

Autumn 2023 Number 41

Kielder Observatory Newsletter



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Shorlisted for
award!

NIGHT SKY

Highlights Nov/Dec/
Jan

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party

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Young stars



EDITORIAL

Most you will have heard about the loss of the iconic tree in Sycamore Gap, so we make no apologies for featuring this in happier times on our front and rear covers. The dark nights have returned - by the time you read this the clocks will have gone back onto GMT meaning more time in the evenings for astronomy! Jupiter is very prominent towards the South East at the moment, and reaches opposition on November 2nd. Simple binoculars should show the four major moons, which change position from night to night.

Robert has been out and about at the Kelling Heath star party, and reports on his experiences. The Kielder Star Camp (not connected to the Observatory) was on the same weekend, and for once was blessed with clear skies.

Nigel Metcalfe

Editors: Nigel Metcalfe & Robert Williams

Kielder Observatory Astronomical Society

Registered Charity No: 1153570.

Kielder Observatory Astronomical Society is a Charitable Incorporated Organisation. Its aims are to

- * Promote interest in the science of astronomy to the general public
- * Facilitate education of members of the public in the science of astronomy
- * Maintain an astronomical observatory in Kielder Forest to support the above aims

<https://kielderobservatory.org>



Front and rear cover: Sycamore Gap, as it was, credit: Dan Monk.

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OBSERVATORY NEWS



We are pleased to announce that we been shortlisted for Small Attraction of the Year at the North East Tourism Awards! These will be held in Spring next year. You can see the full list of finalists at <https://tickets.northeasttourismawards.co.uk/finalists-announced-for-2024-north-east-england-tourism-awards/>

We've been awarded £75000 in funding through the Mindsets + Missions programme, which will see us working with schools and communities to establish

the North East Astroimaging academy, and help connect people who wouldn't usually engage with research, to understand the Universe better. Mindsets + Missions is a pilot learning and grants programme designed to support museums, science centres and vibrant individuals from the sectors to realise new and creative approaches to serving their communities through inclusive, research-related projects. We are one of 12 projects by museums and science centres across the country receiving grants.



OBSERVATORY NEWS

We have completed a creative writing and astronomy project with residents at HMP Northumberland and Novus. The 'Look Up' project was funded by the Joicey Trust. The project was designed to bring the inspiration of astronomy to the residents of HMP Northumberland located 10 miles north of Morpeth. Working with Novus, who provide education and support services to people in custody, and the education team at the prison, we



The poetry produced by the Look Up project has been collated into a zine.

arranged our first visits in March and May, where we gave an in-depth cosmology presentation to two groups, taking learners on a tour to the far reaches of the Universe. Local creative producer Bridget Hamilton also delivered a series of interactive workshops over six weeks to explore poetry on the subjects of

stargazing and understanding our place in the world. We hope to build on the work of this project to do further collaboration with Novus and at HMP Northumberland and bring the inspiration of the dark skies of Kielder and science education to new audiences.

The second round of Frank's Fellowship bursaries have been awarded and the recipients came to the observatory at the end of August to meet each other and exhibit their creations! We had three fantastic, original pieces of art brought along by three talented artists. Jessica had created a bespoke night sky-inspired dress showcasing a wide range of textiles skills, featuring a moon centrepiece and a black cloak flush with constellations. Elizabeth brought with her a brilliant painting of the observatory, featuring the



Our Frank's Fellowship winners display their creations.



OBSERVATORY NEWS

red light of the Sir Pat turret glowing in the night sky and an astronaut floating into the cosmos above. Eve had painted and constructed an atmospheric, unique diorama featuring a traditional painter's box with a painting of moonlit Kielder and a figure capturing the moment.

September was a great month for auroral displays at the observatory, with a particularly splendid display on the 13th. With solar maximum due next year, such displays are becoming more common, so it is worth keeping an eye out - there are

various tools out there to alert you, e.g. Lancaster University run AuroraWatchUK (<https://aurorawatch.lancs.ac.uk/>).

Storm Babet meant we had to close for a few days, but we had one of our pop-up sessions in Hexham instead, plus a live podcast for you to ask our astronomers questions. You can still view this at https://www.facebook.com/KielderObservatory/videos/ask-an-astronomer-live-podcast/711407157085820?locale=en_GB



The aurora on September 13th taken by volunteer Michael Autun.



OBSERVATORY NEWS

As ever we also have our regular monthly podcasts for you at

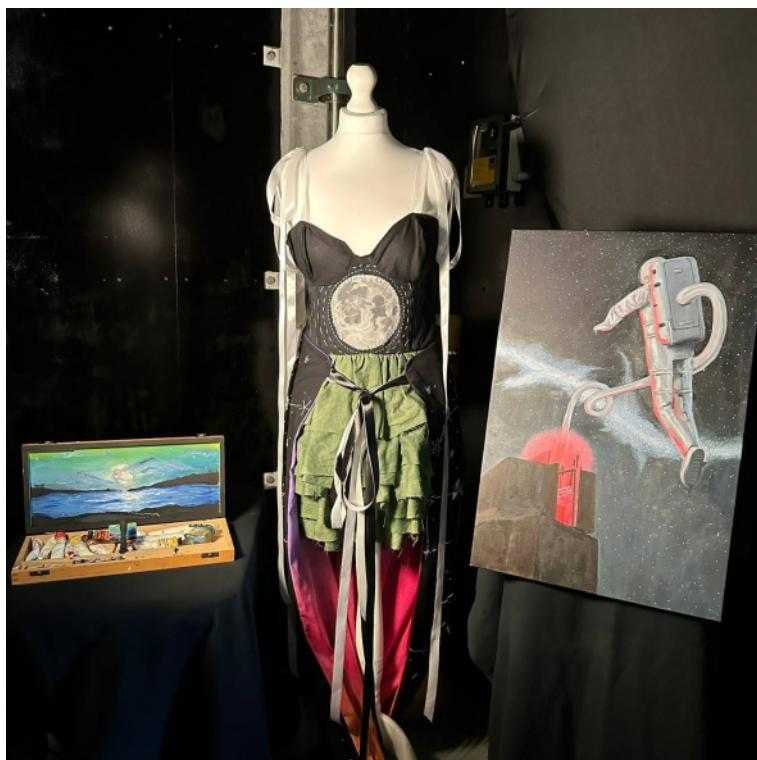
<https://podfollow.com/kielderobs/view>



October there are only a handful of places left in November and December is filling fast. Remember to keep an eye on our Facebook feed, where any spaces due to last minute cancellations are usually advertised.

