



Breckland Astronomical Society

Affiliated to the British Astronomical Association and the Federation of
Astronomical Societies

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Copy is always needed for this newsletter. Articles with an astronomical theme are welcome but anything of likely interest to the membership will be considered. Text or Word documents preferred but handwritten submissions also welcome.

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Chairman's Notes

January and February 2025

I always enjoy open nights and those times we arrange to get together on a visit night for groups at the observatory. It is great to make the best use of the fantastic place. Many of us have given their time to sorting out the building, and directly inspiring the next generation in the free and open events we run. It feels good to be part of something that has a positive influence. Thanks those who came to the talks, but we didn't have a great deal at the planetary imaging talk in November and it was such a stunning talk. With the stopping of the Great Ellingham Parish Pump Magazine, I think fewer of the local folk saw our Facebook adverts. I think there is a lack of advertising and we need to get the talk adverts distributed wider. My own personal time commitments are maxed out. We also would like a tuck box helper as our sadly departed, most altruistic member John Gionis used to do this job. It's joyous to see some friendly faces at the meetings – please spread the word about the talks of as we have some great ones lined up for the next few months.

We welcomed our new committee member Justin and have since met and the society is in need of an inflationary subscription fee rise. So could you please amend your direct debits to £21 single / £28 family / £5 under 18, if that hasn't gone out already. Hopefully with the committee as per original constitution we can now be fully compliant with the rules to apply for a new charity bank account. From our new full committee and those who help around it and meet regularly, we have had some really positive commitments and keen new ideas for the society. Keith Fowler has designed new simpler forms, and some neat and discreet new membership cards to hand out and will be in touch regarding the subscriptions.

To summarise, there has been a good atmosphere inside the observatory on Tuesday nights, but unfortunately not a good atmosphere outside :-)

The Sky

There are some nice events in the first two months of 2025. If it clears! The planets are all visible in theory.

Mercury appears low before dawn for the first 5 or 6 days of January for a good viewing of the rarely seen planet. It increases to magnitude -0.4 and is visible in the South East over a narrow time range from 7:00 to 7:20 or so.

Venus has the moon nearby it on the 3rd Jan

The Quadrantids peak on the 4th Jan– look after dark and in the early morning before dawn for best views if it is clear – the 4th is great, lets hope its clear, because...

On the 4th Jan Saturn is very near the moon and if you watch there is a spectacular series of occultations occurring through the night – let's hope it's clear! It occults Saturn and star 85 Aquarii then a near graze for 84 Aquarii, just an occultation – watch closely for any bumpiness in the light pattern! 1721 – 1830 are the times. You have to note your location as the moon's position appears differently depending on where you are viewing from.

The 4th is also the day Earth is at perihelion in its orbit around the Sun.

On Monday the 5th beta Tauri gets occulted by the Moon

January 6th is also the start of 4 hours of Lunar X visibility, from 5pm ; the moon is at half phase.

The night of 9-10th Jan the Pleiades get occulted by the moon at 2am.

11th January Venus reaches 50% illumination – this doesn't look the case in a telescope. This coincides approximately with the Maximum Eastern Elongation from the Sun at 47 degrees angle in the sky.

Mars is at opposition on the 16th Jan and closest to us on the 12th Jan. The ISS also passes Venus and Saturn on the evening of the 16th at 19:19, rising.

From the 17th or 20th January depending on what time you like to observe, the moon gets out of the way revealing a dark sky, only limited by cloud and light pollution.

18th January Venus and Saturn get closest in the Western sky – not quite so close that Venus has a ‘moon’ but still odd looking. In a telescope, Saturn will appear a bit smaller and you may be able to see that it is illuminated at only 1/200th the intensity of Venus, and its reflectivity is less also, meaning it is 1/250th as bright, 6 magnitudes less. Saturn is 14x further from the Sun than Venus.

26th January Venus reaches the greatest altitude in the sky at sunset

February 1st the very thin Crescent moon appears below Venus.

February 2nd the Crescent moon appears more obviously.

On the 9th February a near-occultation or good-conjunction of the Moon and Mars occurs.

Uranus is still high in the sky throughout the evenings.

February 17th onwards gives folk the chance of dark sky conditions. Time to count those stars in Orion’s rectangle and see how good the sky really is.

Asteroids and Comets

15 Eunomia, in Taurus / Gemini is a relatively bright, fairly, large asteroid, and not often spoken about. It is visible in binoculars and you just need to know which of the dots it is. It is the largest of the Stony S-type asteroids. Also “14 Irene” is at opposition high in Gemini/Auriga.

Comet C/2024 G3 ATLAS will be fleeting and too close to the sun to see in my opinion and the media are over hyping it. You never know though! There are other fainter comets, so not easy or fun to see 29P/Schwassmann-Wachmann is out again worth looking near Regulus for as it has a few outbursts. Plus periodic comet 333P/LINEAR is fading. 21P/Giacobini-Zinner is on the far side of the Sun, so a very poor perihelion passage for us to see this winter, although it is possible to image at dusk.

I think C/2022 E2 ATLAS is worth a look as it is nice and high in Jan and Feb in Cassiopeia, starting the year near the Heart Nebula and approaching the ET cluster in later January. Although it may be faint.

Jupiter

Jupiter needs a section of its own this time. It starts the year at a large diameter of 47” shrinking to 40” by the end of February. It is very high in the sky this year, and still fairly close to the Sun at 5.08 AU, having reached perihelion in 2023 at 4.95AU. It is very bright, of course, with its magnitude increasing from -2.7 to -2.3. You could even capture it in broad daylight and explore more of the transits than I have listed below, but it is a bit of a challenge to find. It is big and bright and has some nice details ‘events’ to view including:

GRS-Great Red Spot

Jan 1 2200 GRS transit (peak)
Jan 2 2143 Ganymede disappears, Io transits
Jan 3 1920 Io disappears
Jan 4 1920 GRS transit
Jan 5
Jan 6 afternoon until 1655 Ganymede shadow transit, 2100 GRS
Jan 7
Jan 8 1930 Europa disappearance, 2245 GRS, 2340 Europa emerges from shadow
Jan 9 late Io transit, Ganymede approaches
Jan 10 0004 Io emerges from shadow, during GRS transit
Jan 11 1905 Io & its shadow transit either side of GRS until 2112
Jan 12 2154 GRS
Jan 13 1827 Ganymede shadow transit until 2054, 2155 GRS
Jan 14
Jan 15 2154 Europa disappears, 2333 GRS
Jan 16 1922 GRS,

Jan 17
 Jan 18 2100 Io shadow transit with moon and GRS until 2308
 Jan 19
 Jan 20 1830 Ganymede transit, 2230 Ganymede shadow start GRS visible.
 Jan 21 1830 GRS
 Jan 22 0020(23rd) Europa disappears, 0024(23rd) GRS, Callisto approaches disk
 Jan 23 2010 GRS,
 Jan 24 1919 Europa starts transit, 2121 shadow starts transit, 0040 Io disappears
 Jan 25 2152 Io starts transit + GRS, 2254 Io shadow starts transit
 Jan 26 1908 Io disappears
 Jan 27 1723 Io on disk, shadow starts to transit, 2206 Ganymede starts to transit, GRS appears
 Jan 28 1917 GRS (Jupiter 'stationary' in R.A.)
 Jan 29
 Jan 30 2100 GRS
 Jan 31 2146 Europa starts to transit, 2356 shadow starts transit

Feb 1 2240 GRS, Io starts transit 2342, followed by shadow 0050
 Feb 2 2059 Io disappears
 Feb 3 1810 Io starts transit, 1919 shadow starts
 Feb 4 1847 Io emerges from shadow, 2000 GRS
 Feb 5
 Feb 6 2150 GRS
 Feb 7
 Feb 8 1900 Callisto just below S pole of disk
 Feb 9 1917 GRS, 2334 Europa emerges from shadow
 Feb 10 2002 Io starts transit, 2115 shadow starts transit
 Feb 11 2058 GRS, 2042 Io emerges from shadow
 Feb 12
 Feb 13 2240 GRS
 Feb 14 1821 GRS, 1913 Ganymede disappears, 2138 Ganymede emerges from behind disk
 Feb 15 0030(16th) GRS
 Feb 16 2017 GRS, 2059 Europa disappears, 0041(17th) Io disappears, Callisto nears N pole
 Feb 17 2154 Io starts transit, 2310 shadow starts transit
 Feb 18 Sun sets 1730 with Europa in transit, 1826 Eu leaves and shadow starts, 1909 Io disappears, 2155 GRS, 2238-41 Io emerges from shadow
 Feb 19 Sun sets with Io and shadow in transit, GRS visible 1740 best (altitude = 58°)
 Feb 20 2335 GRS
 Feb 21 1926 GRS, 2308 Ganymede disappears
 Feb 22
 Feb 23 2103 GRS 2334 Europa disappears
 Feb 24 2348 Io starts transit
 Feb 25 1826 Europa starts transit, 1836 Ganymede shadow starts transit, 2100 Eu shadow starts, 2101 Eu leaves, 2102 Io disappears, 2107 Ga shadow leaves (N.B.!), 2245 GRS
 Feb 26 1817 Io transit starts, 1839 GRS, 1934 Io shadow starts, 2029 Io leaves, 2145 shadow leaves
 Feb 27 1902-1905 Io emerges from shadow
 Feb 28 2010 GRS

For a rather difficult challenge, some amateurs had tried to image Amalthea, Jupiter's 5th moon discovered visually in 1892 by E E Barnard using a 36 Inch refractor at Lick Observatory. It is within an arc minute of Jupiter and about 14th magnitude. It takes 0.498 days to orbit once, putting almost in sync 2:1 with our day here on Earth. It has 1/19th the diameter of Io.

Constellations

Orion dominates the sky for these two months. It contains the sword, that contains the nebula M42, the crown jewel of the sky 1300 light years away. Lepus the Hare is below it, and Gemini and Taurus above it. Auriga above those. I have included some low-res, all-sky charts for identification of constellations if you are not so familiar with the sky and a darker chart for mid period showing lines.

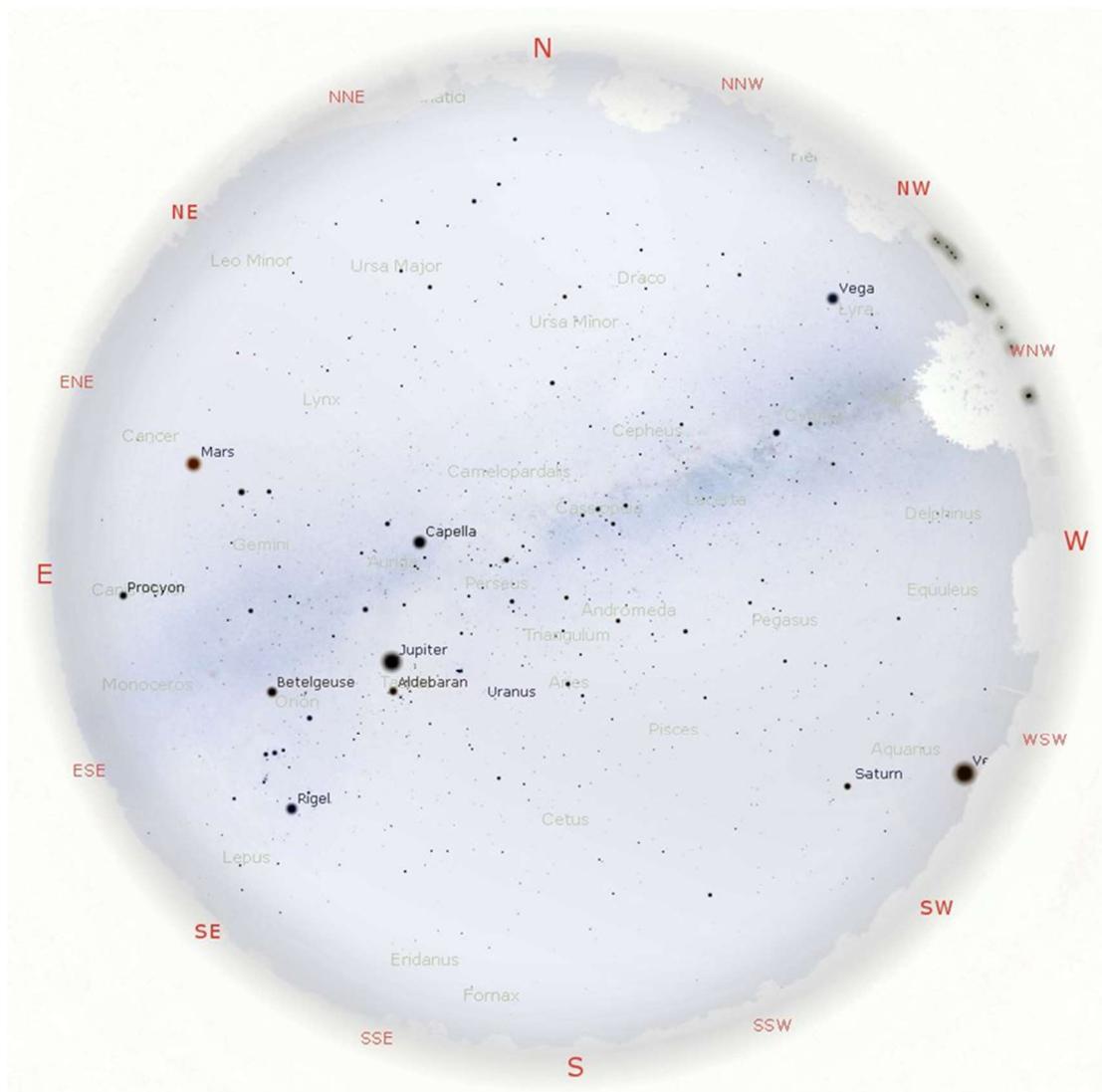
The first chart is for 19:30 on the 2nd January. It can be used for 18:00 later in the month. The second for 8pm on the 3rd February (southern half of the sky white on black) The third chart is for midnight on the 24th February. It can be used for 1:30am earlier in the month.

Check out the Pleiades(M45), M42, and M41 beneath Sirius. Also try M46 and M47 to the left of Sirius and a little higher. You can use Sirius and Murzim, the star to its right as a yardstick, and point it left, twice its length to arrive at the double cluster. Both are quite unlike.

