



Comet, Asteroid and Meteor Section

CAMNotes 2024 No.4 October-December

Observations of the following are requested. Prospective observers who need more information or assistance are welcome to contact the Director.

COMETS

C/2023 A3 (Tsuchinshan-ATLAS) has brightened to magnitude 3 as this issue goes for publication, and is visible in the early morning twilight low in the east before sunrise.

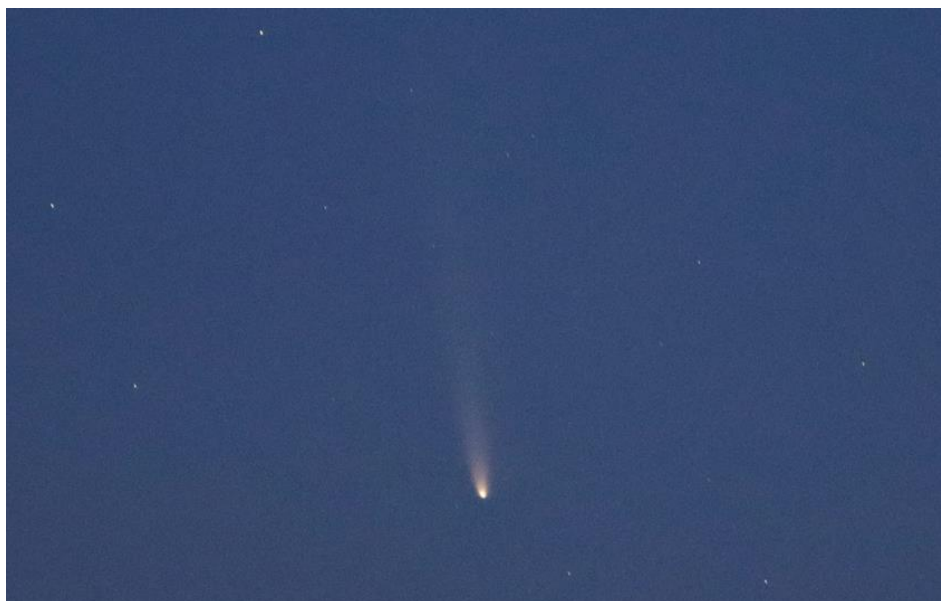
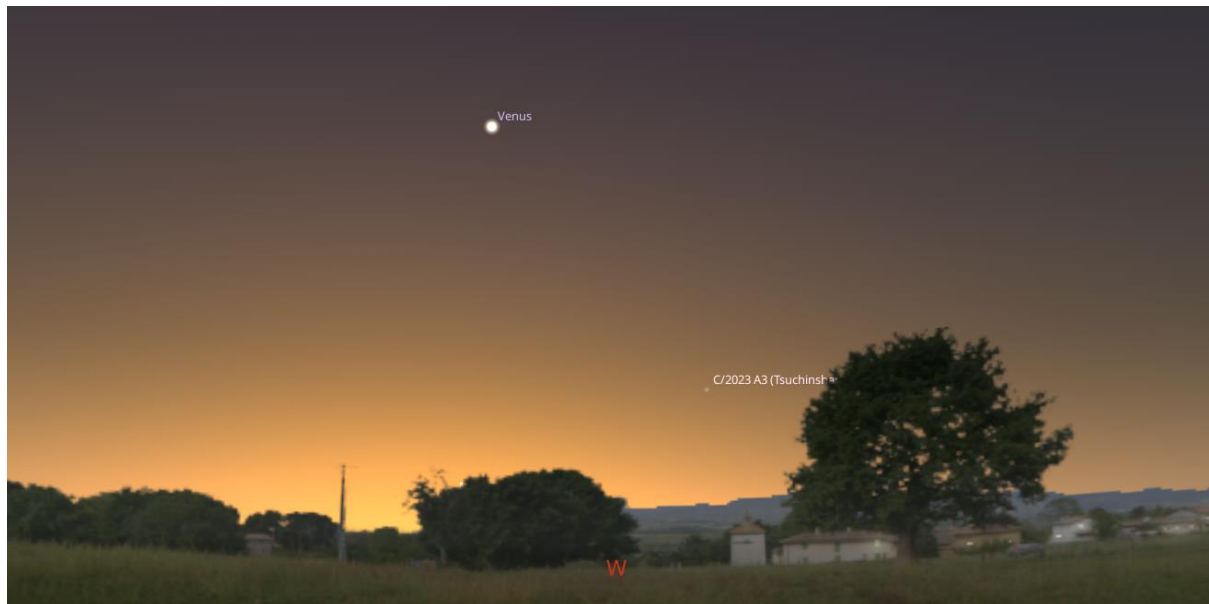


Image of comet C/2023 A3 (Tsuchinshan-ATLAS) on 24 September 2024. Image courtesy of Lafras Smit. The image shows well the appearance of the comet in binoculars.