With Christmas coming, keep an eye open for our 2024 calendar which should be arriving in our [online shop](#) soon. We also have some ideal gifts for the astronomer in your life!

As is usual over the Winter season, we are very heavily booked. As of the end of



A closer look at the work of our Frank's Fellowship artists.



OBSERVERS' SLOT

The Autumn 2023 Kelling Heath Equinox Star Party

September 2022 - Choices, choices – should I go to the 2023 Kielder Autumn Star Party – or should I go to the Equinox Star Party at Kelling Heath in Norfolk. So, I decided to go to Norfolk for my – annual – October astrophotography trip to a dark sky site – sorry KASP - no hard feelings! This year's event was held at Kelling Heath Holiday Village – its annual home for quite some time now – at least 10+ years. Usually I go for 4 nights but this year I decided to go for 6 nights in the hope of getting at least one clear night. Setting off on Monday 9th October in bright sunny weather I had a fairly enjoyable trip across the breadbasket of England – Lincolnshire and East Anglia – with miles and miles of 'stuff' growing in the fields or under glasshouse. Arriving to both heat and Sun I duly set up

my camp and took the opportunity to try out my Lund LS50FHa solar filter set with my – fairly recent acquisition, an Altair FS102 SED f7 apo – refractor. There were some sunspots to see but I also contemplated the still clear weather.



The author's equipment.

Decided to put the solar filter to bed so that I could sort out some food. Once darkness took hold, I got my mount [Avalon M-Zero] polar aligned – I have middle-aged man's vision so the QHY PoleMaster helps me out a lot, set up my



Time to camp!



OBSERVERS' SLOT

scope and connected my mount to the laptop. The weather wasn't good enough to do any imaging – however I set about finding familiar objects and viewing them with my trusty Baader Hyperion Zoom Mark III 8-24mm eyepiece.

Ticked off a few – Jupiter and its moons, Double Cluster in Perseus, M31 Andromeda Galaxy and M101 in Ursa Major as well as a few others. It was a very dewy night so thankfully I had the dew-band at full power to keep it at bay. The sky conditions were very hazy and my equipment reported a dew point of 95%. Decided to call it a day at 10pm, covered up my scope and put all the delicate electrical stuff under cover or inside my tent. By 10:30pm I could hear the – not so delicate – thundering of raindrops on my tent. Talk about timeliness, phew that was a close one.

Tuesday 10th – woke up to no rain and partly clear dawn skies. Saw Venus and the crescent Moon looking splendid in the eastern sky before sunrise. On top of that a squadron of waterfowl were passing overhead – on their way to/from the Fens to/from the coastal mudflats.

I recently purchased an Altair Astro 290X mono imaging camera. Set up with my solar filter and FS102 set and tried – for

the very first time to see if I could image sunspots. After a bit of adjustment with the kit I had a result. Lots to see on the Sun today – sunspots, granulation and prominences.



The sun through the FS102 and an Ha solar filter.

Later that day the clouds rolled in so no stargazing tonight.

Wednesday 11th October – woke up to another partly clear dawn sky – once again the crescent Moon and Venus were in view through the moving clouds – noting that the crescent was thinner and the



Kelling Heath, Norfolk



OBSERVERS' SLOT

Moon had moved away from Venus. Jupiter and Saturn were also – just – visible too. Decided to go for a wander around the campsite and Heath. Kelling Heath – like Kielder – has some unique micro climates/environments. So some unusual fungi can be found on the heathland. One of them is known as the Parasol Fungus – at least according to an online search.



A Parasol fungus.

In the afternoon I joined some friends for a trip to Wells-Next-the-Sea. Picture postcard fishing village with a beach comprising of golden sand topped off by a steep shingle bank. After a quick photo

stop we moved onto Sheringham which is also another picture postcard seaside village – with a preserved Railway Line too.



The camp is not far from the North Norfolk Heritage Railway!

They say when in Rome do as the Romans do, so when in Sheringham pick up some Cromer Crab – which I did. So I would be having Crab for tea – for a day or two.

In the early evening the rain started – and then continued until Friday morning – so no astronomy for 48 hours. I decided to seek out a friend from Kielder Star Parties going back a few years, who was also at Kelling. Once the rain had stopped, we walked – through 100-Acre Wood - from Kelling Heath to Sheringham – about 3 miles and found a rather nice coffee shop to refuel. We quick-marched back to camp just in time to get sheltered before more rain tipped down. Saw some more



OBSERVERS' SLOT



The Flaming Star nebula (IC405) in Auriga.

interesting fungi along the way back [by a different route to earlier in the day]. Then we noticed that the clouds were clearing and the Sun began to shine again. After a good dinner it was time to set up the stargazing Mount, telescope and this time set in my trusty Canon 6D for some imaging time. I decided to include an Altair 0.8x FFR in the imaging train. Also

decided to stick to a few of my favourite objects – M42 and M45 – but was interested in getting to know two others better – IC405 and IC410 in Auriga as they have been targets of mine for quite a while. Just let's say it was a good night as I did not shutdown my astro-gazing until about 0430 the next morning.



