99	-39.01	41866.36	-21.49		
Uranus	I	2036-01-27T04:11:18.968		65.61	-41.68	25392.72		-14.39	-15.04
Uranus	E	2036-01-27T04:44:05.040		72.22	-48.61	25115.81		24.14	25.14
6	E	2036-01-27T04:55:33.929		74.40	-51.02	41835.72	21.52		
5	E	2036-01-27T04:55:53.975		74.46	-51.09	42285.36	21.54		
4	E	2036-01-27T04:56:06.514		74.50	-51.13	42540.50	21.57		
alpha	E	2036-01-27T04:57:45.253		74.81	-51.48	44685.74	21.71		
beta	E	2036-01-27T04:58:31.089		74.95	-51.63	45681.19	21.76		
eta	E	2036-01-27T04:59:39.735		75.15	-51.87	47176.12	21.84		
gamma	E	2036-01-27T05:00:00.547		75.22	-51.95	47630.91	21.86		
delta	E	2036-01-27T05:00:31.142		75.31	-52.05	48300.35	21.90		
lambda	E	2036-01-27T05:01:49.846		75.55	-52.33	50026.71	21.97		
epsilon	E	2036-01-27T05:02:55.342		75.74	-52.55	51467.74	22.00		

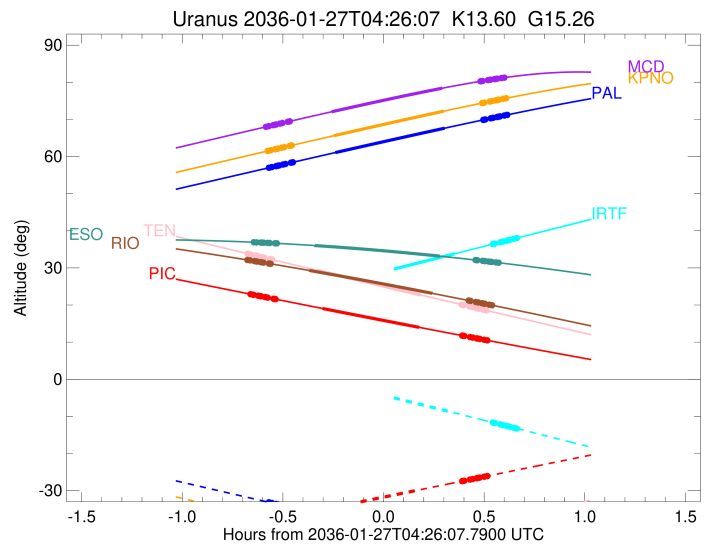
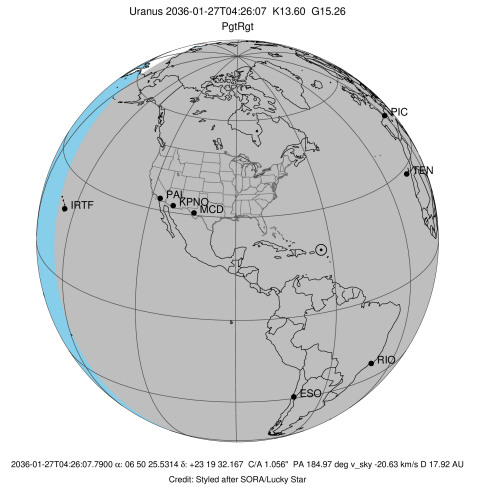
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-01-27T04:27:17.160  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : MCD  
 Location : McDonald Obs. 2.7m  
 Latitude (deg) : 30.67158  
 E. Longitude (deg) : 255.97844  
 Altitude (km) : 2.075  
 Gaia source ID : 3379576453735484928  
 2Mass ID (if available) : 06502552+2319322  
 ICRS Star Coord at Epoch: 06h 50m 25.53143s +23:19:32.16666s  
 RUWE (>1.4 is poor) : 1.10  
 K magnitude : 13.595  
 G magnitude : 15.265  
 RP magnitude : 14.719  
 BP magnitude : 15.637  
 DUPflag : 0  
 Distance (au) : 17.923  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -20.63  
 Sun-Target sep (deg) : 155.26  
 Sun-Moon sep (deg) : 168.65  
 B (ring opening deg) : 64.81  
 PA of pole (deg) : 75.70  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.106  
 C/A sky separation (km) : 14371.7  
 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	2036-01-27T03:51:24.075		68.07	-43.97	50744.90	-22.02		
lambda	I	2036-01-27T03:51:56.710		68.18	-44.09	50026.71	-21.99		
delta	I	2036-01-27T03:53:15.338		68.45	-44.37	48300.35	-21.92		
gamma	I	2036-01-27T03:53:46.354		68.56	-44.48	47621.00	-21.89		