The comet reaches perihelion on 27 September, and is best placed for a day or so either side of this date, at maximum elongation from the Sun. A map to locate the comet at this time can be found in CAMNotes 2024 No.3. From 28 September onwards the comet plunges back into the solar glare and will probably be unobservable after 6 or 7 October until it re-emerges in the evening sky.

The comet emerges again from the solar glare from about 14 or 15 October, and might perhaps still be 3rd magnitude, low above the western horizon. Whether the comet is

observable earlier than this date depends on the degree to which the brightness is enhanced by forward scattering, if at all. Maximum phase angle of 172° occurs on 9 October, but the comet will then be located only 4° from the Sun.



Comet C/2023 A3 (Tsuchinshan-ATLAS) position for early evening on 14 October 2024.

The following ephemeris was prepared using the MPC Ephemeris Service, for 16h00 UT (18h00 SAST) for Johannesburg, and can be used to locate the comet during October.

Date	UT h m s	R.A. (J2000)	Decl.	Delta	r	El.	Ph.	m1	Sky Motion "/min	P.A.	Object Azi. Alt.	Sun Alt.	Moon Phase Dist. Alt.
2024	10 10 160000	13 23 20.6	-02 16 05	0.482	0.522	6.6	167.4	2.7	13.66	083.8	089 +04	+01	0.49 087 +88
2024	10 11 160000	13 45 26.0	-01 40 04	0.475	0.539	10.8	159.7	2.7	14.03	083.8	092 +07	+01	0.59 095 +78
2024	10 12 160000	14 07 51.3	-01 03 28	0.472	0.557	15.4	151.6	2.8	14.07	083.8	094 +11	+02	0.70 104 +65
2024	10 13 160000	14 30 05.4	-00 27 27	0.475	0.575	20.0	143.5	3.0	13.79	083.9	097 +15	+02	0.80 112 +52
2024	10 14 160000	14 51 39.4	+00 06 52	0.483	0.593	24.5	135.7	3.1	13.23	084.0	100 +19	+02	0.89 121 +38
2024	10 15 160000	15 12 10.0	+00 38 37	0.495	0.611	28.8	128.3	3.3	12.46	084.2	102 +22	+02	0.95 129 +24
2024	10 16 160000	15 31 21.0	+01 07 17	0.511	0.630	32.7	121.4	3.4	11.56	084.4	105 +25	+02	0.99 138 +10
2024	10 17 160000	15 49 03.4	+01 32 36	0.530	0.649	36.2	114.9	3.6	10.60	084.7	107 +28	+02	1.00 145 -04
2024	10 18 160000	16 05 14.4	+01 54 36	0.553	0.668	39.4	109.0	3.8	9.64	084.9	109 +30	+02	0.98 150 -19
2024	10 19 160000	16 19 56.0	+02 13 30	0.578	0.688	42.2	103.5	4.0	8.72	085.2	111 +32	+02	0.93 152 -33
2024	10 20 160000	16 33 13.0	+02 29 34	0.605	0.707	44.6	98.5	4.2	7.86	085.5	113 +34	+02	0.86 151 -46
2024	10 21 160000	16 45 12.2	+02 43 10	0.633	0.726	46.7	93.9	4.4	7.09	085.8	115 +36	+03	0.77 146 -59
2024	10 22 160000	16 56 01.0	+02 54 37	0.664	0.746	48.5	89.6	4.6	6.39	086.1	116 +37	+03	0.67 140 -72
2024	10 23 160000	17 05 46.6	+03 04 15	0.695	0.765	50.1	85.8	4.8	5.76	086.4	117 +38	+03	0.57 132 -84
2024	10 24 160000	17 14 36.2	+03 12 21	0.727	0.784	51.4	82.2	5.0	5.21	086.6	118 +39	+03	0.47 124 -83
2024	10 25 160000	17 22 36.3	+03 19 11	0.760	0.804	52.5	78.9	5.1	4.73	086.9	119 +40	+03	0.37 116 -72
2024	10 26 160000	17 29 52.8	+03 24 55	0.794	0.823	53.4	75.8	5.3	4.30	087.1	120 +40	+03	0.28 108 -61
2024	10 27 160000	17 36 30.9	+03 29 46	0.828	0.843	54.2	73.0	5.5	3.93	087.3	121 +41	+03	0.20 099 -50
2024	10 28 160000	17 42 35.2	+03 33 53	0.862	0.862	54.8	70.4	5.7	3.60	087.5	121 +41	+03	0.13 091 -39
2024	10 29 160000	17 48 09.6	+03 37 23	0.896	0.881	55.3	67.9	5.8	3.31	087.7	122 +41	+04	0.07 082 -28

