Comet, Asteroid and Meteor Section

CAMnotes 2022 No.1 April-May

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Diary of events

The following events are of interest and observations are required. Further details are provided on each event in this issue.

Date	Event
April 22/23	Lyrid meteor shower
April 23/24	pi Puppid meteor shower
May 1-12	eta Aquariid meteor shower
May 15	Possible meteor activity from asteroid 2006 GY2
May 31	Potential outburst of tau Herculid meteors
May	Comet C/2017 K2 (PanSTARRS) visible

Further information

This Newsletter provides an overview of the most interesting observing opportunities during the period listed. If you intend to observe any of the events listed and you need further information, please contact the Section Director, Tim Cooper, at CAM[at]assa.saao.ac.za.

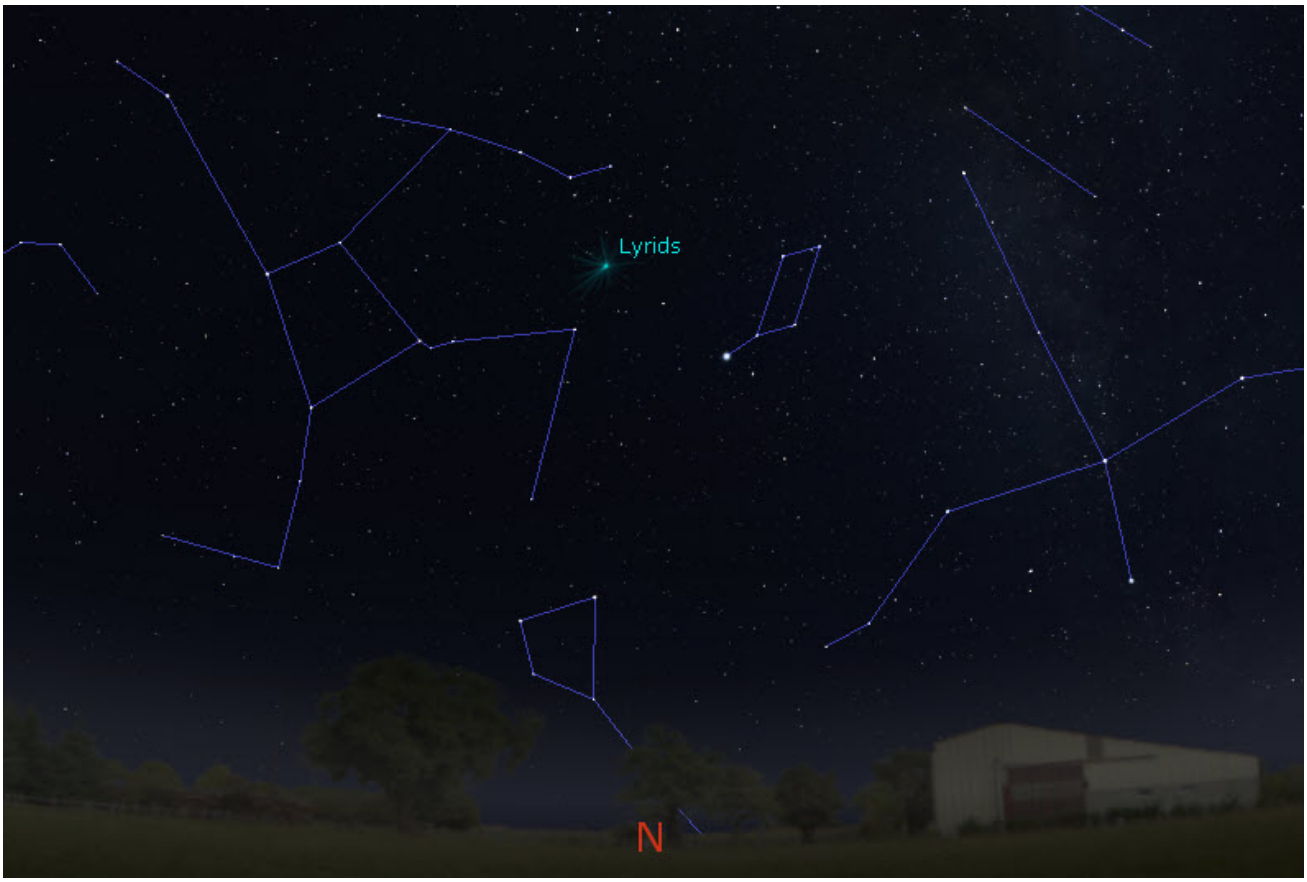
Wishing you all skies, and hope to receive your observations of any of these events.