eta	I	2036-01-27T03:54:06.689		68.63	-44.56	47176.12	-21.87		
beta	I	2036-01-27T03:55:16.929		68.88	-44.81	45644.41	-21.79		
alpha	I	2036-01-27T03:55:58.164		69.02	-44.95	44749.64	-21.74		
4	I	2036-01-27T03:57:36.015		69.36	-45.30	42616.22	-21.60		
5	I	2036-01-27T03:57:57.559		69.44	-45.38	42156.15	-21.57		
6	I	2036-01-27T03:58:10.455		69.48	-45.43	41866.19	-21.55		
Uranus	I	2036-01-27T04:10:41.619		72.06	-48.11	25388.65		-14.57	-15.23
Uranus	E	2036-01-27T04:43:36.640		78.40	-55.12	25114.07		24.19	25.20
6	E	2036-01-27T04:55:02.758		80.26	-57.52	41835.57	21.57		
5	E	2036-01-27T04:55:22.775		80.31	-57.59	42285.57	21.59		
4	E	2036-01-27T04:55:35.269		80.35	-57.63	42540.39	21.62		
alpha	E	2036-01-27T04:57:13.797		80.58	-57.98	44685.72	21.75		
beta	E	2036-01-27T04:57:59.543		80.69	-58.13	45681.19	21.81		
eta	E	2036-01-27T04:59:08.056		80.85	-58.37	47176.12	21.88		
gamma	E	2036-01-27T04:59:28.829		80.90	-58.44	47630.92	21.90		
delta	E	2036-01-27T04:59:59.368		80.97	-58.55	48300.35	21.94		
lambda	E	2036-01-27T05:01:17.933		81.14	-58.82	50026.71	22.01		
epsilon	E	2036-01-27T05:02:23.348		81.28	-59.05	51468.38	22.03		



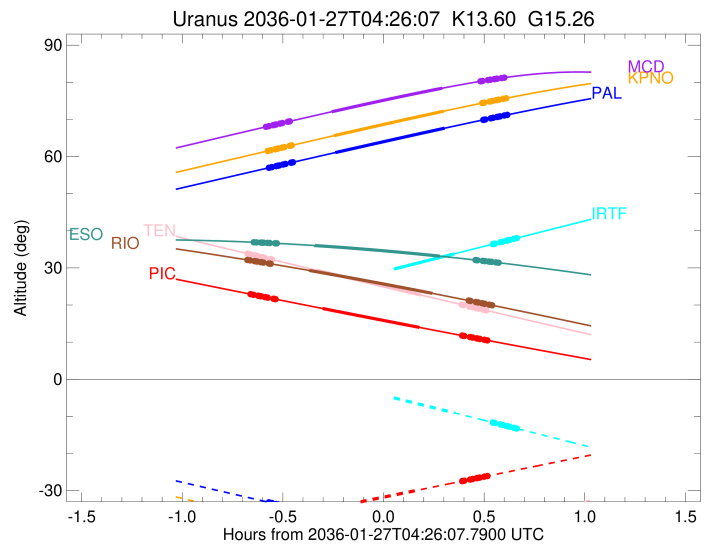
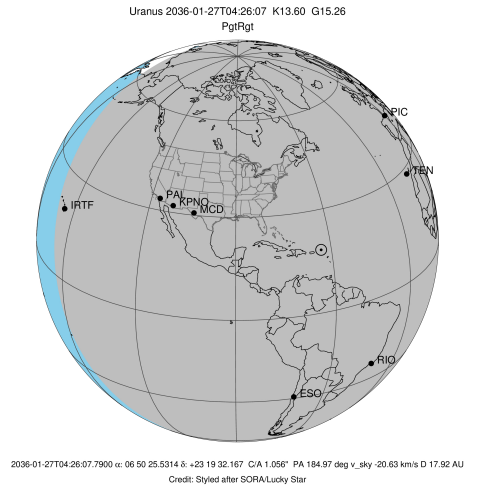
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-01-27T04:21:52.670  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : TEN  
 Location : Teide Obs./Tenerife  
 Latitude (deg) : 28.30050  
 E. Longitude (deg) : 343.48909  
 Altitude (km) : 2.395  
 Gaia source ID : 3379576453735484928  
 2Mass ID (if available) : 06502552+2319322  
 ICRS Star Coord at Epoch: 06h 50m 25.53143s +23:19:32.16666s  
 RUWE (>1.4 is poor) : 1.10  
 K magnitude : 13.595  
 G magnitude : 15.265  
 RP magnitude : 14.719  
 BP magnitude : 15.637  
 DUPflag : 0  
 Distance (au) : 17.923  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -20.63  
 Sun-Target sep (deg) : 155.26  
 Sun-Moon sep (deg) : 167.74  
 B (ring opening deg) : 64.81  
 PA of pole (deg) : 75.70  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.244  
 C/A sky separation (km) : 16173.8  
