



Breckland Astronomical Society

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

EXTRA TERRESTRIAL

Newsletter May 2026



Registered Charity no, 1044478

Contents		Page
Chairman's Notes & Sky Notes	<i>Dan Self</i>	3
John's Space News	<i>John Copsey</i>	10
Do you know your Moons?		11
ALMA Detects Extremely Abundant Alcohol in Interstellar Comet 3I/ATLAS16		
Deep Sky targets with higher surface brightness to combat summer twilight		
	<i>Dan Self</i>	19
Using the 20" for visual observing with Cartes Du Ciel		24
Types of Coloured Filters in Visual Astronomy	<i>Chris Bailey</i>	25
Young Sun Caught blowing bubbles by NASA's Chandra X-ray Observatory.		26
Pulsars	<i>Chris Bailey</i>	31
Do you know your Moons? Answers		37
Pro Am Working group		38
Member's Astrophotography	Various	39
For Sale or Wanted		74
CHILD PROTECTION POLICY		75
Observatory Risk Assessment 2025		78
Equipment available for loan to Members		81
Contacts		83
Programme 2025	<i>Dan Self</i>	84

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.

Rebecca Greef is the newsletter editor. newsletter@brecklandastro.org.uk

Justin Pearson is visitor organiser. visitors@brecklandastro.org.uk

Chairman's Notes

May and June 2026

Hello and welcome. As we welcome another AGM on the 8th after the talk, we are celebrating a year on year boost in numbers and a spring surge of clear skies to boot! A few new members including youngsters have been along on Tuesdays for observing. Also some extremely deep sky observing has been happening, with the sighting of some distant quasars, one 12 billion light years distant!

The sun has gone a bit quiet, in advance of a predicted slight downturn in activity, however a recent resurgence has put some detail on the disk. Thanks Chris Bailey, Roger Hyman, Jacques van Delft and Frank Dutton for keeping the group informed about this on facebook. If any solar activity could cause aurora, you can check out daily info from Jim Rowley-Hill on "AUK – Aurora UK".

We are planning a barbeque this summer again, although this time after the cricket match on Sunday August 9th from 5pm. Until then we will be working on keeping the observatory in its good working order and welcoming as many as possible to use it.

Remember to pack those binoculars if going on holiday to dark sites, and take along good cameras and tripods for some scenic late night Milky Way shots. If these don't fit in your luggage phone cameras do an acceptable job with night photography, though it needs a bit of exploration of your camera app first. Work out how to set a delay timer and keep it still (rested) and pointed in the right direction. You can (post capture) stack multiple images from phones to make even dark sites show detail, so keep clicking.

We will run an exclusive open evening on the last Friday of May again for those late-night folk who want to catch some observing time during summer twilight.

The facebook group is up to 2,100 approx. members now, not sure how many active members that includes, but we occasionally see new names posting pictures, e.g. aurorae, nebulae along with the superb quality deep sky images. This is generally our forum for queries, quick arranging of things and advertising.

We really welcome the rise in Smart Scopes to explore the heavens. The sensors on them are incredibly sensitive given their small size.

You should have received your AGM documents ahead of the meeting if not any queries can be sent to chairman@brecklandastro.org.uk

Sad news for those that knew him, Owen Brazell passed away on his way to Kelling Heath Star Party. He was an expert in visual astronomy, and had leading roles in UK astronomy groups, with

a keen dry sense of humour and a warm friendly character. He will be sorely missed by a very extensive community.

Look out for Society in Focus in the BBC Sky at Night magazine, Iain Todd has contacted us recently so Keith Fowler has produced a great summary.

And lastly in the announcements this will be the last great newsletter of Chris Bailey who is retiring from the role and we have Rebecca Greef taking on the role of editor, a fitting tribute to her late father Bob who had the role for many years. Many of you know Rebecca who was our secretary who had to give up the role for official reasons, but has always been on hand to provide occasional useful help and good ideas and advice. So welcome.

Solar System

The Moon starts May 1 full, and it soon disappears from the sky, although nights are pulling out so rapidly, we only have a brief period of astronomical darkness from May 3 before moonrise until the crescent appears on May 18th beside Venus, which is now rising higher as the evening star setting after 11pm. On the 23rd the Lunar X is visible at 11pm, appearing throughout the evening! The moon remains in the late evening sky until Blue Moon on May 31st (the second in a month). Then the next day, June 1st it disappears below the horizon from the evening sky. The crescent moon is very close to Venus (in conjunction) right as they set 10-11pm June 17th. The moon follows a lower path across the sky in the summer. On June 28th The moon is at a very southerly declination, and if you can see right down to the horizon, below it that night, are clusters M6 and M7 in Scorpius, skimming the horizon.

Jupiter and Venus get 1 ½ degrees apart on the 8th and 9th of June. Near the NW horizon at sunset.

Venus gets higher and then the ecliptic tilt changes with respect to our sunset horizon and starts moving south (left) along the horizon. It is small and distant and has a gibbous bright disk which doesn't reach 50% phase until August 11th. It is slightly brighter when closer.

Mercury is brightest and appears around May 26th below and right of Venus at magnitude -1. Peaking around June 11th at magnitude 0.3. It is only about 7 or 8 arc seconds then.

We are losing Jupiter, and must wait a long time for planets to return in the morning sky. It is time to observe the moon instead and hope for a decent comet.

Deep Sky – see small objects article later in the issue.

Who knows, perhaps T Coronae Borealis will finally go nova.

The open evenings were pretty popular, about 70 for March despite a bit of cloud, and loads April, more like double that 140 I guess, we were busy but we really loved the patience of the public and the fact it is free and relaxed about the timing.

The visitors email contact has been down for a while, apologies but Justin Pearson has taken that role on now and will start getting things arranged for visits soon so bear with us.

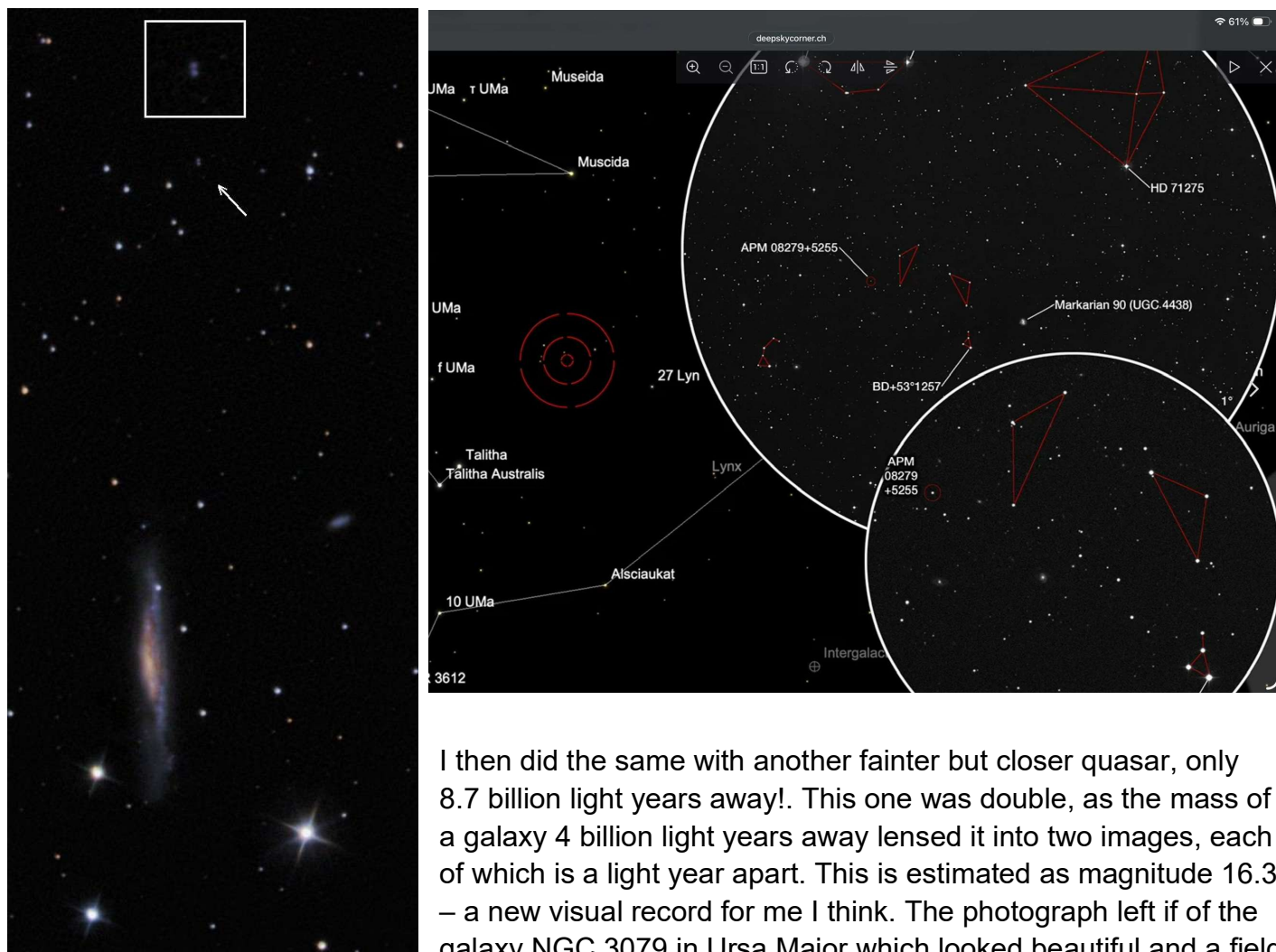


And thanks Keith (F) for a decent coffee machine at the observatory!

I have pushed the 20 inch telescope to near its visual observing limit, by going Quasar hunting. Keith F recently used his SeeStar 50 to image a lensed very powerful quasar. This is a super massive black hole jet pointed at us, while accreting a huge amount of material and heating it up.

The light is so bright it outshines the galaxy and the lensing has added to that. This means we can see an object on camera that is slightly over 12 billion light years away (when it emitted the light) the redshift is very high (over 3) and so Ultraviolet light is being viewed as visible and the object is slightly red.

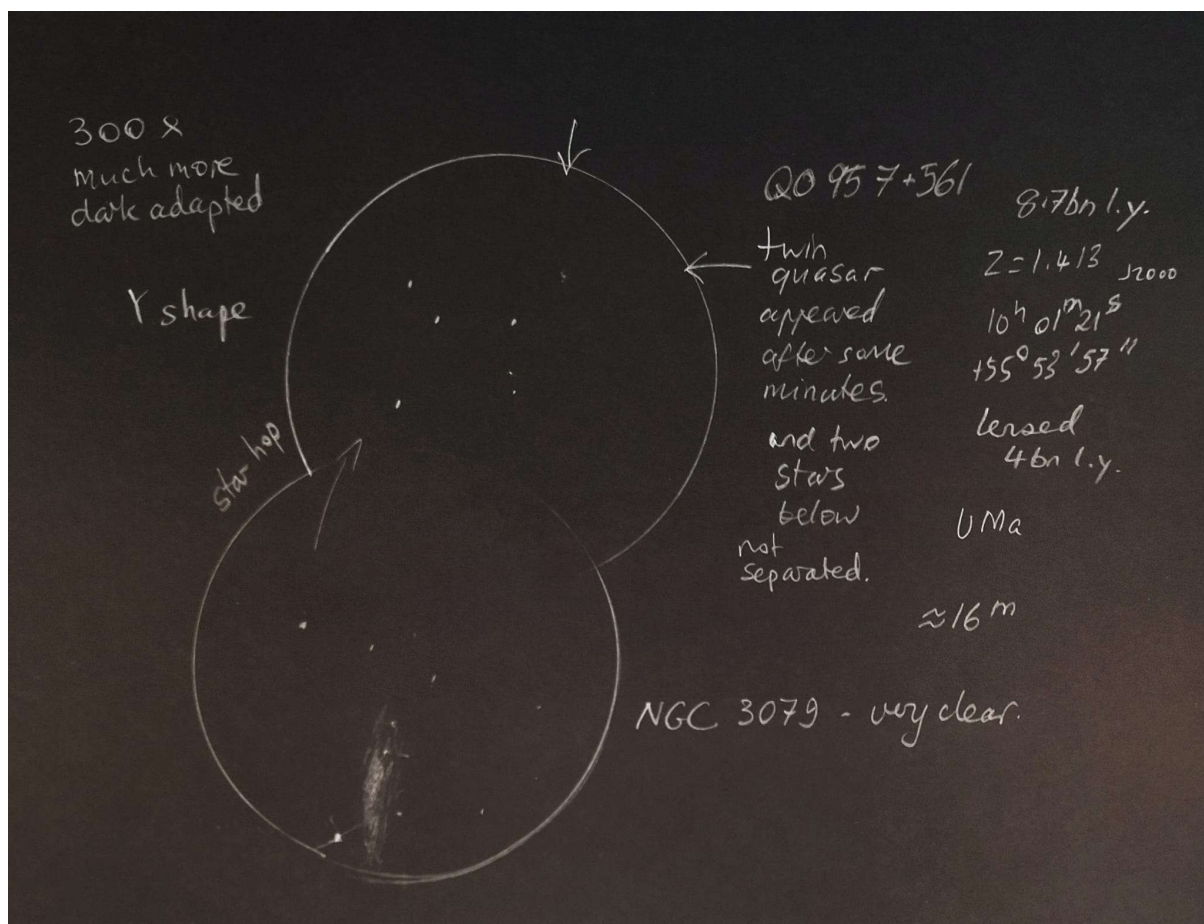
This particular Quasar is in Lynx and is a visual viewing challenge in large telescopes only discovered in fairly recent decades. The chart was how I found it. The stars were faint! They required slow zooming, and allowing the eyes to rest and adjust for 15min!



of view above it was the quasar.

The orientation was as in my photograph (left) and in the end I saw it start to appear in that position more and more, and on the next page I attach my sketch. It was simply a blob that was detectable by averted vision, but this one was the twin quasar.

These are a pale blue colour, something to do with the UV spectrum having been shifted into the visible region. Of course the photographic colour isn't at all detectable visually.



On a following night, the sky got back down to a brightness level of 21.15 less than we've seen for a long time. Perhaps since the Meet Watton visit in late 2024 when it was -5 degrees C.



Meade LX90 12 inch remount upgrade in progress
Richard Harmon.

We also got a lovely review on google maps of our place 5*s saying "Wow! Who knew!!! Outstanding evening with passionate speakers..can't wait to go back!!"

Many thanks for that.

Talks

Dr Sam Lander (UEA) Talk in March on Magnetars.

The new school of physics at UEA is where Sam works. He gave us a talk about the history of Neutron Stars and how radio pulsars were observed and connected to the theory they were neutron stars. They are highly magnetic, with much much higher range of field strengths than anything that could be made here on earth. Fast Radio Bursts have now been seen and attributed to these highly magnetic form of neutron star.

