



Comet, Asteroid and Meteor Section

CAMnotes 2023 No.2 April - June

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Comet C/2017 K2 (PanSTARRS)

Kos Coronaio has continued to observe this comet as it fades. Below are two images by Kos, both taken with a Canon EOS 5D Mark III camera and 200mm lens.



26 February 2023



22 March 2023

The image on 26 February is a stack of 22 x 60 seconds exposures, while the image on 22 March is a stack of 30 x 30 second exposures. From COBS data, the comet was magnitude 8.8 at the time of the left hand image, and faded to magnitude 9.3 by 22 March. The comet should remain observable until the middle of April as it crosses Eridanus, fading slightly further, and before it becomes too low above the SW horizon. On the evening of 13 April the comet will be only 0.3° from the interacting galaxy pair NGC 1531/1532, and should make an interesting target for astro-imagers.

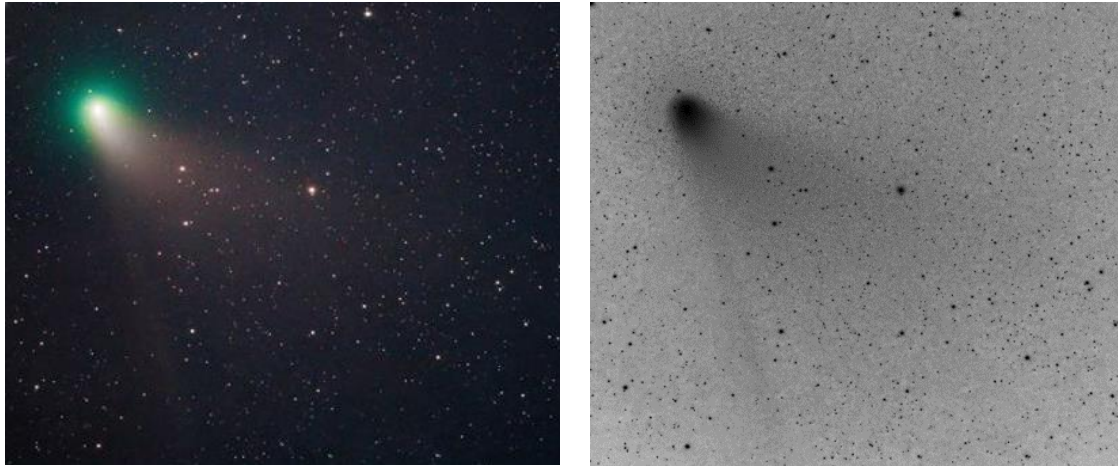
Comet C/2022 E3 (ZTF)

This comet reached its greatest brightness around magnitude 5 in the first week of February, and when it was below the horizon for South African observers. As it gained altitude above the northern horizon it faded quickly, and observability was affected by the near-full moon. Nevertheless, the Director managed to observe the comet on 5 and 6 February during a gap in the seemingly ever-present summer cloud and rainfall, estimating the magnitude as 5.8 on the latter date before moonrise, the comet with a moderately condensed coma, DC=5, and diameter $9'$. Kos Coronaios managed to image the comet on 11 February, when it was around 1° upper right of the planet Mars.



Comet C/2022 E3 (ZTF), image by Kos Coronaios on 11 February 2023, bright object lower left is the planet Mars. Note the green colour of the coma due to fluorescence of C₂ (diatomic carbon)

Angus Burns managed to image the comet on two occasions when weather permitted. Left hand image below was captured on 14 February using a ZWO 294mc Pro camera, Baader Neodymium filter and RASA 8 on a Skywatcher NEQ6 pro mount, stack of 14 x 30 seconds exposures, and shows the green colour of the coma well. Right hand image converted to black and white shows the ion and dust tails of the comet.



Comet C/2022 E3 (ZTF), image by Angus Burns on 14 February 2023

Angus secured a final image on 23 February, on which date the appearance was similar to Kos's image on 11 February, but the comet had faded to magnitude 7.



Comet C/2022 E3 (ZTF), image by Angus Burns on 23 February 2023.