Delta is the distance of the comet from Earth, r is the distance from the Sun, El is the elongation of the comet from the Sun, Ph is the phase angle measured, which is the angle between the Sun and Earth as seen from the comet, and m1 is the predicted total cometary magnitude without forward scattering of sunlight. Note that for 14 October, coinciding with the Stellarium image above, the predicted magnitude is 3.1, and the phase angle has already decreased to 135.7°, so by this date any forward scattering of sunlight will probably be negligible. On this date the elongation from the Sun is 24.5° but the comet is at low altitude once it becomes dark enough to observe.

Three days later on 17 October, the elongation increases to 36°, and the comet will be higher in the sky at dusk, though having faded by about half a magnitude. The view is as shown below.



Comet C/2023 A3 (Tsuchinshan-ATLAS) position for early evening on 17 October 2024.

In the following days the comet gains altitude and increases in elongation from the Sun, although it is expected to fade quickly. Observing conditions from 17 October 2024 are as follows:

Date	Magnitude m1	Elongation °	Altitude °
17 October	3.6	36	15
22 October	4.6	48	25
27 October	5.5	54	28
1 November	6.3	56	28
6 November	7.0	56	27
11 November	7.6	55	25
16 November	8.1	54	22
21 November	8.6	51	19

Observability of Comet C/2023 A3 (Tsuchinshan-ATLAS) for October/November. The altitude given is for when the sun is 10° below the horizon

The Moon's phases during this period are:

Full Moon	Last Quarter	New Moon	First Quarter
17 October	24 October	1 November	9 November
15 November			

METEOR SHOWERS – in particular, an opportunity to contribute observations of the Phoenicids.

Conditions moon-wise are generally poor for the major showers for the last quarter. Nevertheless, the following showers may be observed.

The **Orionids (ORI)** are the second shower of the year, after the eta-Aquariids, which has comet 1P/Halley as parent. They peak around 22 October, although the actual date of maximum may vary a couple of days either side and the peak is quite broad with possibly several sub-maxima. Meteors can be observed from midnight until dawn, though the waning gibbous Moon will interfere on all mornings.

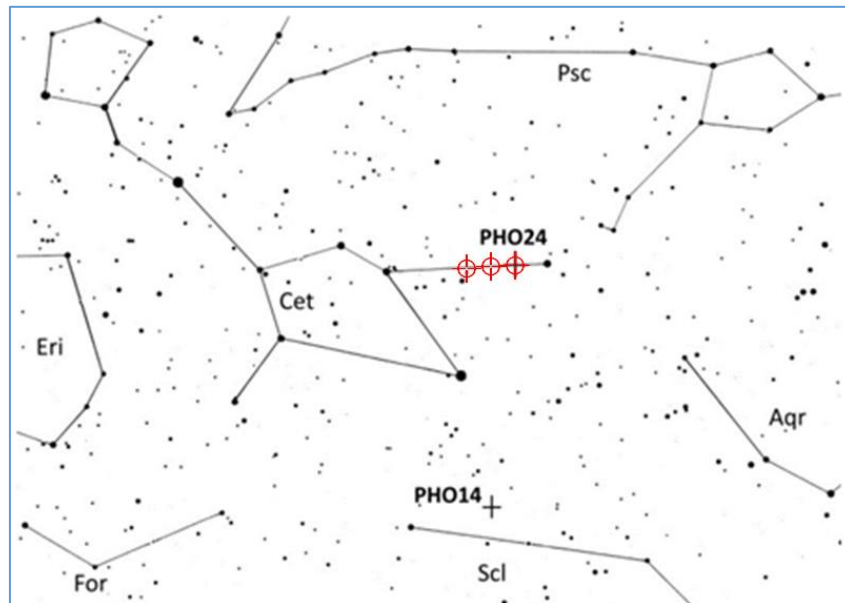
The **Taurids (TAU)** have two branches, the Southern Taurids and Northern Taurids, which reach their maxima around 5 November and 12 November respectively. Rates generally remain low, about ZHR = 5 or less throughout, but the Taurids are known for their tendency to produce occasional very bright fireballs. The Moon, at First Quarter on 9 November, will pose minor interference for those observing in the evening, but will not interfere with observations after midnight.