Baader and Zwicky theorised these stars not long after James Chadwick discovered the neutron in the 1930s. Supernovae of large stars form them, and they are ultra dense collapsed balls with extreme gravity.

We learned a lot and unusual detail from Sam, we do have a copy of the recording only available to members. Transferring a large file is tricky so will have to be arranged on an in person basis.

April talk by BAS members talk on Smart Scopes

We were due to have Simon Bennett an astro retailer talking about smart scopes, but he had business abroad clashing with our slot, so we put together an informative info session about the new technology, where Mick Ladner and Keith Fowler came on stage and spoke about their instruments. The cameras in them are amazing as the scopes themselves are very small and extremely portable and ready to use fast.

Let's just say we were impressed and a good turn out too. 35 people.

Mark gave us a worthy presentation of a 3D showing of Curiosity on Mars and a map projection also, a lovely spectacle!



Next Months

We have Jerry Workman talking about upcoming Eclipses and in June we have professor Manoj Joshi from UEA talking about planetary atmospheres. In July Frank Dutton will be talking about alternative constellations and ways of dividing up the sky by other cultures. We have also booked the Wonderdome Planetarium again for September this was really popular, October we have Mary McIntyre returning and November member Karenmae Bloom is giving us all a more interactive lesson.

Please note: we will start the summer talks from June to September at 8 pm to avoid the peak of cricket and scouts parents using the car park.

Dan Self

John's Space News

As I write this Artemis 2 is going around the Moon and will be out of contact with Ground Control for 42 minutes. It's now coming back for a splashdown on Friday the 10th April. President Trump called the Artemis 2 astronauts after their successful loop around the Moon.

Dream Chaser 1 is to be launched by a Vulcan Centaur Rocket.

In July a Falcon Heavy will take NASA's Dragonfly Mission.

Falcon 9 Booster launched for the record 34th time.

NASA outlines \$20 million plan for a Moon Base and Cancels the Lunar Gateway.

In April China will launch an unknown payload on Long March 8 Rocket.

A Blue Origin Rocket has successfully landed a Booster during a Mars Mission.

This year, India is going to launch a Solar Observations Observatory (2026).

NASA has said a 1,300lb satellite re-enters Earth's atmosphere after 14 years in space.

A new study using satellite images has found that Earth has brightened by 16% since 2014.

Atlas 5 launches Amazon LEO (Low Earth Orbit) satellites.

ESA's most powerful Ariane 6 rocket flies for the first time on Feb 12th launching 32 Amazon satellites.

China's mysterious Shenlong space plane recently launched on its 4th mission to Earth Orbit.

NASA welcomes Portugal as a 60th Artemis accords signatory.

Until next time, clear skies!

John Copsey

Do you know your Moons?

Here are 20 images of various moons in the Solar System. Name them! And for an extra point, what body do they orbit?

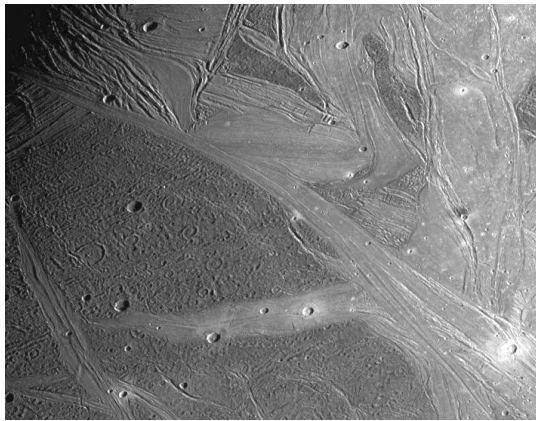
1



2



3



4



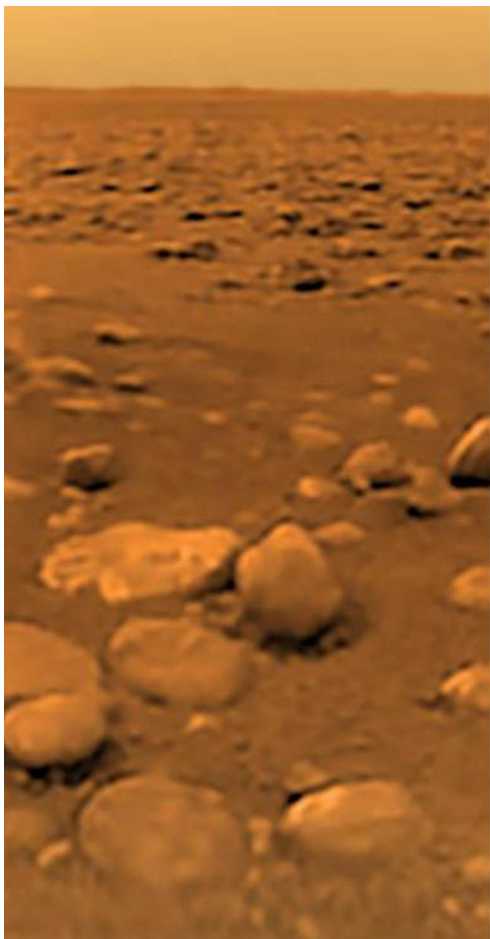
5



6



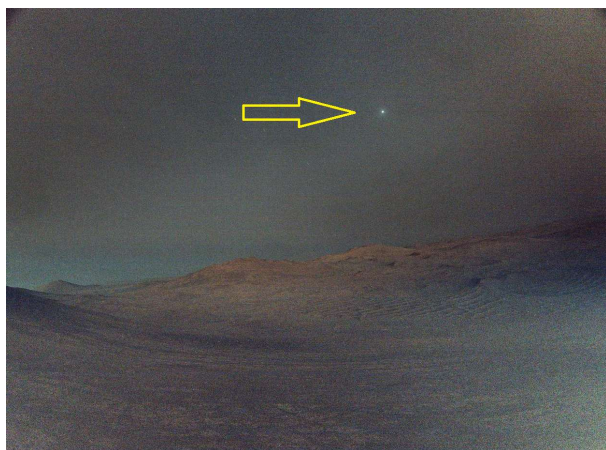
7



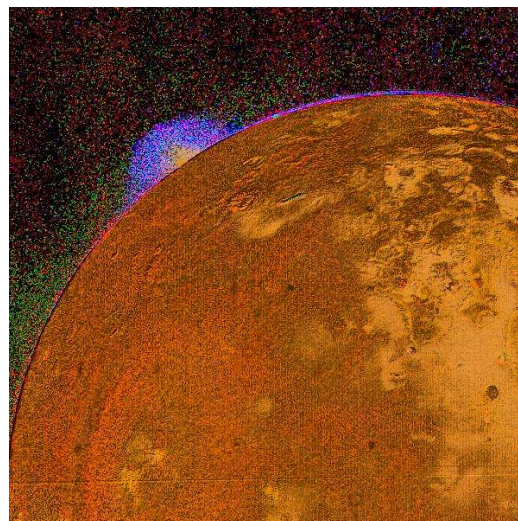
8



9



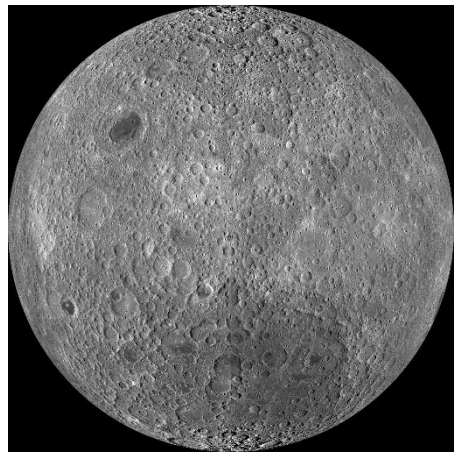
10



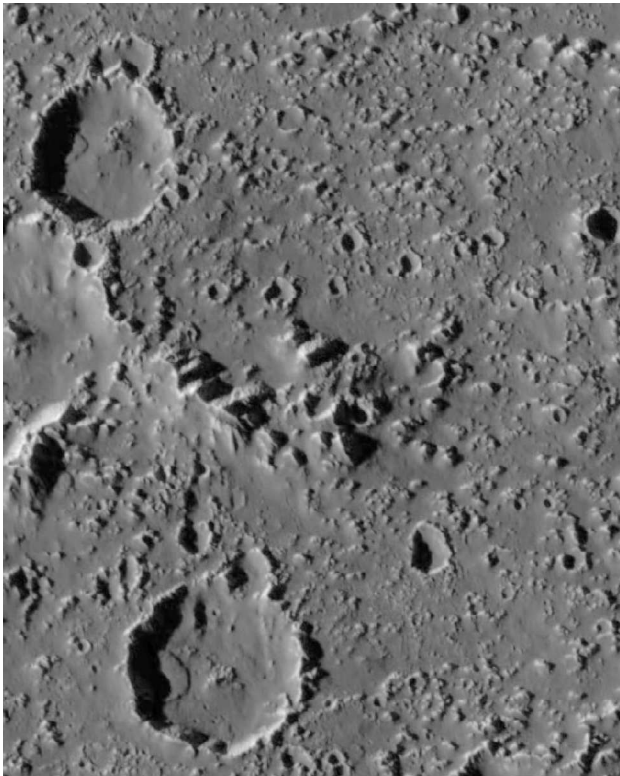
11



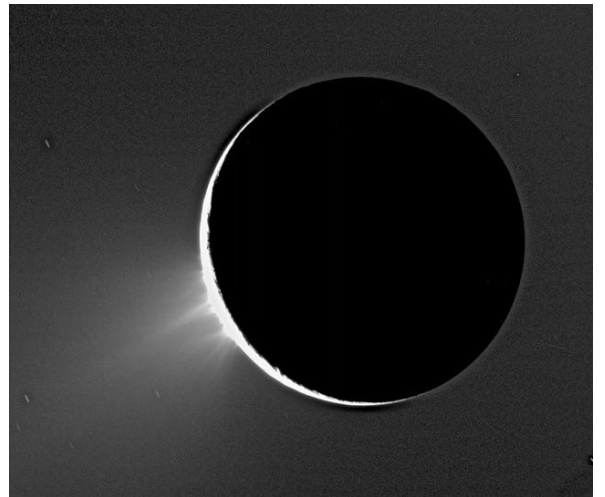
12



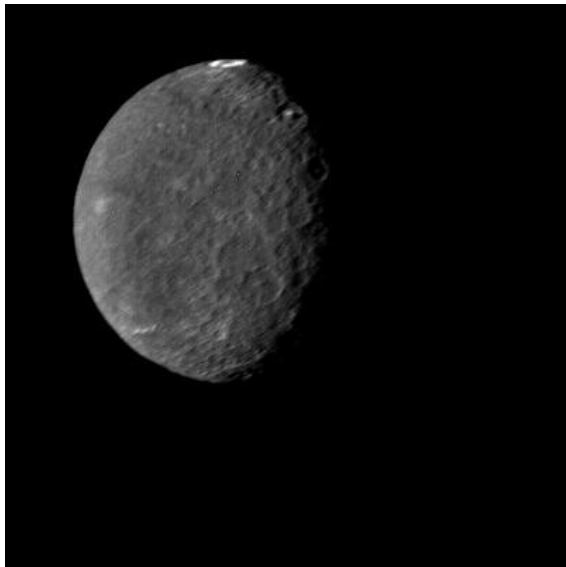
13



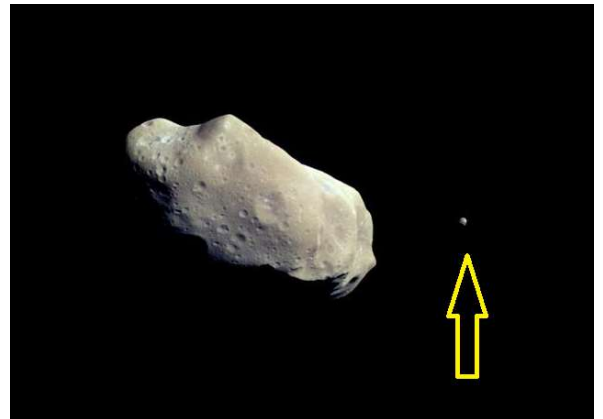
14



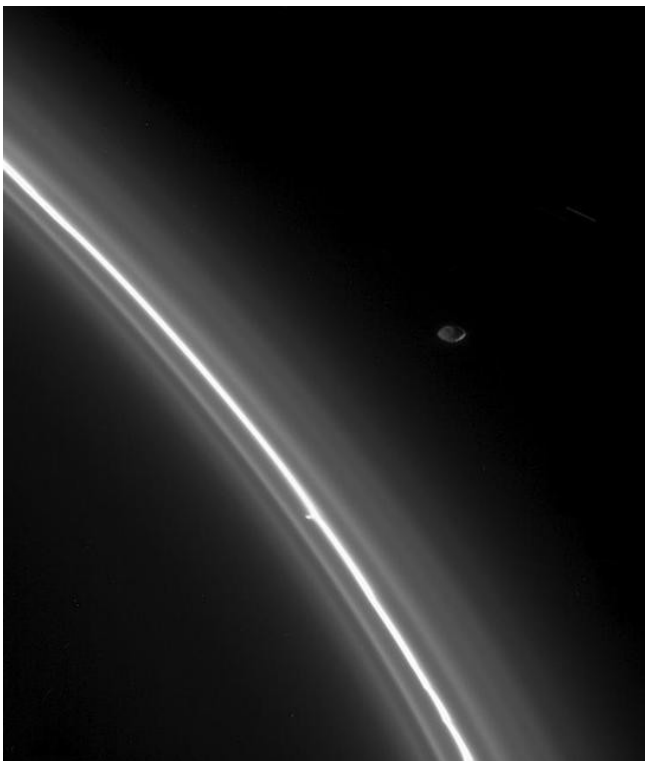
15



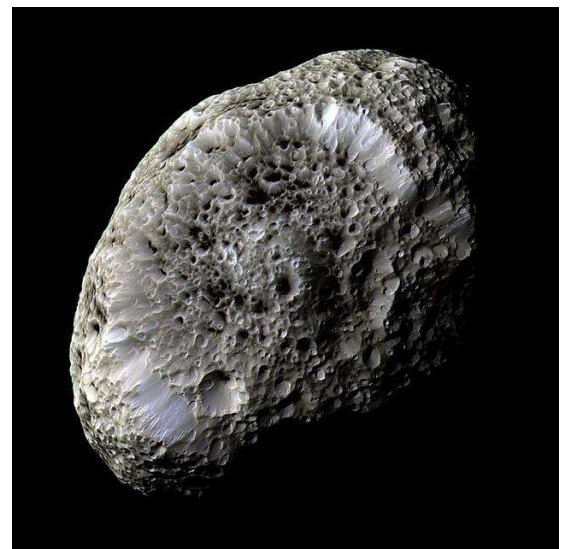
16



17



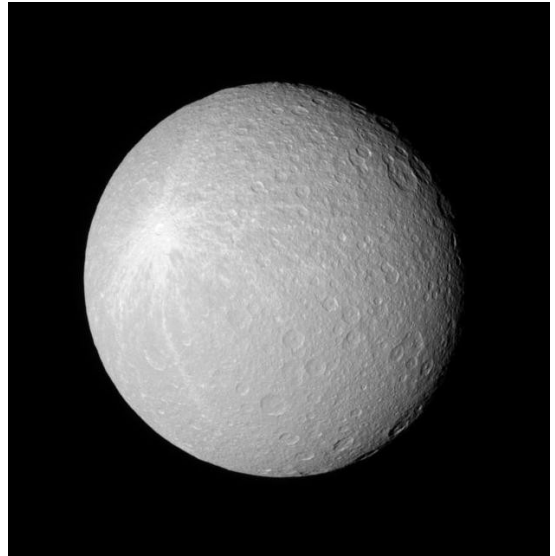
18



19



20



Answers Page 37

ALMA Detects Extremely Abundant Alcohol in Interstellar Comet 3I/ATLAS



An artist's impression of 3I/ATLAS is shown as it passes near the Sun, illuminating one side of the comet. On the side of the comet closer to the sun, the methanol gas is shown in blue, with icy dust grains still present in the gas. On the dark side of the comet, the hydrogen cyanide is shown in orange.