 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	2036-01-27T03:45:57.292		33.76	-54.98	50744.09	-21.56		
lambda	I	2036-01-27T03:46:30.590		33.63	-54.86	50026.71	-21.53		
delta	I	2036-01-27T03:47:50.968		33.34	-54.57	48300.35	-21.43		
gamma	I	2036-01-27T03:48:22.700		33.23	-54.45	47621.02	-21.39		
eta	I	2036-01-27T03:48:43.515		33.15	-54.38	47176.12	-21.36		
beta	I	2036-01-27T03:49:55.441		32.89	-54.11	45644.80	-21.26		
alpha	I	2036-01-27T03:50:37.763		32.74	-53.96	44749.15	-21.19		
4	I	2036-01-27T03:52:18.211		32.38	-53.59	42616.40	-21.02		
5	I	2036-01-27T03:52:40.363		32.30	-53.51	42155.65	-20.98		
6	I	2036-01-27T03:52:53.578		32.25	-53.46	41867.38	-20.95		
Uranus	I	2036-01-27T04:06:07.814		29.38	-50.56	25424.22		-12.91	-13.50
Uranus	E	2036-01-27T04:37:21.125		22.68	-43.68	25141.39		23.37	24.35
6	E	2036-01-27T04:49:26.503		20.11	-41.02	41837.84	20.85		
5	E	2036-01-27T04:49:46.949		20.03	-40.94	42282.19	20.87		
4	E	2036-01-27T04:50:00.134		19.99	-40.90	42542.18	20.91		
alpha	E	2036-01-27T04:51:41.898		19.63	-40.52	44686.19	21.07		
beta	E	2036-01-27T04:52:29.065		19.46	-40.35	45681.11	21.14		
eta	E	2036-01-27T04:53:39.705		19.21	-40.09	47176.12	21.23		
gamma	E	2036-01-27T04:54:01.104		19.14	-40.01	47630.79	21.26		
delta	E	2036-01-27T04:54:32.567		19.03	-39.89	48300.35	21.30		
lambda	E	2036-01-27T04:55:53.444		18.74	-39.60	50026.71	21.39		
epsilon	E	2036-01-27T04:57:00.202		18.51	-39.35	51456.99	21.42		

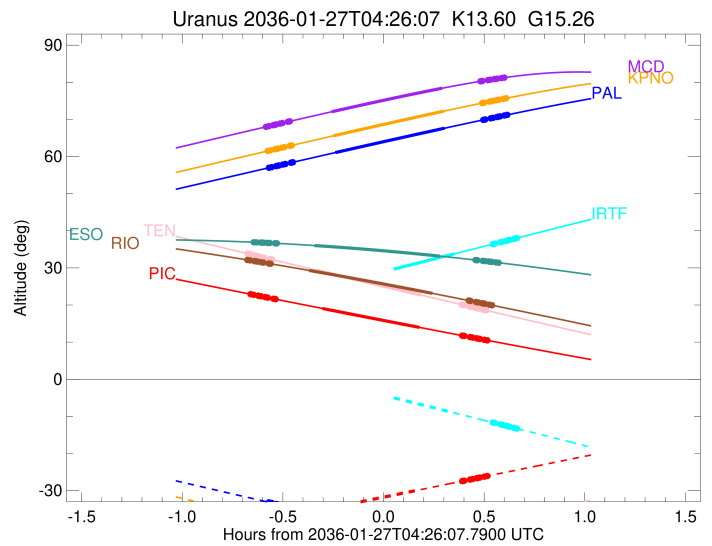
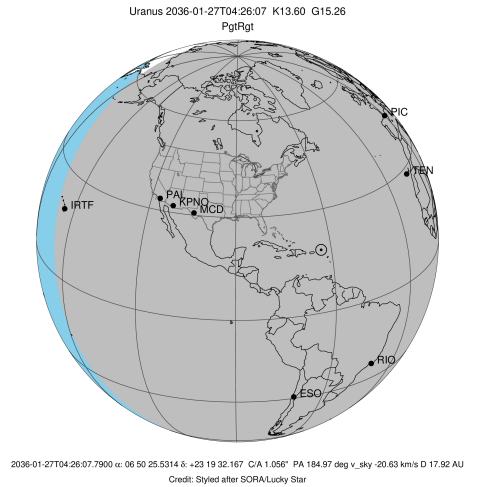
```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2036-01-27T04:30:39.150
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        : 3379576453735484928
2Mass ID (if available) : 06502552+2319322
ICRS Star Coord at Epoch: 06h 50m 25.53143s +23:19:32.16666s
RUWE (>1.4 is poor)  : 1.10
K magnitude           : 13.595
G magnitude           : 15.265
RP magnitude          : 14.719
BP magnitude          : 15.637
DUPflag              : 0
Distance (au)         : 17.923
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -20.63
