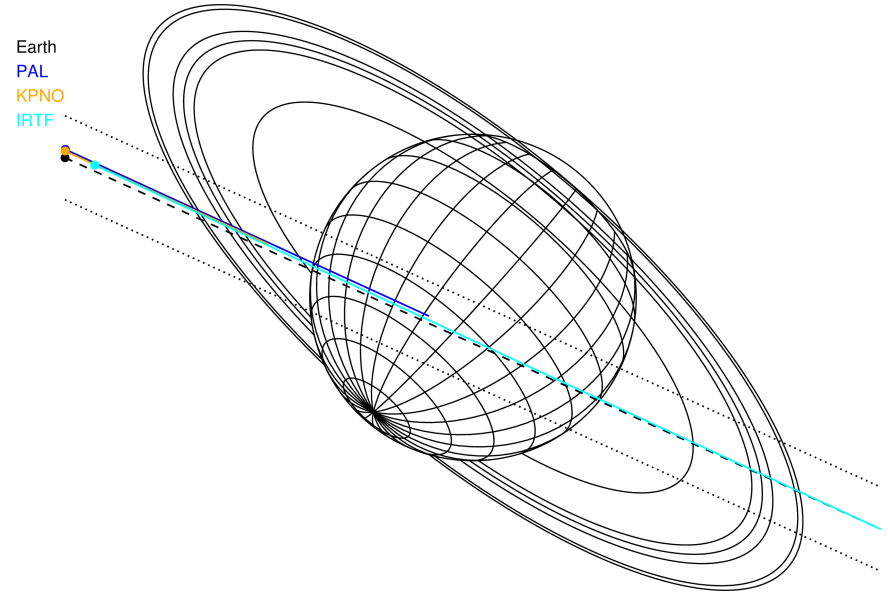
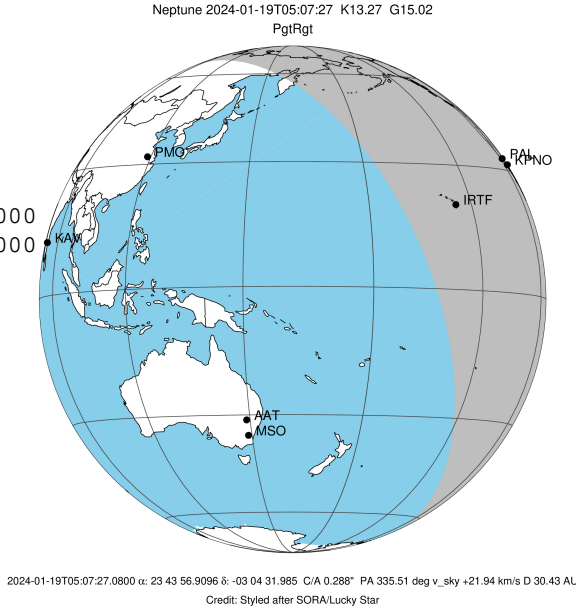


target : Neptune
 target radius (km) : 24764.00
 C/A epoch : 2024-01-19T05:07:27.080
 Event type : PgtRgt
 : Neptune occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 2639725730922360960
 2Mass ID (if available) : 23435690-0304318

Neptune 2024-01-19T05:07:27 K13.27 G15.02 PgtRgt

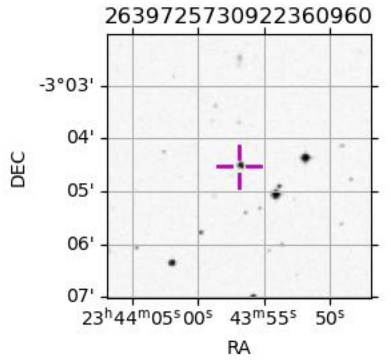
ICRS Star Coord at Epoch: 23h 43m 56.90963s -03:04:31.98483s
 RUWE (>1.4 is poor) : 21.05
 K magnitude : 13.274
 G magnitude : 15.018
 RP magnitude : 14.343
 BP magnitude : 15.295
 DUPflag : 0
 Distance (au) : 30.430
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 21.94
 Sun-Target sep (deg) : 56.83
 Sun-Moon sep (deg) : 46.50
 B (ring opening deg) : -21.52
 PA of pole (deg) : -41.00
 # a(km) ring

- 1 42000.0 Galle
- 2 53200.0 LeVerrier
- 3 55200.0 Lassell
- 4 57200.0 Arago
- 5 61953.0 Galatea
- 6 62933.0 Adams