The **Phoenicids (PHO)** are a shower which are in urgent need of observation, for reasons I will explain in detail here. South Africa played a major part in the discovery of this shower, when on the evening of 5 December 1956, Pretoria amateur astronomer, and past Director of the Comet and Meteor Section, S. C. Venter plotted paths of 40 meteors from a previously unknown radiant. The shower was also independently observed in Australia, New Zealand and Japan, but Venter's plots were instrumental in determining the radiant of the new shower which was called the Phoenicids. Since that outburst very little has been seen of the Phoenicids, apart from a good return in 1972. It was subsequently found that the parent is comet 289P/Blanpain or minor planet 2003 WY25, which is probably a piece from comet 289P/ which fragmented in 1819. The orbit of the comet itself is subject to perturbations by Jupiter, and the dust stream from the comet presumably suffers the same fate, affecting the date of activity and the radiant position of the meteors. Mikiya Sato (see IMO Meteor Shower Calendar 2024) predicts activity this year resulting from dust streams from the 1861 and 1866 apparitions as follows:

Date	Time, UT	Dust trail	RA/Decl.
14 November	07h37	1866	00h28m, -08°
15 November	22h07	1861	00h28m, -09°
17 November	13h36	1861	00h28m, -10°

Possible activity from the Phoenicids in 2024

Note these dates differ from the 1956 date of 5 December, and the radiant position differs from the previously listed R.A. and Decl. 01h12, -53°. The three radiant positions are shown in the figure overpage, and are located in the constellation Cetus.



Radiant positions for possible Phoenicid activity in 2024, the three red symbols are from left to right for 14, 15 and 17 November. Adapted from the diagram in the IMO Meteor Shower Calendar 2024. Credit International Meteor Organization.

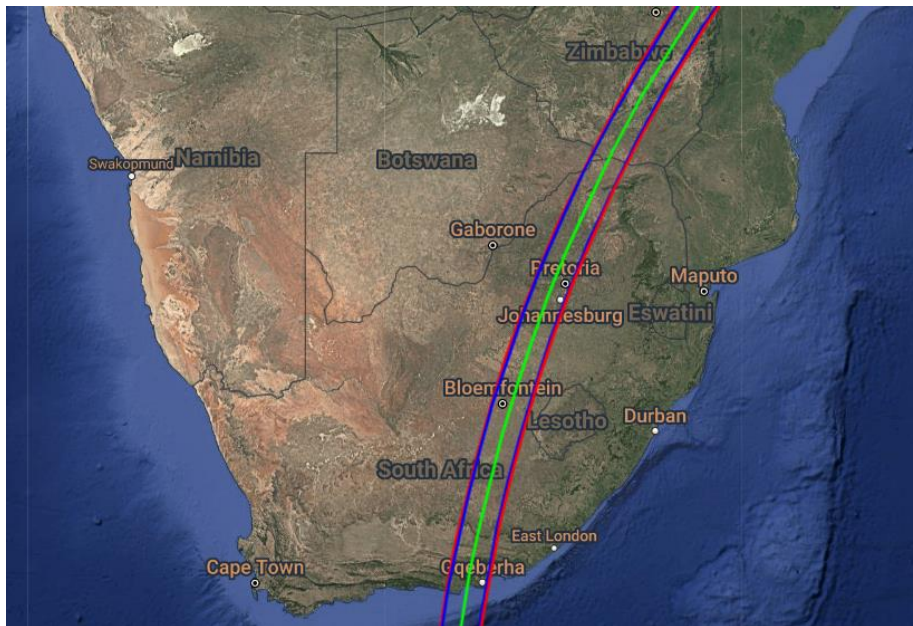
Observations can begin immediately after dark and can continue until around 2am local time. Phoenicids enter the atmosphere at 15 km/s and so any members will appear to be very slow moving. Unfortunately the Full Moon will affect observations this year, but despite that fact observations should be carried out.