M47 contains fewer but much brighter stars and is 1600 light years away. Whereas as you can tell, M46 has much fainter stars – this is only apparent due to its much larger distance of 5000 light years. It is a very large cluster 38 light years across, about 500 stars in it. It also contains an interesting object, a planetary nebula NGC2438, of 10th magnitude floating seemingly among the stars of the cluster. The nebula is in face 1370 light years away. It is an interesting object and becomes visible with a moderate sized telescope.

More beautiful clusters are visible through Auriga, M37, M36 and M38 above Elnath are above an asterism within the bottom of the pentagon of stars. Just south of this is asteroid Eunomia. Also you can't miss the Beehive in Cancer also – but try M67 at the bottom of the faint constellation. It can be found by using Castor and Pollux as pointers downwards, then drifting off a bit to the left.

It is inside a box of stars called Job's Coffin. During those later sessions in January try looking at Beta Monocerotis – it is a truly lovely triple star. It can be found using Orion's belt to point down and left to find two faintish stars, gamma (right) and beta (left).





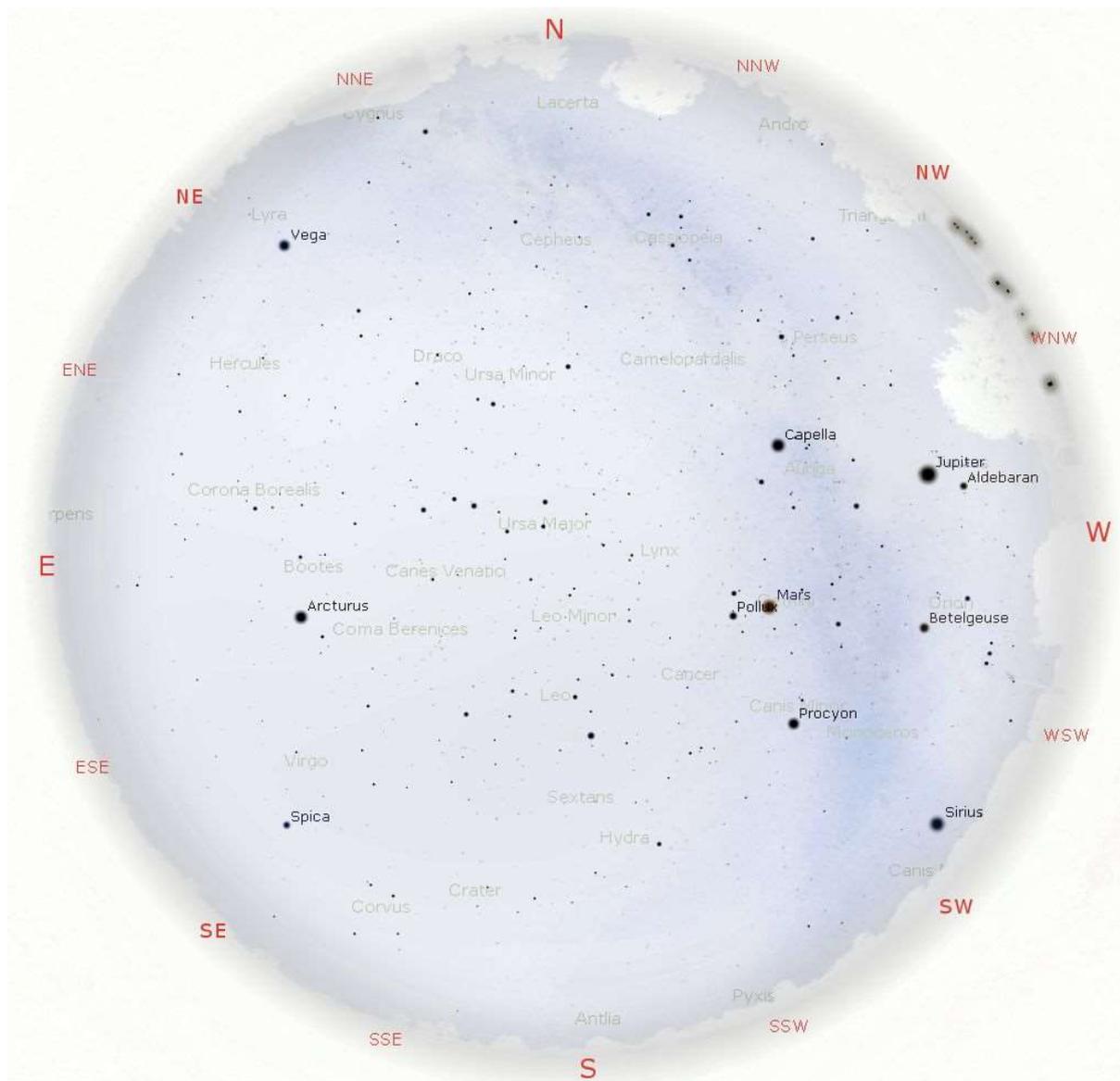
M31 Andromeda galaxy is still very high in the sky early in the evening. Well worth a look.

Orion also contains more than just the Orion Nebula. The Horsehead nebula is incredibly faint visually but good for imaging and M78 is good visually (above the left belt star) and not so good for imaging. There is also a small planetary nebula near the star triangle that makes Orion's head (Meissa or lambda Orionis) just to its lower left is NGC 2022, you will need a chart to hop and find it but it is worth it – it is listed as 14th magnitude, but it seems easier than that. See picture later in the magazine.

Dark skies are key to observing these things. Humidities below 80% also help increase starlight.

You may find this white on black chart more useful It is for the middle of the period, 8pm on the 3rd February but can also be useful eg at 10pm on the 3rd Jan.

Chart below for late February 2025 at midnight.



Talks

In November we had the pleasure of Amateur Astronomer Martin Lewis visiting us from St Albans, he was a really pleasant chap, who found us at Kelling and introduced himself. Check out his website at <https://skyinspector.co.uk/> – it leaves me amazed looking at how much detail he achieves. It is on a par with the worlds best, e.g. Damian Peach & Christopher Go.

He demonstrated a very professional and rigorous approach to planetary imaging. He explained how the operation was at the resolution of the telescope and at that resolution, many, many factors come in to play. He opens the talk by showing a picture of M42. That's not too hard to achieve a picture of, then he puts Jupiter next to it, to scale, taken with the same camera. It is tiny!

He says you need:

- An equatorial mount
- At least an 8 inch telescope
- A barlow
- A decent planetary camera
- A laptop with USB.

You consume 50GB of hard drive space at least in an hour, 150GB if imaging larger targets like the moon. He shows an example from a ZWO camera of a 4GB video stretched (brightened) to make it visible, as it is of low noise, but with short exposure times. Jupiter is locked on target, and wobbles a bit but features are sort of visible, hidden by the flicker.

He says the best single pictures used to be terrible even on the world's best telescopes. Such as a picture of Jupiter on the 1.06m Pic du Midi telescope – it was blurry! The same scope was used again in 2017 by Peach et al (<https://www.damianpeach.com/picdumidi2017.htm>)

He recommended AutoStakker! Free software for stacking images. And WinJUPOS for derotating long exposures. Not the most expensive setup. He says when stacking images, to keep about the best 50% for sharpening later in Registax. He seemed to like 21ms exposure for Jupiter. He had a 222mm (9 inch) Dobsonian telescope (yes, a push-pull alt-az type!) but his secret is he has built an equatorial platform that goes under it that tracks it – this clearly does a good job! He is an engineer. Incidentally we looked into one of those for the Fox Carter 20 inch telescope, once. He then upgraded to a 450mm 18 inch dobsonian. An ADC – Atmospheric Dispersion Corrector also shortly became a MUST have item. With this setup, he got shortlisted for a Royal Maritime Museum solar system category and a highly commended in another competition, then he won Astronomy Photographer of the Year 2022 Winter, with a beautiful picture of shadows across Plato.

He tries all sorts of projects, you may think there are only 7 planets and the moon, but there is a lot you can do. For instance, Infrared picture of Mercury – image scales of 0.075 arc sec per pixel while 29 degrees altitude. Mars in 2022 when it was only 16 arc sec across. He even had good detail on Jupiter's Moons at 0.048" per pixel using an ADC. Uranus can be imaged well with a Bader 685 nm cut on near infrared filter. He pushed the exposure time to 7 minutes on Neptune. And the Moon got a colour boost in the sea of tranquility.

The project that got the most dedication was Imaging the night side of Venus. He has to look at filters, 807nm seemed good to pick up the heat through the clouds, but the phase had to be very small, which meant going close to the sun. The sky also was very turbulent or it was at a low altitude. He did capture the 'horn extensions' of Venus going round the ring of the planet when it was 3 degrees from the Sun on 1/6/2020. Apparently you can get the whole ring, if Venus is 1.5 degrees from the Sun.

The UV filter on venus (Baader brand) gives nice detail on the cloud structure from down here. There is a wavelength band in the near infra red (about 1000 nanometres) 990-1030 that works well. He achieved an image of a bright spot on Venus, that had been seen by professionals, and using that got a BAA Ridley Grant for a filter and Camera. He tried two cameras, and for that project he became aware of glare reflection issues due to the chip design. He went for long exposure 25-200ms, short f ratio f/4.5 prime so minimising optics and with no twilight allowed.

The ZWOASI174MM looks a good camera but the ASI120 (mine!) had bad read noise (and yes I have noticed it, but it is better than its predecessors by a long way). His chip of choice was made of Silicon which has a low sensitivity (3%) at 1000nm but the IMX290 chip had better reflection patterns. The PlayerOne Uranus-C camera iMX585 has a great efficiency across the infrared. Sony colour cameras are great but they become mono above about 880nm if you remove the window – the bayer matrix red green and blue filters all seem to be transparent at those wavelengths.

He used a Pixel Tech 1010 38nm bandwidth filter \$158 and found he had a very small window to catch Venus the crescent phase in the morning sky. It was the best time. The phase was only good for 3 weeks or so, 30% - 15%, the 5th September 2023 at 5am was good. The sky was best until the sun got to -5 degrees below the horizon and there was a noisy weave pattern appearing after that.

Martin showed us a plot of sky brightness versus solar altitude. It is very steep! It affects the noise in the image. If you have 9 electrons worth of signal light from the night side of venus, when you have 16 of sky brightness, it creates a noise of 4. When the sky brightens to 64, you get a noise of 8 that swamps the image. He uses www.nakedeyepixels.com by Martin Powell to find optimum times. One is coming up in March 2025.

He mapped his Night Side maps on to an equirectangular projection map of Venus' Globe. It is Tidally Locked to the Sun in a ratio so we see roughly the same side every day. The bright spot that had been imaged by Magellan had disappeared, showing variation on Venus. He had made a great discovery. It had gone in a few days.

He had to move his scope, as he had a Laburnum tree in the way on the 9th September – he recorded a hotspot that day – amazing. The 15th September gave the best image. He reveals the darkest feature 'Aphrodite' – mentioned at an earlier talk by Andy which he imaged on the 23rd September. This is all BEAUTIFUL and available FREE on his website above.

Cheers Martin!

December talk: Galaxies by Keith Fowler.

December we had a very clear informative presentation about galaxies by Keith Fowler. Keith is (like me) a lifelong astronomer, who has a real interest in galaxies. If you look at names, the Tadpole galaxy, Whirlpool galaxy, etc – there are a lot of them!

The French astronomer Charles Messier listed things that bored him when discovering comets.

His list included objects not all galaxies

He met Caroline Herschel, William's sister, who was eventually the first paid woman astronomer. She was 4 foot 2 with a blind eye. Then his son John went to South Africa and discovered some more objects. Then Dreyer came and created with all of it, the New General Catalogue. There were 6032 galaxies out of the 7900 odd items.

We looked at Gaia's ESA milky way pic - stunning.

In the 1920's there was a debate that our Milky way is the Entire Universe. There was Shapley's vs Curtis's view with the Island Universes theory, originally a term by Immanuel Kant. This was borne out when Hubble found M31 was one! But the discovery was also thanks to Henrietta Swan Leavitt, she was nominated for the Nobel Prize for discovering Standard Candles.

In 1923, Adrian Van Maanen found internal Motions in M33, but this just was too slow to discover and turned out to be unconscious bias. In the meantime, more standard candles were discovered. These were the way of measuring distance. (Cue quirky actual candle demo!)

Auguste Comté said humans would never know what stars are made of as they are too far away, tut! Then spectroscopy was invented. Cynthia Payne said "hold my beer... I will split starlight into a spectrum and tell you about them. It is Hydrogen and something else." [actually don't quote me on that]. Her thesis was one of the most brilliant pieces of work – that is a fact.

So Hubble's Law could now be seen by spectral redshift and could be shown on a graph. This is the first case of showing the Universe is expanding with distance.

Keith showed us a log scale of our Time history – this was a great little diagram albeit with small text. Then we got details of the light from galaxies versus dinosaurs – great comparison! At one point it was mentioned that we sent nudes to aliens. We've not been contacted!

Anyway getting back to Galaxies – they have shapes! There is a tuning fork diagram to clarify them. But every galaxy's up to something! M87 in particular is definitely up to something. It has a Cambridge radio designation 3C348 and has giant radio lobes. It is an elliptical featureless old star galaxy.

Some examples, M81 is a galaxy in Ursa Major it is Sa or Sb, M77 an Sb with lots of star forming regions. NGC1672 is a barred spiral Sbb Sbc. The best bar is NGC 1300. Some other good examples of S types are NGC1084 and Sb NGC1073 in Cetus.

NGC 2008 has nice spiral arms. Which way are they rotating? We could all work it out assuming outer edge is slower. They can be seen by dust lane shadows and outer arms rotating. However, some rotate backwards. The speed they move mean they should wind up totally. But there are density waves where the stars move through them and bunch up. Also supernovae waves cause pressure waves that make star formation and both occur (they think) to explain most spirals' structures. 2 out of 3 spirals are barred and they can interchange throughout their lifetime.

Edge on galaxies are hard to classify - NGC 4565 being an example. A better one is Our Milky way which is a barred spiral! Who knew?

In the end they all merge to become ellipticals... but on their way they are interesting like NGC 4676 The Mice.

The thing sticking out of M87 was studied by looking at it with a huge set of telescopes synchronised together to reveal a hole! M87* star! A catchy name. It was a black hole imaged for the first time - most material gets slungshot round and glows brightly.

Galaxies can also form groups that orbit each other. Our group is the small magellanic cloud, NGC3109, the L.M.C., M32, US1, then M31 with it's satellites. All the dwarves are like an entourage with us and the Andromeda galaxy.

Galaxies can also form larger clusters like Abell 2537, etc. where there are hundreds and thousands of galaxies. The best of them in the sky is the Virgo Cluster.