OBSERVERS' SLOT

Saturday 14th - then it was time to – try to – get some sleep. Not easy with the dawn chorus kicking off – including a Corncrake – who's call is a bit like a chainsaw. After a few hours sleep I got up and as it was fine went for a wander across part of the Heath for some fresh air. After a freshen up I decided to browse the trade stands and a few things on the Altair Astro stand caught my eye. Did not spend too much this time around.

I think that sleep deprivation was taking hold so went back to my pitch for an afternoon snack followed by a trip to the ablutions – which for Kelling Heath are quire smart – as campsite facilities go. The weather was beginning to close in so decided to pack away my scope and stuff. Following that it was off to the on-site pub for a drink or two with my travelling companions and then prepared for an early night. Others were staying on until Monday so I left them to it.

The return trip to West Yorkshire was uneventful.

I have already booked for next year. Late September 2024, New Moon.
Hope you can join me!

Robert Williams

All images by the author



"An excellent evening with a very knowledgeable and friendly team. All of the team were fabulous in their own way (who knew rocks were that interesting!) Can't wait to come back!"

Sarah, Kendal



NIGHT SKY

NOVEMBER 2023 (times in GMT)

Lunar phases

Last quarter	05/11/2023	08:37
New moon	13/11/2023	09:28
First quarter	20/11/2023	10:50
Full moon	27/11/2023	09:16

PLANET SUMMARY

Mercury is too close to the Sun this month. Venus will be visible pre-dawn this month from 0430. Mars is in conjunction with the Sun this month. Jupiter is quite close to opposition and will be visible from 18:00 until 04:00. Saturn will be visible from 18:00 until 22:00. Uranus is close to opposition and will be visible from 18:00 until 06:00 – it will be quite close to Jupiter in the sky.

THE STARS AT 8PM

North – Cepheus is high overhead, with Draco and the two Bears nicely placed. East – Cassiopeia and Andromeda are high up with Perseus nicely placed. Taurus is near the horizon and to its top RHS is Aries. South – Pegasus is nicely placed with Pisces. Aquarius is low down and you can

find Formalhaut in Pisces Austrinus – a bright star that is the most southerly placed bright star we can see from the UK. West – Cygnus dominates this view along with Sagitta, Vulpecula and Lyra. Low down you can find Hercules.

METEOR SHOWERS

November hosts two meteor showers:

1) Taurids – around the 1st to 6th of November – this is a short shower but the particles are quite 'large'. The Taurids tend to be few in number but they make up for this by being bright slow moving and often quite colourful, with occasional fireballs. Best seen before midnight in 2023, as the Moon will interfere later in the night.

2) Leonids – on the 16th, 17th and 18th of November – another annual shower that usually puts on a good show of 50 to 100 meteors every hour. These particles are fast moving and 'small' and so the meteors are quite faint. Best seen after midnight once the First Quarter Moon has set. Potentially a good opportunity as activity is increasing year on year until 2032/2033.

The Planets 15/11/2023

	Sun	Moon	Mercury	Venus	Mars	Jupiter	Saturn	Uranus
Rise	07:34	10:41	09:17	03:04	07:43	15:32	13:52	15:48
Set	16:03	16:35	16:22	14:55	16:02	06:15	23:27	07:32



NIGHT SKY

The sky chart for Newcastle looking E at 9pm on 15/11/2023.

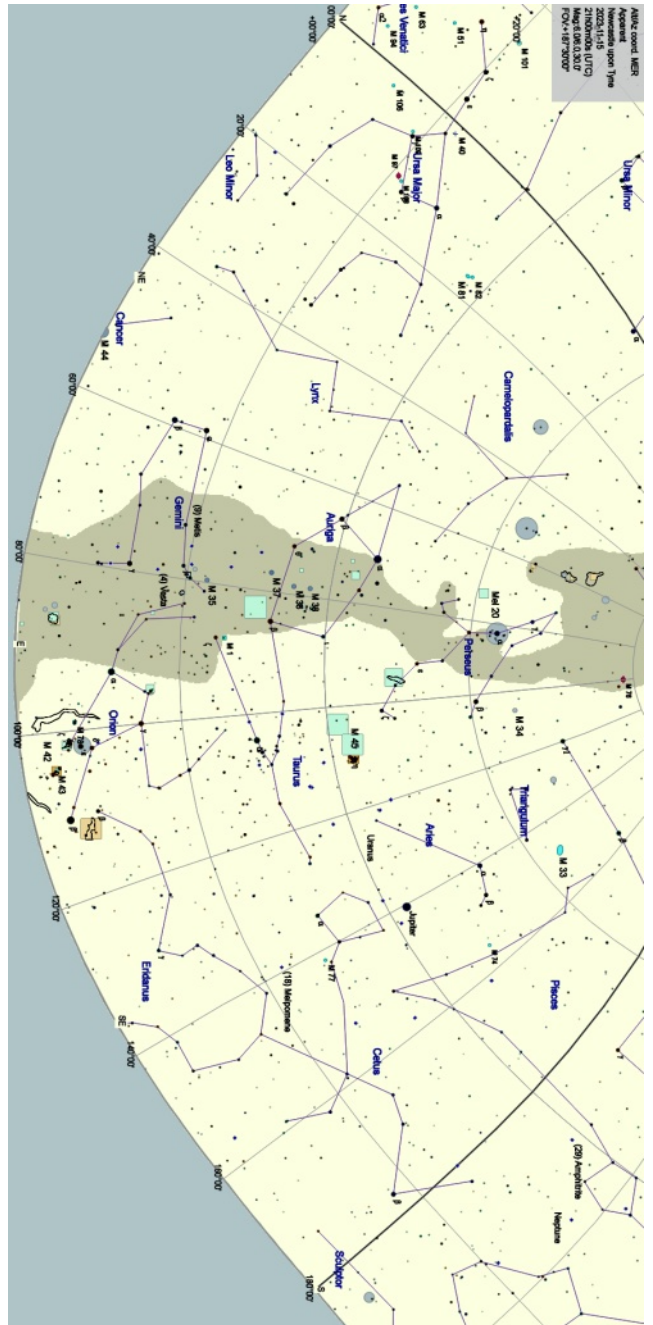
COMETS

There are no bright comets expected this month.