The **Geminids** suffer this year with the bright Moon, which reaches its full phase the night after Geminid maximum which should occur on the night of 13/14 December. All the pity, as the Geminids are the year's most prolific meteor shower, and generally produce ZHR above 100 at maximum. The night after maximum generally sees lower rates, but the meteors are on average brighter due to mass-sorting of particles within the stream. Observations can nevertheless be carried out, though you will need to take into account the bright Moon will be just 46° from the radiant on night of maximum, and only 32° the night after.

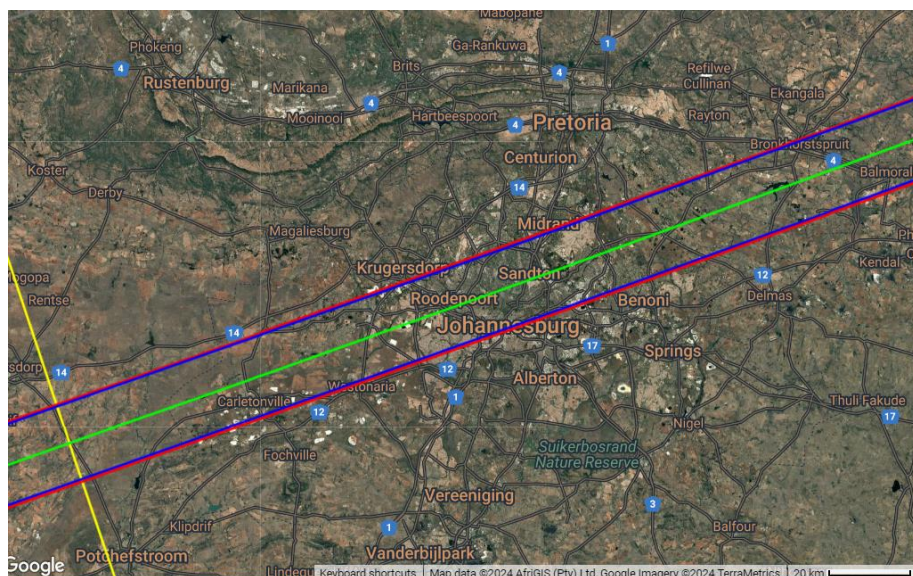
ASTEROIDS

On 9 October 2024 at 22:18 UT, asteroid 152 Atala will occult the magnitude 9.4 star TYC 7446-00317-1. The path is shown overpage and moves from south to north, with Gqeberha, Bloemfontein, Johannesburg and Pretoria observers all within the expected track limits.

On 7 November 2024 at 16:29 UT, the main-belt asteroid (17230) 2000 CX116 will occult the magnitude 9.8 star TYC 6851-04988-1. The path favours Gauteng but the observation will be difficult, and occurs in bright twilight.



Path for 9 October 2024 occultation by asteroid 152 Atala.



Path for 7 November 2024 occultation by (17230) 2000 CX116

Prospective observers are welcome to contact me for further details on how to observe asteroidal occultations.

I hope the foregoing gives visual observers and astro-imagers plenty of opportunities. If you do observe or image any of these events, I will be pleased to receive any reports or images for analysis.

Clear skies,

Tim Cooper

Director, Comet, Asteroid and Meteor Section.

Acknowledgements

Star maps were drawn using Stellarium 0.20.1, Copyright © 2000-2020 Stellarium Developers. Comet ephemerides are prepared using the Minor Planet Centre's Ephemeris Service. Data on meteor showers is courtesy of the International Meteor Organization's Meteor Shower Calendar 2024. Asteroid occultation predictions are from Occult Watcher 5.0.4.1 with additional information from Steve Preston's site at asteroidoccultation.com. Maps for asteroid occultations are from Google Earth, copyright Google, INEGI Imaging, © NASA 2024, Terrametrics.