Close approach of asteroid 2023 BU

Following its discovery on 21 January by Genady Borisov, the author issued an observing alert for this asteroid which was predicted to make a close approach only 3500 km above Earth's surface at 21h17 UT on 26 January. With an angular velocity of more than 2° per minute and at magnitude 10 the object would show perceptible motion in a wide field view in a small telescope. In the event, both Kos Coronaios and Tim Cooper were thwarted by weather, but Carol Botha managed to capture the path of the asteroid using the Slooh Canary Three telescope. She commented 'I knew I had no chance of catching this one with my own gear and started a buzz in the 'near-earth-object-club' on Slooh. Quite a few members came to my rescue. BerndL.2014 set up this mission and I was able to go along for the ride. As Bernd described: "Canary Three has a field of view of only 1.77×1.21 degrees. Thus, without being able to precisely control the timing of the telescope, some luck is required to catch an extremely fast moving object. The exposure started at 23:40:16 and ended at 23:41:06. Because the coordinates were calculated for the nominal start time of the mission at 23:40:00, we see only the beginning of the trail. The angular velocity was 4591 arcsecs per minute = 76.5 arcsecs per second!" In the image you can see the trail beginning just below the center of the image, extending southwest and out of the field of view'.



Asteroid 2023 BU captured on 26 January by Carol Botha using Slooh Canary Three, image reproduced with credit to BerndL.2014, Slooh. The asteroid can be seen as a faint diagonal streak towards lower right. To its right is an unidentified satellite trail.

Meteors from comet P/2016 BA14

The IMO posted the possibility of an outburst of meteors from this Earth-approaching comet, from a radiant at about R.A. 06h, Decl. -51° , near Canopus, between 00h00-04h00 UT on the morning of 21 March 2023. The author issued a call for observations. Tim Cooper observed visually for 4.05 hours in five sessions between 19h35 UT on 20 March until 01h00 UT on 21 March, seeing 6 sporadic meteors and 1 gamma Normid, but no activity from near Canopus. Tim Cooper and Philip Mey contributed video observations as part of the global CAMS network. No meteors from the comet were detected. Similarly, Paul Ludick and Louw Ferreira contributed video observations using their GMN cameras. They also detected no meteors from the comet.

gamma Normid meteors

No visual observations were carried out by the author due to cloud and rain. However, Kos Coronaios captured a probable gamma Normid meteor from Pearly Beach on an exposure taken on 26 March 2023, using a Canon EOS 5D Mark III, 77mm lens at f/5.6, 30 second exposure at ISO 16000 starting at 17h59m UT.