Cue balloon demo of universe expansion with pieces of sellotape that stay together despite the expansion – this explains a question many folk have – that why don't groups expand with the universe. It's their mutual gravity keeping them together.

On an even larger scale, a Supercluster – the universe has this large scale structure – and we see a Map of Laniakea ...wow! The biggest structures look just like Neurons in a human brain. Very very similar. Wow!

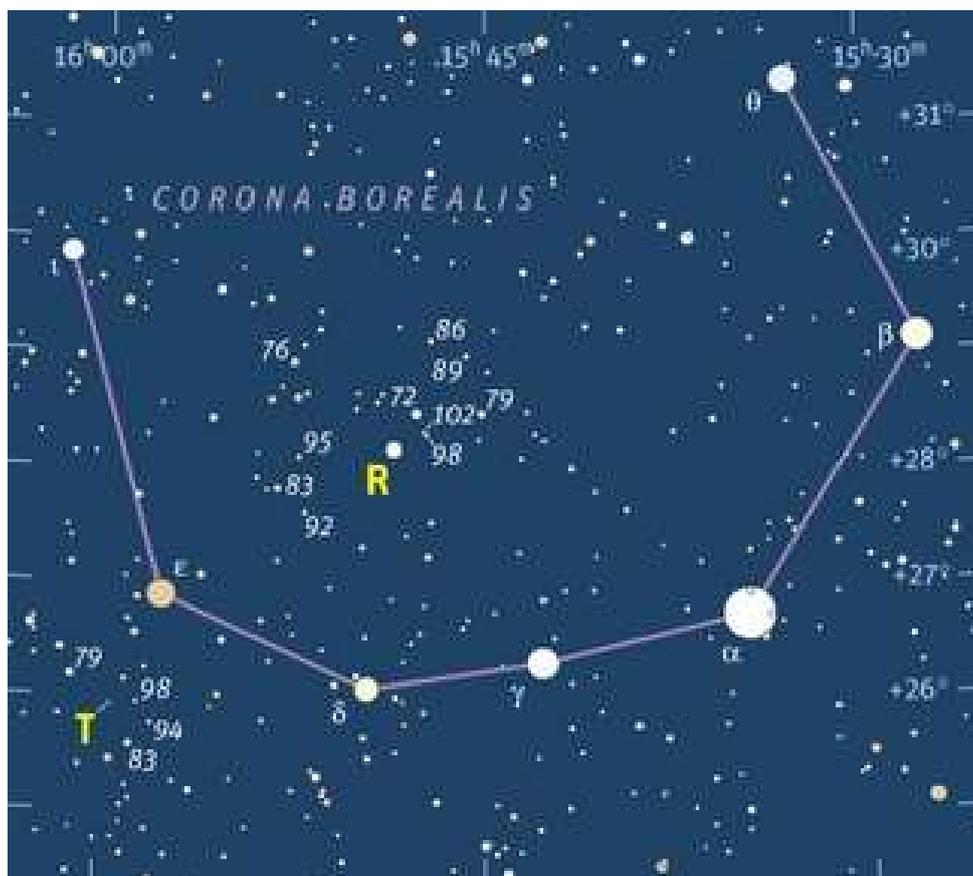
<https://youtu.be/VQ3F8TATa0g?t=10532&si=TWxEN79PsQskIHBC>

Next up is seeing these galaxies. Get your own personal view with our 20 inch telescope!

Thanks so much Keith – brilliant bit of inspiration.

Still no nova (at the time of writing) ...

T Cor Bor or T CrB, Coronæ Borealis as of December 27th 2024 has still not gone nova yet. If it hasn't yet, give the Northern Crown a look in Binoculars and look out for a new star next to epsilon, also look before it goes off to get an idea of what it looks like. Unfortunately the constellation disappears shortly after evening twilight fades and appears again later in the early hours. Worth it for a nova though, especially if you are out with a good North East horizon.



Coming Up

We have an equipment and imaging talk in January – about what telescope kit is available when getting into astronomy and then imaging. Our group will show you how this kit is used to take stunning images.

In February we have a talk by the one and only Dr Robin Catchpole, a famous UK astronomer, who will tell us all about the best JWST images – in all their glorious detail.

Dan Self

JOHN'S NEWS NOTES

January 2025

New Glenn – Escape. 2 Satellites have been Named “Blue” and “Gold”, which will make an 11 month journey to Mars.

As the first Vulcan flight nears, the new space plane Dream Chaser 1 prepares for launch December 2024 or early 2025. It is called the Sierra Space Dream Chaser and looks like a mini Space Shuttle. A fleet is planned.

Cape Canaveral Space Force Station, located SSE of NASA Kennedy, plans to host one of the “Demo” series of flights to the Space Station to rescue the Crew aboard it.

The International Space Station has now spent 25 years in orbit and 270 astronauts have visited.

Artemis II: First crewed mission on SLS rocket and Orion Spacecraft for the first time with astronauts. As I write this the SLS rocket is being stacked in the VAB (vehicle assembly building) the launch date is September 2025 but this may get pushed back unless it gets cancelled by Donald Trump when he takes office in January. (Edit: it has been pushed back to 2026). The stranded crew Sunita Williams and Butch Wilmore are expected back in February 2025.

Artemis 2 is an 8 day mission that will send 4 crew in the Orion ship to the Moon on a free return trajectory.

The end is in sight for the Voyager probes, launched in 1977 Voyager 1 and 2 are the oldest probes to have left our solar system, barring the two Pioneers. they went to Jupiter, Saturn, Uranus and Neptune. Although NASA can still receive data from the probes its power supply has nearly run out.

The web site for all news on NASA is [nasa.gov](https://www.nasa.gov)

Also if you want to follow the Space Station go to “Spot the Station” and sign up for info for when it comes over for your area.

A new comet C/2024 G3 ATLAS is probably going to be the brightest of 2025, but you will probably not see it as it appears for 2 days and it is dangerously positioned just above the Sun in the sky and so visible only in daylight.

John Copsey

Constellation Wordsearch

Dan Self

Find 12 of the official 88 IAU constellations in this 9x9 grid

Their English names are:

The Altar, The Swan, The Dragon, The River Danube, The Roman Hero, The Water Snake, The Hare, The Scales, The Harp, The Serpent Bearer, The Peacock, The Great Bear.

Answers can be up, down, left or right. Good luck!

S	U	H	C	U	I	H	P	O
U	F	A	D	R	A	C	O	S
N	R	H	Z	S	C	O	P	E
A	R	Y	L	A	Y	R	A	L
D	A	D	A	M	G	S	X	U
I	L	R	S	A	N	U	A	C
R	O	A	Q	J	U	P	T	R
E	P	A	V	O	S	E	W	E
K	L	I	B	R	A	L	S	H

Telescopes of Herstmonceux

The 36-inch Yapp reflector

Gerald North



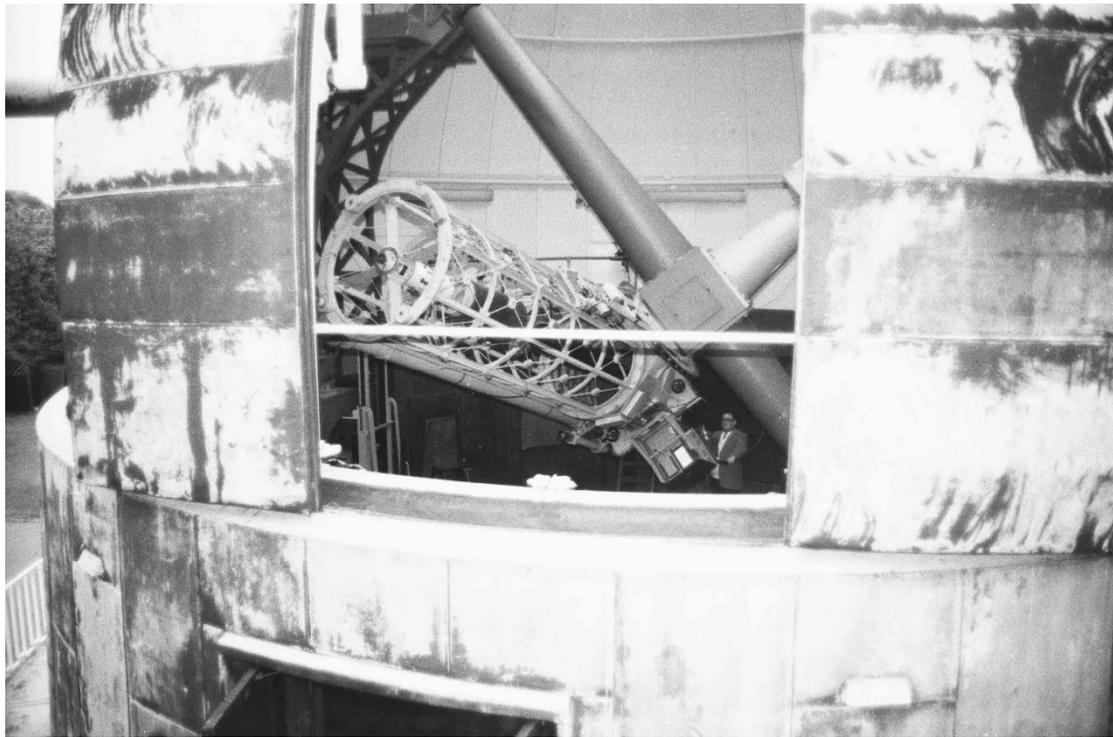
This telescope was built in 1932 by the firm of Grubb-Parsons in Newcastle and paid for by a financial gift from the Industrialist William Yapp. It was initially set up at the Greenwich Observatory in London but moved to the then newly built observatory at Herstmonceux in the late 1950s.

This photograph was taken of me with the telescope in 1989 in response to a request from Dr John Phillips of the Los Alamos National Laboratory and Dr Christopher Russell of the University of California to accompany a magazine article about their international campaign to observe the

controversial 'ashen light' of the planet Venus. I took part in the campaign and obtained some significant results. Their article was published in the January 1990 issue of 'Sky & Telescope'.



Part of the cluster of six domes and buildings of the 'Equatorial Group' at Herstmonceux. The dome with the shutters open on the right of this photograph is the one that houses the Yapp reflector.



I took this photo from the roof of the adjoining building in 1989. It shows the Yapp Reflector seen through the open dome slit. A six foot tall friend of mine, Alan Carey, helps to give an indication of the scale of this telescope.

This instrument is a Cassegrain reflector. Light from the celestial body passes down the telescope tube to the 36-inch concave parabolic mirror housed at the bottom end of the telescope tube. The light is reflected back up the tube in a converging cone where it is caught by a smaller (about 10-inch across) convex hyperbolic mirror held within the structure that can be seen within the tube near its top end. This mirror sends the light back down the main tube as a less steeply converging cone. The light passes through a six inch diameter central hole in the primary mirror to emerge at the back end of the telescope. There one can put the photographic, or other, equipment to image or study the celestial object of interest. I made my own eyepiece unit to use with this telescope.

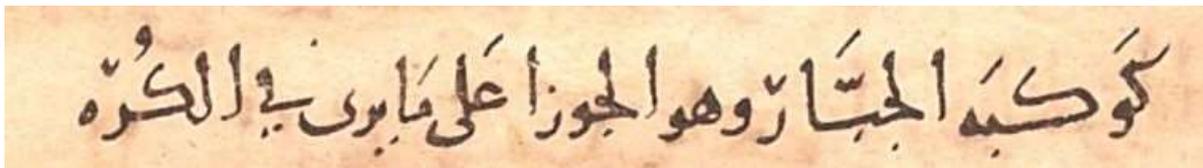
The 36-inch (0.9 metre) primary mirror is six inches (152 mm) thick and weighs half a ton (a ton and a metric tonne only slightly differ). The focal length of the primary mirror is fifteen feet (4.57 metres) but the convex secondary mirror actually multiplies that focal length by 3, so the effective focal length at the Cassegrain focus (at the bottom of the telescope tube) is 45 feet (13.7 metres.) So the f/5 focal ratio of the primary mirror is converted to an f/15 effective focal ratio at the Cassegrain focus.



Me using the Yapp Reflector at Herstmonceux in 1988. The length of the exposure used to take this photo has made the twilit sky at the time look brilliant white but was necessary to show some details of the telescope and the interior of the dome. It isn't necessary to have a dark sky for observing the Moon or the bright planets. I did use this telescope to observe the planets, particularly Mars and Venus, but most of the time I used it in conjunction with the Thompson 30-inch reflector and its high dispersion spectrograph for lunar research. I made my own eyepiece unit to use with this telescope, the 44 mm Plossl eyepiece it utilised giving a nominal magnification of X312.



For most of its life until the telescopes at Herstmonceux ceased to be part of the Royal Greenwich Observatory (which itself closed down eight years later) the Yapp reflector has been used for stellar research, particularly for the spectroscopy and photometry of stars. This late 1950s photograph shows the Astronomer Royal of the time (Richard van der Riet Woolley) using the Yapp with an attached low-medium dispersion spectrograph attached to the Cassegrain focus. Those were halcyon days for the RGO. (This photograph is from the RGO archive, the others in this article were taken by the author or by Alan Carey using the author's camera.)



The title reads (from right to left) “KawKabah AlJabbar’ wahu AlJawza ‘alaa mayra fi alkurah” which translates to The constellation of the giant and he’s AlJawza (Orion) as one sees it into the globe”, i.e. from the outside of some mythical celestial sphere. AlJawza translates now to Gemini, but it was originally used as Orion.

The giant’s name is where the star name Betelgeuse derives. Look at Orion’s right shoulder in the picture (mirror reverse it). Those Arabic letters beneath it start on the right with a small squiggle, that squiggle could have been a bit unclear, as the Arabic letter B has a single dot underneath it and the Arabic letter Y has a double dot. If one of those dots go missing, the word changes.

The piece on the left says AlJawza (the L sits on top of the J, which has one dot below it)

And I point out with the blue arrow the second dot, which has gone astray and sits below the D. So this should say Yad AlJawza – the shoulder of the giant. The exact translation is disputed (hand, armpit?) and this manuscript got studied again in 1246, and it was decided the name was BadAlJawza, and there was only one dot. AlSufi has also put what looks like a full stop near the final A (vertical line) – so perhaps he accidentally adds extra dots. We got our spelling of Betelgeuse from the French rendering of this mistranscription! Then we corrupted its pronunciation further to Beetle Juice! Still, it survived over 1000 years, in some form.