Credit: NSF/AUI/NSF NRAO/M.Weiss

Comet 3I/ATLAS continues to make astonishing headlines, thanks to new findings from astronomers using the Atacama Large Millimeter/submillimeter Array (ALMA), of which the U.S. National Science Foundation National Radio Astronomy Observatory (NSF NRAO) is a partner. This new research reveals that 3I/ATLAS is packed with an unusually large amount of the organic molecule methanol – more than almost all known comets in our own solar system.

“Observing 3I/ATLAS is like taking a fingerprint from another solar system,” shares Nathan Roth, lead author on this research, and a professor with American University, “The details reveal what it’s made of, and it’s bursting with methanol in a way we just don’t usually see in comets in our own solar system.”

Using ALMA’s Atacama Compact Array in Chile, on multiple dates in late 2025, the team observed 3I/ATLAS as it approached our Sun. As sunlight warmed its icy surface, 3I/ATLAS released gas and dust,

forming a glowing halo (or coma) around its core. By analyzing this coma, astronomers revealed the chemical fingerprints of the material it is composed of, allowing them to study how objects might be made in another planetary system, without leaving our own.

The team focused on the faint submillimeter fingerprints of two molecules: methanol (CH_3OH), a type of alcohol, and hydrogen cyanide (HCN), a nitrogen-bearing organic molecule commonly seen in comets. The ALMA data reveal that 3I/ATLAS is heavily enriched in methanol compared to hydrogen cyanide, far beyond what is typically seen in comets born in our own solar system. On two observing dates, the team measured methanol-to-HCN ratios of about 70 and 120, placing 3I/ATLAS among the most methanol-rich solar system comets ever studied.

These measurements imply that the icy material from 3I/ATLAS was formed by (or experienced) very different conditions than those that shape most comets in our own solar system. Previous work with the James Webb Space Telescope has shown that 3I/ATLAS had a coma dominated by carbon dioxide when it was far from the Sun, and these new ALMA results add methanol as another unusual detail in its chemical inventory.

ALMA's high resolution for imaging also allowed the team to see how different molecules move away from the comet, revealing surprising differences between methanol and hydrogen cyanide. Hydrogen cyanide appears to come, for the most part, directly from the comet's core, or nucleus, which is typical for comets in our solar system. Methanol, on the other hand, appears to come from both the nucleus AND from ice particles in the coma. These tiny, icy grains act like mini-comets: as the object moves closer to the Sun, where ice turns into gas, they also release methanol. Similar behavior has been observed in some solar system comets, but this is the first time the physics of such detailed outgassing has been traced in an interstellar object.

Comet 3I/ATLAS is only the third confirmed object ever seen passing through our solar system from interstellar space, after 1I/'Oumuamua and 2I/Borisov. Observations of these objects also revealed unusual properties. As astronomers continue to discover and study more interstellar objects, our understanding of planet formation in other planetary systems continues to grow more interesting.

About NRAO

The National Radio Astronomy Observatory (NRAO) is a facility of the U.S. National Science Foundation, operated under cooperative agreement by Associated Universities, Inc.

About ALMA

The Atacama Large Millimeter/submillimeter Array (ALMA), an international astronomy facility, is a partnership of the European Southern Observatory (ESO), the U.S. National Science Foundation (NSF) and the National Institutes of Natural Sciences (NINS) of Japan in cooperation with the Republic of Chile. ALMA is funded by ESO on behalf of its Member States, by NSF in cooperation with the National Research Council of Canada (NRC) and the National Science and Technology Council (NSTC) in Taiwan and by NINS in cooperation with the Academia Sinica (AS) in Taiwan and the Korea Astronomy and Space Science Institute (KASI).

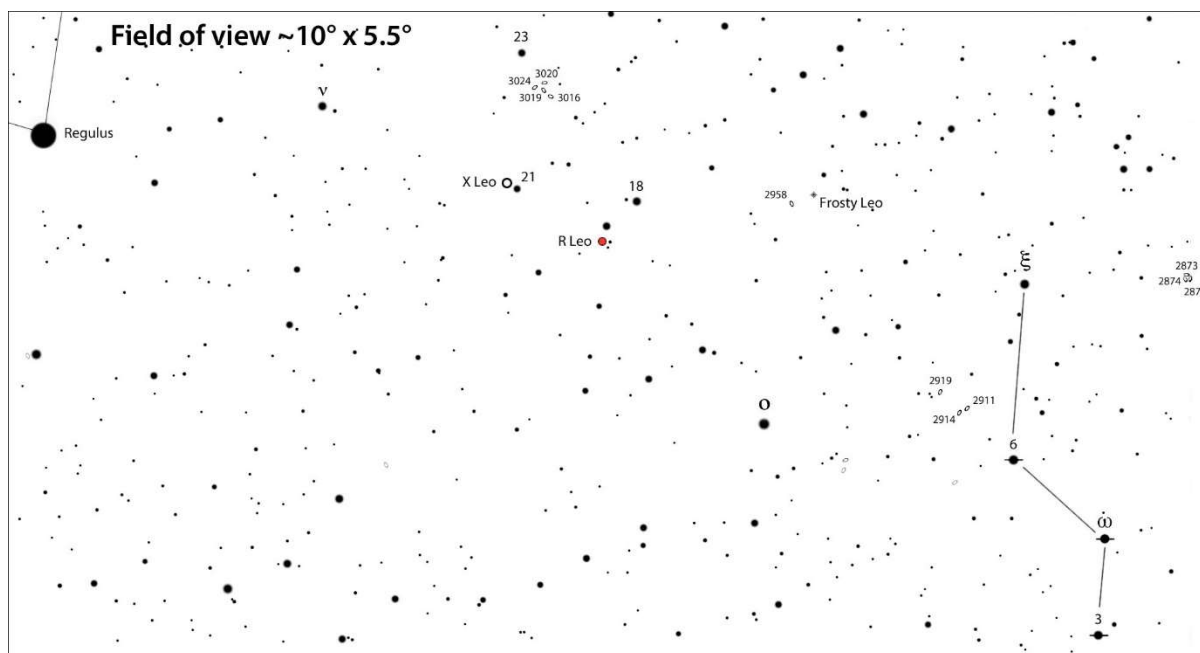
ALMA construction and operations are led by ESO on behalf of its Member States; by the National Radio Astronomy Observatory (NRAO), managed by Associated Universities, Inc. (AUI), on behalf of North America; and by the National Astronomical Observatory of Japan (NAOJ) on behalf of East Asia. The Joint ALMA Observatory (JAO) provides the unified leadership and management of the construction, commissioning and operation of ALMA.

Deep Sky targets with higher surface brightness to combat summer twilight

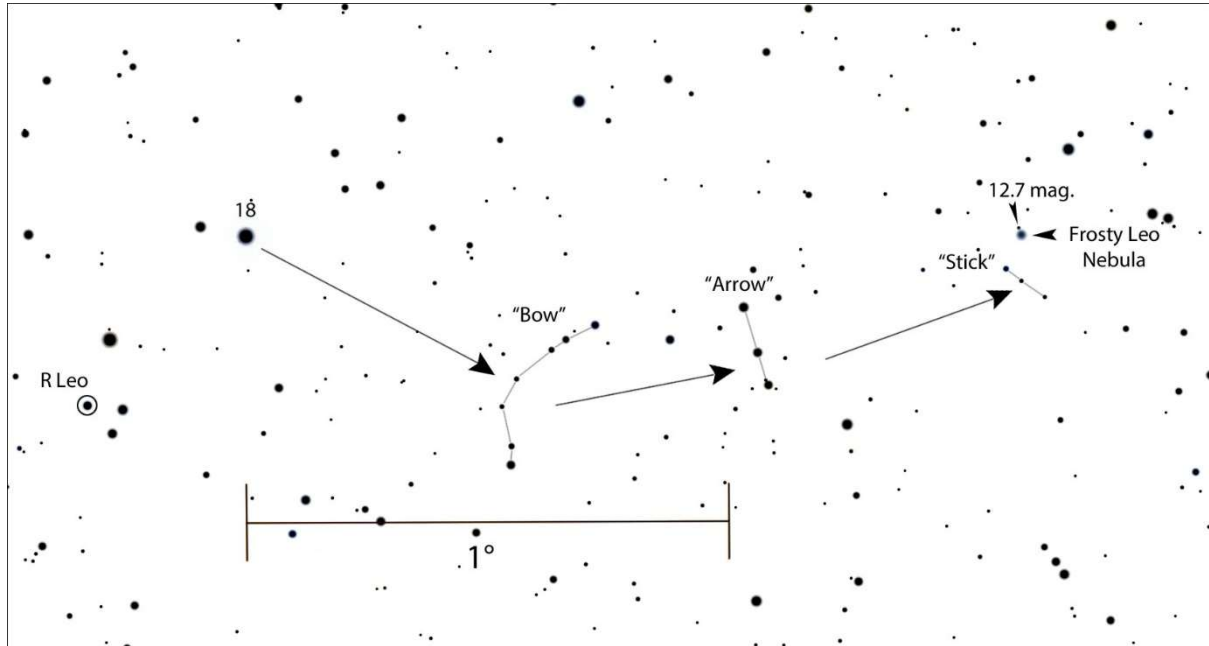
Here are a good range of smaller and brighter objects that can be seen better against a twilight background, in contrast to those diffuse galaxies and nebulae that require moonless, transparent or non-light polluted skies. The light of young planetary nebulae is more concentrated, but it does not necessarily allow you to see and find them any easier. These are the atmospheres of recently collapsed low mass stars. The core of a late-stage red giant runs out of fusion fuel and gravity takes over but the atmosphere is very extended, it is pushed outward by the intense radiation pressure from the centre of the star. This process continues until the expanding shell is pushed outward in strange inexplicable, but often symmetrical shapes. I will also include some stars as their light is as concentrated into points.

In this section I'd suggest you can easily find information on such things as M57 the Ring Nebula in Lyra. Other really bright objects are NGC 6543 (Cat's Eye in Draco), NGC6826 (Blinking Planetary nebula in Cygnus), and M27 (Dumbell) which is large but still fairly high in surface brightness. You can find them using StarWalk or Stellarium on your phone. I'd like to explore some less commonly referred to objects, that may lack the visual appeal but can be all the more fascinating. Trying to see any of these should improve your observation skills a great deal.

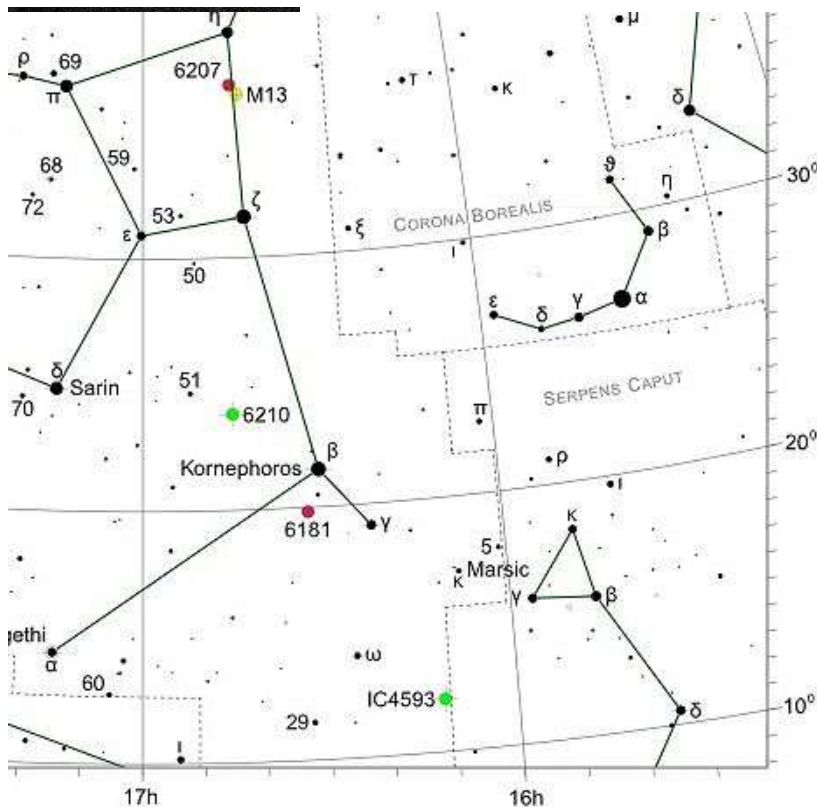
With Leo high in the South we should look for Regulus and star hop to the Frosty Leo Nebula, an Infrared rich protoplanetary nebula. We should hop via the interesting star R Leonis, a Mira variable (of IR mag -2) and see how it is doing and compare your results with the values observers get in the AAVSO (<https://www.aavso.org/LGCv2/>). This link provides a handy viewer although you need to input the correct format for star names, e.g. "R Leo", "CN Leo" or "alp Ori" for Betelgeuse (PS try "T CrB"). The nebula looks like an 11th magnitude star at low power, but appears bigger over about 80x magnification. An interesting object indeed. It gets its name from the fact there is ice detected in its spectrum.



Hop from R Leo to Frosty Leo IRAS 09371+1212 below. Note: it is not in the NGC or IC catalogue!



