

Spring 2015 Number 7

# Kielder Observatory Newsletter

KIELDER  
OBSERVATORY  
Infinite Inspiration



**OBSERVATORY  
FEEDS LIVE  
ECLIPSE  
IMAGES  
ROUND THE  
UK**



## NEWS

Eclipse  
broadcast

## SCIENCE

Beating the weather

## OBSERVING

Highlights for  
Apr/May/June

## GALAXY SEASON

We look at the spring  
skies



## EDITORIAL

Spring is now well underway, bringing with it the galaxy season, but also shorter nights. The excitement of the solar eclipse is behind us, but it was great to see KOAS images on giant screens around the UK. There have also been some excellent aurora seen from Kielder. In this edition we take a look at some real science being undertaken at the observatory, some planetary conjunctions coming up in the next few months, and take a tour around the Realm of the Galaxies.

**Nigel Metcalfe**

**Robert Williams**

[newsletter@kielderobservatory.org](mailto:newsletter@kielderobservatory.org)

### Kielder Observatory Astronomical Society

Registered Charity No: 1153570.

Patron: Sir Arnold Wolfendale 14th Astronomer Royal

Full Membership ..... £75 per annum

Friends of Kielder ..... £25 per annum

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

<http://www.kielderobservatory.org>

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## DIRECTOR'S CUT

The nights are now getting shorter, as the sun slowly climbs in the sky we see the approaching end to our supply of long dark clear nights...(well now and again we do get them!). Actually this last season has seen quite a good supply of clear nights, 20% more than we got last year. So we say goodbye to the darkness and welcome the light - Spring is often however a great time to get some observing done. The constellations of Scorpius and Sagittarius make a brief appearance which means a chance to see some of the southern objects that elude us for most of the year. The caveat is you need to stay up very late, but if you can do it it is worth it with some stunning sights! The last month has seen a lot of solar activity with Matt getting some great pictures of the aurora on the 9th April from the observatory. This late spike on the wrong side of solar max has provided a great opportunity. Well we can't ignore the eclipse can we? I hope you got a chance to see this incredible sight and the clouds cleared for you - if they did let's see your pictures! Of course at the observatory it was an absolute hive of activity. I had made the decision about a month before that we should be doing something around this, after all we are a charity and we should be seen to be bringing astronomy outside and away from the

facility too. So boy did we, paying 5K for a screen in the centre of Newcastle and having others spread out around the country proved to be a massive hit. With over 2.5 million requests for our live stream worldwide we were overjoyed - and the 1000 people who gathered at the Monument in Newcastle, sitting on deck chairs with the KOAS logo everywhere, was a joy to see. I have to say a massive thanks to Neill, Patti and Guy for working tirelessly to make the event a success. Plans for the astronomy village are now firing on nearly all cylinders and we continue to make progress, suffice to say its going to get very exciting very quickly. Whilst this is all fabulous it does mean that I am less able to be at the observatory doing my thing - my heartfelt thanks is therefore due to our volunteers who are helping continue the dream! It can't happen without your help and dedication. Thank You.

As noted elsewhere, Matt Robinson is now working at the observatory as an apprentice science explainer, he has been in post now for 4 weeks and he's doing great! Wish him luck. Last but not least a big shout for Dan, he has worked tirelessly at the facility night and day doing his job, way beyond the call of duty, we are all lucky to have him.

**Gary Fildes (FRAS MSc Hon.Caus.)**



## KOAS NEWS

### TRUSTEE NOTES

The trustees met on January 15th, making use of the new Newcastle office. There was some discussion of ways to increase the capacity of the observatory, as many events, particularly at weekends, are limited by the available space. Midweek is not always so busy, and thought was given to how to increase take up - corporate nights and discount 'cloudy night recompense' tickets for those whose initial event had suffered the misfortunes of the UK's weather were two ideas mooted.

Work on setting up the the trading arm (KOS Ltd) continues and with that ideas for what KOAS merchandise should be produced. At the moment the KOAS mugs sell well, but KOAS blankets, pullovers, gloves, hats (something of a theme here ed.!), photos, etc could all bring in useful extra revenue.

Since the meeting, HMRC have granted gift aid status on our ticket sales - this is excellent news. When buying tickets, visitors are now given the opportunity to add a 10% 'gift' to the ticket price, on which we can claim an extra 25% from HMRC.

The extra income from gift aid and merchandise will be used to further enhance our equipment and increase the numbers of staff employed by KOAS, in order to cope with the ever increasing workload of events delivery. In the longer term, this will include the recruitment of an operations manager to help Gary with operational matters, business continuity and continuous improvement processes including the introduction of a more formal training programme for staff and volunteers.

The trustees meet again in mid April.



***The solar camera being tested on the Meade, in preparation for the solar eclipse.***



## OBSERVATORY NEWS

Another busy three months at the observatory, and another award! This time the WhatsOnWhere award for the best visitor attraction in Northumberland.