There is some text beneath the stars in the belt region, rather a string of letters, that I can try to hazard a guess to the Arabic alphabet I know (which hasn’t changed!) “Almanitaq...ah wa...” it sounds a bit like Mintaka or Alnitak, the modern names for those stars in the belt. It translates to something like the region has systems also. I gather that it refers to it being a Central Region of the sky.

The ‘shield’ text is Crown and Appendages ... also – it appears as a strange extension of his arm.

The star we know as Bellatrix has an inscription “Almarzam & AlTajed”



The star we know as Rigel is described as “Rijel Aljawza Alyusra” meaning his left part

Lastly the head stars we now call Meissa, is labelled “Al Heqaah”. The name Heka is still a recognised name for the star in Stellarium v21

Dan Self

The Many Names of the Pleiades



Image by Chris Bailey

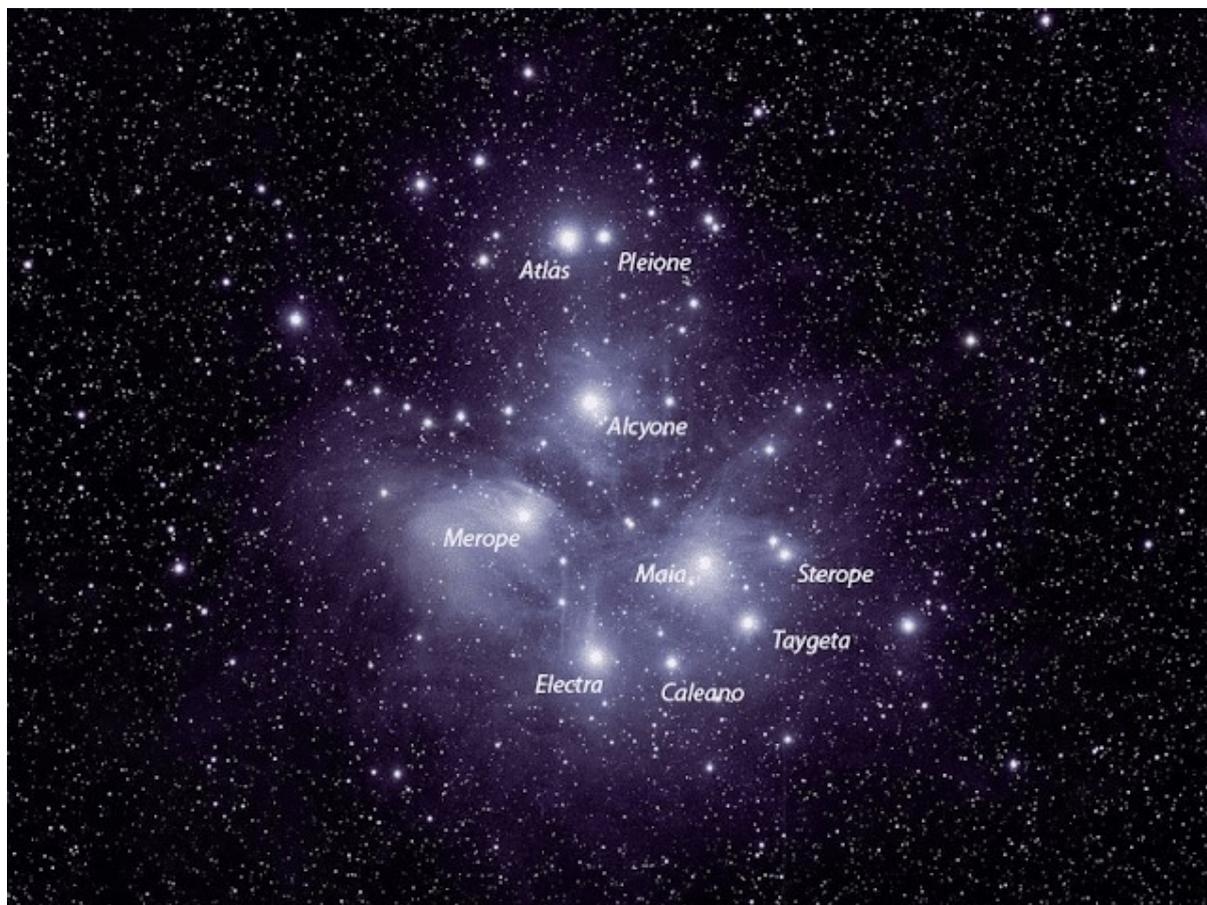
A wide view of the Pleiades star cluster.

The Pleiades star cluster in the constellation Taurus is one of a handful of objects in the heavens that never fail to amaze and inspire even the most experienced observers. As beautiful in an inexpensive pair of binoculars as in images from big professional telescopes, this star cluster presents visual observers an especially lovely sight with stars of an unearthly blue ensconced amid a faint frost of nebulosity

The Most Famous Star Cluster

Sometimes called the Seven Sisters, the Starry Seven, and the Seven Atlantic Sisters, the stars of this small dipper-shaped cluster take their names from the ancient Greek god Atlas, his wife Pleione, and their seven daughters. The star Atlas marks the handle of the dipper-shaped cluster. The stars Alcyone, Maia, Electra, Taygeta, and Merope form the small bowl. Near Atlas lies Pleione, his wife of mythology. The fainter star Sterope (sometimes called Asterope) forms an equilateral triangle with Maia, and the

star Celaeno lies between Taygeta and Electra. In the Mediterranean world, the cluster took its name from *pleiad*, the ancient Greek word for sail since its appearance in the morning spring sky heralded the beginning of sailing season.



The star names of the Pleiades

Most naked-eye observers can see six stars of magnitude 3.0 through 5.5 in the Pleiades – Atlas, Alcyone, Merope, Maia, Electra, and Taygeta. However, many ancient cultures from Europe to Japan to Australia once claimed to see seven stars here. The Greek poet Aratus in the 3rd century B.C. wrote, “*Their number seven, though the myths oft say, and poets feign, that one has passed away.*” Some speculate that Pleione, a short-term variable star, may have shone brighter in classical times. A more recent explanation, based on star motions measured with the European *Gaia* space telescope, suggest Atlas and Pleione were long ago more widely separated and easier to resolve into two distinct stars with the naked eye. It may be, however, the confusion about the number of stars in the Pleiades may come down to a matter of the visual acuity of the observer. Modern stargazers with very dark sky and excellent vision can spot nine or ten stars in total. Some claim to see as many as 18!

As such a prominent star cluster, one that lies near the ecliptic, the Pleiades has been known since the dawn of history by cultures all over the world. A study of the mythologies based on these stars and their appearance in literature around the world make for fascinating reading. Some examples:

- Polynesian peoples called them *matarii* or *matariki* (“little eyes”) and held they were once a single star split into six during a battle among the gods
- Medieval northern European cultures, including the Vikings, presumably occupied with the essentials of life rather than poetry, called them the ‘Hen and her Chicks’
- Kiowa and Cheyenne of the American great plains believed these stars were seven maidens placed into the sky and protected from harm by the Devil’s Tower (in Wyoming)
- Finnish and Lithuanian stargazers saw them as a sieve or net (in Tolkien’s *The Hobbit*, they were called “The Netted Stars”)
- The Quechua and other cultures in the Andes called them the ‘Storehouse’ since their appearance in the morning sky (in May) coincided with harvest time
- In Japan, these stars were called *subaru*, which means unity (the Subaru car company was named when five smaller firms merged into a larger sixth firm, Fuji Heavy Industries).

In Canada, these stars were known to the Blackfoot First Nation as the ‘Orphan Boys’, fatherless boys rejected by their tribe and befriended by a pack of wolves who became their only companions. The boys found the sadness of their lives hard to bear, so they asked the Great Spirit to let them live and play together in the sky, so he placed them there as a small cluster of stars. As a reminder of their cruelty, the cruel tribe members were disturbed every night by the howling of the wolves who missed their lost human friends.

The Pleiades is visible in the evening hours from December through April, and observing the cluster requires no particular knowledge or experience. Spectacular with or without optics, the Pleiades look best in a small wide-field telescope at low magnification that can take them all in with enough surrounding sky to frame them nicely. An 80mm refractor shows about 80-100 stars. Look for close pairings of stars, especially Asterope, Atlas and Pleione, Taygeta, and a faint pairing near the center of the bowl. Any decent pair of binoculars also give a spectacular view.

Physically, the Pleiades are quite young. With an age of 100 million years, the cluster still contains many bright blue and blue-white stars. There are a few more evolved stars that have swelled and turned yellow or orange. A white and orange pair, ADS

2755, can be seen in the bowl of the dipper. And a 6th-magnitude orange star is visible about 0.3° north of the bowl.

Look also just south of Alcyone for a lovely chain of stars that turns south-southeast.

The last two stars in the chain appear orange or yellow orange. The first star in the chain is the fine double star Struve 450 (Σ 450). The primary is magnitude 7.3 separated by 6.1" from the 9th-magnitude secondary. A small scope at 75-100x should split the pair nicely. The star Sterope is also a widely-split pair, just barely split without optics by keen-eyed observers. Taygeta is also a wide double. The primary is magnitude 4.3, while the secondary, some 69" north, shines at magnitude 8.3. Any telescope at low power can split this pair.

Images of the Pleiades shows a beautiful lacework of nebulosity around these stars, a result of the cluster passing by chance through a cloud of interstellar dust. Visual observers can see hints of this nebulosity in dark and pristine sky with a small telescope. The easiest patch of nebulosity appears around the star Merope. The Merope Nebula, or NGC 1435, appears frosty-white and just barely brighter than the background sky. It's sometimes confused with the effect of dew on a telescope's objective lens or mirror or eyepiece, so to make sure you're really seeing the nebula, move the telescope from the Pleiades to the Hyades and back. If you see nebulosity around the stars of the Hyades, you have a dew problem. If you only see a faint glow around Merope, you're seeing something real.

Like all open star clusters, the Pleiades will get buffeted and tugged by gravity from passing stars and gas clouds. Over the next few hundred million years, its stars will get pushed out of the cluster and make their way around the Milky Way alone

Geminids Meteor Shower 2024

The Geminid meteor shower is the strongest shower of December each year. Before 1983 the object that caused the debris stream was unknown. Phaethon was discovered in Draco on October 11th, 1983, by John Davis and Simon Green using IRAS (the Infrared Astronomical Satellite) The object first known tentatively as 1983 TB until it received its permanent designation as 3200 Phaethon. It was moving in an orbit that closely matched the orbit of the Geminid stream. The orbit takes Phaethon close to the Sun with an orbit period of 1.4years.

Meteor streams tend to come from comets and this object has not shown any cometary activity at all, neither coma nor tail, since it was discovered. Most scientists now believe that Phaethon was once an active comet, but that the repeated close encounters with the Sun caused it to lose its cometary material leaving only its rocky core. Others have the theory that Phaethon is indeed an asteroid and that pieces of it fall off each time it passes close to the Sun. In fact it is about one seventh the distance between the Earth and the Sun at its closest point. It is possible that at such a close distance small pieces of rock would leave the asteroid adding strength to the Geminid stream.

The discovery of Phaethon was a highlight of a long story. In the 1950s it was suggested that the parent comet was once in a very different orbit. It was thought to be possibly connected to the big comet of 1680 on a parabolic orbit. Later, comet discoverer L'ubor Kresak suggested that the orbit of the Geminids did not get perturbed into its present Earth crossing orbit, and that the comet should be somewhere in the same orbit as the debris stream. In October 1983 the discovery of Phaethon proved him right.

In 2023, Cukier used data from a Nasa spacecraft called the Parker Solar Probe to learn more about this process. Parker had surreptitiously observed another section of the Geminids debris stream in space in 2020. Using these observations, Cukier concluded that the Geminids likely came from a single violent event, rather than being a continuous release of debris like a comet.

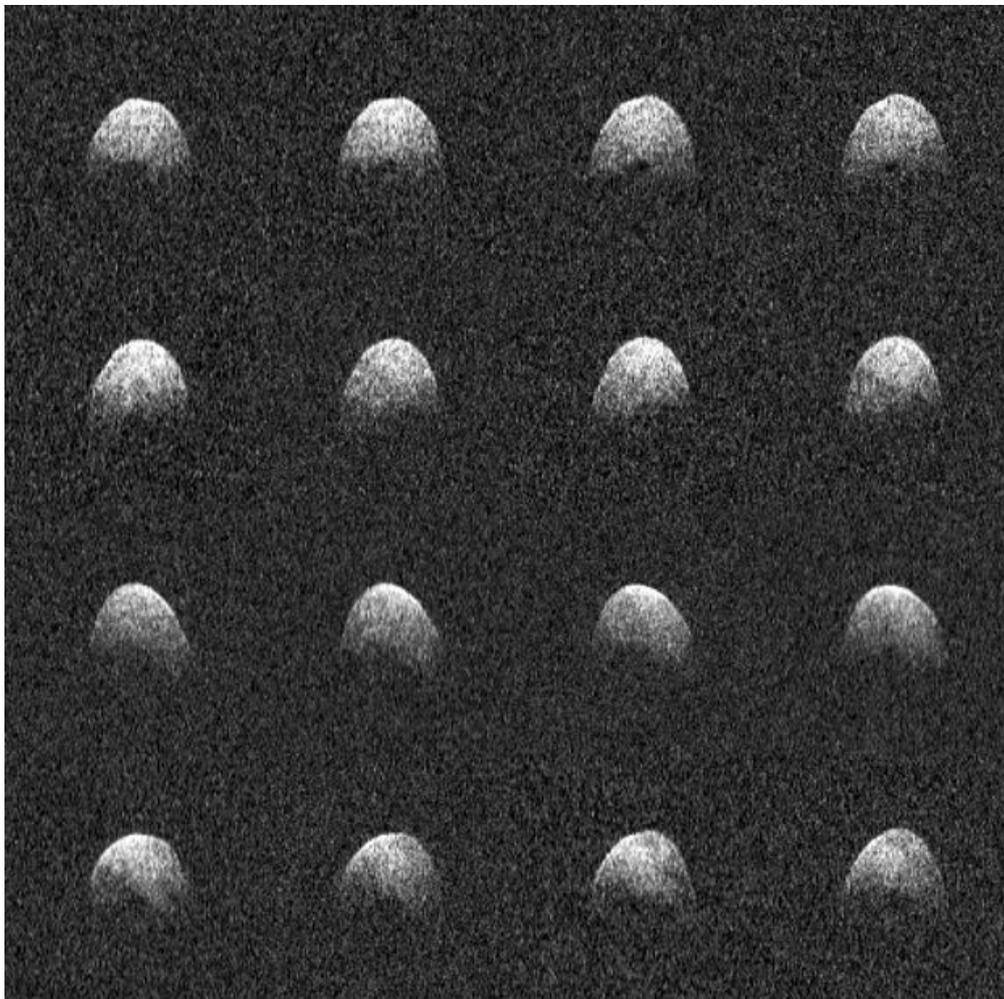
That event might have been a "low speed explosion", says Cukier. "As asteroids get close to the Sun, they get hot, and that causes thermal stress inside the asteroid. If they get too hot, that stress might build up to a point where the asteroid fragments apart into a bunch of pieces."