Sun-Target sep (deg)  : 155.26
Sun-Moon sep (deg)    : 169.10
B (ring opening deg)  : 64.81
PA of pole (deg)      : 75.70
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.085
C/A sky separation (km) : 14102.9
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	2036-01-27T03:54:19.615		21.82	2.74x	50744.89	-21.79		
lambda	I	2036-01-27T03:54:52.581		21.94	2.62x	50026.71	-21.77		
delta	I	2036-01-27T03:56:11.994		22.24	2.33x	48300.35	-21.70		
gamma	I	2036-01-27T03:56:43.316		22.35	2.21x	47620.99	-21.68		
eta	I	2036-01-27T03:57:03.850		22.43	2.14x	47176.12	-21.66		
beta	I	2036-01-27T03:58:14.766		22.70	1.88x	45644.41	-21.59		
alpha	I	2036-01-27T03:58:56.391		22.85	1.72x	44749.65	-21.54		
4	I	2036-01-27T04:00:35.145		23.22	1.36x	42616.21	-21.41		
5	I	2036-01-27T04:00:56.883		23.30	1.28x	42156.17	-21.38		
6	I	2036-01-27T04:01:09.895		23.35	1.23x	41866.16	-21.36		
Uranus	I	2036-01-27T04:13:45.318		26.19	-1.56x	25385.75		-14.69	-15.36
Uranus	E	2036-01-27T04:47:15.749		33.79	-9.06	25109.50		24.33	25.34
6	E	2036-01-27T04:58:43.557		36.40	-11.65	41835.03	21.45		
5	E	2036-01-27T04:59:03.738		36.47	-11.72	42286.36	21.47		
4	E	2036-01-27T04:59:16.238		36.52	-11.77	42539.97	21.50		
alpha	E	2036-01-27T05:00:55.301		36.90	-12.15	44685.62	21.64		
beta	E	2036-01-27T05:01:41.304		37.07	-12.32	45681.21	21.69		
eta	E	2036-01-27T05:02:50.194		37.34	-12.58	47176.12	21.76		
gamma	E	2036-01-27T05:03:11.084		37.42	-12.66	47630.95	21.78		
delta	E	2036-01-27T05:03:41.792		37.53	-12.78	48300.35	21.81		
lambda	E	2036-01-27T05:05:00.797		37.83	-13.07	50026.71	21.89		
epsilon	E	2036-01-27T05:06:06.712		38.08	-13.32	51471.26	21.91		

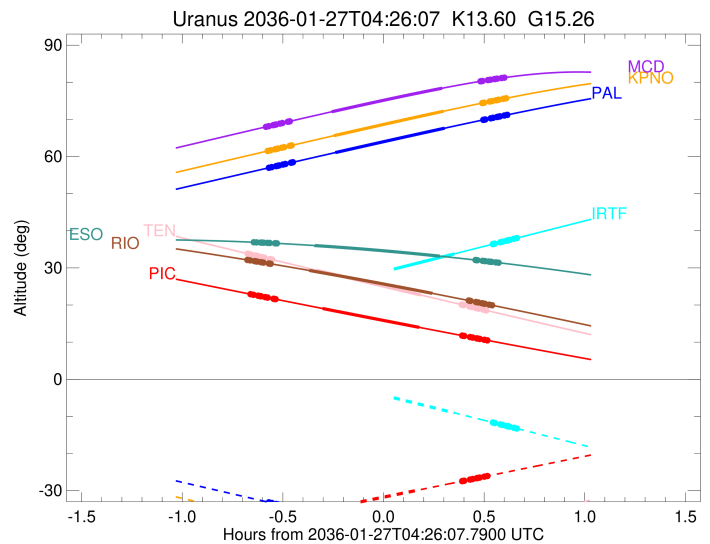
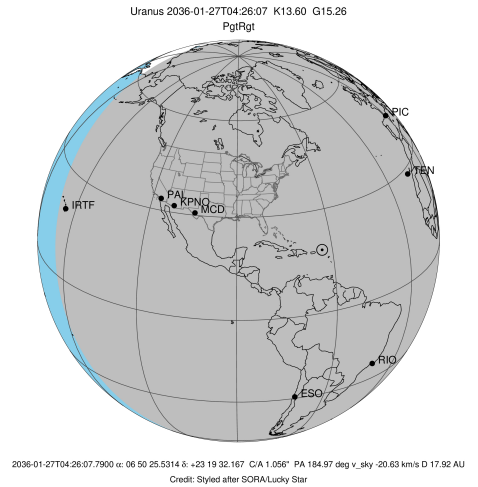
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-01-27T04:22:25.600  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : RIO  
 Location : Rio de Janeiro  
 Latitude (deg) : -22.89506  
 E. Longitude (deg) : 316.77708  
 Altitude (km) : 0.033  
 Gaia source ID : 3379576453735484928  
 2Mass ID (if available) : 06502552+2319322  