The next interesting object is NGC 6210 the Turtle Nebula in Hercules, it can be seen fairly easily once found – but may well need a more detailed chart than below. It mainly emits light in the OIII band, 500nm green-blue range and is fairly small, the colour can be just about made out in large telescopes. It is 9.7 magnitude and 25 arc seconds across roughly circular with tantalising hints of structure and a faint halo. Best viewed at high magnification, this is many thousand light years away.



South of the former nebula, along the edge of Hercules into Serpens Caput, lies IC 4593, also called the White-eyed Pea nebula. It is small, at 13 arcsec across and just 10.7 magnitude, still putting it in the reach of most telescopes. Finding it is more challenging due to its distance from bright stars. This nebula is probably about 10 000 light years away and located well north of the galactic plane. This was discovered by Williamina Fleming, one of



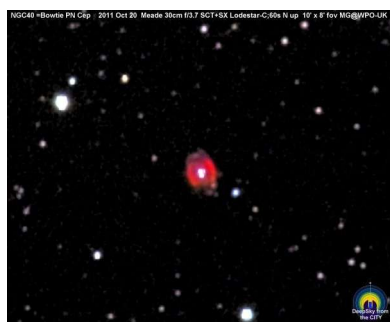
Pickering's maids at Harvard. Due to its size, it appears fairly stellar under 100x magnification, sandwiched between 8 and 9 magnitude stars. It shows a bluish colour in larger telescopes and at higher magnification the central star is visible. There is a nice double star about 15 arcmin away – Struve 2016.

NGC 6572 – The SHOWPIECE. The Emerald nebula or Blue Racketball is so bright it really reveals its colour. It is to be found near a distinct asterism in the upper left of Ophiuchus. Stars Cebalrai and Muliphen point to a triangle of 67, 68 and 70 Ophiuchi. North of this triangle lie two stars, 71 and 72 Ophiuchi. If you use these stars as a ruler, point south, turn 40 degrees towards the left (east) and move 2 ½ times this distance. These instructions are like a treasure hunt, now go find the Emerald! It is bright at 8.1 magnitude and small ish at 20" x 15" so has a high surface brightness, thus the colour is very apparent upon direct vision. It is something like 6000 light years away, and started shedding its gases a few thousand years ago. There is a slight twist not that your eye could pick it up. Most of the light is in the OIII band.

NGC6790 is fairly faint at 11th magnitude and its light is very condensed, in to just 2 arc seconds diameter. Thus it appears stellar, so you will either need a very good star chart, or the use of a UHC or OIII filter to blink in front of the eyepiece would be wise. It lies about 2 degrees East of 23 Aquilae in the centre of the constellation. It is a youngish compact nebula with a big infrared emission but nobody knows if its 3300 or 19000 light years away! I'm not aware of GAIA data coming to light.

There are lots of such planetaries around the Aquila - Cygnus area: NGC 6803 (NGC 6804 is much larger), NGC 6807, NGC 6778, NGC 6833, NGC 6881. NGC7026 & NGC 7027 in Cygnus

may show a bit of detail as they are a bit larger and in a high, darker sky. NGC 6879 in Sagitta may be interesting to attempt to resolve at 4.7 arc seconds.

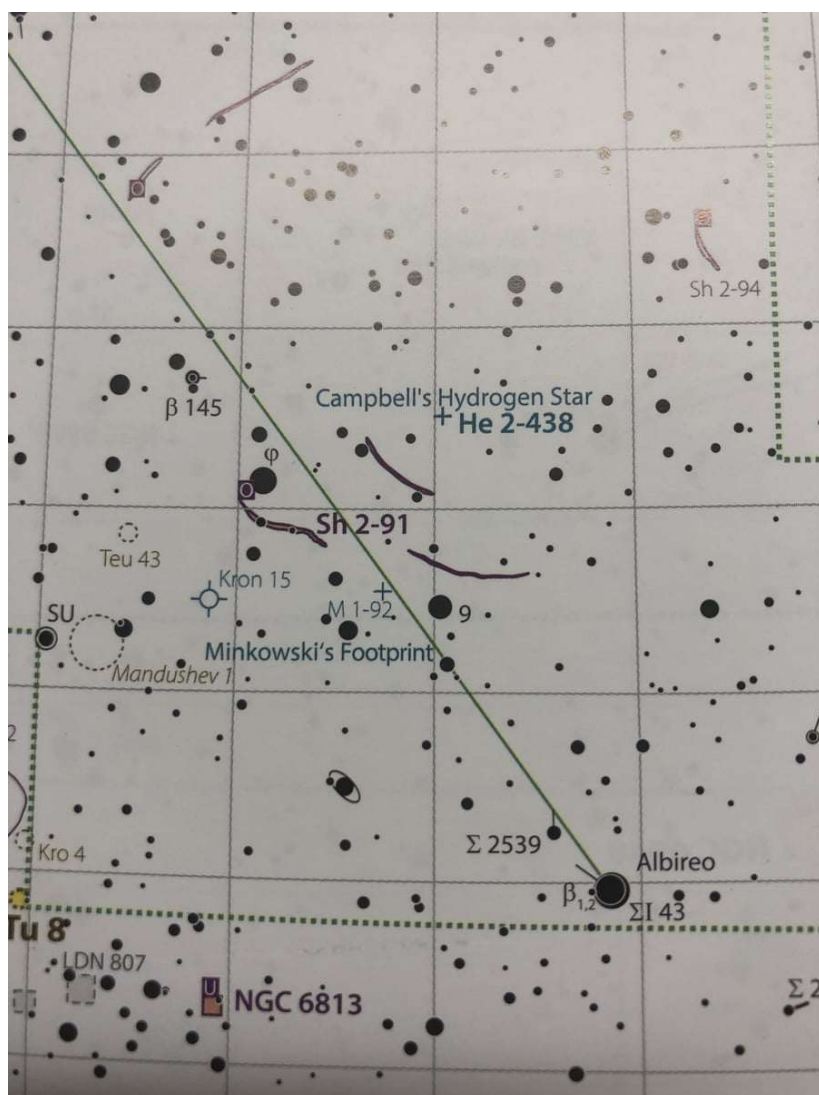


An unusual tiny Planetary Nebula is 'Campbells Hydrogen Star' aka HD184738 with PK 64 +5.1 which is a WC star at magnitude 11.3 that has a faint red ring of nebulosity around it at magnitude 9.6 – this is reasonably bright. Being small at 5 arc seconds and bright means the Hydrogen alpha emission line itself can be seen, also H beta can stand out (blue). It is odd the oxygen isn't very abundant to glow the usual green-blue that our eyes perceive well. The star itself is a WC star, which are closely related to Wolf Rayet stars in that they are hot,

but they are rich in Carbon and Oxygen but with no Nitrogen. Only mainly hydrogen has made it out into the nebula so far. It is very roughly 16,000 light years away, putting it across in the next spiral arm. It is a little difficult to find, so see attached photo of small piece of Deep Sky Hunter chart.

NGC6309 can be found much lower in the sky in Ophiuchus – this constellation has to be caught quickly at this time of year as the twilight brightens and when its visible again it's lower in the South West. The nebula is above Sabik and right of nu Serpentis Cauda. It is called the Box nebula due to its shape. It has quite a faint surface brightness compared to the others detailed here, but is magnitude 11.5. A magnitude 14.5 star lies right next to it, which may be visible in the really big scopes. It is very roughly 6000 light years away.





The nebula may be too low in the Southern sky to see well. If you can find nu (ν) Serpentis 4.3mag, locate it with a telescope, pan 1 degree WSW (lower right) to HIP84544 (7.6magnitude) and then WNW again $\frac{3}{4}^\circ$ to the Nebula, a $\frac{1}{4}^\circ$ further is 8th magnitude star HIP84243.

Albireo is a great starting point for a viewing session, but it is a fairly long star hop across to Campbell's Hydrogen Star (Henize 2-438) especially if at high magnification. As seen on the picture, it lies in the milky way plane and many other distant planetary nebulae are in that direction. The main chart isn't quite detailed enough to see the faint stars around the nebula visible in a telescope. They are plotted here to magnitude 9, but the star with the nebula around it has two 10th magnitude stars to its North in a gentle curved line.

Dan Self

Using the 20" for visual observing with Cartes Du Ciel

1. Power up scope computer in control room. Turn on at main switch on column.
2. Check PC time is correct if not set it via a Radio Clock.
3. Turn Monitor on with remote.
4. Put dome lights on, open hatch and go up. Adjust LED colour.
5. Open dome hatch with UP switch – care with chain handle which can get caught.
6. Turn on power to telescope. Switches are under base.
7. Uncover mirrors and remove stand.
8. Using mouse/screen on trolley start SciTech.exe (minimises to taskbar)
9. Unpark telescope using SciTech
10. Start Cartes du Ciel (CdC) (desktop icon: Skychart)
11. Connect telescope using menu: telescope>control panel>connect. After a slew the telescope will track.
12. Find target on sky, check whether this corresponds to the real position of the scope (should be East, ~15° up). If not, find a star on CdC at this position and right click on it> Telescope> Sync. Telescope can now be controlled using CdC or handpad.
13. Rotate dome - swap plugs and use lower switch. The switch has a metal catch to prevent reversing. For finer adjustment:
14. Select bright star, use Telrad target or finder scope to position roughly, and handpad to centralise in eyepiece. Then synchronise the telescope, right click on star> telescope> sync.

Shut Down

Park with SciTech

(Safer:) manually move to rest position E, 15°, and click Set park, then Park. Tracking should now be off.

Put wooden stand under telescope & cover mirrors

Disconnect with CdC using control panel

Close SciTech and Shut down PC

Turn off telescope power

Rotate dome to south, swap plugs and close dome.

Turn off in control room

Hand Pad

Turn on with SPD

SPD selects Slew, Pan, Guide Speeds, red, yellow, green lights on side of telescope. Use red for most movement.

ALT turns torch on/off. ESC & RTN adjust brightness

Turn off with ALT & ALT, Auto off after 15mins.

Spiral search, on back of hand pad, exit with left or right arrows.

To stop during a slew, hit STOP on SciTech on PC, but this can be hidden behind CdC window.

IN AN EMERGENCY, TO STOP - TURN OFF POWER!

Telescope can be positioned manually using the hand pad without turning on CdC.

Types of Coloured Filters in Visual Astronomy

Coloured filters are indispensable for planetary observation, helping to reveal subtle details and contrast that are otherwise drowned out by glare or atmospheric effects. Each colour serves a unique purpose, optimising your view of different features across the Solar System.

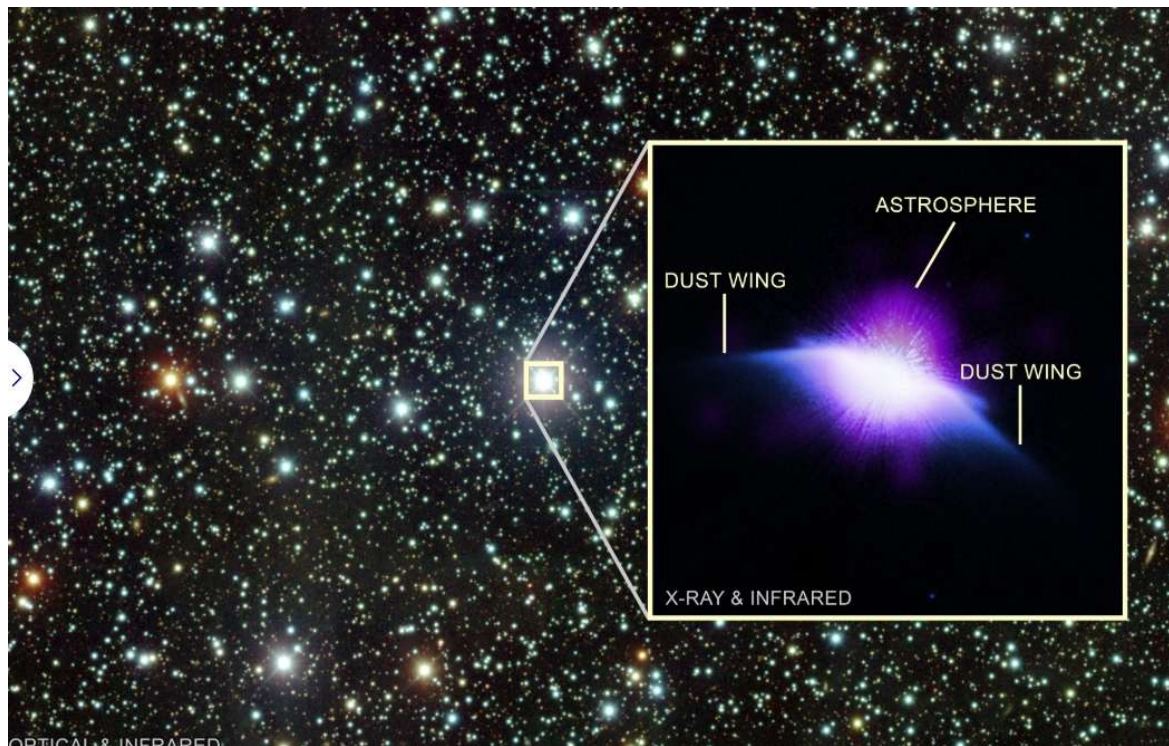
- **Red Filters:** Red filters (typically #23A) enhance surface details on Mars, such as polar ice caps and dust storms. They are also useful for observing Jupiter's Great Red Spot and Saturn's cloud belts, as they block blue and green wavelengths, improving contrast.
-
- **Blue Filters:** Blue filters (#80A) accentuate Jupiter's cloud structures and Saturn's ring details. They are particularly effective for highlighting the polar regions of Mars and detecting atmospheric haze on Venus.
-
- **Green Filters:** Green filters (#56) help to clarify the boundaries between Martian surface features and bring out Saturn's ring structure. They also increase the visibility of lunar features, particularly the contrast between maria and highlands.
-
- **Yellow Filters:** Yellow filters (#12) are well-suited for observing Mercury and Mars, enhancing contrast in atmospheric phenomena and surface markings. They also sharpen the view of Jupiter's belts and Saturn's rings by reducing chromatic aberration.
-
- **Orange Filters:** Orange filters (#21) provide improved contrast for observing Mars's surface and help bring out details in Jupiter's belts and Saturn's atmosphere.
-

Selecting the appropriate coloured filter can make a dramatic difference in the richness and clarity of planetary observations. Experimenting with different filters is key to unlocking the hidden beauty and complexity of the night sky.

Young Sun Caught blowing bubbles by NASA's Chandra X-ray Observatory.

For the first time, a much younger version of the Sun has been caught red-handed blowing bubbles in the galaxy, by astronomers using NASA's Chandra X-ray Observatory.

HD 61005 in X-ray, infrared, and optical light



The bubble – called an “astrosphere” – completely surrounds the juvenile star. Winds from the star’s surface are blowing up the bubble and filling it with hot gas as it expands into much cooler galactic gas and dust surrounding the star. The Sun has a similar bubble around it, which scientists call the heliosphere, created by the solar wind. It extends far beyond the planets in our solar system and protects Earth from cosmic radiation.