Tim

April 22/23
Lyrid meteor shower

The Lyrids (IAU shower code LYR) are active between April 15-29 and should peak this year during the night of April 21/22. Activity normally reaches ZHR = 15-20 per hour at maximum, but the shower has shown outbursts traced back to ancient times. The most recent was on 1982 April 22.3 UT with a duration of only 0.64 hours and a peak ZHR 200-300. The parent body is comet Thatcher C/1861 G1 which has an orbital period of 415 years. Meteors before maximum are generally fainter, and appear brighter about the night of maximum. Normal activity is low for about 5 days prior to the maximum, which is quite sharp, lasting at most two days above half peak activity. The activity profile is slightly skewed, with a more rapid drop in activity after maximum. For southern Africa the radiant rises about 23h20. Hence useful observations can be made between about 01h00 and about 05h00. Whether good rates are observed or not depends on the position of this narrow observing window on the sharp activity profile.

The radiant is at 18h04m, +34°, is located upper left of the bright star Vega as shown in the map below, and is highest in the sky just before dawn, at which time it is best placed for observation. Observe for the last couple of hours before twilight interferes, for the three mornings of April 21-23. The Lyrids are medium speed, with velocity 48 km/sec. There is a low tendency to produce persistent trains, but the shower produces occasional fireballs. The moon will unfortunately pose some hindrance, and will be 65% illuminated and located in Sagittarius on the morning of maximum activity.