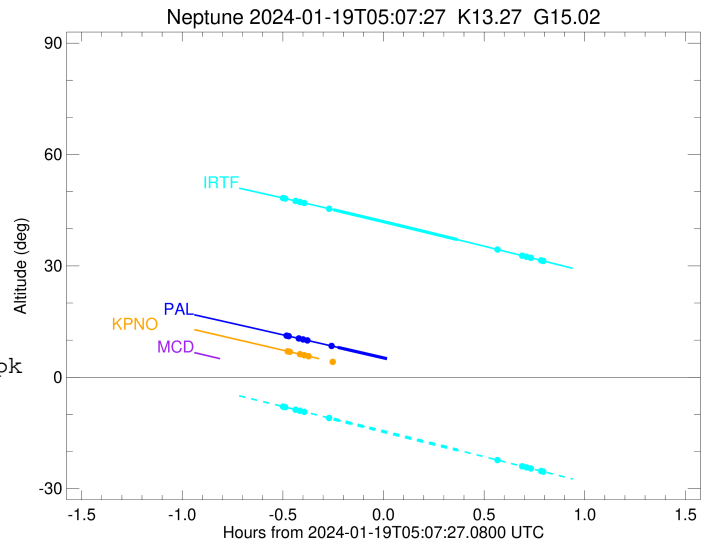
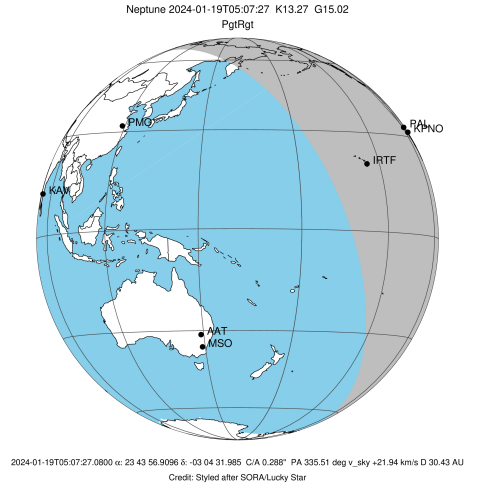
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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 04:38 - JAN 19 04:53	PinRin
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+	+			PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	+		JAN 19 04:38 - JAN 19 04:45	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	+	+	+	JAN 19 04:37 - JAN 19 05:54	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



```

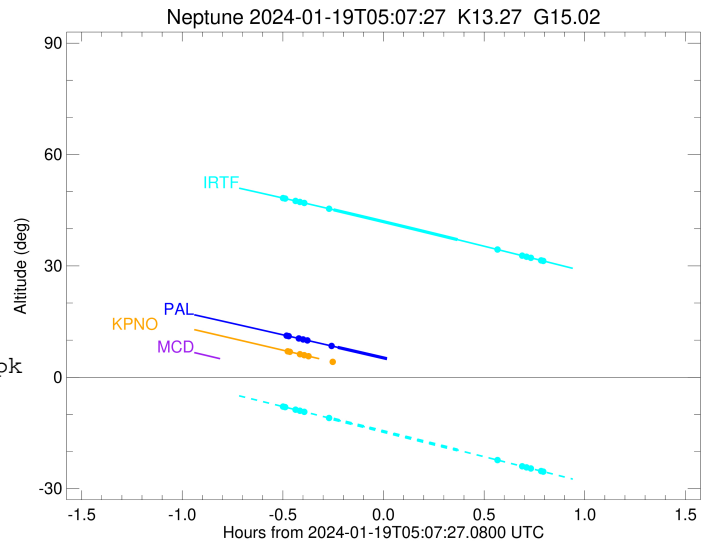
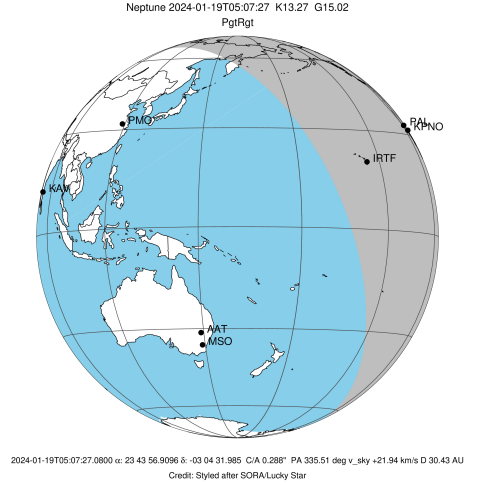
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2024-01-19T05:12:12.720
Event type           : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : PAL
Location             : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)   : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 2639725730922360960
2Mass ID (if available) : 23435690-0304318
ICRS Star Coord at Epoch: 23h 43m 56.90963s -03:04:31.98483s
RUWE (>1.4 is poor) : 21.05
K magnitude          : 13.274
G magnitude           : 15.018
RP magnitude         : 14.343
BP magnitude         : 15.295
DUPflag              : 0
Distance (au)        : 30.430
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 21.94
Sun-Target sep (deg) : 56.83
Sun-Moon sep (deg)   : 45.90
B (ring opening deg) : -21.52
PA of pole (deg)     : -41.00
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.242
C/A sky separation (km) : 5350.0
NAIF SPICE kernels   : RAJobs_U111+rgf16.spk
URKALLv1.spk
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
earthstns_itr93_040916.bsp
earth_200101_990628_predict.bpc
pck00010.tpc
pck.urall11.tpc.Neptune
naif0012.tls
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
earth_flat_IAU.spk
    
```