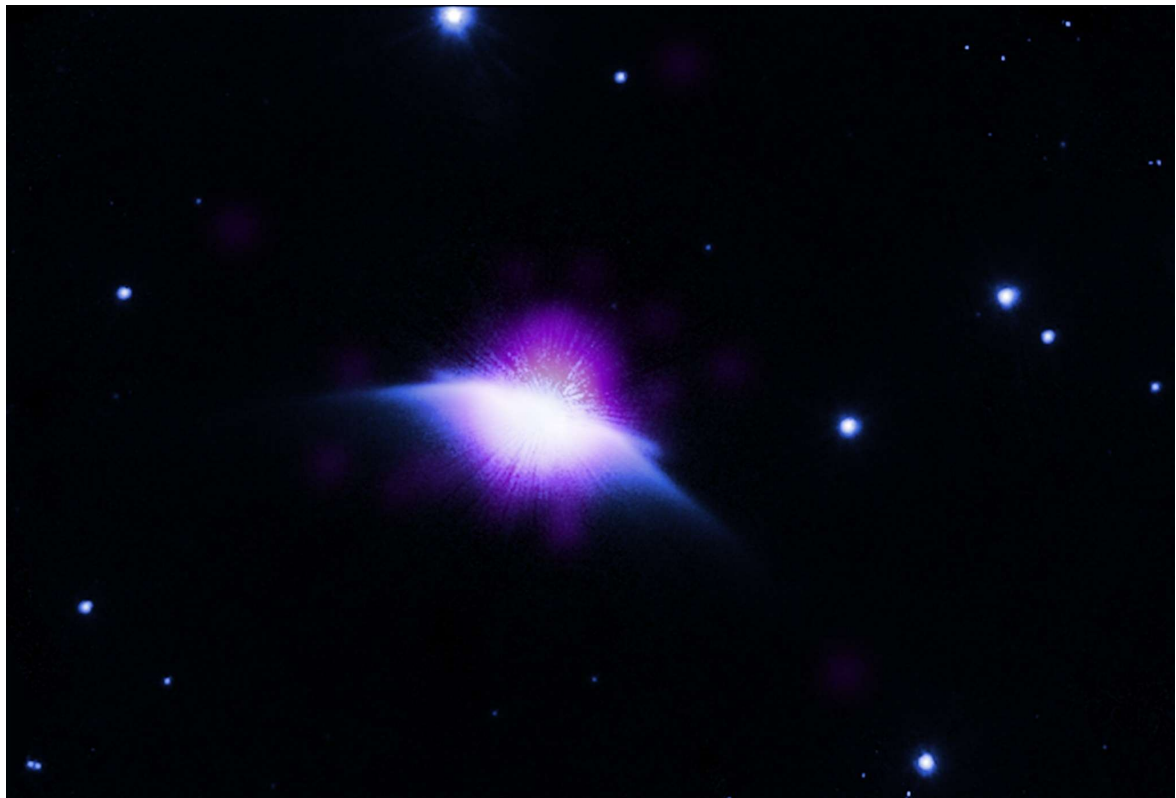
This is the first image of an astrosphere astronomers have obtained around a star similar to the Sun. It shows slightly extended emission, rather than a single point of light as seen for other such stars.

“We have been studying our Sun’s astrosphere for decades, but we can’t see it from the outside,” said Carey Lisse of Johns Hopkins University in Baltimore, who led the study, which published

[day of week] in the Astrophysical Journal. “This new Chandra result about a similar star’s astrosphere teaches us about the shape of the Sun’s, and how it has changed over billions of years as the Sun evolves and moves through the galaxy.”

The star is called HD 61005 and is located about 120 light-years from Earth, making it relatively close. HD 61005 has roughly the same mass and temperature as the Sun, but it is much younger with an age of about 100 million years, compared to the Sun’s age of about 5 billion years.

Because it is so young, HD 61005 has a much stronger wind of particles blowing from its surface that travels about 3 times faster and is about 25 times denser than the wind from the Sun. This amplifies the process of astrosphere bubble-blowing and mimics how our Sun was behaving several billion years ago.



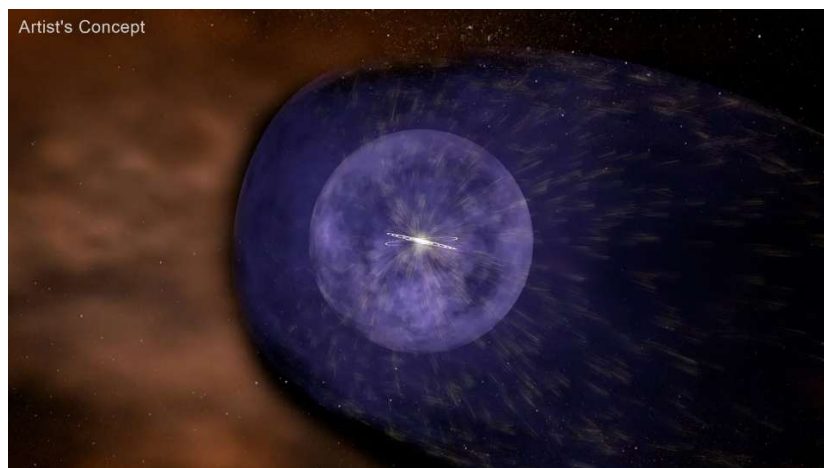
HD 61005 in X-ray and Infrared light.

X-ray: NASA/CXC/John Hopkins Univ./C.M. Lisse et al.; Infrared: NASA/ESA/STIS; Image Processing: NASA/CXC/SAO/N. Wolk

“We are impacted by the Sun every day, not only through the light it gives off, but also by the wind it sends out into space that can affect our satellites and potentially astronauts traveling to the Moon or Mars,” said co-author Scott Wolk of the Center for Astrophysics | Harvard & Smithsonian (CfA). “This image of the astrosphere around HD 61005 gives us important information about what the Sun’s wind may have been like early in its evolution.”

Astronomers have nicknamed the HD 61005 star system the “Moth” because it is surrounded by large amounts of dust patterned similarly to the shape of a moth’s wings when viewed through infrared telescopes. The wings are formed from material left behind after the formation of the star, similar to the Kuiper Belt in our own solar system. Observations of these wings with NASA’s Hubble Space Telescope showed that the interstellar matter surrounding HD 61005 is about a thousand times denser than that around the Sun.

Since the 1990s, astronomers have been trying to capture an image of an astrosphere around a Sun-like star. Chandra was able to detect the astrosphere around HD 61005 because it is producing X-rays as the stellar wind runs into cooler local interstellar medium dust and gas that surrounds the star. The dense local galactic environment, combined with Chandra’s high-resolution X-ray vision, the strong stellar wind, and the star’s proximity, all helped create a strong X-ray signal, allowing discovery of an astrosphere around HD 61005. It has a diameter about 200 times the distance from Earth to the Sun.



An artist’s illustration depicts the astrosphere in more detail, including a bow shock in blue — akin to a sonic boom in front of a supersonic plane — that is caused by the motion of the star and its astrosphere as it pushes against and flies through gas in interstellar space.

NASA/Goddard Space Flight Center, Conceptual Image Lab

The Sun not only likely passed through a phase of development similar to HD 61005 when it was younger, it also likely traveled through a denser region of dust and gas than where the Sun is currently located, strengthening the connection with HD 61005.

“It is amazing to think that our protective heliosphere would only extend out to the orbit of Saturn if we were in the part of the galaxy where the Moth is located, or, conversely, that the Moth would have an astrosphere 10 times wider larger than the Sun’s if it were located here,” Lisse said.

HD 61005 is not visible from Earth with the unaided eye, but it is close enough that skywatchers could see it using binoculars.

The first hints of X-ray emission from the Moth's central star were based on a brief, one-hour-long Chandra observation of HD 61005 in 2014. In 2021, astronomers observed HD 61005 for almost 19 hours, which allowed the detection of the extended astrospheric structure.

NASA's Marshall Space Flight Center manages the Chandra program. The Smithsonian Astrophysical Observatory's Chandra X-ray Center controls science operations from Cambridge, Massachusetts, and flight operations from Burlington, Massachusetts.

Image credit: X-ray: NASA/CXC/John Hopkins Univ./C.M. Lisse et al.; Infrared: NASA/ESA/STIS; Optical: NSF/NoirLab/CTIO/DECaPS2; Image Processing: NASA/CXC/SAO/N. Wolk

To learn more about Chandra, visit:

<https://science.nasa.gov/chandra>

Read more from NASA's Chandra X-ray Observatory

Learn more about the Chandra X-ray Observatory and its mission here:

<https://www.nasa.gov/chandra>

<https://chandra.si.edu>

Visual Description

This release contains three main images, each offering a different take on the astrosphere surrounding a young star called HD 61005. An astrosphere is a wind-blown bubble full of gas and dust particles that encases a star as it pushes through interstellar space.

In this release, an optical image from the Cerro Tololo Inter-American Observatory in Chile shows HD 61005 in the context of its star field. Here, the star in question appears as a glowing, gleaming white dot surrounded by other glowing dots of similar and smaller sizes. The image is utterly packed with specks of light in shades of blue, white, gold, green, and red. At this distance, in an optical observation, the star's astrosphere is not discernible.

The second image is a composite, which presents a close-up of HD 61005 using infrared data from Hubble, and X-ray data from the Chandra X-ray Observatory. Here, the spherical star has a

brilliant core bursting with white X-ray light. Ringing the white core is a neon purple glow; the astrosphere surrounding the star. A distinguishing feature of HD 61005 is a white, wedge-shaped tail with neon blue tips, which trails the fast-moving star. This tail is dusty material left behind after the star's formation. The wedge, or wing shape of the tail has earned the star the nickname 'Moth' by astronomers spying it through infrared telescopes.

The third image in this release is an artist's illustration of an astrosphere in action. Here, a large, pale purple ball soars from our right toward our left, into a misty brown cloud. The purple ball appears to be protected by a blue force field, which pushes the brown cloud aside as the ball dives in. In this illustration, the purple ball represents the astrosphere surrounding a star and the brown cloud is interstellar gas. The blue force field is a bow shock, a curved free-floating shock wave, similar to the sonic boom that travels in front of a supersonic plane. The bow shock is caused by the motion of the star and its astrosphere hurtling through space. This illustration features a series of faint lines representing wind patterns from HD 61005, but does not show the tail of debris found behind and beside HD 61005.

News Media Contact

Megan Watzke

Chandra X-ray Center

Cambridge, Mass.

617-496-7998

mwatzke@cfa.harvard.edu

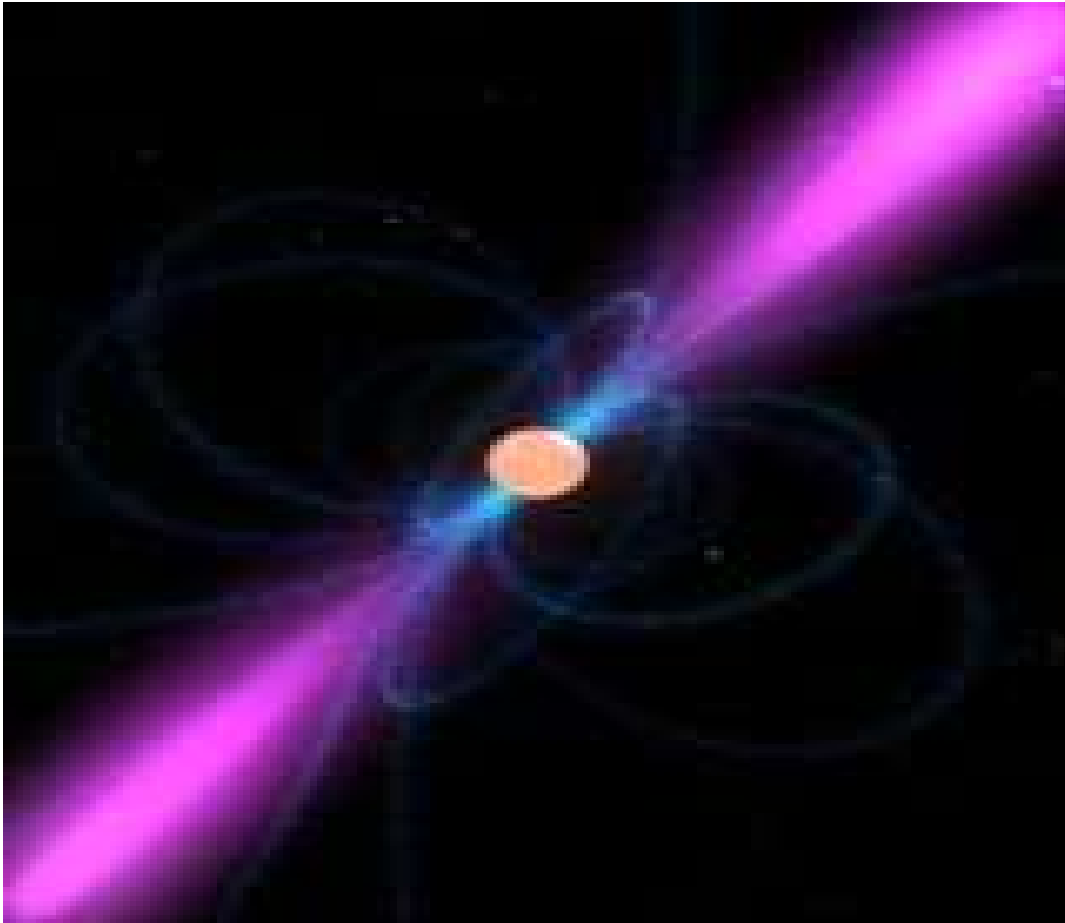
Joel Wallace

Marshall Space Flight Center, Huntsville, Alabama

256-544-0034

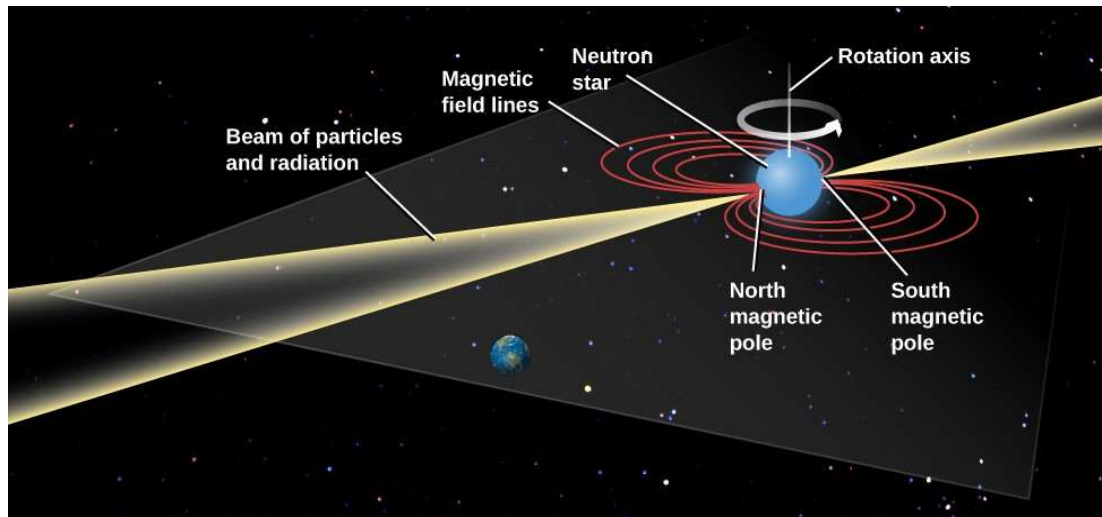
joel.w.wallace@nasa.gov

Pulsars



Pulsars are highly magnetized, rapidly rotating neutron stars that serve as cosmic lighthouses, emitting beams of electromagnetic radiation from their magnetic poles. As these beams sweep across space, they become visible from Earth whenever they are pointed in our direction, producing a distinctive pulsing effect. The first pulsar was discovered in 1967 by Jocelyn Bell Burnell and Antony Hewish, marking a groundbreaking moment in astronomy. Since then, pulsars have offered profound insights into the nature of dense matter, the behaviour of extreme magnetic fields, and the fundamental laws of physics.