Another possibility is the asteroid broke apart because of its spin. Phaethon currently rotates once every 3.6 hours, which is "really fast" says Qicheng Zhang, an astronomer at Lowell Observatory

in Arizona, possibly a result of the Sun heating its surface and imparting rotational speed as radiation flies off the surface, known as the Yorp effect.

In 2023, Zhang observed sodium being emitted from Phaethon, which could be linked to this process. "It could have lost a bunch of its surface as pieces of it spun off, exposing fresh sodium underneath," he says.

Researchers at the Johns Hopkins University in Baltimore, Maryland, suggest that Phaethon may still be losing tiny amounts of its surface every time it loops back close to the Sun. They say the blue-hue of the asteroid is due to extreme heating during its closest approach to the Sun, which they estimate causes a microscopic layer of rocky material, iron oxide and pyroxene to sublime off its surface.



The asteroid 3200 Phaethon, shown here in a number of radar images, is thought to be the parent of the Geminid meteor shower (Credit: Arecibo Observatory/NASA/NSF)

Observations of the 2024 shower

Visual observations were not possible due to the cloud cover and the Full Moon which, had the skies been clear, would have made observations difficult. The All-Sky camera recorded no meteors.

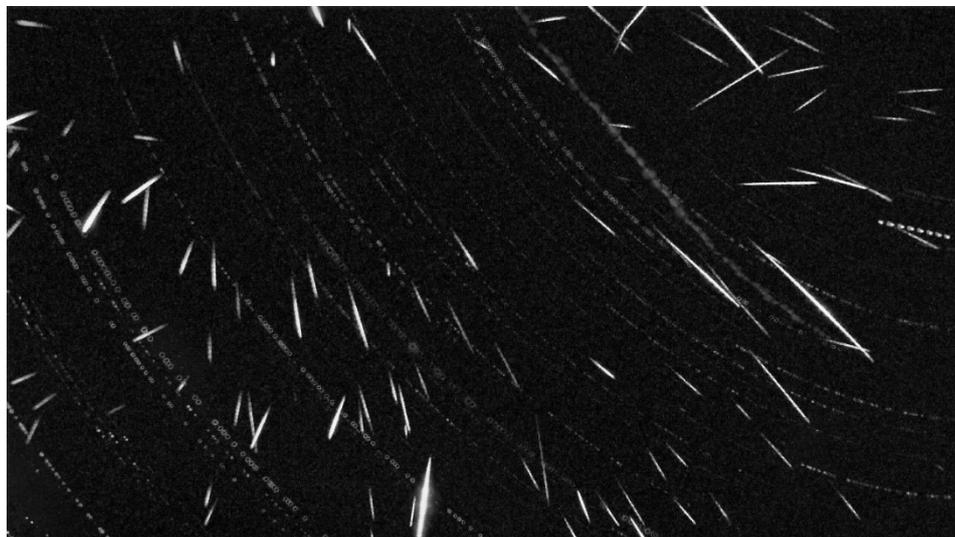
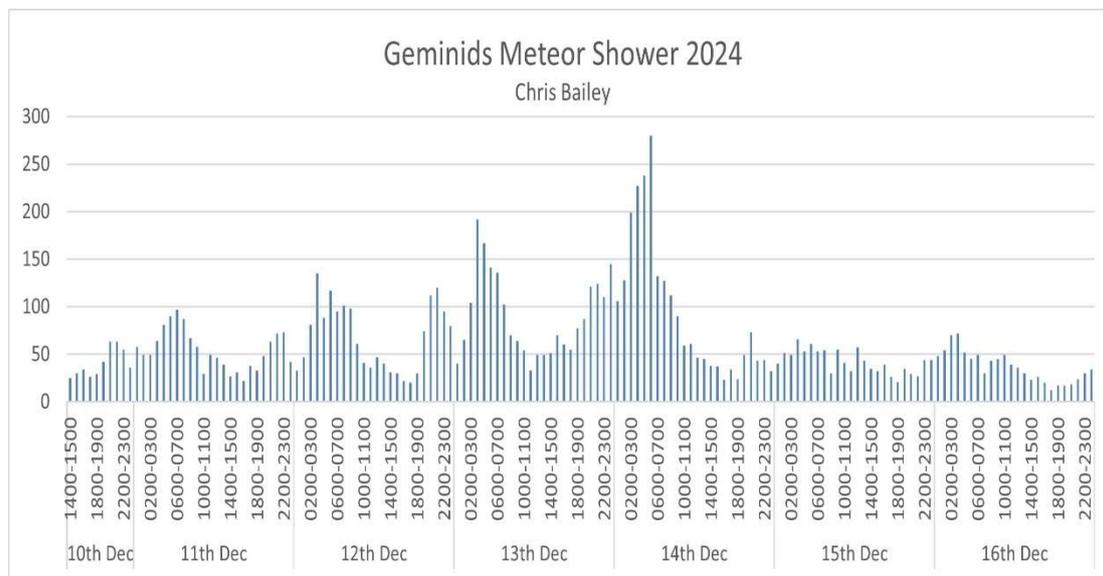


Image from previous year.

Radio observations were again centred on forward scatter radar using the GRAVES transmitter near Dijon France. One problem that is building with time is the serious interference and false echoes from Starlink Satellites. Automatic counting of the echoes is no longer possible (I have tried for comparison and there is an overcount of over 20% against careful manual counting.)

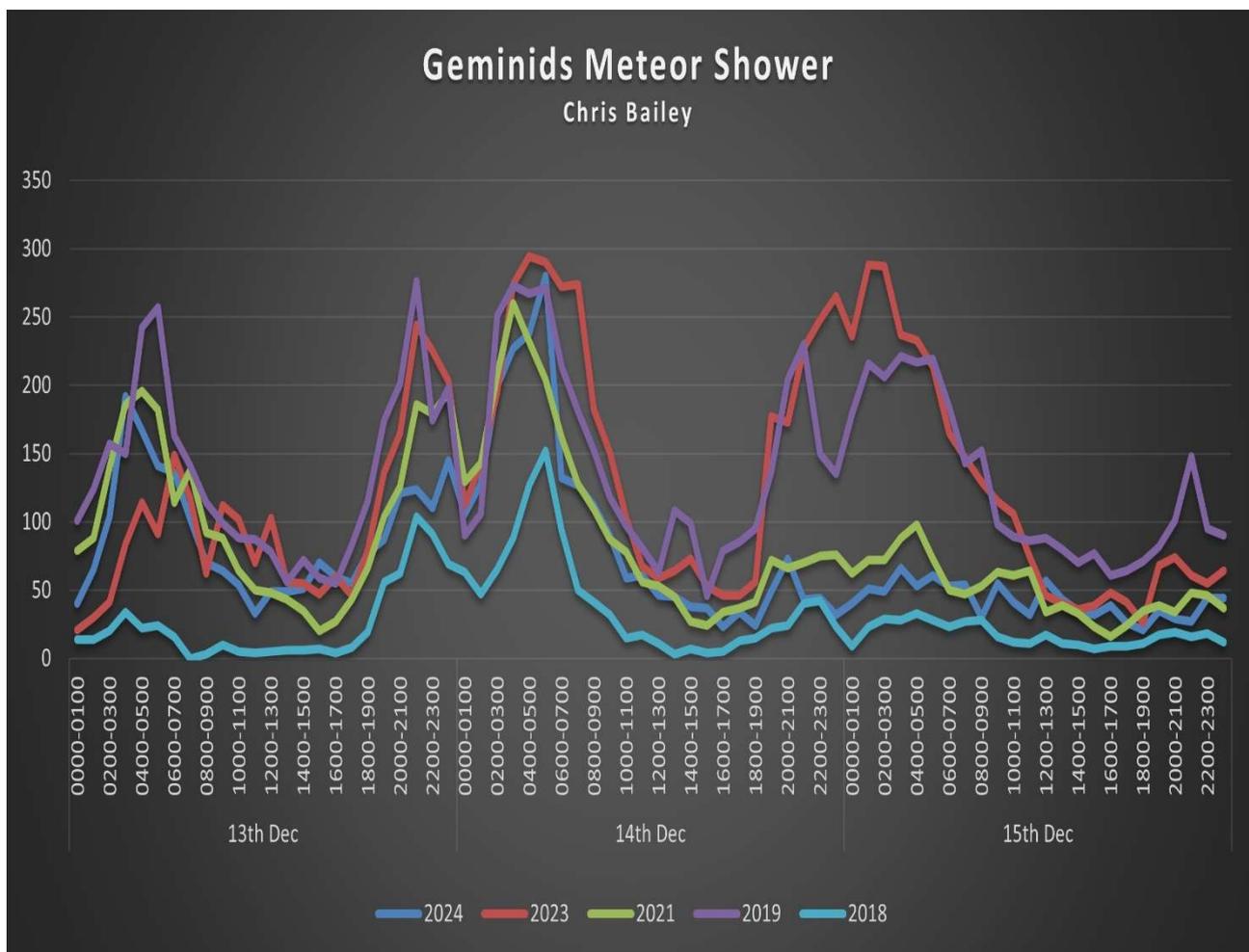
Below are the results obtained for the period 10th to 16th December 2024.



It is always good to compare the recordings from different years. I cannot find the figures for 2020 and 2022 so have used 2019, 2021 & 2023. 2018 has also been included for the peak days but as these were taken with a different setup they may have a different sensitivity. 2019 had a higher

number all together and the peak appears to have built up earlier, but what I find an interesting comparison is the similarities between the two profile shapes. The double peak 13th-14th shows each year, and the peak on 14th-15th was not present again this year as it was in 2023 and 2019. Will be good to see a few more results to see if the trend continues. Research into the makeup and breakup of Phaethon may give more clues to the differences.

It is possible that I removed too many Starlink suspected echoes but it is also possible that it is just a slightly less active year. 2023 follows 2021 closely and taking sporadic meteors (not from the Geminids) into account there is very good correlation.



Also monitored was the UK meteor beacon, but not too many were detected. I need to improve the antenna arrangement and then try again with future showers. It will make an interesting comparison although being a much lower power will probably never have the same coverage.

VLF recordings were not taken due to local interference.

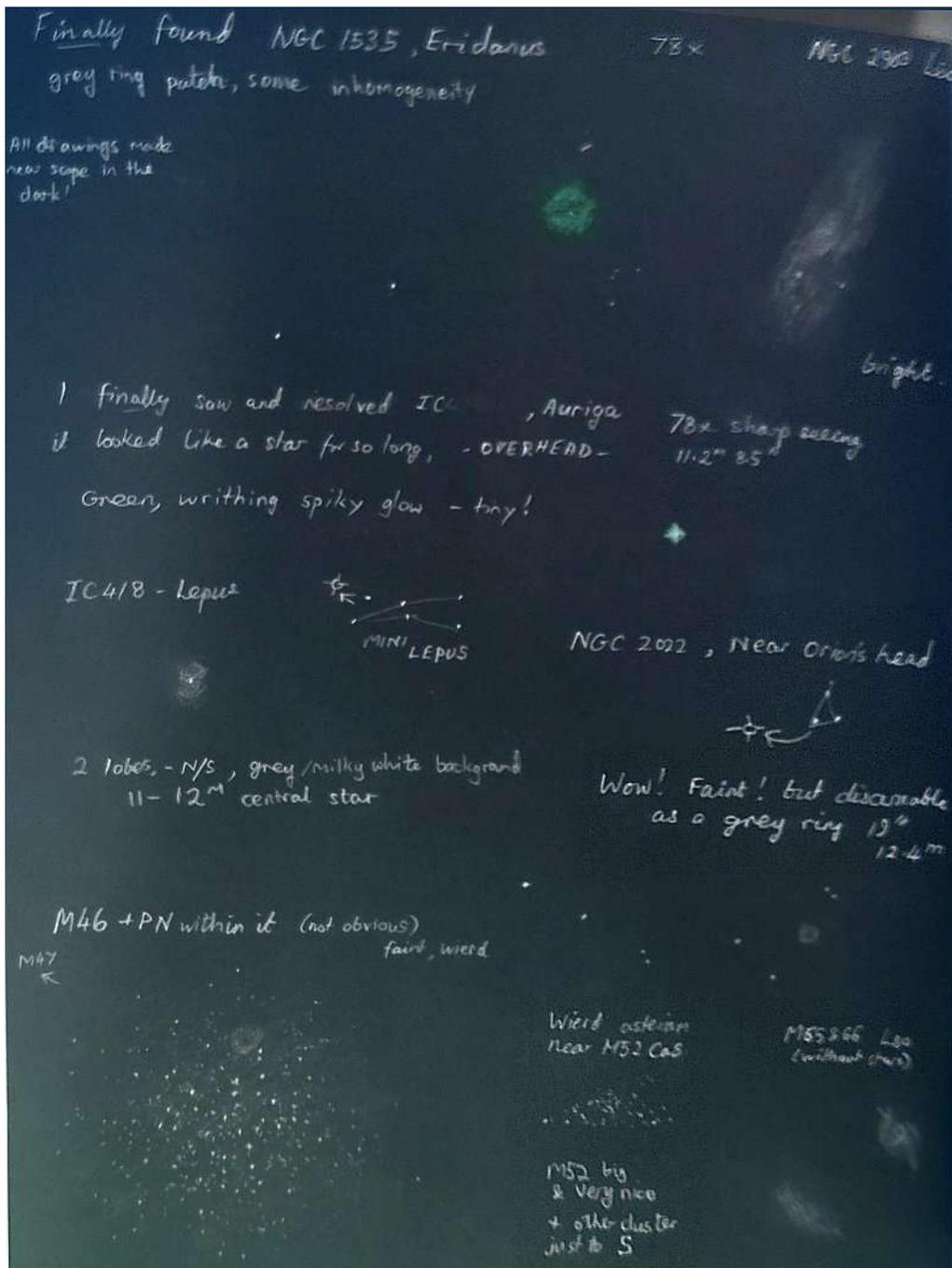
So, let's be happy that we live in the short period of time when the Geminids are so strong. As their orbit slowly perturbs, in a century or so we may lose the Geminids, and there is also the risk of being hit by Phaethon as it has a crossing orbit with our own. It is estimated from observations that Phaethon is about 3 miles wide!!