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2024-01-19T04:38:38.009		11.19	-44.19	62933.00	-26.33		
Galatea	I	2024-01-19T04:39:15.238		11.06	-44.32	61953.00	-26.32		
Arago	I	2024-01-19T04:42:16.125		10.44	-44.95	57200.00	-26.23		
Lassell	I	2024-01-19T04:43:32.428		10.18	-45.22	55200.00	-26.19		
LeVerrier	I	2024-01-19T04:44:48.864		9.92	-45.48	53200.00	-26.14		
Galle	I	2024-01-19T04:52:00.452		8.43	-46.98	42000.00	-25.70		
Neptune	I	2024-01-19T04:53:48.620		8.06	-47.36	24750.79		-26.70	-27.50
Neptune	E	2024-01-19T05:30:35.723		0.39x	-54.96	24763.73		3.68	3.81
Galle	E	2024-01-19T05:41:44.909		-1.95x	-57.23	42000.00	25.92		
LeVerrier	E	2024-01-19T05:48:52.851		-3.44x	-58.67	53200.00	26.37		
Lassell	E	2024-01-19T05:50:08.611		-3.71x	-58.93	55200.00	26.43		
Arago	E	2024-01-19T05:51:24.225		-3.97x	-59.18	57200.00	26.47		
Galatea	E	2024-01-19T05:54:23.411		-4.60x	-59.78	61953.00	26.57		
Adams	E	2024-01-19T05:55:00.278		-4.73x	-59.90	62933.00	26.59		

```

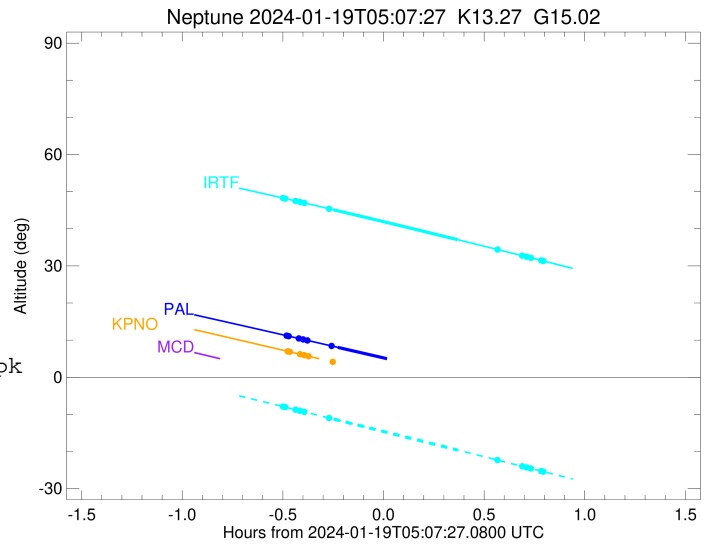
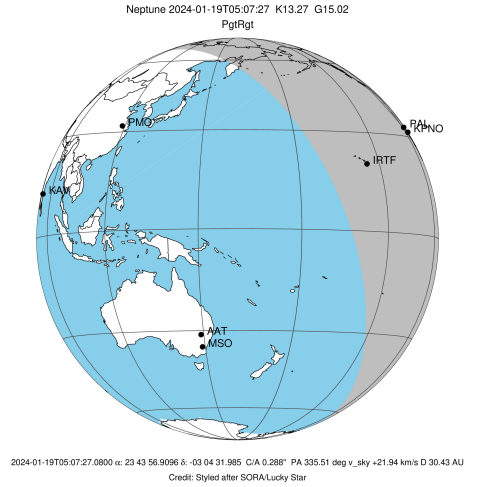
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2024-01-19T05:12:14.970
Event type           : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : KPNO
Location             : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)   : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 2639725730922360960
2Mass ID (if available) : 23435690-0304318
ICRS Star Coord at Epoch: 23h 43m 56.90963s -03:04:31.98483s
RUWE (>1.4 is poor) : 21.05
K magnitude          : 13.274
G magnitude          : 15.018
RP magnitude         : 14.343
BP magnitude         : 15.295
DUPflag             : 0
Distance (au)        : 30.430
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 21.94
Sun-Target sep (deg) : 56.83
Sun-Moon sep (deg)   : 45.84
B (ring opening deg) : -21.52
PA of pole (deg)     : -41.00
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.251
C/A sky separation (km) : 5541.0
NAIF SPICE kernels   : RAJobs_U111+rgf16.spk
URKALLv1.spk
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
earthstns_itr93_040916.bsp
earth_200101_990628_predict.bpc
pck00010.tpc
pck.urall11.tpc.Neptune
naif0012.tls
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
earth_flat_IAU.spk
    
```