Neutron stars themselves are formed from the remnants of massive stars that have exploded in supernovae, leaving behind extraordinarily dense cores with masses greater than our Sun but diameters of only about 20 kilometres. When these remnants possess strong magnetic fields and rotate quickly - sometimes hundreds of times per second - they become pulsars. Their pulses are remarkably regular, making them some of the universe's most accurate clocks, with some millisecond pulsars used to test theories of gravity and to search for gravitational waves.



History of Pulsar Discovery

The discovery of pulsars marked a transformative moment in the field of astronomy. In 1967, Jocelyn Bell Burnell and Antony Hewish, while using a radio telescope at the University of Cambridge, identified an unusual, regularly repeating radio signal coming from space. This signal, later understood to be the first detected pulsar, was initially dubbed "LGM-1" for "Little Green Men," reflecting the mystery and excitement surrounding its origin. Their groundbreaking observation revealed a new type of celestial object: highly magnetized, rapidly rotating neutron stars emitting beams of electromagnetic radiation.

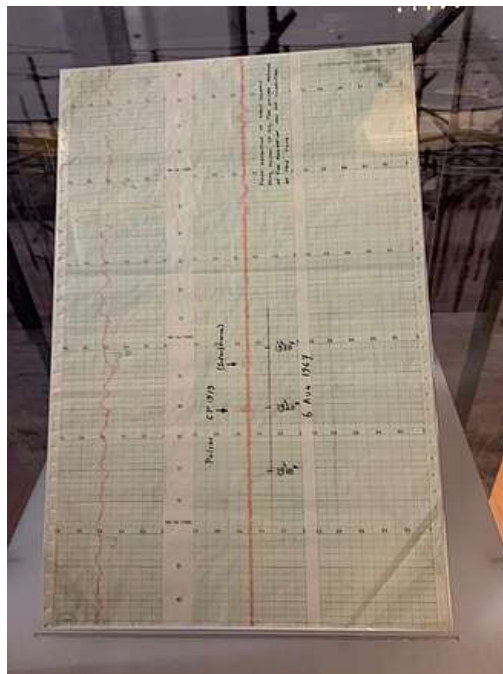


Chart on which Bell Burnell first recognised evidence of a pulsar,
exhibited at Cambridge University Library

The Interplanetary Scintillation Array

The Interplanetary Scintillation Array (also known as the IPS Array or Pulsar Array) is a radio telescope that was built in 1967 at the Mullard Radio Astronomy Observatory, in Cambridge, United Kingdom, and was operated by the Cavendish Astrophysics Group. The instrument originally covered 4 acres (16,000 m²). It was enlarged to 9 acres in 1978 and was refurbished in 1989.



The array operates at a radio frequency of 81.5 MHz (3.7 m wavelength) and is made up of 4,096 dipole antennas in a phased array. Using 14 beams, it can map the northern sky in one day. The observatory's staff use sheep to keep grass away from the antennas because a lawn mower cannot fit in the spaces.

Antony Hewish designed the IPS Array to measure the high-frequency fluctuations of radio sources, originally for monitoring interplanetary scintillation. Hewish received a Nobel Prize after the high time-resolution of the array allowed the detection of pulsars by Jocelyn Bell in 1967.

The IPS Array has more recently been used to track and help forecast interplanetary weather, and specifically to monitor the solar wind. It is now essentially retired and has lost a significant fraction of its area.

The identification of pulsars quickly led to new insights into the physics of neutron stars, extreme magnetic fields, and dense matter. Subsequent discoveries of different types of pulsars - including millisecond pulsars and binary systems - have expanded our understanding of the universe, confirming predictions from Einstein's general theory of relativity and helping scientists study gravitational waves. Today, the study of pulsars remains a vibrant area of astronomical research, with ongoing observations unveiling more about these fascinating cosmic lighthouses.

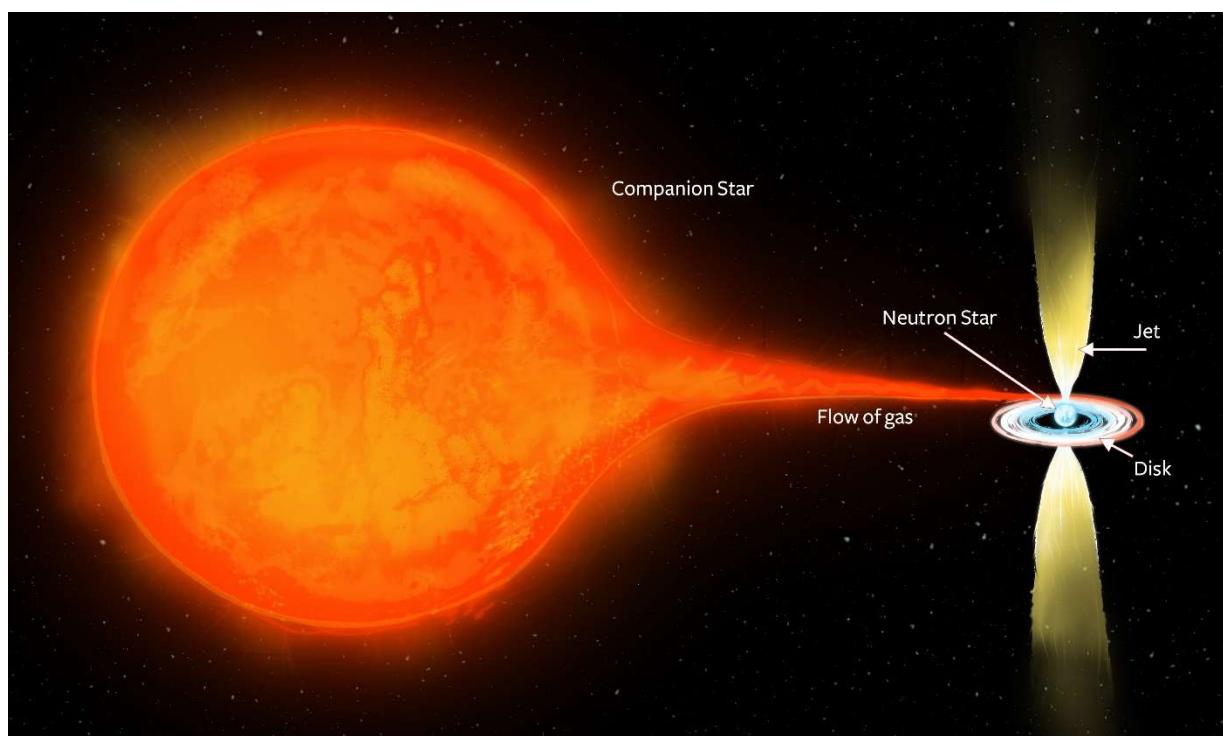
Pulsars are classified into several types, including radio pulsars, which emit detectable radio waves, and X-ray or gamma-ray pulsars, whose emissions are found in higher energy bands. Binary pulsars, paired with companion stars, have been crucial in confirming predictions from Einstein's general theory of relativity. In addition to their scientific importance, pulsars have also been used for practical purposes, such as helping spacecraft navigate deep space by timing their pulses.

Radio pulsars:

Radio pulsars are a type of pulsar that emit beams of radio waves detectable from Earth. These neutron stars rotate rapidly and have intense magnetic fields, causing them to emit radiation primarily in the radio frequency range. As the star spins, its radio beams sweep through space, and if one of these beams crosses our line of sight, we observe a regular series of radio pulses. Radio pulsars are the most commonly observed class of pulsars and have played a key role in advancing our understanding of neutron stars, dense matter, and fundamental physics.

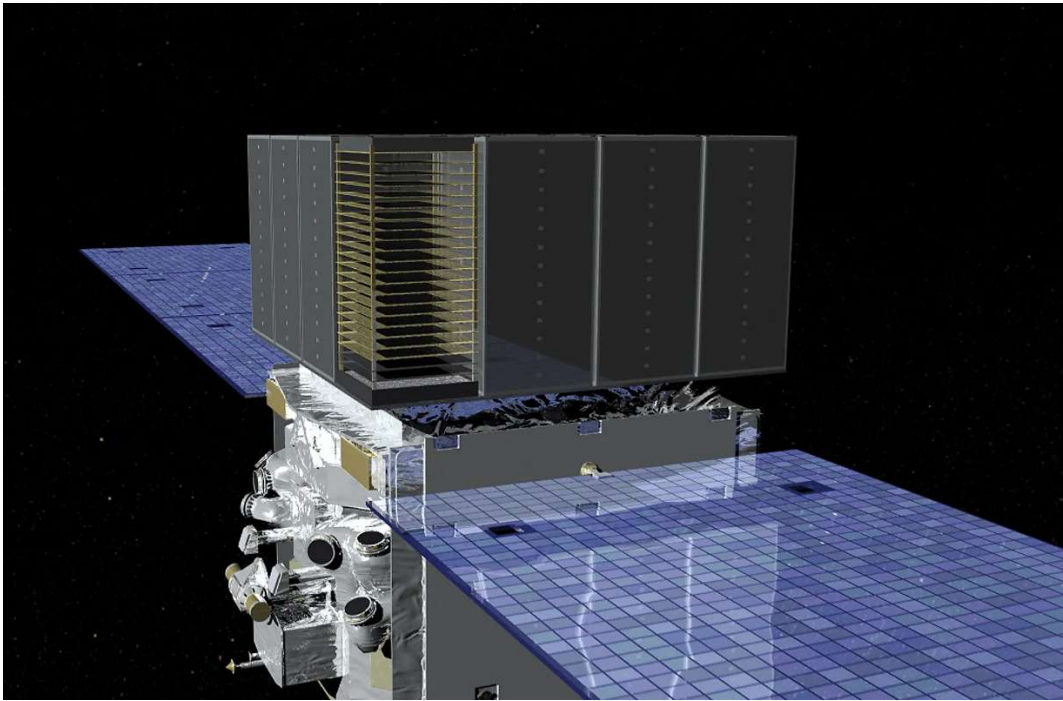
X-ray pulsars:

X-ray pulsars are neutron stars that emit powerful beams of X-ray radiation, typically detected in binary systems where material from a companion star is accreted onto the pulsar's surface. This infalling matter heats up and generates intense X-rays, which are observed as regular pulses due to the star's rapid rotation and strong magnetic field. The study of X-ray pulsars has provided valuable insights into the physics of accretion, magnetic fields, and the behavior of matter under extreme conditions.



Gamma-ray pulsars:

Gamma-ray pulsars are neutron stars that emit beams of extremely energetic gamma-ray radiation, often detected by space-based observatories like the Fermi Gamma-ray Space Telescope. Unlike radio or X-ray pulsars, gamma-ray pulsars can sometimes be found in isolated settings, and their emissions are produced through processes involving particle acceleration in the pulsar's intense magnetic field. Studying these objects helps scientists probe the mechanisms behind high-energy astrophysical phenomena and offers clues about the extreme conditions present in the universe.



Fermi's Large Area Telescope, shown in partial cutaway in this illustration, detects gamma-rays by tracking the electrons and positrons they produce after striking layers of tungsten. This ability also makes the LAT an excellent tool for exploring high-energy cosmic rays.

Credit: NASA/Goddard Space Flight Center Conceptual Image Lab

The study of pulsars continues to evolve with modern telescopes and observatories, revealing new discoveries about these enigmatic stars and their role in the cosmic tapestry. Their unique properties and reliability make them not only fascinating objects for researchers, but also valuable tools for exploring the universe and understanding its deepest mysteries.

Chris Bailey

Do you know your Moons?

Answers

1	Phobos, Mars	2	Charon, Pluto
3	Ganymede, Jupiter	4	Ariel, Uranus
5	Mimas, Saturn	6	Triton, Neptune
7	Titan, Saturn	8	Europa, Jupiter
9	Deimos, Mars	10	Io, Jupiter
11	Nix, Pluto	12	The Far Side of our Moon, Earth
13	Callisto, Jupiter	14	Enceladus, Saturn
15	Umbriel, Uranus	16	Dactyl, Asteroid Ida,
17	Pandora (and Prometheus), Saturn	18	Hyperion, Saturn
19	Miranda, Uranus	20	Rhea, Saturn

All images are courtesy of NASA

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.