Good places to check for weekly information on the visibility of comets are

<http://aerith.net/comet/weekly/current.html> and

<https://in-the-sky.org/data/comets.php>





NIGHT SKY

DECEMBER 2023 (times in GMT)

Lunar phases

Last quarter	05/12/2023	05:49
New moon	12/12/2023	23:33
First quarter	19/12/2023	18:39
Full moon	27/12/2023	00:33

PLANET SUMMARY

Mercury is too close to the Sun this month. Venus is visible for a few hours pre dawn. Mars is in conjunction with the Sun this month. Jupiter is an evening object visible from dusk [17:30] until 02:30. Saturn is an evening object visible from dusk until 20:00. Uranus is visible for most of the hours of darkness [17:30 until 03:30].

THE STARS AT 8PM

North – Cepheus is overhead, with the two Bears nicely placed. Hercules is low in the NW and Cancer low in the NE.
East – Perseus is overhead, with Auriga nicely placed. Taurus, Gemini and Orion are well placed for observation.
South – Triangulum and Aries are overhead. Pisces and Cetus are nicely placed. Aquarius is low down in the SW.
West – Lacerta is overhead with Cygnus

nicely placed for viewing. Pegasus is nicely placed in the SW. Hercules and Lyra are low in the SE.

METEOR SHOWERS

The main meteor shower of December is the Geminids which are visible on the night of the 13th/14th of December with some activity a few days either side. This shower is unusual in that it originates from an asteroid – Phaethon.
Later in the month – on Christmas Day – the Ursids are active. Expect up to 5 per hour from this weak shower. It will be visible all night but is best seen after midnight this year.

COMETS

There are no bright comets visible this month.

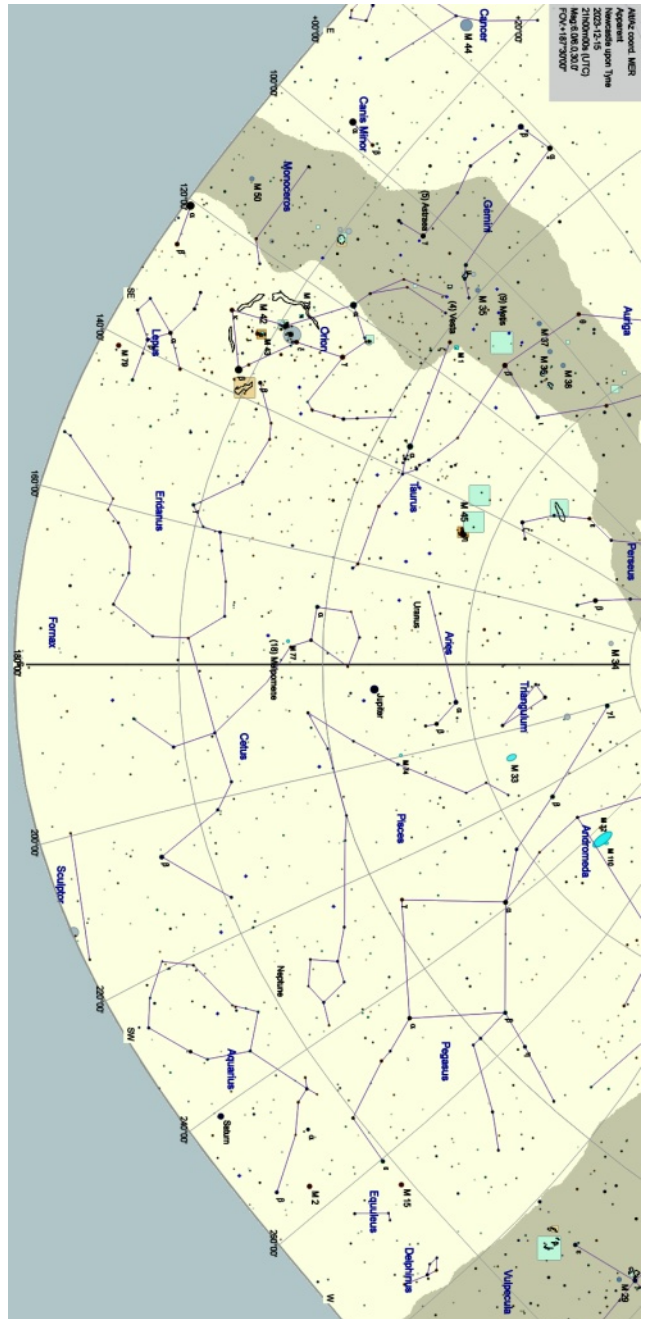
The Planets 15/12/2023

	Sun	Moon	Mercury	Venus	Mars	Jupiter	Saturn	Uranus
Rise	08:22	11:52	09:31	04:29	07:48	13:58	11:56	13:47
Set	15:37	17:52	16:37	13:58	17:52	04:00	21:37	05:28



NIGHT SKY

*The sky map looking S from
Newcastle at 9pm on
15/12/2023.*





NIGHT SKY

JANUARY 2024 (times in GMT)

Lunar phases

Last quarter	04/01/2024	03:31
New moon	11/01/2024	11:58
First quarter	18/01/2024	03:53
Full moon	25/01/2024	17:53

PLANET SUMMARY

Mercury is coming out of conjunction with the Sun but is still too close to the Sun to see it before dawn. Venus will be visible in the evening twilight. Mars is visible from 17:30 until 04:00 this month. Jupiter is an evening object visible from 17:30 until 21:00. Saturn is lost in the evening twilight this month. Uranus is an evening object visible from 17:45 until 0:130.