 ICRS Star Coord at Epoch: 06h 50m 25.53143s +23:19:32.16666s  
 RUWE (>1.4 is poor) : 1.10  
 K magnitude : 13.595  
 G magnitude : 15.265  
 RP magnitude : 14.719  
 BP magnitude : 15.637  
 DUPflag : 0  
 Distance (au) : 17.923  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -20.63  
 Sun-Target sep (deg) : 155.26  
 Sun-Moon sep (deg) : 167.60  
 B (ring opening deg) : 64.81  
 PA of pole (deg) : 75.70  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.779  
 C/A sky separation (km) : 10122.6  
 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	2036-01-27T03:45:51.166		32.10	-47.50	50749.79	-22.47		
lambda	I	2036-01-27T03:46:23.341		32.02	-47.47	50026.71	-22.47		
delta	I	2036-01-27T03:47:40.249		31.83	-47.40	48300.35	-22.43		
gamma	I	2036-01-27T03:48:10.552		31.75	-47.37	47620.96	-22.41		
eta	I	2036-01-27T03:48:30.406		31.70	-47.35	47176.12	-22.40		
beta	I	2036-01-27T03:49:38.962		31.53	-47.28	45643.34	-22.36		
alpha	I	2036-01-27T03:50:19.009		31.43	-47.24	44750.90	-22.34		
4	I	2036-01-27T03:51:54.180		31.19	-47.14	42615.31	-22.27		
5	I	2036-01-27T03:52:15.023		31.14	-47.12	42158.30	-22.25		
6	I	2036-01-27T03:52:27.702		31.11	-47.10	41862.46	-22.24		
Uranus	I	2036-01-27T04:03:58.428		29.32	-46.27	25295.07		-18.30	-19.10
Uranus	E	2036-01-27T04:40:43.215		23.14	-42.57	25083.61		25.09	26.12
6	E	2036-01-27T04:51:30.937		21.21	-41.23	41831.29	22.15		
5	E	2036-01-27T04:51:50.895		21.15	-41.18	42291.55	22.16		
4	E	2036-01-27T04:52:02.623		21.11	-41.16	42537.25	22.17		
alpha	E	2036-01-27T04:53:38.908		20.82	-40.95	44685.06	22.23		
beta	E	2036-01-27T04:54:23.744		20.69	-40.85	45681.22	22.26		
eta	E	2036-01-27T04:55:30.934		20.48	-40.70	47176.12	22.29		
gamma	E	2036-01-27T04:55:51.340		20.42	-40.65	47631.13	22.30		
delta	E	2036-01-27T04:56:21.337		20.33	-40.59	48300.35	22.32		
lambda	E	2036-01-27T04:57:38.634		20.09	-40.41	50026.71	22.35		
epsilon	E	2036-01-27T04:58:43.954		19.89	-40.27	51487.48	22.36		



target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-01-27T04:24:20.170  