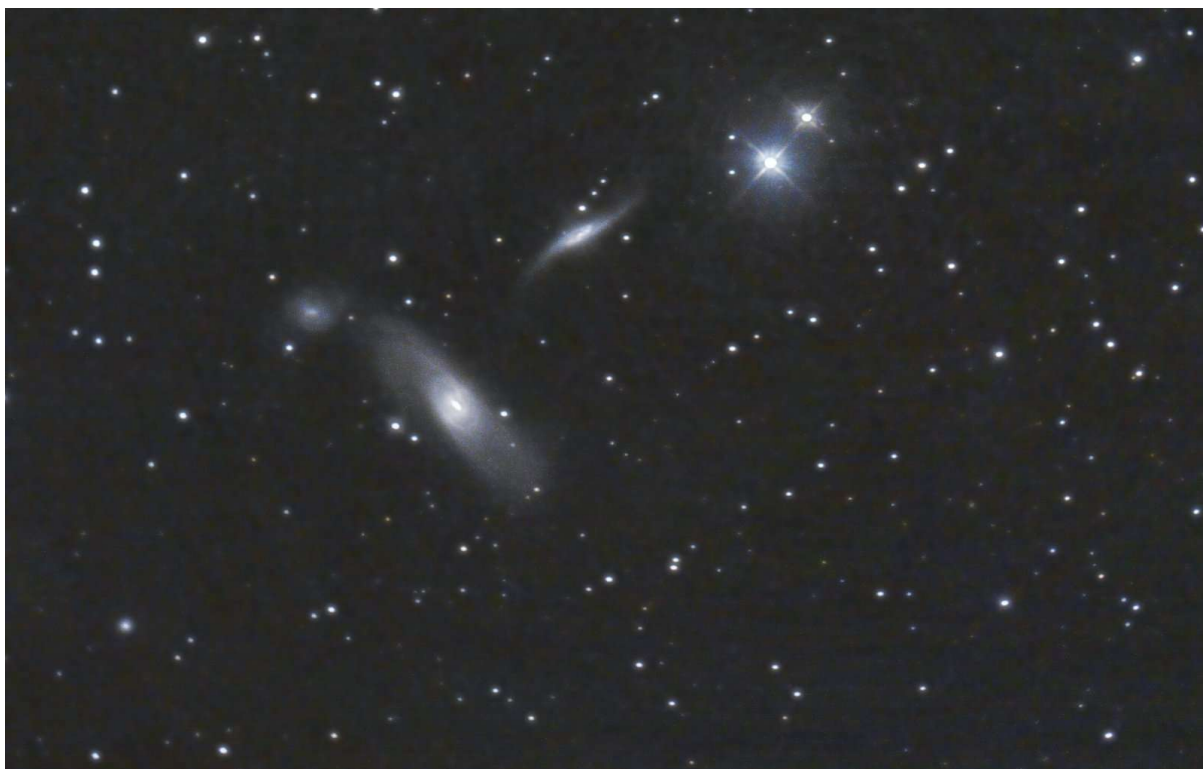
Dan Self



Auriga 23X60sec with L-Enhance from Norwich



M51 34X30 Sec



NGC5566 Largest absolute size in Virgo



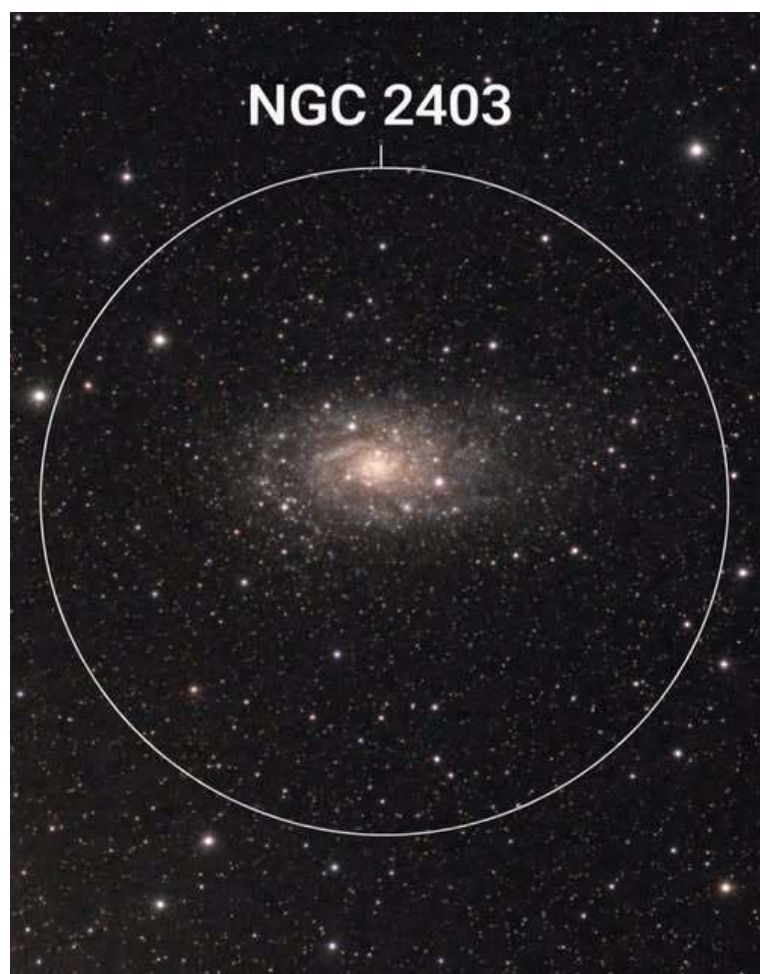
NGC5609













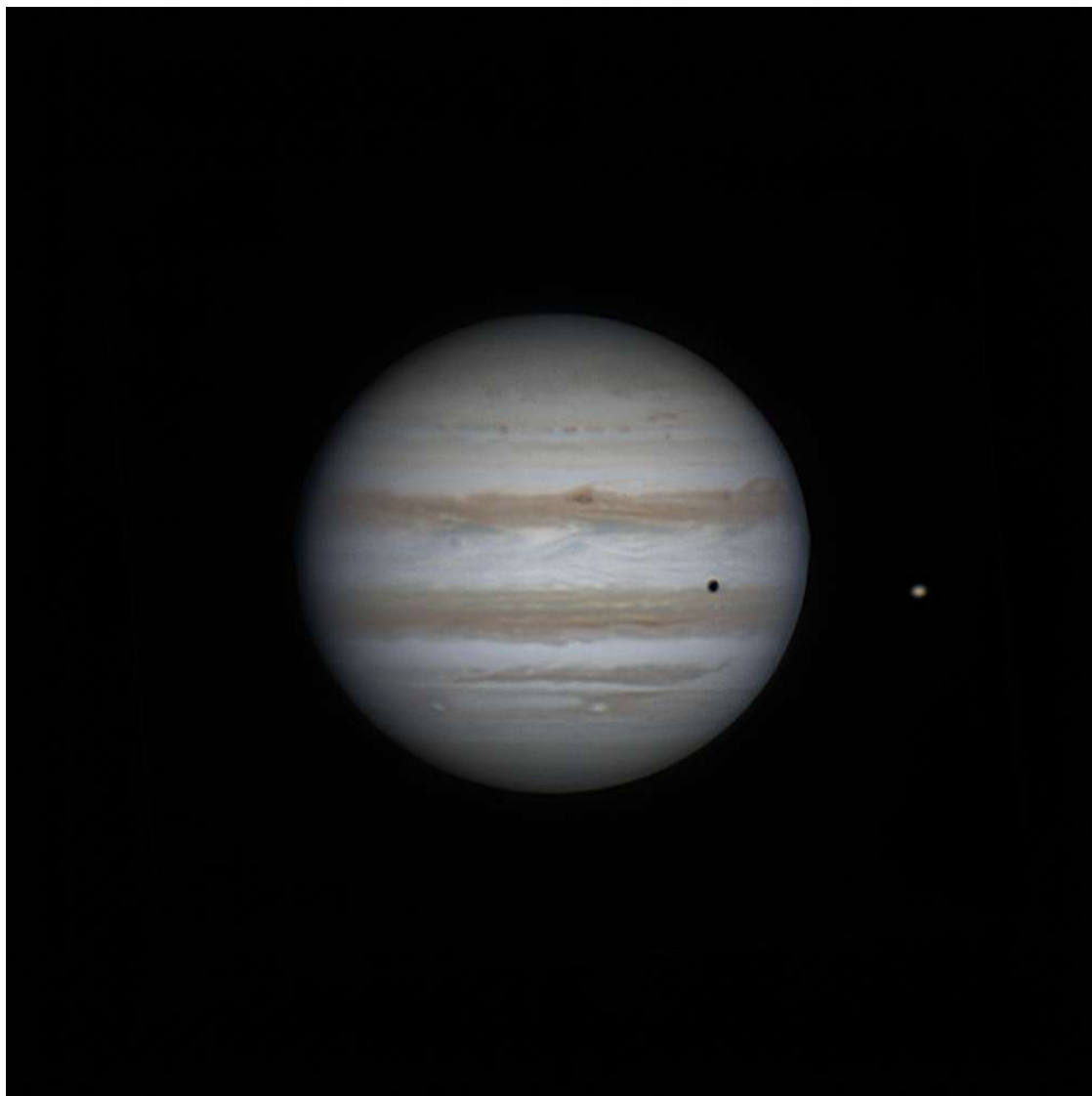
Bodes Galaxy and Cigar Galaxy.
M81 and M82.

Early evening between 20:00 and 22:00.
120 mins x 10sec, stacked and post processed with Zwo S50 internal software.
Focused more on M81 as you can see in the image.



First Quarter Moon Image.
10second video, stacked and post processed with Zwo S50 Seestar software.

Luke Broom-Lynne



Jupiter and Io on Monday, March 3rd 2026. 250mm f/4.8 Newtonian. 6 x 1 minute captures derotated with Winjupos. Altair Hypercam 585C camera, 5x Televue Powermate.

Keith Fowler



Seestar S50. 60 mins x 10s subs. Siril. Needs more data, but delicate and sweet (yes, I know it's a thumping great pair of galaxies)



60mins of 10second exposures with Seestar S50, processed in Siril.



Seestar S50. Approx 50 minutes of 10 second subs before clouds stopped play. Siril, Graxpert, Veralux, Cosmic Clarity and others.



IC342 - "The Hidden Galaxy" - face on spiral - I've never looked for this visually, but I imagine in small telescopes it'd be stellar.
This is about an hour of data with a Seestar S50 and processed with Siril.



M106, Seestar S50, Siril, 25mins



M3. Seestar S50, Siril, only 8min



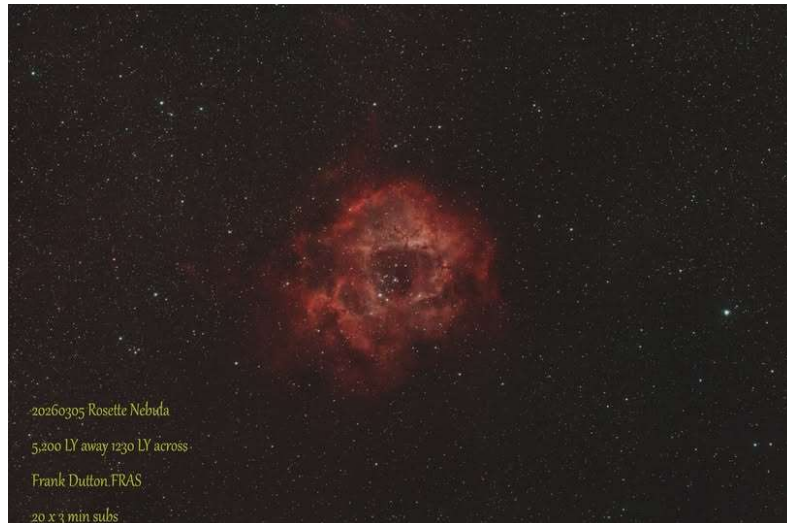
This is 72 mins of NGC 4631 also know as The Whale



Abell 21 - Medusa Nebula. 2 hours of 10s with a Seestar S50. Bortal 4

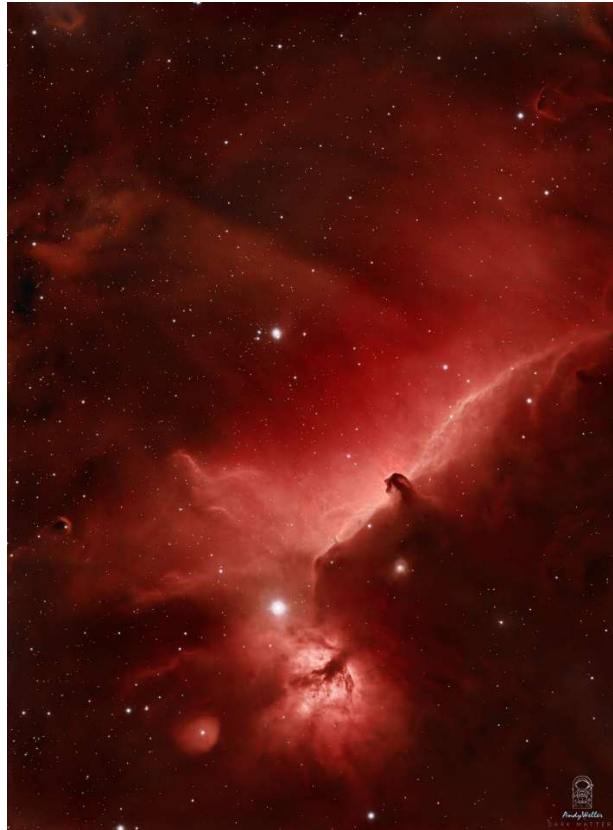


Frank Dutton



Rosette Nebula last night. 1 hour of data (20x3 min subs) 5,200 light years away 130 light years across.....
Whitecat and ASI2600Air. 20x3min subs







Water Bug Galaxy NGC 5033 in the constellation Canes Venatici.
Taken with an Edge 11



NGC 4676 Mice Galaxies. Two colliding spiral galaxies in the constellation Coma Berenices that are circa 345 million light-years away from us. Taken with an EDGE 11 SCT 1960mm FL @ F/7.



NGC 4725 Galaxy

Hugh Lodge



Hugh Lodge @ 2026

DWARF 3

2026.03.11 21:19

Bode's Galaxy Megastack Astro 30s 60g

Bode's Galaxy | 1 h 44 min

Astro



Hugh Lodge @ 2026

DWARF mini

2026.03.11 21:00 | 52.4° N 0.6° E

Medusa Nebula

NGC 2395 | 1 h 39 min

30s | 60 | Astro



The North American Nebula, The Mexican Nebula and The Pelican Nebula edited in the Stella Studio software and the starless edited in Snapseed for brightness saturation and contrast and then the star image merged feinter to include the stars but lighter.