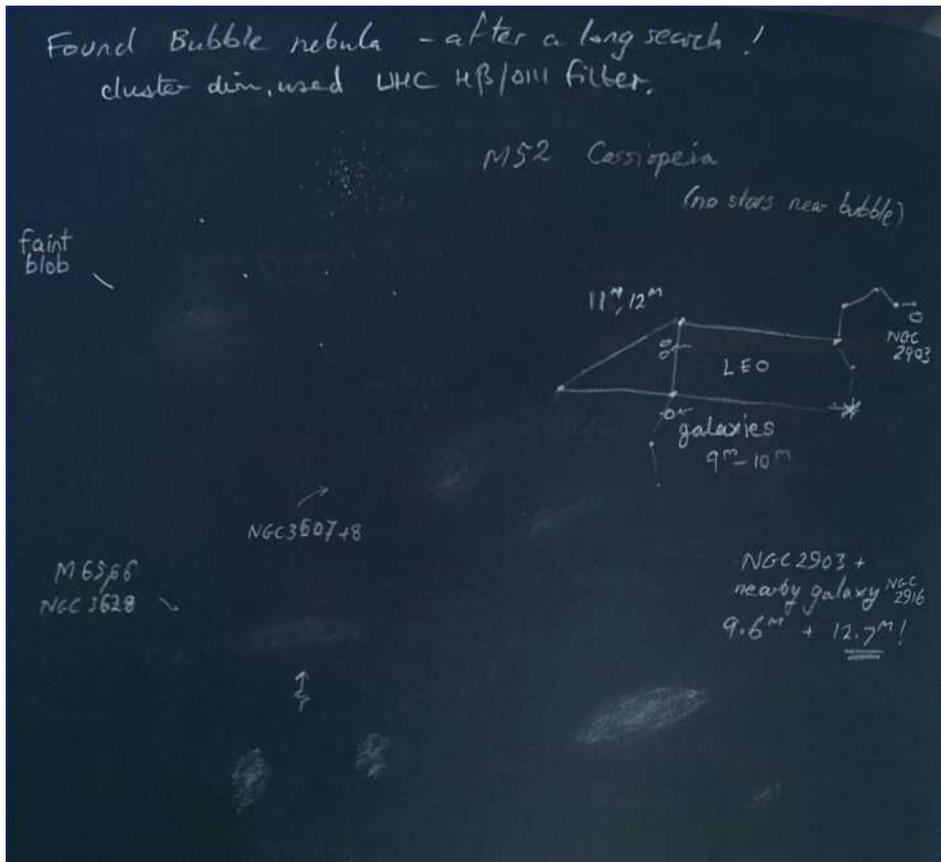
Chris Bailey

Sketches and Observations of Winter Sky Objects

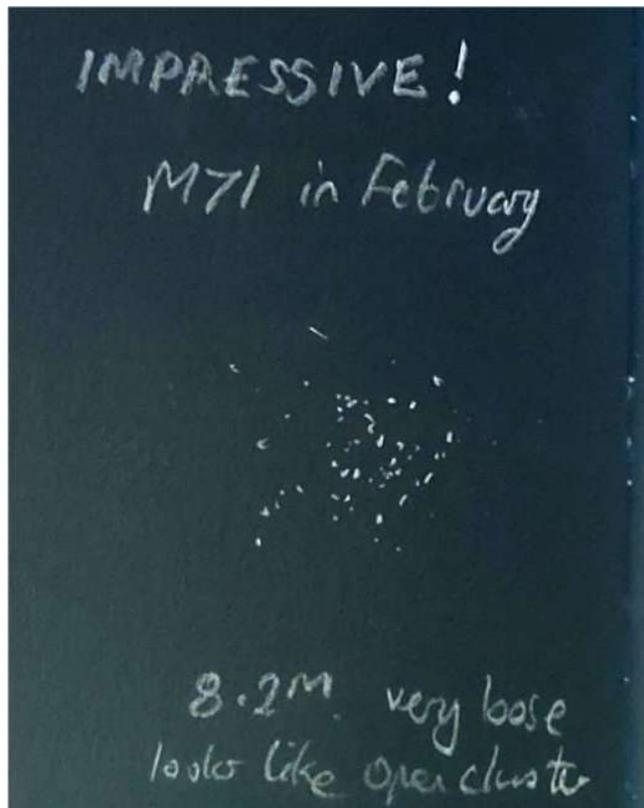
Dan's Notebook

Hopefully this stuff will tell you what to try to look at and what to expect to see when finding stuff in the night sky. It takes a lot of learning, and the best way is to find an object and test out your equipment. A most satisfying hobby though it does require some ability to resist sleep and cold tolerance!





Some of Leo's galaxies – they may just look like smudges after a lot of looking...be patient.



M71 is in a summer constellation but I saw it in February. It is much brighter than I expected.

Good night?
 Blue Snowball
 Rosette nebula
 could see!!
 better
 with
 filters
 h&X lovely
 as usual.
 tried M42 binoculars 7x
 with LPR filter on one eye
 and UHC filter on other
 could see a 'blob' in Auriga's
 'Flaming star nebula' centre
 California nebula? - just!
 Lunicon UHC shouldn't accept cone angles < 5/6 ish

M76

nice!

Cone
 nebula
 impossible

M46 planetary
 stands out more with filter

M57 - stands out more with filter.

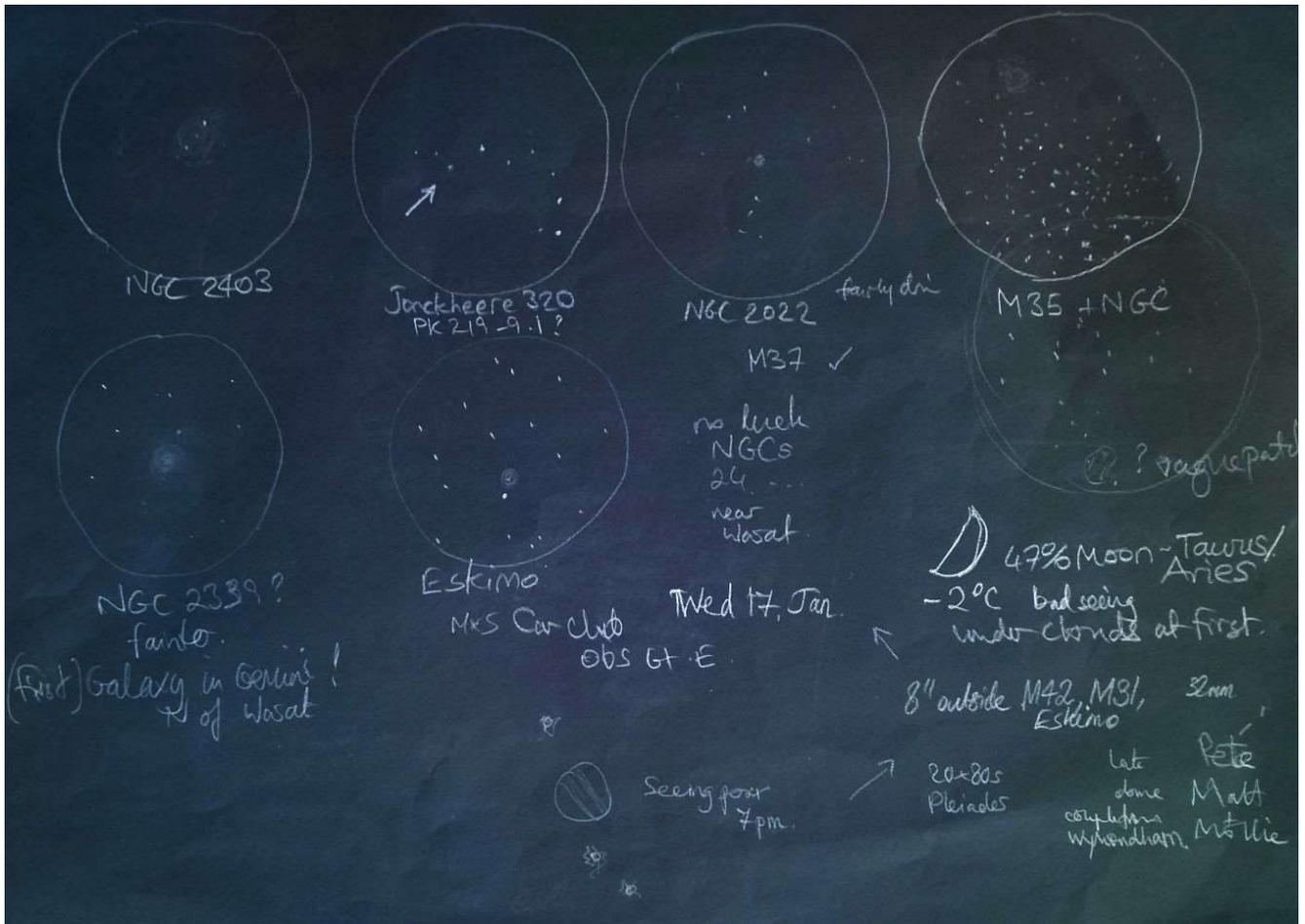


held over
 eye cups

8th February 2100-2300 GMT Good night! @ G&E (Fri)
 Helix still visible just in Poseus 5^m naked eye Mars - 0.4^m orange red
 Saturn (Leo) + 0.7^m distinct
 M35 Gemini fuzz
 ↑ Mars good near Et Nath
 M34 Perseus. 4-5^m fuzz
 Algal *
 hex Posei 4^m fuzz saw as double!

See if you can find some of those objects when it next clears. It is a joy to see such heavenly mysteries. There is something very awesome about encountering them.

I will also leave you with another page of sketches I made after and during a session where a group visited the observatory last winter, arranged by Mick. It was cold, and very, very clear. Nice hard icy ground and none of that squishy mud. Feel free to zoom in – this was with a moon in the sky too but it set and got even better.



Dan Self

Pro-Am Working Group

Calling all Amateur Astronomers,

As you may recall, last year, you completed a survey expressing interest in collaborating with professional astronomers from the International Astronomical Union (IAU) on various research efforts. The newly launched IAU Pro-Am Research Collaboration (PARC) initiative promotes and facilitates research initiatives between amateur and professional astronomers. We invite amateur astronomers from around the world to visit the PARC web portal, explore the “Active Projects”, and sign up to participate in those that are of interest to you.

PARC Web Portal LINK - https://www.iau.org/science/scientific_bodies/working_groups/professional-amateur/

Please note that new projects will be added as they are proposed by professional astronomers and approved, so be sure to visit the PARC web portal regularly to explore new opportunities.

In addition to these research opportunities, the first PARC workshop will take place in person in Mumbai, India, December 1-3, 2023. This is a great opportunity for amateurs to learn about new projects, tools and techniques, and to meet other amateurs and professionals interested in research collaborations. Please visit the link below for more information and to register for the meeting.

PARC Meeting LINK: <https://khagolmandal.com/ProAm2023.html>

Thank you so very much for your time and consideration, and please share this invitation with others who may be interested. We are looking forward to your participation! If you have any questions, please direct them to Tim Spuck at tspuck@ui.edu or Aniket Sule at aniket.sule@gmail.com.

Best wishes,

Tim Spuck, Pro-Am Working Group Co-Chair
Aniket Sule, Pro-Am Working Group Co-Chair

Members Astro-photographs.

Dan Self



Abell 24 Planetary Nebula Canis Minor 20" Observatory telescope.

Processed in Siril



NGC2022 N Orion crop 10X 30sec



Keyhole nebula Orion Just below M42 5 X 30secs

20" Observatory telescope

Andy Weller



Crescent and Tulip Nebula with all the dense Ha clouds that are in this area

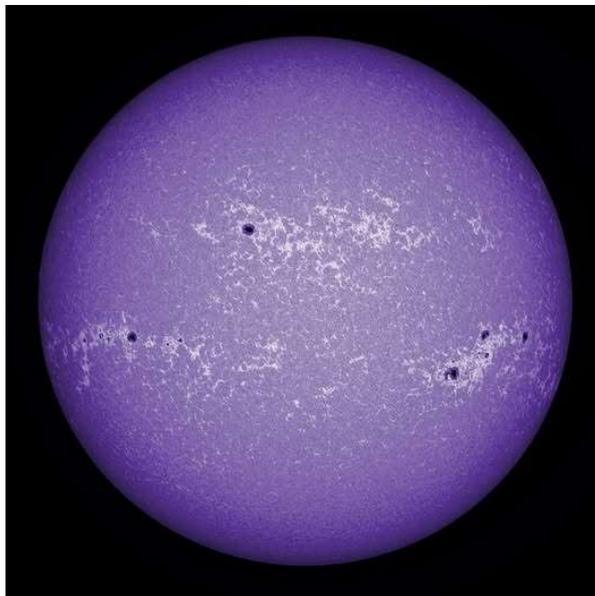
It is a 2x2 SHO Mosaic.



Wizard Nebula

Roger Hyman





Calcium-K
William Optics GT71
Lunt Calcium K B1200
ZWO ASI174mm
Skywatcher SolarQuest mount.

Pat Goddard





Malcolm James Dent



LDN 1173 is a dark nebula, a dense cloud of interstellar dust and gas obscuring the light from background stars. It's located in the constellation Cepheus

This project has been several months in the making with just over 13 hours of data captured using special filters tuned to capture just ionised hydrogen gas and Oxygen. Delicately processed to reveal some truly amazing structures.