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2024-01-19T04:38:58.108		6.97	-48.79	62933.00	-26.35		
Galatea	I	2024-01-19T04:39:35.308		6.84	-48.92	61953.00	-26.34		
Arago	I	2024-01-19T04:42:36.075		6.20	-49.56	57200.00	-26.25		
Lassell	I	2024-01-19T04:43:52.343		5.93	-49.83	55200.00	-26.20		
LeVerrier	I	2024-01-19T04:45:08.754		5.67	-50.09	53200.00	-26.15		
Galle	I	2024-01-19T04:52:20.468		4.14x	-51.61	42000.00	-25.68		
Neptune	I	2024-01-19T04:53:54.469		3.81x	-51.94	24750.38		-27.15	-27.95
Neptune	E	2024-01-19T05:30:34.374		-3.99x	-59.59	24763.79		3.29	3.41
Galle	E	2024-01-19T05:41:48.960		-6.38x	-61.90	42000.00	25.90		
LeVerrier	E	2024-01-19T05:48:56.947		-7.90x	-63.34	53200.00	26.38		
Lassell	E	2024-01-19T05:50:12.669		-8.17x	-63.59	55200.00	26.44		
Arago	E	2024-01-19T05:51:28.235		-8.44x	-63.85	57200.00	26.49		
Galatea	E	2024-01-19T05:54:27.273		-9.07x	-64.44	61953.00	26.60		
Adams	E	2024-01-19T05:55:04.104		-9.20x	-64.56	62933.00	26.62		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2024-01-19T05:11:03.440
Event type            : PgtRgt
: Neptune 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        : 2639725730922360960
2Mass ID (if available) : 23435690-0304318
ICRS Star Coord at Epoch: 23h 43m 56.90963s -03:04:31.98483s
RUWE (>1.4 is poor) : 21.05
K magnitude           : 13.274
G magnitude           : 15.018
RP magnitude          : 14.343
BP magnitude          : 15.295
DUPflag              : 0
Distance (au)         : 30.430
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : 21.94
Sun-Target sep (deg) : 56.83
Sun-Moon sep (deg)   : 46.47
B (ring opening deg) : -21.52
PA of pole (deg)     : -41.00
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.269
C/A sky separation (km) : 5932.0
NAIF SPICE kernels   : RAJobs_U111+rgf16.spk
URKALLv1.spk
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
earthstns_itr93_040916.bsp
earth_200101_990628_predict.bpc
pck00010.tpc
pck.urall11.tpc.Neptune
naif0012.tls
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
earth_flat_IAU.spk
    
```



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2024-01-19T04:37:33.928		48.26	-7.92	62933.00	-25.80		
Galatea	I	2024-01-19T04:38:11.931		48.13	-8.06	61953.00	-25.78		
Arago	I	2024-01-19T04:41:16.679		47.49	-8.75	57200.00	-25.67		
Lassell	I	2024-01-19T04:42:34.669		47.22	-9.04	55200.00	-25.62		
LeVerrier	I	2024-01-19T04:43:52.835		46.94	-9.33	53200.00	-25.56		
Galle	I	2024-01-19T04:51:15.221		45.39	-10.97	42000.00	-25.01		
Neptune	I	2024-01-19T04:52:33.354		45.12	-11.26	24749.86		-27.71	-28.52
Neptune	E	2024-01-19T05:29:32.724		37.07	-19.60	24763.91		2.12	2.20
Galle	E	2024-01-19T05:41:18.213		34.44	-22.27	42000.00	25.21		
LeVerrier	E	2024-01-19T05:48:37.278		32.80	-23.94	53200.00	25.75		
Lassell	E	2024-01-19T05:49:54.847		32.51	-24.24	55200.00	25.82		
Arago	E	2024-01-19T05:51:12.232		32.22	-24.53	57200.00	25.87		
Galatea	E	2024-01-19T05:54:15.499		31.53	-25.23	61953.00	25.99		
Adams	E	2024-01-19T05:54:53.187		31.38	-25.37	62933.00	26.01		