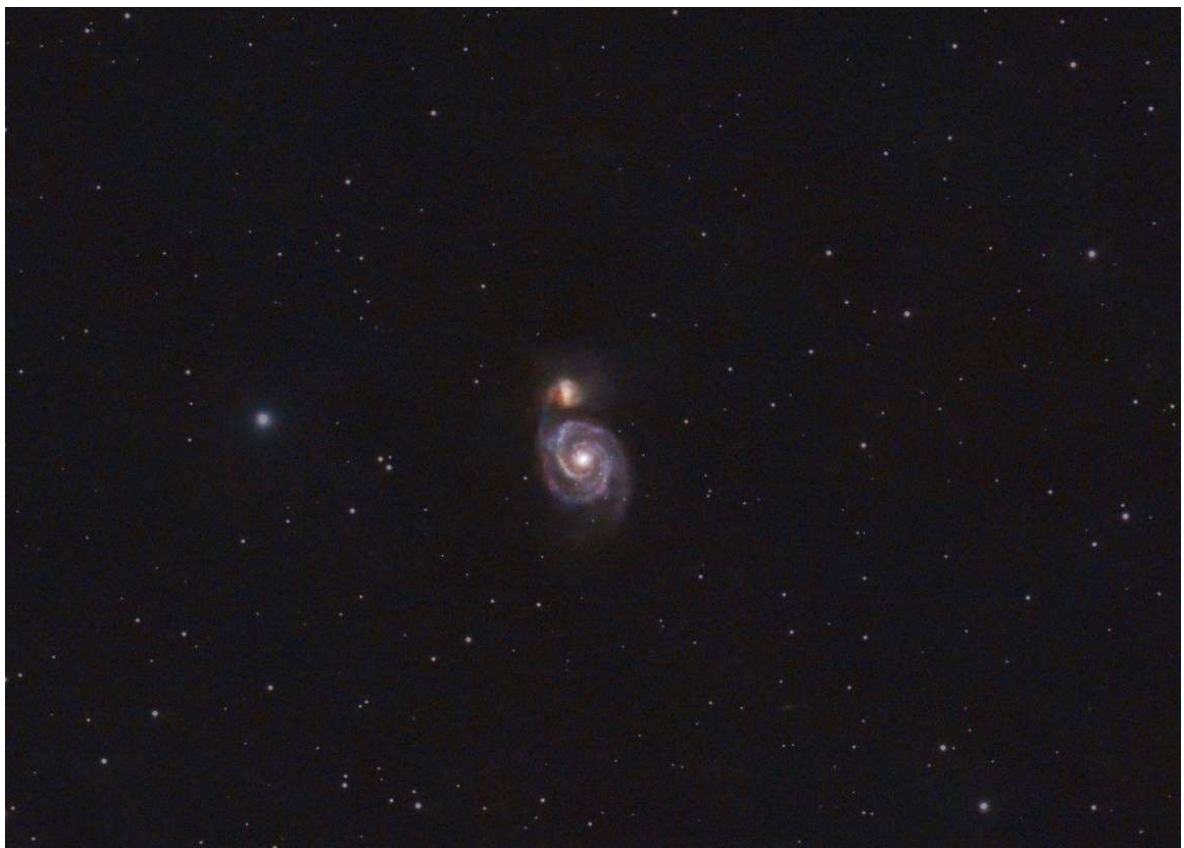
Veil Nebula with the normal editing with the starless in Snapseed adjusting saturation brightness and contrast and then merging back the star image and then cropping it.



Hugh Lodge @ 2026

DWARF mini
2026.03.13 22:18 | 52.4° N 0.6° E

Whirlpool Galaxy | 38 min 15 s
15s | 60 | Astro





DWARF mini
2026.03.14 20:25 | 52.4° N 0.6° E
M 97 Owl Nebua

Owl Nebula | 58 min 30 s
30s | 80 | Astro



DWARF 3
2026.02.28 21:30 | 52.4° N 0.6° E

Rosette A | 1 h 33 min
60s | 80 | Duo-Band



DWARF mini
2026.03.18 22:51 | 52.4° N 0.6° E
M86 Markarian Chain

M 86 | 1 h 52 min
60s | 40 | Astro





Dwarf3 telescope over 90 minutes, each frame 15 seconds with a gain of 60 with the astro filter. It is centred on Polaris.





Hugh Lodge @ 2026

DWARF mini
2026.03.21 18:49 | 52.4° N 0.6° E

Moon | 0.1 s
1/60s | 2 | Astro



@Hugh Lodge. 7/2025

DWARF 3
2025.07.11 23:47 | 52.4° N 0.6° E
60 of 60 stacked

Bubble Nebula | 30 min
30s | 60 | Duo-Band

Mick Ladner





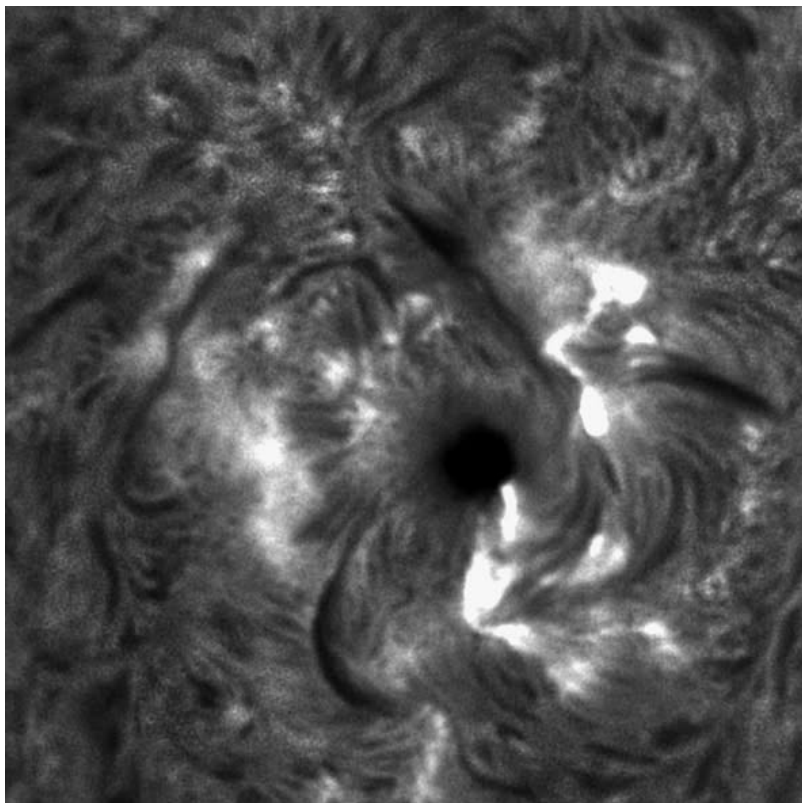
Pinwheel Galaxy M101 with my Dwarf 3 smart scope.
 240 x 30 second subs @ 60 gain.
 Astro filter.
 EQ mode.

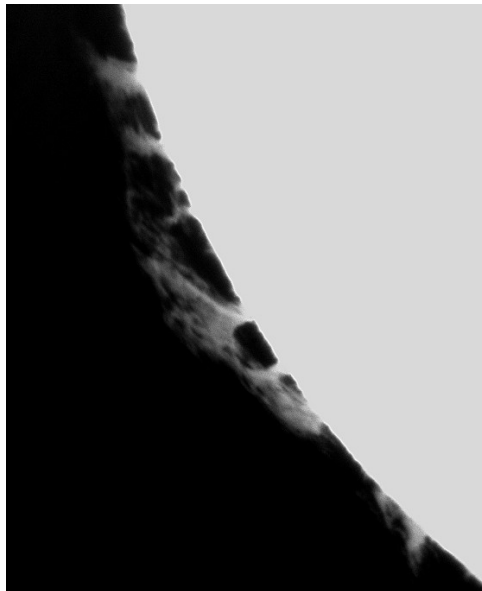


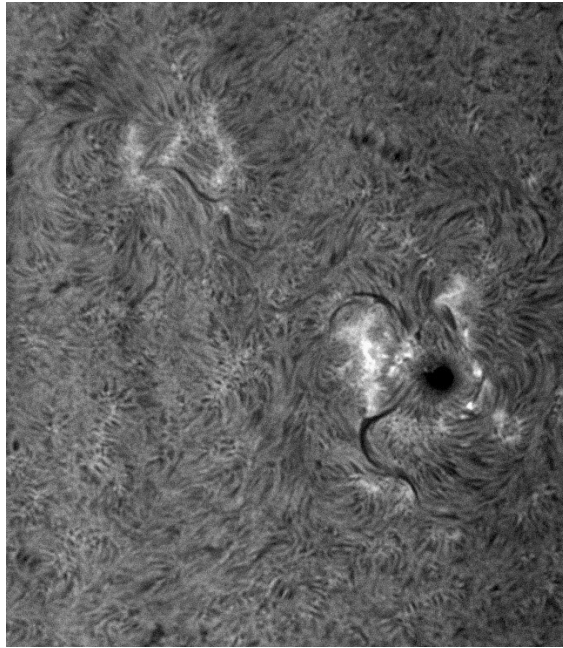
Dwarf 3 smart scope.
 The Whale and Hockey Stick Galaxies.
 120 x 30 second subs @ 60 gain.
 Astro filter.
 EQ mode.
 Processed using the in camera Stellar Studio.

Martin Bulmer









2.6% Moon and Venus

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.



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

CHILD PROTECTION POLICY

This document Incorporates Child Protection & Safeguarding. The Risk Assessment for the use of the premises and the society's and our personal equipment is a separate document. Other statements of intent are laid out in the society's constitution.

Background: 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. We run visits and outreach activities at other sites. For the purpose of definition 'Supervisor' below shall refer to any demonstrator, teacher undergoing an outreach activity.

General statement of intent: Breckland Astronomical Society abides by the duty of care to safeguard and promote the welfare of children and young people, is committed to safeguarding practice that reflects statutory responsibilities, government guidance and complies with best practice requirements.

1. It is the statutory duty of the trustees and appointed supervising members of Breckland Astronomical Society to look out for the welfare of under 18's at the society's facility and at outreach events and protect them from harm.
2. The Chairman is DBS checked as part of his profession, but we cannot pursue checks for all supervising members. Therefore, we require any visitors under 18 to be accompanied with a

suitable parent/guardian or a responsible DBS checked adult(s) at an appropriate minimum adult to child ratio: Ages 4-8 6:1, Ages up to 12 8:1, Ages up to 18 10:1 (NSPCC guidelines).

3. The organisation cannot afford external Safeguarding training for all supervisors however it is best practice. The chairman has up-to-date training as part of their job and will provide supervisors with the overarching principles that guide our approach to child protection. See <https://learning.nspcc.org.uk/>

Physical safety

4. A copy of the Risk Assessment is available on request.
5. Children should be supervised when around equipment in order to not expose them to hazards. Supervisors should be made aware of the equipment's hazards.
6. Contact details for under 18s should be available in case of accidents. The society's details should be publicly available.
7. Supervisors acting on behalf of the society should be aware of the nearest available medical facilities in the event of an accident.
8. Parental or guardian consent is necessary for children to visit, or attend our outreach events. The responsibility for organising this is with the visiting party leaders.
9. Other than open evenings, visits to our facilities should be arranged in advance.

Concerns

10. In the event of a concern being raised regarding one or more of our members or supervisors, one of the trustees should be contacted. Details are available on the website and should be given as a matter of course. The issue shall then be investigated at the earliest opportunity by an independent safeguarding authority, such as the Multi Agency Safeguarding Hub or the Local Area Designated Officer.
11. No supervisor or member who is deemed not being suitable for supervising children, unanimously by the Trustees listed below (the committee) will be permitted to be present when delivering outreach activities where there could be a child present.
12. No supervisor or member who has a known record of failing a Disclosure and Barring Service Check shall be permitted to attend outreach activities or be present at any session where children may be present. This rules out many sessions including some weekly members nights where visits have been arranged.

Abuse

13. It may not be possible during short activity times and in various contexts, but it is important to recognise and report evidence of abuse against any particular child or children including: bullying (including cyber bullying), child sexual exploitation, child criminal exploitation, child trafficking, domestic abuse, grooming, historical abuse, online abuse.

Confidentiality

14. a. Information (identifiable pictures, names, data) about children should not be shared without explicit permission from the child or parent/guardian/leader. Leaders need to obtain parent/guardian permission. Care must be taken especially with social media.
b. However, records must be kept about any concerns, signed and dated and include details, decisions and be reported to the appropriate agency, then stored in line with GDPR.

15. Work together to safeguard children and provide a safe environment of care, and taking action to enable all children to have the best outcomes. This includes the ability to raise concerns or whistleblow and that there should be no culture of authority or threat against such doing (whether legally provable or not).
16. This policy also extends to vulnerable adults.

Contacts

17. Officers to whom safeguarding issues can be reported are the chairman, treasurer and secretary, listed below, who have regular safeguarding training. The LADO (local area designated officer) are available on 01603 223473 lado@norfolk.gov.uk for reporting suspicions. Police can be called on 101 for non-emergency or 999 for emergency situations. NSPCC run a helpline on 0808 800 5000.

Trustees as of 18/04/2026 are: Dr Dan Self *(Chairman) – chairman@brecklandastro.org.uk Keith Fowler (Treasurer/Membership secretary) treasurer@brecklandastro.org.uk , John Copsey (Secretary) johncopsey@live.co.uk , Richard Harmon, Mark Humphrys, Justin Pearson. Other appointed supervising members for visits and outreach: Peter Farmer, Andrew Luck, Chris Bailey, Mick Ladner, Keith Morris, Gerald North.

*DBS checked for their main job



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 2026

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

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
Child protection risks (under 18s)	Two adults should be available at all times. DBS checks are in place for DS and MH but this is not transferable. Breckland Astronomical Society operates a child protection policy. The committee are vigilant with regard to risks. Advise for group leaders to be DBS checked.	Low
Virus transmission	This is at own risk and applies in any public place. There is good ventilation at the observatory, although space can be tight.	Low
Reporting	Sign in for track and trace purposes not needed now, but good to keep records. GDPR applies and it is not necessary to sign.	N/A

Trustees as of 18/04/2026 are: Dr Dan Self ⁺ (Chairman), Keith Fowler (Treasurer), John Copsey (Secretary), Richard Harmon, Mark Humphrys*, Justin Pearson. Trusted supervising members: Keith Morris, Mick Ladner, Peter Farmer, Chris Bailey, Pat Goddard, Gerald North, Andrew Luck. *DBS checked for day job. ⁺First Aid trained for day job.

Signed.....

Chairman, Breckland Astronomical Society, UKCC 1044478.

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 Telenegative 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 11/4"+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 Justin Peerson
Contact visitors@brecklandastro.org.uk

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

Newsletter Rebecca Greef
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 – 2026

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

between NR17 1HZ and 1HX **£3 over 18s** *what3words:octopus.vibrates.hubcaps*

Friday May 8 th	Solar Eclipses: Recent and Upcoming.	Jerry Workman G&L School Hammersmith
Friday May 29 th	Late night open evening	Observatory
Friday June 12 th	Planetary Atmospheres	Prof Manoj Joshi UEA
Friday July 10 th	Alternative Sky Cultures	Frank Dutton KLADAS
Sunday August 9 th	Astro Barbeque and Perseid night	Observatory 4pm-
Friday August 14 th	TBC	
Friday August 28 th	Public Open Evening	Observatory
Friday September 11 th	The Wonderdome immersive 360	Dave at Wonderdome
Friday September 25 th	Public Open Evening	Observatory
Friday October 9 th	Women In Astronomy Part 2 (zoom)	Mary McIntyre FRAS
Friday October 30 th	Public Open Evening	Observatory
Friday November 14 th	A lesson in Astronomy	Karenmae Bloom BAS