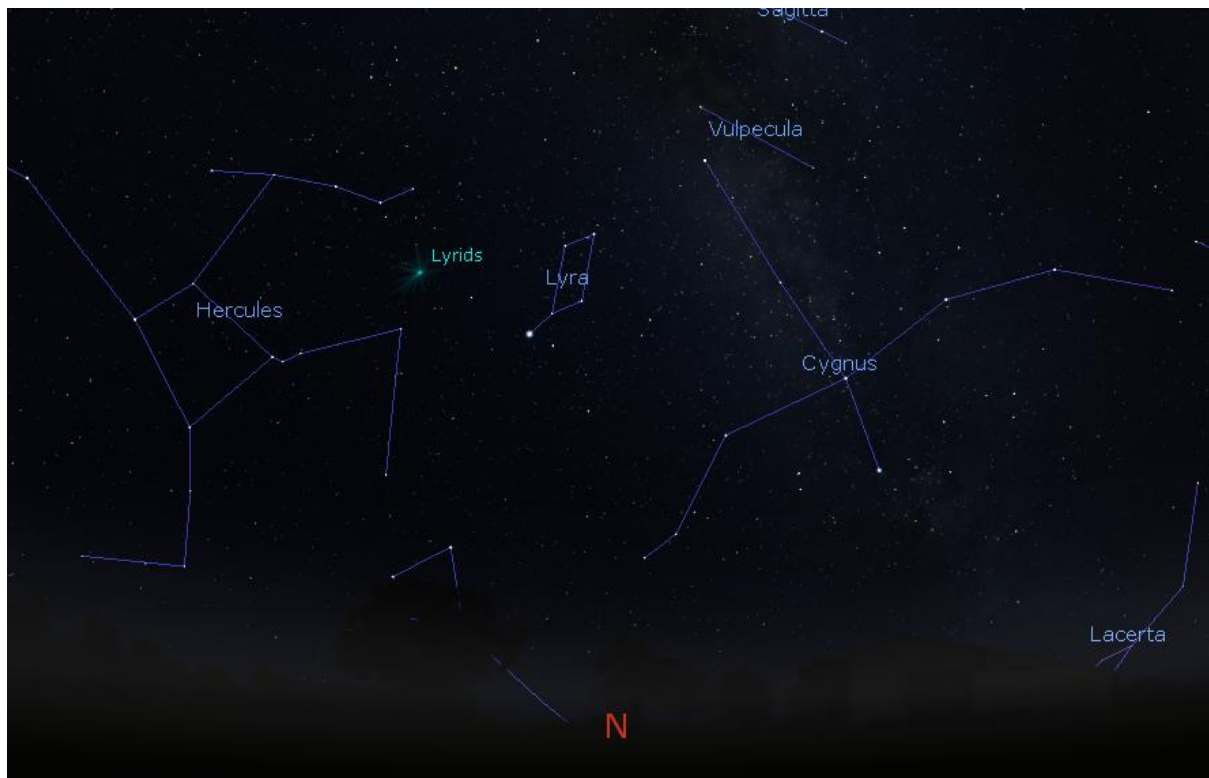


Probable gamma Normid meteor captured by Kos Coronaios on 26 March 2023.

The meteor passes in between Crux Australis and Musca. The path when plotted on Atlas Brno Chart 11 gives a good agreement with the position of the gamma Normid radiant for the date of exposure, and shown as the red target on the plot at right. Plot by the author using Atlas Brno Chart 11.

April Lyrid meteor shower

The April Lyrids are the debris left behind by comet C/1861 G1 (Thatcher). In most years they show modest activity with 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, when the outburst was well observed with a duration of only 0.64 hours and a peak ZHR 200-300. No outburst is predicted for this year, but the shower should be observed nonetheless just in case something untoward happens. Meteors before maximum tend to be fainter, and appear brighter about the night of maximum, which is predicted this year for the night of April 22/23. The maximum, which is quite sharp, normally lasts at most two days above half peak activity. Meteors enter the atmosphere at 49 km/s, and appear medium speed. The radiant is at $\alpha = 271^\circ$, $\delta = +34^\circ$, and is shown in the view below. For southern Africa the radiant rises about 23h20. Hence useful observations can be made between about 01h00 and about 05h00, at which time the radiant is at its highest elevation of about 30° . The New Moon on April 20 means the shower can be observed without any hindrance.



Location of the Lyrid radiant, view is for Johannesburg at 05h00 SAST.

pi Puppids meteor shower

This shower was unknown until 1972, when first evidence of activity was detected. The parent comet is 26P/Grigg-Skjellerup, the orbit of which was perturbed due to a close encounter with Jupiter in 1964. The first significant outburst was observed on the night of 1977 April 23/24, with many bright fireballs, leaving trains up to several

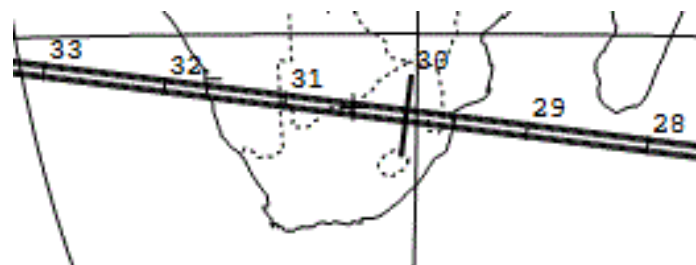
minutes duration. A second outburst occurred in 1982, again with many fireballs, all of which left persistent trains. The meteors were all slow, and yellow or orange coloured. No enhanced activity has been observed since. By now the comet's orbit has moved to 5.3 years, and it is possible the earth will 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. Further observations are critical to understanding if this is indeed the case. The radiant is highest just after dark and can be observed until about midnight. Observe at least on the evenings of 23 and 24 April from dusk to midnight.



Radiant of the pi Puppids, is easy to find using the two brightest stars in the sky, upper right of Canopus and to the left of Sirius, looking west.