 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 : 3379576453735484928  
 2Mass ID (if available) : 06502552+2319322  
 ICRS Star Coord at Epoch: 06h 50m 25.53143s +23:19:32.16666s  
 RUWE (>1.4 is poor) : 1.10  
 K magnitude : 13.595  
 G magnitude : 15.265  
 RP magnitude : 14.719  
 BP magnitude : 15.637  
 DUPflag : 0  
 Distance (au) : 17.923  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -20.63  
 Sun-Target sep (deg) : 155.26  
 Sun-Moon sep (deg) : 167.88  
 B (ring opening deg) : 64.81  
 PA of pole (deg) : 75.70  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.682  
 C/A sky separation (km) : 8868.0  
 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	2036-01-27T03:47:45.779		36.90	-39.61	50751.48	-22.65		
lambda	I	2036-01-27T03:48:17.782		36.88	-39.65	50026.71	-22.64		
delta	I	2036-01-27T03:49:34.078		36.82	-39.75	48300.35	-22.61		
gamma	I	2036-01-27T03:50:04.131		36.80	-39.79	47620.96	-22.60		
eta	I	2036-01-27T03:50:23.817		36.79	-39.81	47176.12	-22.59		
beta	I	2036-01-27T03:51:31.789		36.74	-39.90	45643.11	-22.56		
alpha	I	2036-01-27T03:52:11.450		36.71	-39.95	44751.15	-22.54		
4	I	2036-01-27T03:53:45.734		36.64	-40.06	42615.00	-22.49		
5	I	2036-01-27T03:54:06.345		36.62	-40.09	42158.99	-22.48		
6	I	2036-01-27T03:54:18.950		36.61	-40.10	41861.48	-22.47		
Uranus	I	2036-01-27T04:05:34.394		36.02	-40.84	25271.42		-19.14	-19.98
Uranus	E	2036-01-27T04:42:57.011		33.16	-42.24	25080.55		25.18	26.21
6	E	2036-01-27T04:53:33.532		32.12	-42.34	41829.88	22.42		
5	E	2036-01-27T04:53:53.391		32.09	-42.34	42293.41	22.43		
4	E	2036-01-27T04:54:04.834		32.07	-42.34	42536.28	22.44		
alpha	E	2036-01-27T04:55:39.997		31.90	-42.34	44684.90	22.49		
beta	E	2036-01-27T04:56:24.332		31.83	-42.34	45681.20	22.51		
eta	E	2036-01-27T04:57:30.777		31.71	-42.34	47176.12	22.54		
gamma	E	2036-01-27T04:57:50.964		31.67	-42.34	47631.19	22.55		
delta	E	2036-01-27T04:58:20.635		31.62	-42.34	48300.35	22.56		
lambda	E	2036-01-27T04:59:37.119		31.49	-42.33	50026.71	22.58		
epsilon	E	2036-01-27T05:00:42.041		31.37	-42.33	51493.59	22.59		