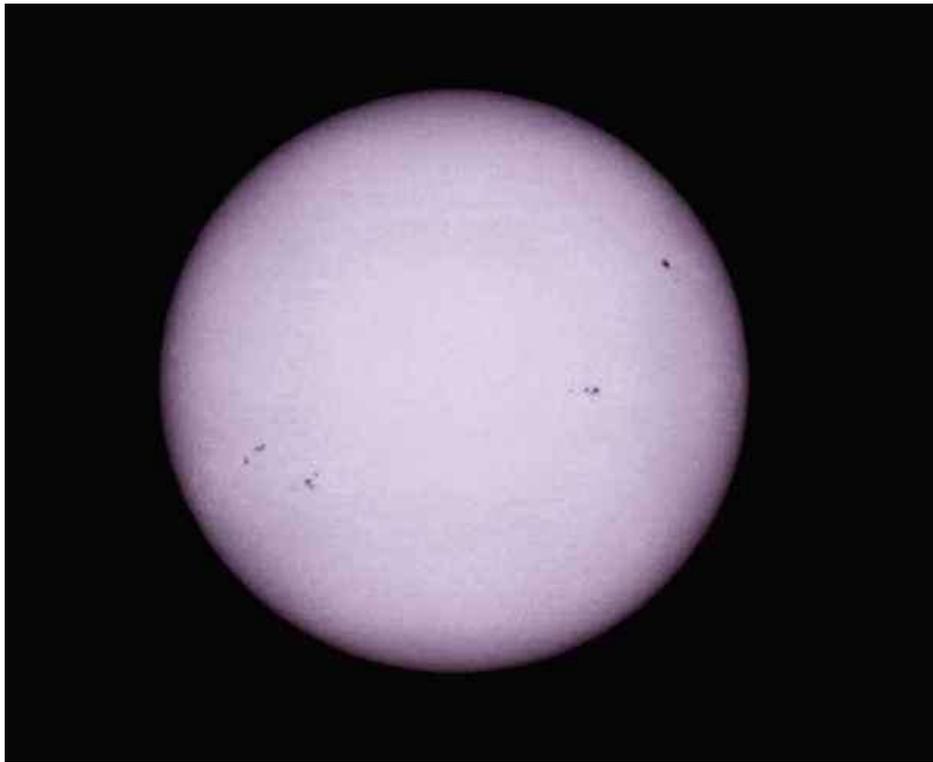
David Bryant





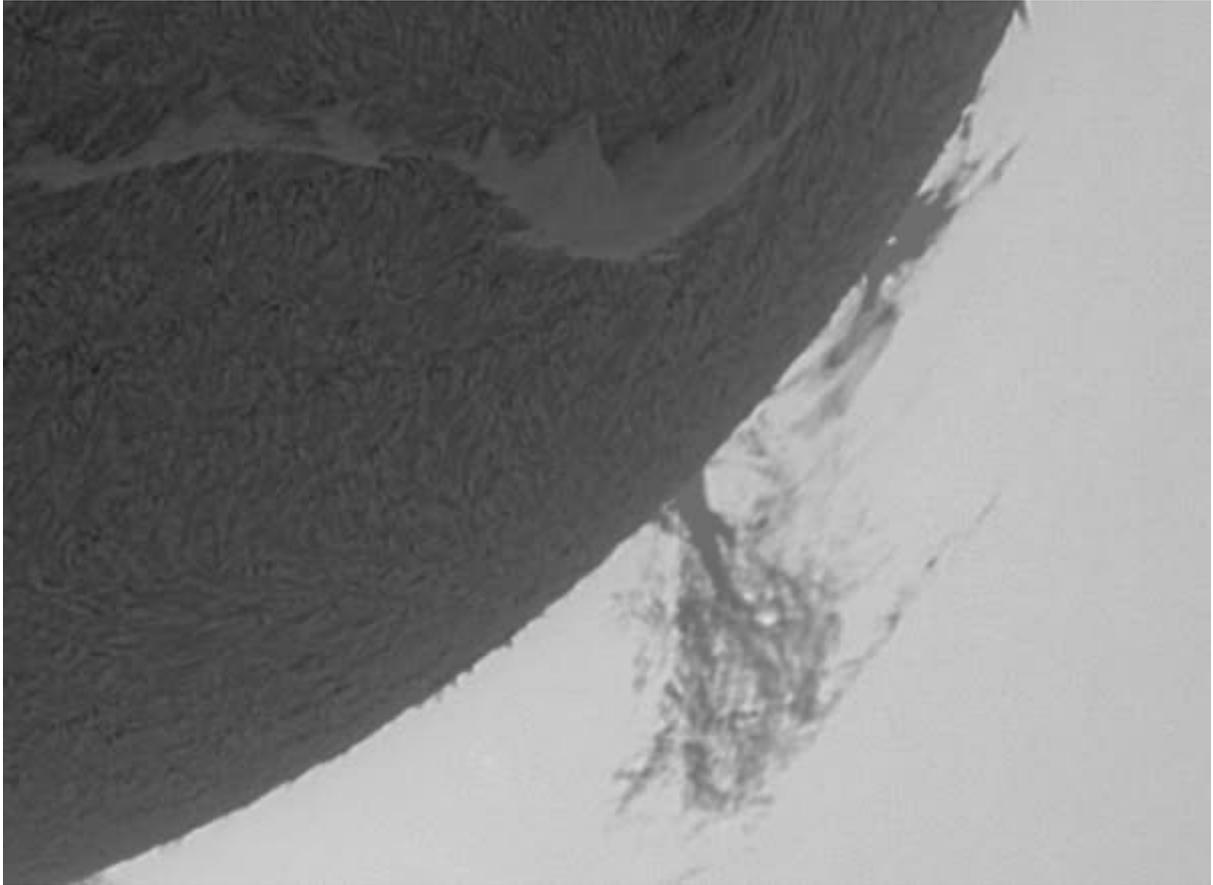
Moon and Mars





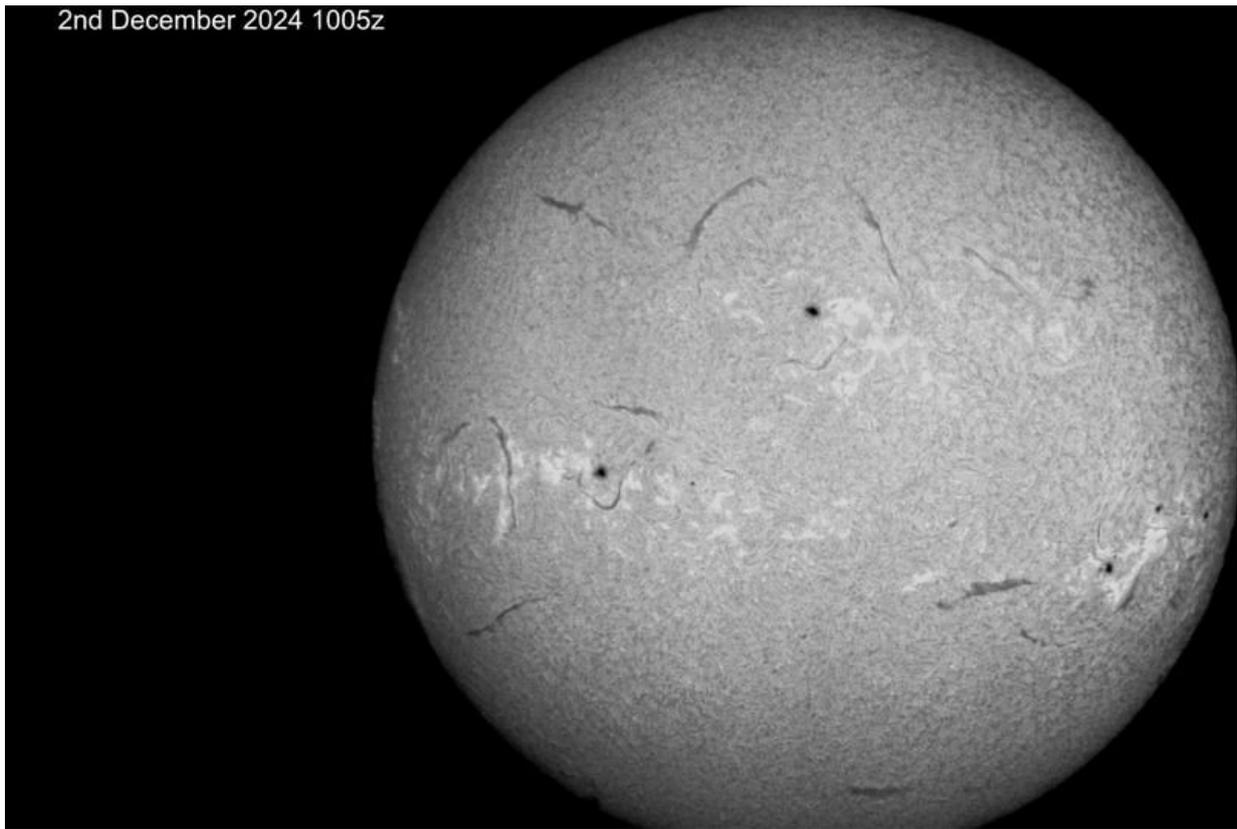
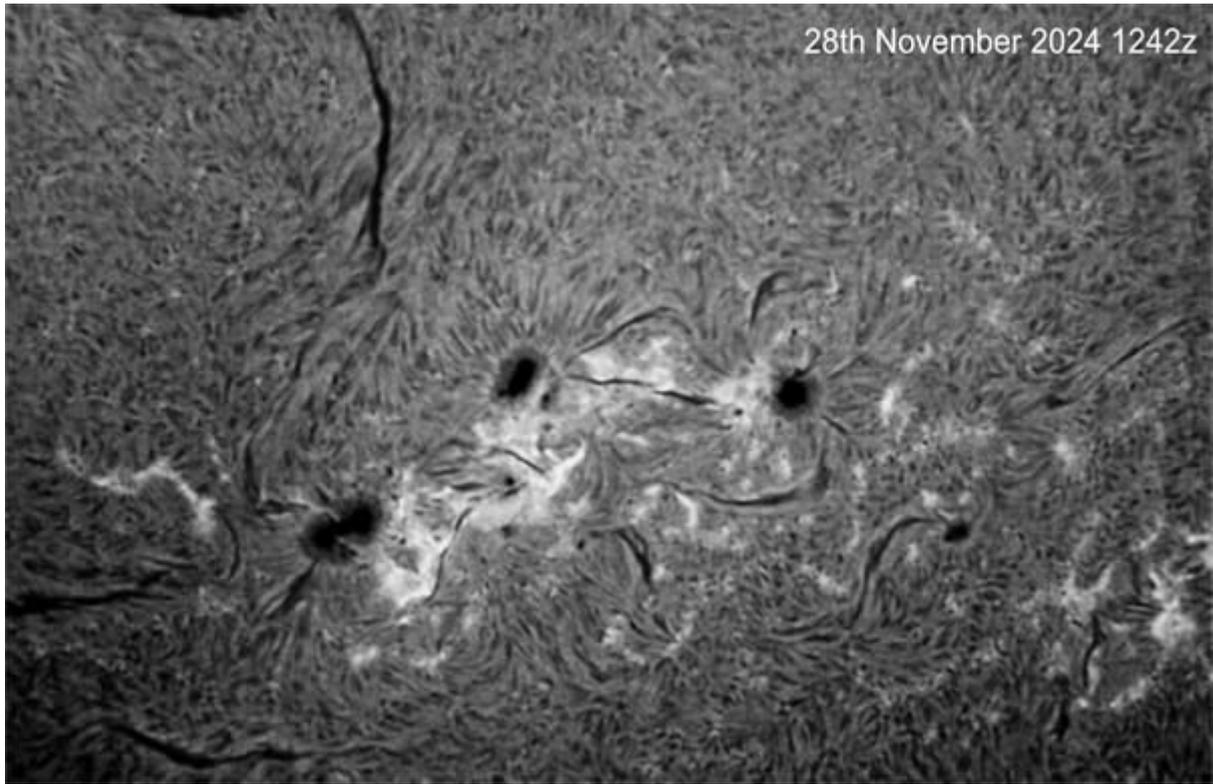


Chris Bailey

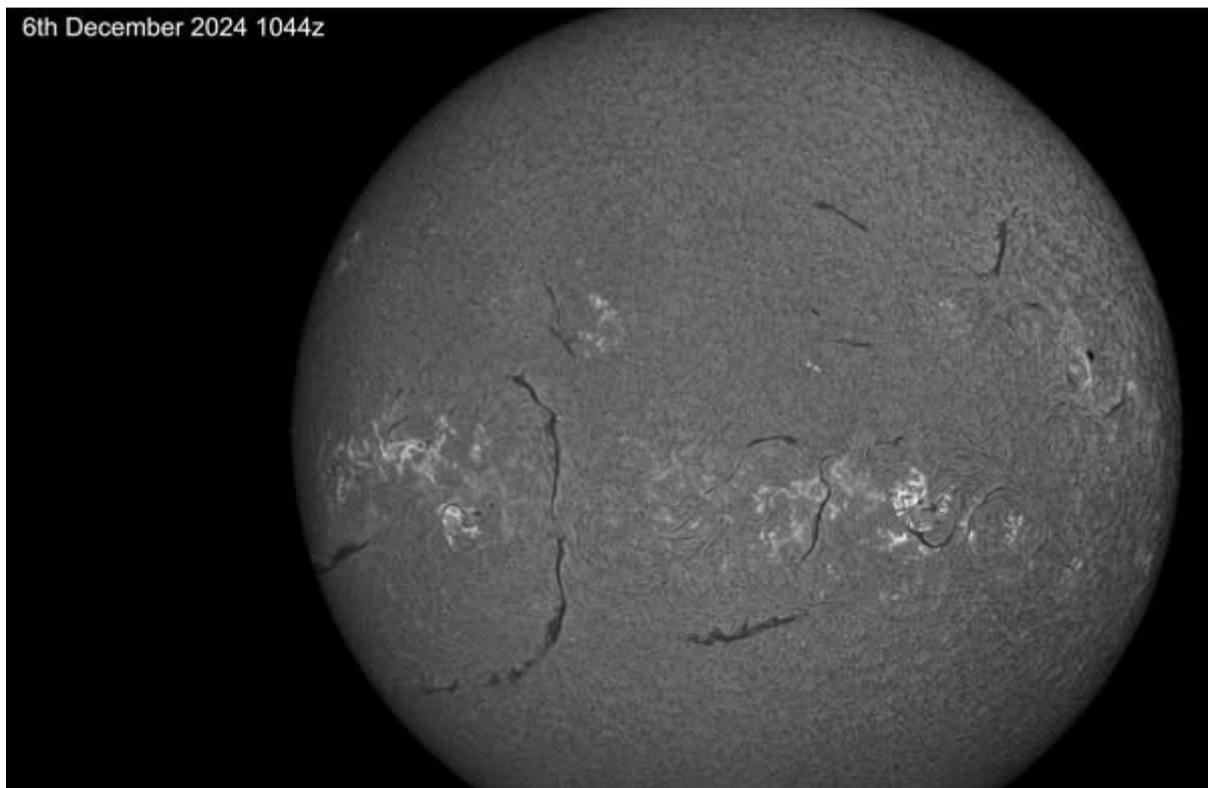


20th November 2024 1007z





6th December 2024 1044z





BRECKLAND ASTRONOMICAL SOCIETY

Charity No.1044478

www.brecklandastro.org.uk

Affiliated to the British Astronomical Association and the Federation of Astronomical Societies

Dr Dan Self, Chairman, 56 Lindley Street, Norwich, Norfolk, NR1 2HF.