THE STARS AT 8PM

North – Draco is prominent splitting up the two Bears. Hercules is low in the NNE. Cepheus is nicely placed in the NW with Cygnus just below it.
East – Auriga is overhead with Gemini nicely placed. Orion is prominent in the NE with Lepus – the Hare, Monoceros the Unicorn and Canis Major – and Minor - beginning to show themselves again.

South – Taurus and Orion are well placed for observing. Eridanus and Cetus are low down. Aries and Pisces are high up in the SW.
West – Andromeda is overhead with Lacerta just below it. Pisces, Pegasus and Cygnus are well placed as is Pisces – with Mars.

METEOR SHOWERS

The major meteor shower of this month are the Quadrantids on the 4th of January. Muralis Quadrans was a constellation introduced in the early 17th century, but as the use of the quadrant circle diminished it was absorbed back into Bootes.
The Quadrantids meteors shower is a very short – sharp – peak of very bright and often colourful shooting stars.
It may only last for a few hours but if you catch a Quadrantid fireball then it will be worth the wait.
These particles can be both bright and colourful but the shower may only last a few hours around midnight on the 3rd or 4th of January. A last quarter Moon will make seeing this shower a bit of a

The Planets 15/01/2024

	Sun	Moon	Mercury	Venus	Mars	Jupiter	Saturn	Uranus
Rise	08:20	00:43	07:03	09:24	12:01	10:35	09:37	11:35
Set	16:07	11:17	15:04	17:56	05:35	22:43	17:48	02:56



NIGHT SKY

The sky map looking W from Newcastle at 9pm on 15/01/2024.

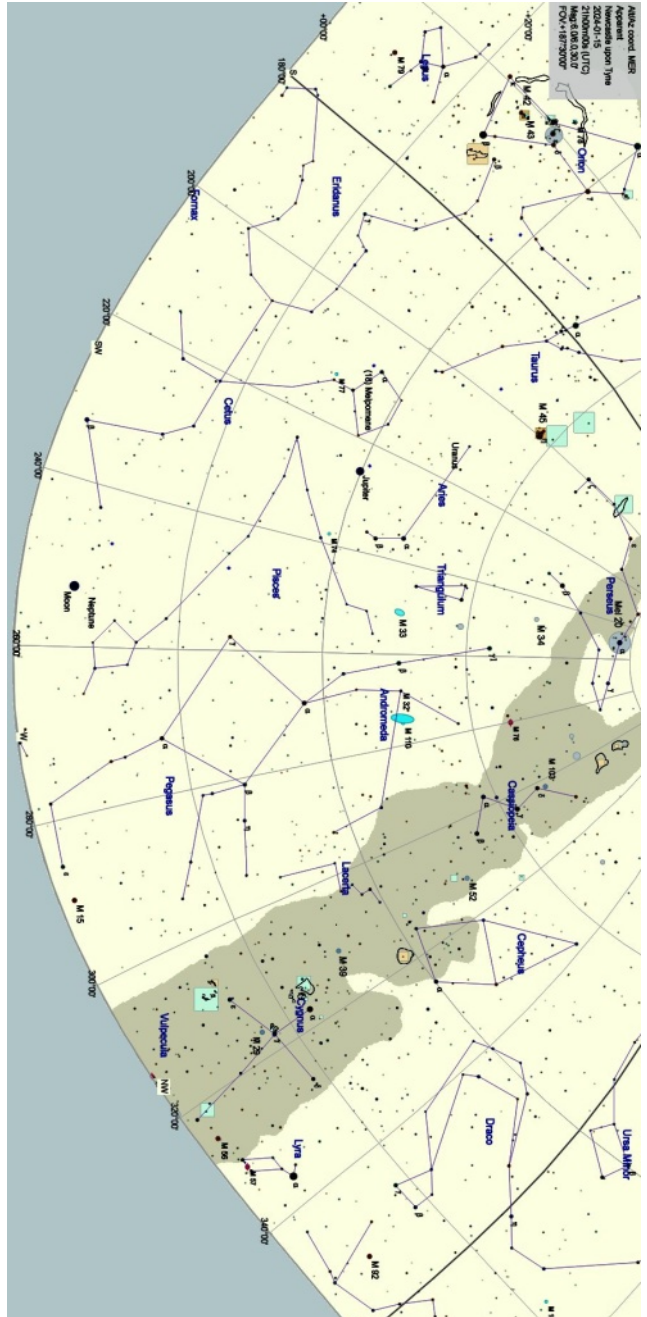
challenge at it is in the sky at the same time of night [early morning] when this shower it most active.

COMETS

There are no bright comets expected to be visible this month.

Night Sky credits:

Data sourced from *Cartes du Ciel*,
<https://www.timeanddate.com/moon/phases/>
 and <https://in-the-sky.org/>





SCIENCE SLOT

Young stars

When you observe the night sky it isn't at first obvious how ancient that particular stellar object might be. There are a – relatively small – number of objects that are in the northern night sky which are in fact very young stellar objects. By their very nature they are difficult to observe, principally because they are either faint, shrouded in dust, or a combination of the two. Currently some of these objects are the focus of many of the world's largest optical – and also infra red – telescopes – including both the Hubble Space Telescope and JWST – as well as their predecessors such as VISTA and numerous others.

These young, pre-stellar, nebulae are known by a number of designations – principally as a result of the astronomer[s] or groups or telescopes which discovered them first. There are also a number of objects of this type which were observed by astronomers going back 100s of years but with more modern and more sensitive equipment were subsequently found to be rather more unusual in their nature.

One such type of young star are the [Herbig-Haro Objects \['HH'\]](#). These were first correctly identified as bright patches of nebulosity surrounding new born stars by George Haro and Guillermo Herbig, in

the 1940s, though they were first investigated as far back as the late 1800's by SW Burnham. The first HH Object known was [T Tauri](#), which Burnham observed in the late 19th century using the 36" telescope at Lick Observatory.



T Tauri, imaged in the infra-red by the Two Micron All Sky Survey (2MASS). The associated nebulosity is Hind's Variable Nebula, NGC 1555.