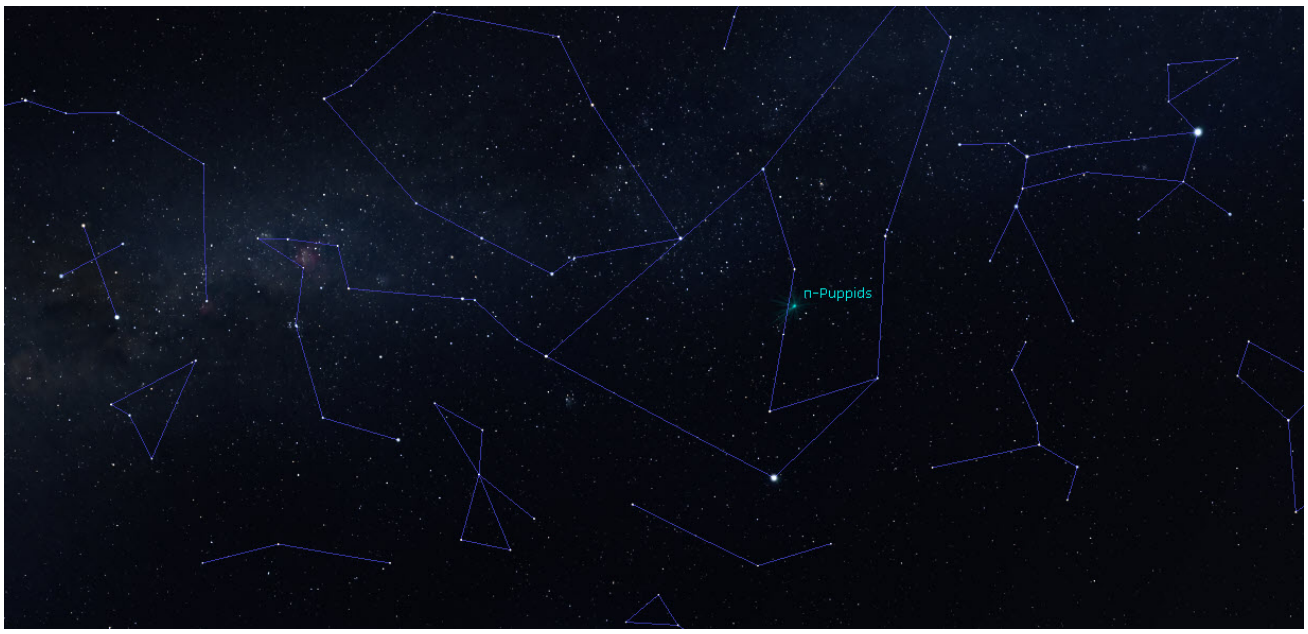


Radiant position for the Lyrids for 05h00 SAST on April 22. Lyra and Cygnus to the right, Hercules to the left of the radiant. The bright star Vega is below right of the radiant. Map produced using Stellarium.

April 23/24
pi Puppid meteor shower

This shower was unknown before 1972, when first evidence of activity was detected. The parent comet is 26P/Grigg-Skjellerup, the orbit of which was perturbed after a close encounter with Jupiter in 1964. A strong outburst was observed on the night of 1977 April 23/24, with many bright fireballs leaving trains up to several minutes duration. A second outburst occurred in 1982, again with many fireballs, all of which left persistent trains. The meteors were all slow, and yellow or orange coloured. No enhanced activity was observed in 1987, or indeed in any year since. The comet returned to perihelion again in November 2002 but observations in April 2003 showed barely detectable activity. By now the comet's orbit has moved to 5.3 years, and it is possible the earth will no longer intersect the debris stream, as was the case before 1964, and the pi Puppids will no longer be observable as a meteor shower.

Although no enhanced activity is predicted for this year, the shower should nevertheless be observed to see if any activity is detected at all. The radiant is at 07h20m, -45°, to the lower left of Sirius looking west. Any pi Puppids seen will be recogisable by their very slow speed, with velocity 18 km/sec. The radiant is highest just after dark and can be observed until about midnight. The waning gibbous moon will not interfere, only rising around midnight.