07734 364667 chairman@brecklandastro.org.uk

OBSERVATORY RISK ASSESSMENT 2024

This policy document applies to the aforementioned charity and covers all instances of normal use of the observatory building and equipment within it. All other statements of intent are laid out in the society's constitution.

The purpose of the society (Breckland Astronomical Society) is to promote and to advance public education in the Science of Astronomy and all branches of scientific research and in so doing the following policy statements are necessary.

Persons visiting are members and public of all ages by pre-arrangement, or on public open nights.

Section 2 - Risk Assessment

Hazards <i>(The visit leader must identify any additional hazards relevant to the planned activity where applicable)</i>	Risk Control Measures	Outcome risk rating
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For external parties: Safety whilst travelling to observatory.	Responsibility is with individual regarding transport.	Low
Lost people	A nominal roll should be available for parties with minors. Stay in groups and count in and out, especially risky when young children running around on dark field. Responsibility with teachers/akelas.	Tolerable
Pre-existing medical conditions	Visitors have been asked to bring with them anything they need with regard to medicine/ first aid training. DS is first aid trained as part of job.	Tolerable
In the Observatory: Moving the telescope dome - Mechanical hazard from cogs and metal clips on dome motors and sliding parts. Falling from dome.	Supervision is necessary to prevent visitors' fingers being caught in dangerous places before moving. Train supervisors. Gears are located in inaccessible places. Signs to keep head out of opening while moving it. Failure of clips holding very difficult due to strong fastening.	Tolerable Tolerable
Electrical hazards	All electrical circuits are protected by RCD trip switches, which have been checked. Equipment should only be used by trained demonstrators as PAT testing is not viable.	Tolerable
Light intensity from laser pointer, bright LEDs	A low power class 2 laser can be used to collimate scope, this should not be used during visits. An upper end- class 2 green laser is sometimes used for pointing out stars outside. This should NOT be pointed near people, or planes, only switched on briefly and used by supervisors/demonstrators only. Laser is currently broken.	Low
Skin contact with dangerous chemicals	Fly spray, propanol, and cleaning fluid kept in cupboard in small quantities. Keep cupboards shut when visitors are present and supervise.	Tolerable
Standing in dome - Falling (height is 7 feet)	Shutter opening is guarded by 2 bars at child / adult heights. Limit numbers in dome 7 + supervisors can easily fit.	Tolerable
Standing in dark places - Stumbling in low light	Use dim red lights on floor to preserve night vision. Dim lights gradually.	Low
Climbing ladder in dark - Falling while viewing through telescope.	Ladder must be shown to people first, but enough light is available. Check for mobility difficulties. Note ladder has straps tying it into an A shape that can become invisible in the dark. Space is limited.	Tolerable
Ascending stairs - Falling or being hit with trap door	Be sure demonstrator to go up first and lock door open. A knocking procedure is known if the door is shut. The door is heavy and familiarity with how to slide it open safely is essential. Tiredness can be a factor – do not rush around in the dark. Awareness of some risk. Especially when children are present, young children can explore.	Tolerable

Fire risk	Large items are not flammable. Mainly metal fixtures and fittings. Sources of ignition (sparks) are contained in electrical equipment. Flammable gases are not kept in building. Radio linked smoke alarms installed. Fire extinguishers available and annually checked. Call 999 in emergency. Can exit via dome opening in emergency.	Tolerable
Standing in dark cold field - frostbite	Weather could be freezing at this time of year. Warm clothes have been advised before trip. Heaters indoors if cold and keep a blanket at the observatory. Trip hazard in dark. Torch guidance will be provided but is limited because of dark sky observing.	Tolerable
Safeguarding risks (under 18s)	Two adults should be available at all times. DBS checks should be in place for those leading the visits. Visits shall be arranged in advance and parents and guardians should be aware of their childrens' location. Visit leaders should have numbers to call. The organisation that runs the observatory, Breckland Astronomical Society, operates a safeguarding policy. The committee are vigilant with regard to risks.	Low
Viral Airborne Transmission indoors	Observatory is well ventilated. Open shutter and main door. Wear mask if you have tested positive for Covid + avoiding coming is best. Limit numbers to 20 youngsters plus supervisors and accompanying adults due to limited space. Split group and provide outdoor activities, electronically assisted astronomy may be an option.	Tolerable – as an outbuilding and lack of seals on doors, there is very good ventilation.
Outdoor transmission	Risk is low but be mindful of face-to-face breath transmission.	Tolerable
Surface transmission	Keep all surfaces clean especially toilet. Use kitchen area for paper towels. Limit to one in kitchen/bathroom area due to space. Wash up cups after use with washing up liquid and water heater.	Low
Reporting	Sign in for track and trace purposes not needed but will keep own records. Not compulsory to sign in and out since 2022.	N/A

Trustees as of 20/08/2024 are: Dr Dan Self ^{**}(Chairman), Keith Fowler (Treasurer), Richard Harmon, John Copsey (Secretary), Mark Humphrys. Trusted supervising members: Rebecca Greef*, Mick Ladner, John Gionis, Peter Farmer, Andrew Luck, Chris Bailey.

*DBS checked for day job. [†]First Aid trained for day job.

Signed.....

Chairman, Breckland Astronomical Society, UKCC 1044478.

For Sale or Wanted

This section is for the sale of Astronomical items and any wants from members. Details of items for sale (With photographs where applicable) should be forwarded to the newsletter editor at newsletter@brecklandastro.org.uk

It is suggested that a donation of 5% of the final sale price be given to the Society to assist with funds. If sellers do not wish to make their contact details public then please make this known to me and I will field any enquiries on a box number system. Please send any sales details to me before the 26th of the month for inclusion in the next issue.

Please ensure that if any item is sold by another means prior to publication that I am advised so it can be removed to avoid confusion.



Hi all, got a difficult decision to make. Since moving I have not used any of my astrophotography gear at all. Our new garden doesn't give me enough sky to do photography with a fixed set up and my equipment is too heavy to use as a portable set up, so I am thinking of selling all of it and getting something like a sky tracker for occasional use.

What I have is as follows

Skyshed Pier

Skyshed Extension

iOptron CEM40 and tripod

Altair 72 EDF

Guide Scope and camera

Hypercam 269C TEC Cooled Camera

Pegasus Powerbox

Pegasus auto focus tube

Reducer

Flatner

The new value of all this is in excess of £5000. Looking for £3000 ono

If you are interested, then please get in touch via e-mail Mickladner21@gmail.com

Equipment available for loan to Members

As well as our fantastic library members of the society can borrow our equipment. Here is an equipment list that can be used or borrowed by members, subject to personal responsibility for replacement value. Discuss your plans with one of the regulars first, as it is not easy for beginners to use some of this kit. We are here to help show you how to use it, when the weather holds up, then you will need to sign it out and get approval by a member of the committee. We can discuss a reasonable term.

Refractors:

William Optics Megrez 102 S.V. F7 D102mm f/7 and reducer to f/5.6 – this may be unavailable soon.
William Optics GT-102 2019 D102mm F703mm f/6.9
Vixen 4" Refractor f/9

SCT/Maks:

Celestron C925 Starbright F10 SCT FL D234.95mm F2350mm f/10 Refractor – preferably this should not be taken off the premises.

Celestron C8 SCT D203.2mm F2000mm f/10 Refractor (orange tube)

Meade LX200R SCT D203.2mm F2000mm f/10

Konus Motormax-90 Maksutov-Cassegrain 90mm F1200mm f/13 #1795

Meade ETX125 D127mm F1900mm f/15 Maksutov-Cassegrain Reflector

Mak-Newt:

Skywatcher 190MN DS Pro Maksutov-Newtonian Optical Tube Assembly D190mm F1000mm

Dobsonians:

Skywatcher Skyliner 200mm F1200mm Dobsonian Reflector

Helios D200mm F1000mm Dobsonian Reflector

8-inch Dobsonian (turquoise tube, hand-made)

Solarscope:

Coronado Solarmax 40

Meade 8x50mm Guide Scope

Binoculars:

Vanguard KR-7500 7X50mm Field 7 degrees Binoculars – a little out

Konus #2253 7x50 Field 6.8° Binoculars

Chinon RB Optics 8-20 x 50 HB Zoom Binoculars

Prinzlux 10x50 Binoculars – needs optically cleaning

Mounts:

Berlebach Planet Tripod with Double Clamps

Orange EQ4 telescope mount

Skywatcher SynScan EQ5 Equatorial Mount & Tripod

SynScan mount controller

Meade LXD German Equatorial Mount & Autostar Controller

SynScan mount controller

iOptron IEQ45 Mount and Pier

iOptron Go2Nova mount controller

Eyepieces:

Tele Vue Delos 17.1mm 2"
Antares Speers-Waler 4.9mm SWA Series 2 2"
Antares Speers-Waler 9.4mm SWA Series 3 2"
Meade Ultra Wide Angle 14mm 1.25/2"
Antares W70 Series 8.6mm
Meade Super Wide Angle 18mm 1.25"
Celestron 32mm Plossl 1.25"
Celestron 26mm Plossl 1.25"
Antares 17mm Plossl FMC 1.25"
Intes-Micro Q74 WA 21mm 1.25"
Orion (Or) Circle-T 9mm 1.25"
Vixen K 18mm 1.25"
Fullerscope K 25mm 1.25"
66 Ultrawide 20mm Long Eye Relief 1.25"
Or 6mm 1.25"
Plossl 40mm Multi-coated
Plossl 17mm Multi-coated
14mm (7mm 21mm) 1.25"
Super 20mm 1.25"
Soligor PE-6mm 1.25"
Super Plossl 32mm 1.25"
Lanthanum LV 2.5mm 45 degree 20mm 1.25"
Televue 2x Barlow 1.25"
Televue 2.5x Barlow Powermate 1.25"
2x Barlow Lens
Meade Teleneegative 2x Barlow 1.25"

Telescope accessories:

William Optics AFR-IV Adjustable Flatteners Reducer
Meade Zero Image-Shift Microfocuser
Meade 4000 Series f6.3 Focal Reducer
Meade 4000 series f3.3 CCD Focal Reducer with T-Adapter
Celestron Reducer/Corrector f6.3 (Model: 94175)
Tamron Adaptall-2 Custom Mount

Eyepiece accessories and filters:

Meade Electronic Eyepiece
Meade Illuminated Reticle MA12mm
Celestron Radial Guider (#94176)
Light Pollution Filter 1.25"
Meade #908 O-III Nebular Filter
Variable Polarizing Filter #3
Baader Planetarium Contrast-Booster Filter (#2458360) 1.25"
Celestron Colored Eyepiece Filters (#25 Red, #38A Blue, #47 Violet, #53 L Green)
Baader G-CCD Filter 1.25" (Cat: 2458470G)
Baader R-CCD Filter 1.25" (Cat: 2458470R)
Baader B-CCD Filter 1.25" (Cat: 2458470B)
Baader UV/IR Cut/L-Filter 1.25" (Cat: 2459207A)
Baader H-alpha 7nm CCD Narrowband-Filter 1.25" (Cat: 2458382)
Baader O-III 8.5nm CCD Narrowband-Filter 1.25" (Cat: 2458435)
Baader S-II 8nm CCD Narrowband-Filter 1.25" (Cat: 2458430)
Baader H-beta 8.5nm CCD Narrowband-Filter 1.25" (Cat: 2458425)
Astronomik L-RGB Type 2c Filterset 1.25" (4 filters, Cat: 10220125)
Astronomik CLS-Filter 2" (Cat: 10213200)
Astronomik CLS-Filter 1.25" (Cat: 10213125)

Astronomik CLS CCD-Filter 1.25" (Cat: 10208125)
Star Analyser 100 (Model: PHEL-SA100) – produces spectra

Cameras:

Atik Focal Reducer 58mm
Atik 383L + FW 1 1/4"+Filters
Atik Infinity Camera
Atik 314L+ CCD Camera (SNI1003041)
Atik One 6.0 Monochrome CCD Camera (SN: 1191452-0093)
Atik 460EX Color (SN21223-26)
ZWO ASI290MM Mini USB 2.0 Monochrome Small Format CMOS Camera
Imaging Source DBK21AU618.AS 640x480 USB2 planetary camera
STV ('vintage video CCD AV camera) and Filter Wheel
Astrovid 2000 ('vintage' CCD camera)
Nikon D100 DSLR
Sigma EX DG Macro 105mm 1:2.8 DLSR Lens
Geoptik CCD Adapter x Canon (Model: 30A189)

CONTACTS

Chair Dan Self
Contact chairman@brecklandastro.org.uk

Observatory/Visits Mick Ladner
Contact visitors@brecklandastro.org.uk

Webmaster Andrew Luck (temporary)
Contact webmaster@brecklandastro.org.uk

Newsletter Chris Bailey
Contact newsletter@brecklandastro.org.uk

Membership/Treasurer Keith Fowler
Contact treasurer@brecklandastro.org.uk

Secretary John Copsey
Contact secretary@brecklandastro.org.uk

Please check with any of the contacts in bold before visiting the observatory. Please ensure you are wearing appropriate footwear and clothing and bring a torch (preferably one showing a RED light)

Breckland Astronomical Society Events – 2025

7:30pm Great Ellingham Recreation Centre, Watton Road, Great Ellingham, Attleborough, Norfolk

between NR17 1HZ and 1HX **£3 adults £1 children** *what3words: octopus.vibrates.hubcaps*

Friday January 10 th	Astronomy Equipment Session: Demos & short talks on equipment and producing stunning images	Dr Simon Bennett FRAS Malcolm Dent Dan Self
Friday January 31 st	Public Open Evening	Observatory 7:30pm
Friday February 14 th	All about the best images from the James Webb Space Telescope	Dr Robin Catchpole IoA / Greenwich
Friday February 28 th	Public Open Evening	Observatory 7:30pm
Friday March 14 th	All about Comets	Nick James, lead, BAA Comet section
Friday March 28 th	Public Open Evening	Observatory 7:30pm
Friday April 11 th	The Interstellar Medium	Mark Humphys, NUA
Friday April 25 th	Public Open Evening	Observatory 8:30pm
Friday May 9 th	The Curiosity Rover at Mars AGM	Jerry Workman, G&L School, Hammersmith
Friday May 30 th	Public Open Evening	Observatory 9-11pm