Credit: 2MASS/UMass/IPAC-Caltech/NASA/NSF

T Tauri is known to be less than 10 million years old. It was first identified as unusual in 1852. This star is the first of a catalogue of similar stars. Their principal characteristics are a mass of $<0.5 M_{\text{sun}}$, within a cloudy Nebula of $<3M_{\text{sun}}$. They all have a 'late' spectral class [F, G, K, M].



SCIENCE SLOT

Compared to main sequence stars of the same classes, T Tauri stars are more luminous because their visible physical surface is larger. Also, like [Brown Dwarfs](#), their core temperature is below that required to trigger full fusion reactions. Rather the energy they generate is created by converting gravitational collapse into thermal energy, as they evolve towards the main sequence [at which point their nuclear furnaces will eventually ignite], a process that will take another 100 million years or so.

Similar to [Red Dwarfs](#), whilst they undergo this transition, they display large star-spots. This indicates that there are strong magnetic fields at play on the surface of these protostars.

They all have quite fast rotation [≤ 14 days] – another indication for the generation of large and complex magnetic fields through/around them and also give off – relatively – sizeable amounts of Radio and X-Ray emissions, typically 1000x as powerful as our Sun does. Coupled with this HH objects also generate strong stellar winds and powerful polar jets. These are collectively responsible for stirring up the contents of the surrounding dust and gas clouds which cause these clouds to glow strongly in the – mostly - Infra-Red and radio wave bands.

Examining the spectrum of a HH Object shows that they contain significantly more Lithium than our Sun. This further indicates the the cores of these objects must be at less than 2.5 million Kelvins [Sun's core is at ~ 15 million K]. During the transition between HH object and main sequence star, Lithium is dredged up from the core of the object and selectively burnt – to heavier elements – during nucleosynthesis.

This process cannot take place within Brown Dwarfs of 60 Jupiter masses or less, which puts a close constraint on the mass of the HH object that will transform into a main sequence star.

There are three classes of T Tauri Stars:

- 1) Classical TT Stars – see below
- 2) Weakline TT Stars – similar to classical T Tauri stars but they appear to have less well developed circumstellar discs [CSD], possibly indicating a slightly more evolved system (see "[Weak-line T Tauri stars: circumstellar disks and companions](#)")
- 3) Naked TT Stars (see <https://ui.adsabs.harvard.edu/abs/1988BAAS...20.1092W/abstract>) – more highly evolved T Tauri class stars with almost no residual CSD – possibly getting very close to becoming normal stars.



SCIENCE SLOT

About half of all T Tauri Stars have circumstellar discs. These are known to have lifetimes of <10 million years. Energy from the T Tauri stars gets conveyed into the circumstellar discs causing their evolution into planetary systems over time scales of about 100 million years. The Sun may have started out at a T Tauri star. Also, many T Tauri stars exist in binary systems. The Sun does not, indicating that its partner may have been released from the system during the formation of the planets of the solar system.

There is a related class of objects for heavier stars [$2-8 M_{\text{sun}}$] A&B pre-spectral sequence stars [also known as **Herbig Ae/Be objects**]. The main distinctions are their mass – being typically 10x the mass of a T Tauri star and their spectral class [A or B]. These types of stars have strong emission lines in their spectra. Because these were born near dust and gas clouds, their neighbourhood is full of strong emission objects. Both types of objects exhibit significant variability in their energy output. This is due to a combination of dust shielding of the light from the main star and material from the nebula being ingested by the main star causing a – temporary – thermonuclear runaway reaction before the system settles down again.

How do I go about observing some of these objects?

Let's take a look at some of the brighter T Tauri and Ae/Be objects in the northern night sky:



V633 (center) and V376 (left) as seen by the Hubble Space Telescope.

Credit: ESA/Hubble & NASA

- 1) **V633 Cassiopeiae**, located ~0.25 degree Southeast of Caph - Beta Cassiopeia. RA 00 11 25.97 Dec+58 49 29.1



The field around V633 includes the reflection nebula vdB1.

Credit: Bernhard Hubl (<http://www.astrophoton.com>)



SCIENCE SLOT

First identified in 1960, HH161 and HH164 are nearby. Visually this 'star' cannot be resolved indicating the extended nebulosity around it.

2) V376 Cas – HH162. Located very close to V633 Cas (see image).

3) HBC 327/328 located at RA 00 16 54.82 Dec +65 46 53.2

4) RNO 1 located at RA 00 36 46.30 Dec +63 28 54.1, [a type FU Orionis star](#).

5) [NGC 1333 in Perseus](#), located at RA

03 29 02 Dec +31 20 54

6) [XY Persei](#) located at RA 03 49 37.03 Dec +38 58 57.6 – an Ae/Be star embedded in the nebula [vdB 24](#).

7) T Tauri itself – located at RA 04 22 00.00 Dec +19 36 00.0

8) The reflection nebula [Sh2-239](#) in Taurus – located at RA 04 31 16.80 Dec +18 07 12.0 – contains numerous HH objects.

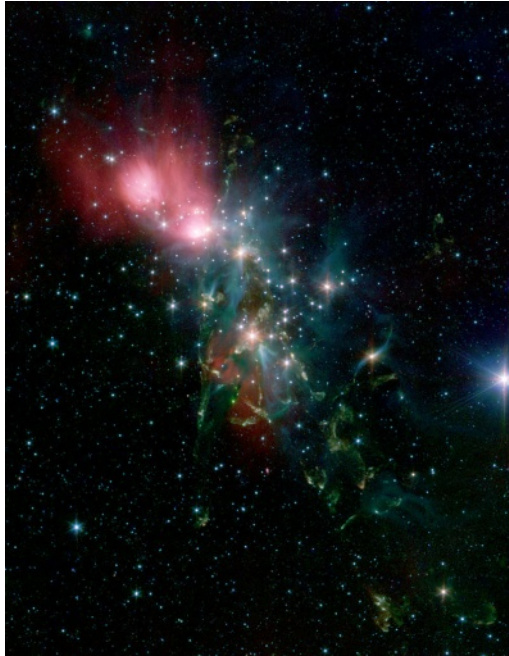


The region around Sh2-239 as imaged by the Mosaic camera on the Mayall 4-m telescope at Kitt Peak.