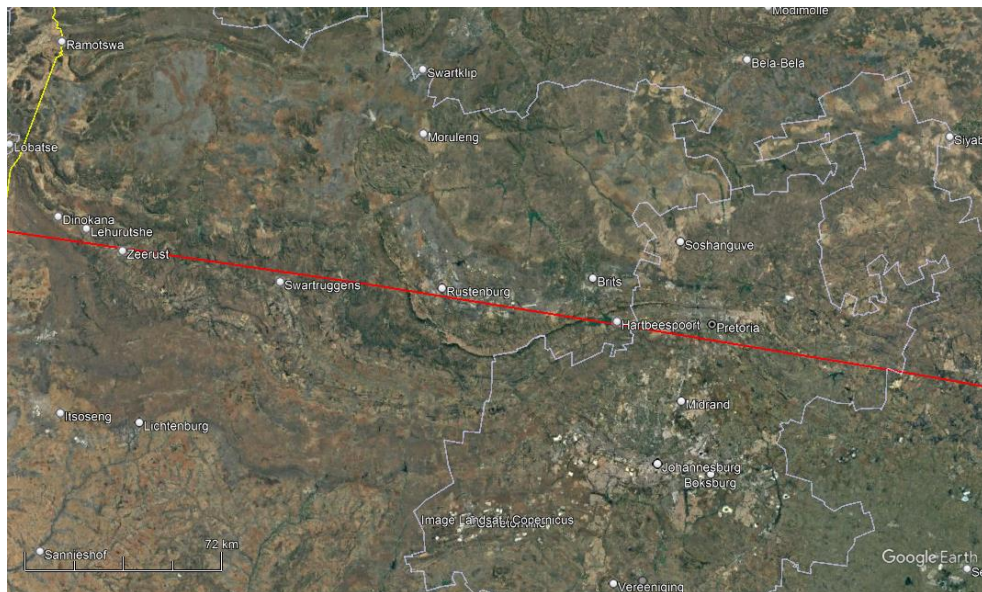
Occultation of magnitude 7.6 star by asteroid 859 Bouzareah

During late night of 19 April, the magnitude 14.8 asteroid 859 Bouzareah will occult the magnitude 7.6 star HIP 64498 (SAO 139227), in the constellation of Virgo. The path runs from east to west across Mpumalanga, Gauteng and North West provinces, before entering southern Botswana.

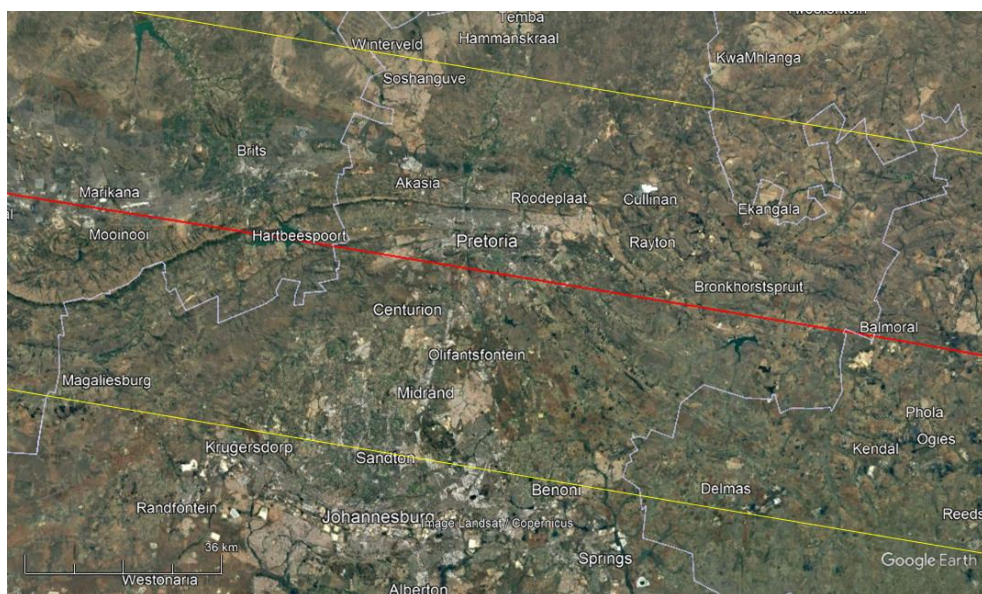


Path of occultation 19 April, the time stamps are 2100 UT plus the indicated time in minutes.

Specifically, the path runs almost directly overhead of Pretoria and Hartebeespoort, and many in Gauteng can expect to see the occultation.



The asteroid has a diameter of about 71 km, and those on the (red) centre line can expect the occultation to last for up to 4.8 seconds. The centre line for Gauteng is shown below, with the northern and southern limits shown as yellow lines. Anyone between these lines can expect to see an occultation.