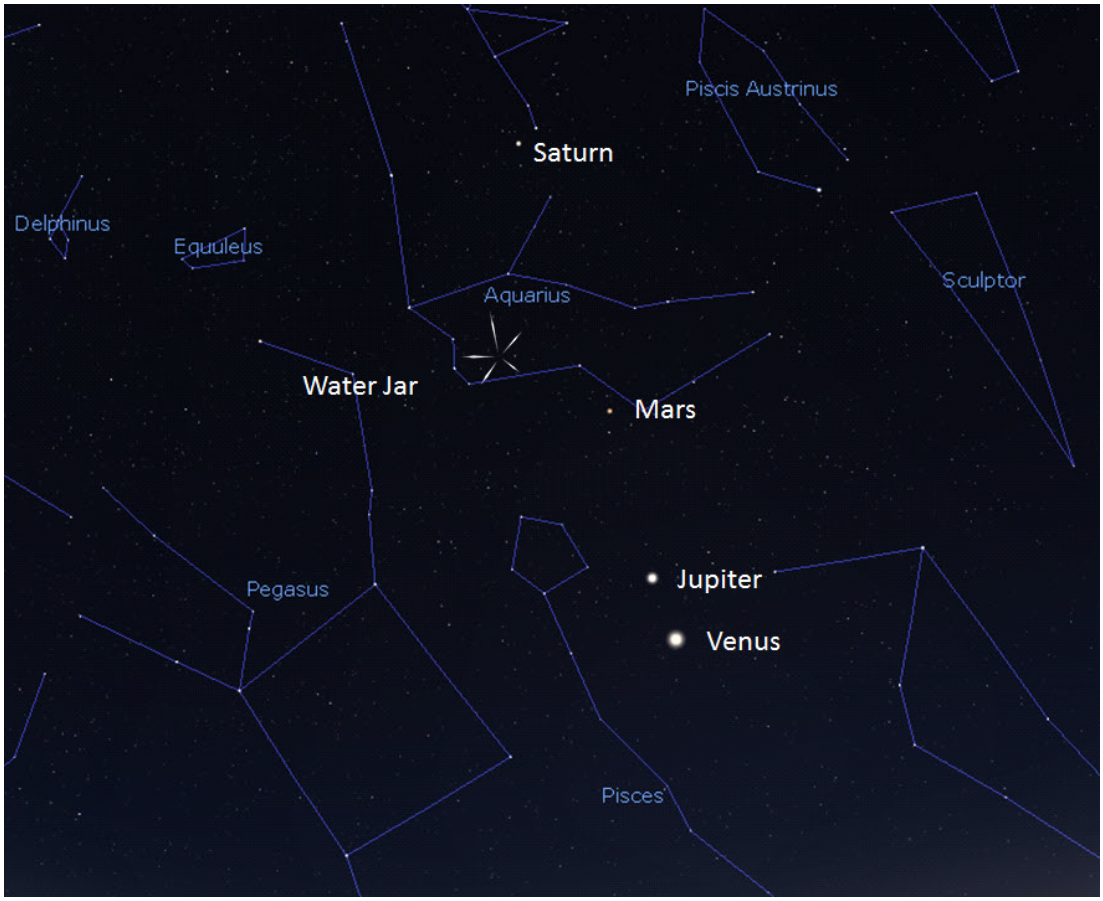


Radiant position for the pi Puppids for 20h00 SAST on April 23, looking West. The bright star Sirius is upper right of the radiant, and Canopus directly below. Map produced using Stellarium.

May 1-12, maximum May 5/6
Eta Aquariid meteor shower

The eta Aquariids are one of two meteor showers associated with comet 1P/Halley, and occur when the earth crosses the debris stream on its outward passage from the sun. The other shower associated with the comet are the Orionids, which peak in October each year. The eta Aquariids are the most active of the southern meteor showers; in fact the radiant is virtually on the celestial equator. They produce good rates of fast meteors (entry speed 66 km/sec) during the first week or so in May, with maximum generally occurring around May 5 or 6. The Zenithal Hourly Rate (ZHR), which is the number of meteors you could expect to see with the radiant at the zenith and under skies where magnitude 6.5 stars are discernible, is generally around 50-60 meteors per hour. Where the radiant is lower, or under poorer skies, the observed rate will be lower. In some years, where Earth crosses a rich filament of particles, rates may be much higher, as was the case in 2013 when the ZHR exceeded 100 per hour.

The radiant is only really high enough in the last two hours before dawn, when it reaches an altitude of about 45° before twilight interferes. Observe on the mornings of May 4-8 to give yourself the best chance of witnessing activity at its peak. The radiant is close to the Water Jar asterism in Aquarius. Finding the radiant this year will be made easier due to the proximity of Saturn, Mars, Jupiter and Venus in the East, and to the right of the radiant. The moon will not interfere at all this year, so observing the eta Aquariids in 2022 is about as good as it gets. Let's hope for a good show!