Credit: T.A. Rector (University of Alaska Anchorage) and H. Schweiker (WIYN and NOIRLab/NSF/AURA)



SCIENCE SLOT



NGC1333 as imaged by the infrared Spitzer Space Telescope.

Credit: NASA, Caltech, R.A. Gutermuth (CfA)



10) R Mon – [Hubble's Variable Nebula](#),
NGC 2261 – located at RA 06 39 09.51
Dec +08 44 39.6



Hubble's Variable Nebula, NGC 2261, imaged by the Hubble Space Telescope in 1999.

Credit: HST/NASA/JPL/Judy Schmidt

R Mon is the star which illuminates the nebula. The changes in brightness are visible even in small telescopes over periods of a few weeks.

So if you want to track a few of these objects down here is a handy – online – guide

[Strange Young Stars \(http://reinervogel.net/index_e.html\)](http://reinervogel.net/index_e.html)

The Hubble Space Telescope's view of NGC1999 and V380.

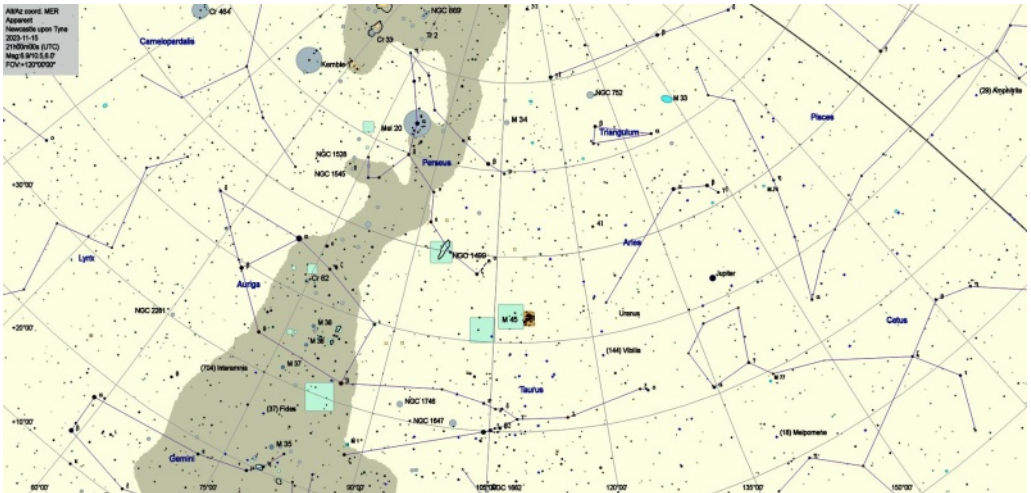
Credit: NASA/STScI



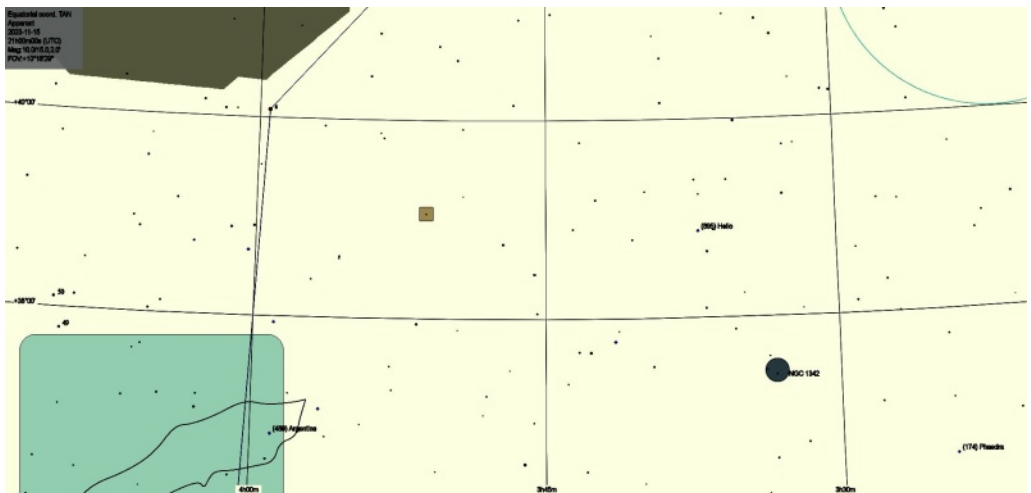
SCIENCE SLOT

Meanwhile, here are some finding charts
for a few of these objects:

Robert Williams



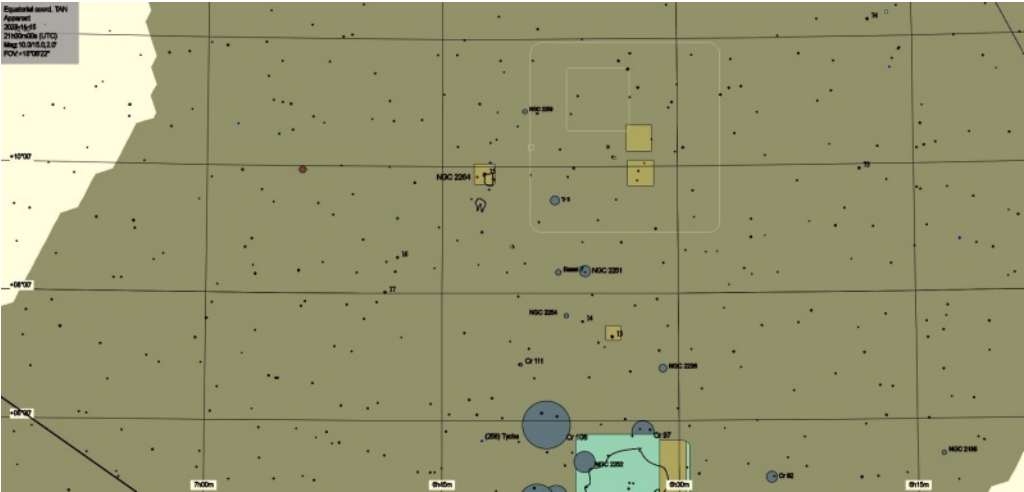
NGC 1333



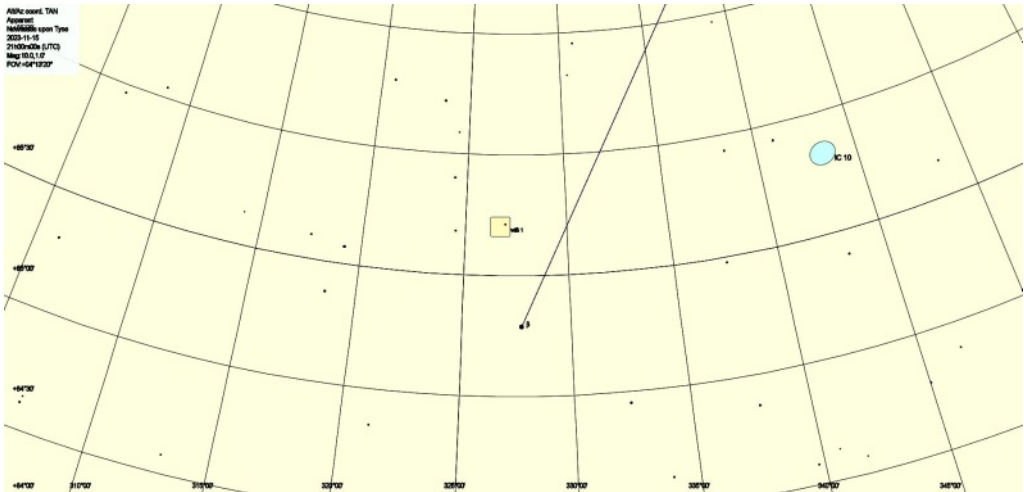
XY Persei



SCIENCE SLOT



NGC 2261



vdB 1 (V633)



SCIENCE SLOT



The nebula vdB 24, which contains the star XY Per, as imaged by the Mosaic camera on the Mayall 4-m telescope at Kitt Peak.

Credit: T.A. Rector (University of Alaska Anchorage) and H. Schweiker (WIYN and NOIRLab/NSF/AURA)

Not been to Kielder Observatory yet?

Then why not book one of our events for yourself and/or your family?

Advanced booking is essential. Weekend events can fill up several weeks in advance. Please book online at <https://www.kielderobservatory.org/our-events/>.

We can also be contacted at admin@kielderobservatory.org



GALLERY

We would love to display your images here, whether they are taken up at Kielder or not. Please send them to

admin@kielderobservatory.org

along with a brief description of how and when they were taken.



Noctilucent clouds, taken late in the evening on July 5th

Credit: Kevan Hubbard.



GALLERY



Perseus over Wensleydale, with the Pleiades rising. Canon 1000D, 30s exposure at f3.5, 18mm focal length.

Credit: Nigel Metcalfe

"The experience was wonderful, we did benefit from clear conditions. We would recommend this visit to others and we've been talking about it all day. We think you should call this review a 'star rating'."

Elizabeth, Wigan



GALLERY



Another dazzling aurora from September. This image was captured by Dan Monk on the Northumberland coast at Howick.



GALLERY



Comet C/2023 P1 Nishurama seen from the Observatory at 4:30am in early September. Taken with a 250mm lens at f5.6 by Dan Monk.



GALLERY



Sunspots seen through a 25mm Pocket Borg refractor, Baader Solar film and Google Pixel 3a (on July 21st).

Credit: Kevan Hubbard

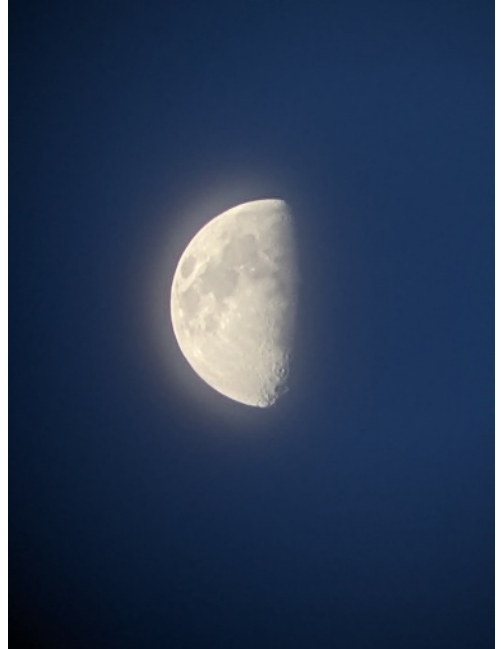


GALLERY



Sunrise over the North Sea in April

Credit: Kevan Hubbard



The Moon, May 28th

Credit: Kevan Hubbard



Despite the clouds, the Moon and Jupiter can clearly be seen rising over the North Sea in the East around 10pm in early September.

Credit: Kevan Hubbard



"We felt very welcomed by all of the team. It was really nice to feel that we could ask any questions as me and my partner are both very much beginners! Found everything very interesting - thank you for taking the time to show us around."

Kerry, Manchester

"Was such a fabulous night learning about Aurora Borealis, even though we didn't get to see it. We got to see Saturn which was very exciting. Was such a great experience!"

Bronwynn, Leeds

Kielder Observatory - a beacon for dark skies

<https://kielderobservatory.org>

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