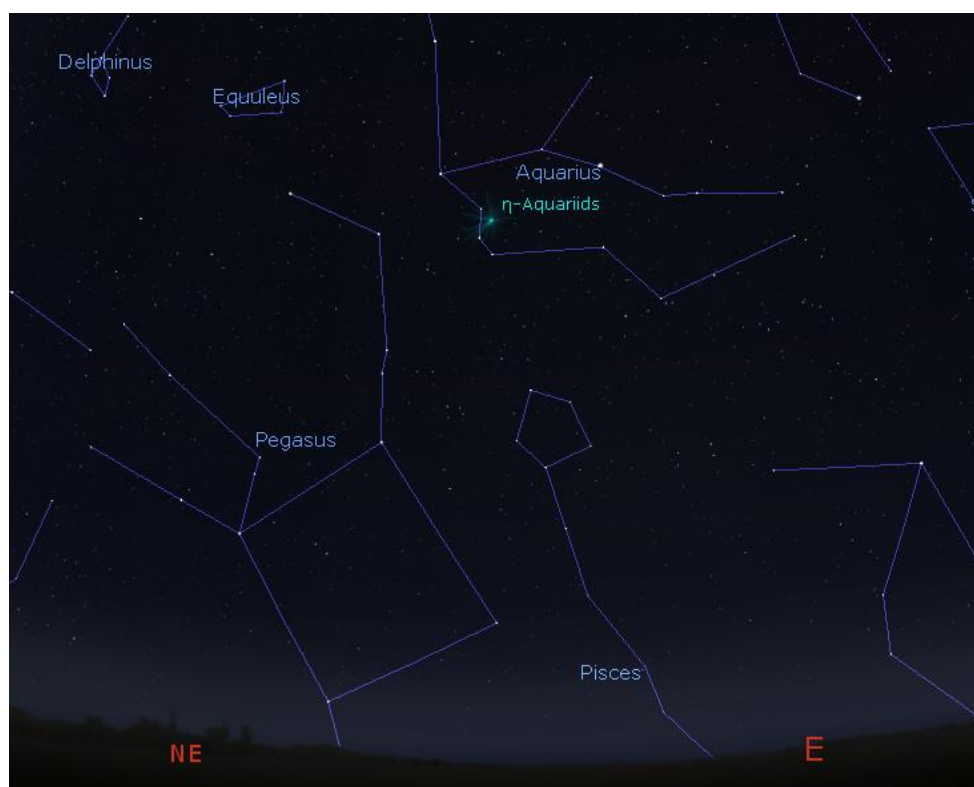


The star is at R.A. $13^{\circ}13'13.5''$, Decl. $-02^{\circ}33'21.4''$, and is a close double star with component magnitudes 8.0 and 10.1, and separated by 9 arc seconds (WDS). The A component will be occulted, while the B component will remain visible, and the magnitude drop will be 2.5 magnitudes. Predicted time of occultation for most of southern Africa is 21h30 UT on 19 April. I recommend observing for 5 minutes either side of this, so from 21h25-21h35 UT, to account for any uncertainties in the prediction, but more so to detect potential secondary occultations from any moons of Bouzareah

if they exist. All predictions courtesy Steve Preston at <https://www.asteroidoccultation.com>. Predicted paths drawn by the author with Google Earth using Steve's data.

eta Aquariids meteor shower

The most active southern meteor shower occurs when earth intersects the outward passage of the debris stream left by comet 1P/Halley. The shower normally peaks around May 5-6 with ZHR = 50-60 meteors per hour. However it is thought periodic outbursts occur with a period around 12 years related to the 1:6 mean motion resonance with Jupiter. The next outburst is predicted to occur this year or next. Unfortunately the full moon on 5 May will hamper observations this year, but seeing we have a unique opportunity to prove whether the 12 year periodicity is real or otherwise, the shower is in urgent need of observation in 2023. In the early days of May, activity picks up, and peaks about May 5 or 6. The decline from maximum is slower, and rates can remain quite high until about May 10. On May 6 the radiant rises at 01h30 local time, and observations can begin from about 03h00 when the altitude is about 15°. Observations will be cut short by encroaching twilight at about 05h30 or shortly thereafter.



Radiant position of the eta Aquariids, close to the Water Jar asterism of Aquarius

Clear skies *Tim*