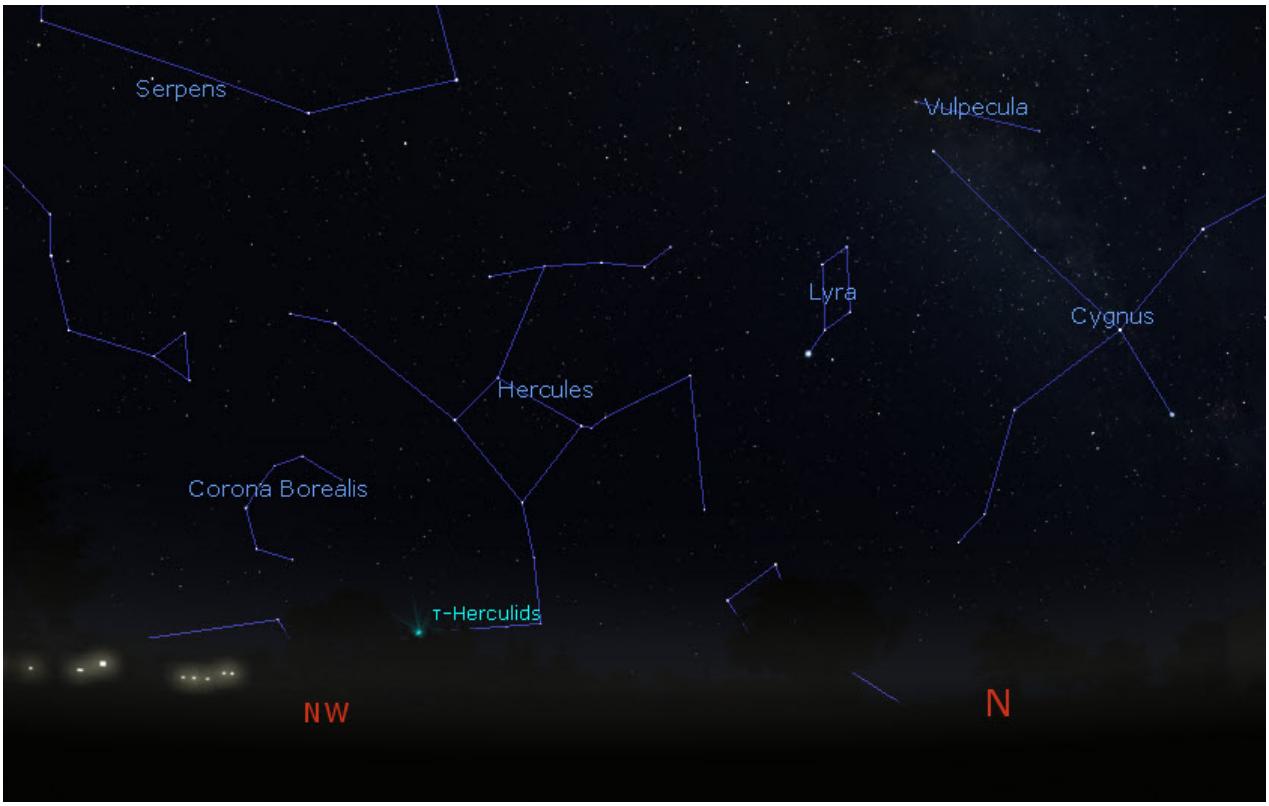
Radiant position for the eta Aquariids for 05h00 SAST on May 6, looking East. Note the position relative to Saturn, Mars, Jupiter and Venus. Map produced using Stellarium.

May 15
Meteor activity from asteroid 2006 GY2

According to the IMO 2022 Meteor Shower Calendar, there is a possibility of meteors from asteroid 2006 GY2, radiating from 16h32m, +46°, which is in the constellation of Hercules. Any activity is predicted to peak at around 10h UT on May 15, which is during daylight for southern Africa. The radiant sets for South Africa at around 5:15 local time, but it may be worthwhile observing an hour of so before dawn on May 15 for a chance to catch any long-pathed meteors as they graze the upper atmosphere.

May 31
Potential outburst of tau Herculid meteors

This meteor shower is the remnants of comet 73P/Schwassmann-Wachmann, which is a comet noted for outbursts in its activity. The last such outburst was during 1995, when the nucleus was seen to split into several fragments. During 2022 the earth crosses the orbit of the debris which resulted from that outburst, which might lead to enhanced meteor activity this year from the tau Herculids. Again the predicted time of any outburst does not favour southern Africa, but it may be worthwhile observing to see if we can observe any early activity in the early morning of May 31. The radiant is at 13h56m, +28°, and sets around 4 am local time. Observe for an hour or so before the radiant sets.



Radiant position for the tau Herculids for 03h00 SAST on May 31, looking North.
Map produced using Stellarium.

May onwards
Comet C/2017 K2 (PanSTARRS)

During December 2021 and January 2022 we were treated to a fine display from comet C/2021 A1 (Leonard). Following on its heels we have another opportunity to observe a comet which should become visible in binoculars, and also should be well placed in southern skies to observe over a period of several months. Comet C/2017 K2 (PanSTARRS) was discovered in May 2017 while at large heliocentric distance of 16 au. It reaches perihelion in its hyperbolic orbit on 2022 December 19.97, at which time it may peak as bright as magnitude 6. However, it should already be picked up telescopically in early May as a ninth magnitude object in the constellation of Aquila, moving into Ophiuchus by month end, and perhaps as bright as magnitude 8. In the following months it will be ideally placed to observe in the evening sky as it brightens, crossing the head of Scorpius during August, possible at magnitude 7. On June 20 the comet will be located half a degree from IC 4665, the Summer Beehive Cluster, and on July 15 the comet passes the magnitude 6.4 globular cluster M10, separated by less than 0.5° and giving excellent opportunities for astro-imagers. On October 6 the comet is within 10 arc minutes of the faint planetary nebula NGC 6026, which could provide an nice imaging challenge to capture both objects. I will give more details in the next Newsletter, but in the meantime, for those who would like to prepare their own ephemeris, please use the following orbital elements from the JPL Small-Body Database Lookup. Alternatively below that is an ephemeris for the month of May prepared from the MPC Ephemeris Service page.

Date of Perihelion T	2022 Dec 19.972698
Distance of perihelion q	1.799368
Eccentricity of orbit e	1.000411
Inclination of orbit i	87.542993
Argument of perihelion ω	236.163473
Longitude of ascending node Ω	88.265590

Date	UT	R.A. (J2000)	Decl.	Delta	r	El.	Ph.	m1	Sky Motion		Object		Sun	Moon		
	h m s								"/min	P.A.	Azi.	Alt.	Alt.	Phase	Dist.	Alt.
2022 05 01	000000	18 51 06.4	+11 43 08	2.821	3.311	110.5	16.6	9.0	0.29	261.8	227	+39	-60	0.00	112	-61
2022 05 02	000000	18 50 38.2	+11 42 01	2.799	3.302	111.3	16.5	8.9	0.31	261.2	226	+39	-61	0.01	121	-73
2022 05 03	000000	18 50 08.3	+11 40 46	2.776	3.293	112.2	16.5	8.9	0.33	260.6	225	+40	-61	0.04	129	-84
2022 05 04	000000	18 49 36.6	+11 39 22	2.754	3.284	113.1	16.4	8.9	0.35	260.0	224	+41	-61	0.09	136	-84
2022 05 05	000000	18 49 03.3	+11 37 49	2.732	3.275	114.0	16.3	8.8	0.37	259.5	223	+42	-61	0.15	140	-73
2022 05 06	000000	18 48 28.2	+11 36 06	2.710	3.266	114.9	16.3	8.8	0.39	259.0	221	+42	-61	0.23	141	-62
2022 05 07	000000	18 47 51.2	+11 34 13	2.688	3.256	115.8	16.2	8.8	0.41	258.5	220	+43	-61	0.31	140	-52
2022 05 08	000000	18 47 12.5	+11 32 09	2.666	3.247	116.7	16.1	8.7	0.43	258.0	219	+44	-61	0.40	136	-41
2022 05 09	000000	18 46 32.0	+11 29 54	2.644	3.238	117.7	16.0	8.7	0.45	257.5	218	+44	-61	0.50	129	-29
2022 05 10	000000	18 45 49.6	+11 27 28	2.622	3.229	118.6	15.9	8.7	0.47	257.0	216	+45	-61	0.60	121	-18
2022 05 11	000000	18 45 05.3	+11 24 50	2.601	3.220	119.5	15.8	8.7	0.49	256.6	215	+46	-61	0.69	112	-06
2022 05 12	000000	18 44 19.2	+11 21 59	2.580	3.211	120.4	15.7	8.6	0.51	256.1	214	+46	-62	0.79	102	+06
2022 05 13	000000	18 43 31.1	+11 18 56	2.559	3.202	121.3	15.6	8.6	0.53	255.7	212	+47	-62	0.87	091	+19
2022 05 14	000000	18 42 41.1	+11 15 40	2.537	3.193	122.3	15.5	8.6	0.55	255.3	211	+48	-62	0.94	080	+32
2022 05 15	000000	18 41 49.2	+11 12 10	2.517	3.184	123.2	15.4	8.5	0.57	254.9	209	+48	-62	0.98	068	+45
2022 05 16	000000	18 40 55.3	+11 08 25	2.496	3.175	124.1	15.3	8.5	0.60	254.4	208	+49	-62	1.00	058	+59
2022 05 17	000000	18 39 59.5	+11 04 26	2.475	3.166	125.1	15.2	8.5	0.62	254.0	206	+49	-62	0.99	048	+73
2022 05 18	000000	18 39 01.7	+11 00 13	2.455	3.157	126.0	15.0	8.4	0.64	253.6	204	+50	-62	0.95	041	+87
2022 05 19	000000	18 38 01.8	+10 55 43	2.435	3.148	126.9	14.9	8.4	0.66	253.2	203	+50	-62	0.89	038	+79
2022 05 20	000000	18 36 59.9	+10 50 58	2.415	3.139	127.9	14.7	8.4	0.69	252.8	201	+51	-62	0.80	040	+65
2022 05 21	000000	18 35 56.0	+10 45 55	2.395	3.130	128.8	14.6	8.4	0.71	252.4	199	+51	-62	0.70	046	+51
2022 05 22	000000	18 34 50.1	+10 40 36	2.376	3.121	129.7	14.4	8.3	0.74	252.0	197	+52	-62	0.59	055	+38
2022 05 23	000000	18 33 42.1	+10 34 59	2.356	3.112	130.7	14.3	8.3	0.76	251.6	195	+52	-62	0.48	064	+25
2022 05 24	000000	18 32 32.0	+10 29 04	2.337	3.103	131.6	14.1	8.3	0.78	251.2	193	+53	-63	0.37	075	+13
2022 05 25	000000	18 31 19.8	+10 22 50	2.318	3.095	132.5	14.0	8.2	0.81	250.8	191	+53	-63	0.27	085	+00
2022 05 26	000000	18 30 05.6	+10 16 17	2.300	3.086	133.5	13.8	8.2	0.83	250.4	189	+53	-63	0.19	096	-11
2022 05 27	000000	18 28 49.3	+10 09 24	2.281	3.077	134.4	13.6	8.2	0.86	250.0	187	+53	-63	0.11	106	-23
2022 05 28	000000	18 27 30.9	+10 02 11	2.263	3.068	135.3	13.4	8.1	0.88	249.6	185	+54	-63	0.06	116	-35
2022 05 29	000000	18 26 10.5	+09 54 37	2.245	3.059	136.2	13.3	8.1	0.91	249.3	183	+54	-63	0.02	125	-46
2022 05 30	000000	18 24 48.0	+09 46 42	2.228	3.050	137.1	13.1	8.1	0.94	248.9	181	+54	-63	0.00	133	-57
2022 05 31	000000	18 23 23.4	+09 38 24	2.210	3.041	138.0	12.9	8.1	0.96	248.5	178	+54	-63	0.00	139	-68