The big event was, of course, the partial solar eclipse on March 20th. As you may have seen, the observatory managed to pipe live pictures to large screens in Newcastle and elsewhere, and this provided a great marketing opportunity for

from a hilltop near Rothbury!

Meanwhile **WE** have invested in a HD projector and a better projection screen. The images now presented at the observatory are awesome and have definitely improved the visitor experience. On the telescope front, the 20" has been retired for a while and we have installed the 14 inch GOTO Meade telescope in the Sir Patrick Moore turret. This means we



us. Gary, Neill and others worked their socks off to make this happen. The social and TV and radio media outlets were full of it! You can follow the full story on our blog :-

<http://www.kielderobservatory.org/blog/>  
Suffice to say the broadcast finally came

now have a GOTO telescope in each of the main turrets. In addition we are working on a system to show video imagery of what is being observed in each turret that will again provide a better experience for visitors.





## OBSERVATORY NEWS

There have been a couple of new faces. Matt Robinson ( an ex volunteer) has been taken on as an apprentice astronomer, and Patti Purcell has been recruited as the KOAS office manager and PA to the Director. The new office in Newcastle now has a landline, by the way, 0191 2655510.



***Patti, Guy, Toni and Jacqui at the eclipse in Newcastle.***

We have decided to sell the KOAS Land Rover and lease an Audi Estate car. This will give us more reliability, as servicing, up-keep etc comes as part of the package, and in the event of a breakdown we will be able to rapidly acquire a substitute vehicle.

On the observing front, those of a nocturnal disposition may be interested in our Late Night Shooting Star Special

overnight April 21st-22nd, to coincide with the annual Lyrid meteor shower. These meteors tend to be bright, so it should be a great chance to witness what is actually the debris from long-period Comet C/1861 G1 Thatcher.

Last but not least, in our attempts at delivering the wonder of our great universe to more of the public at large we've decided to bring Kielder to Town! Gary will deliver an interactive session (the first of several planned throughout this year) at the Vermont hotel in Newcastle on Sunday April 26th. We debated at length the fact that weekends are very often the only time some people have available and with the observatory places sold out months in advance for every weekend evening space it seemed like natural progression to look at a 'Kielder on tour' option which would mean many more could come along and listen /learn from Gary delivering the fascinating story of the skies and in so doing continue to promote the essence of the Kielder Brand that is 'infinite inspiration'. Tickets for this event are now on sale on the observatory website - see also our advert on the last page of this newsletter.



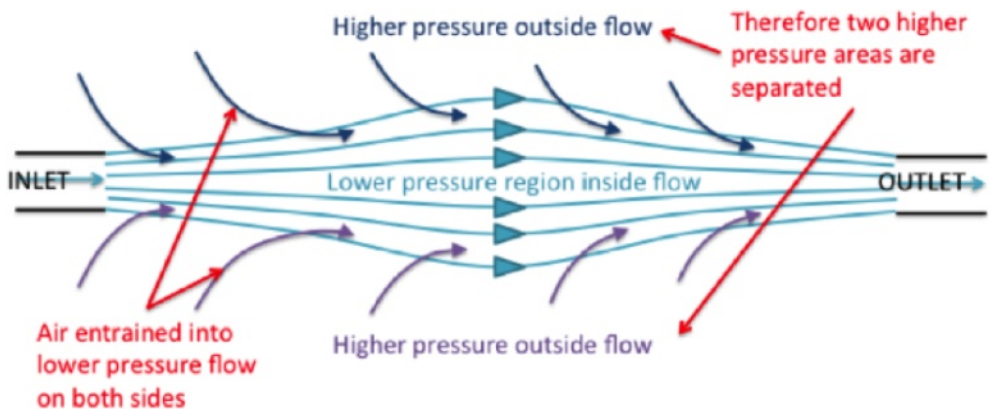
## SCIENCE SPOT

This edition's science slot is a bit different. We report on some real research undertaken at the observatory by Durham University ...

### Using air curtains to improve astronomical observations

All ground-based astronomical observatories, including Kielder, are affected by astronomical 'seeing', whereby

we are also developing methods for reducing the 'seeing' itself: a significant proportion of the 'seeing' is caused locally by structures on the ground, such as the telescope dome, and by changing airflow around these structures it can be improved. We therefore recently undertook an experiment at Kielder, seeking to understand how we might be able to reduce 'seeing' in the vicinity of a telescope dome.



**Fig 1: How an air curtain stops air from the two sides mixing.**

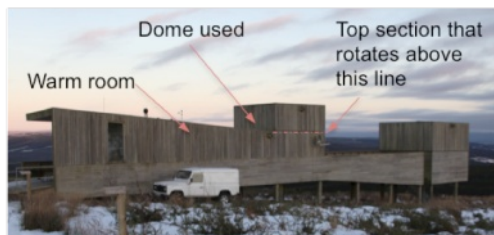
incoming light from a star is perturbed by atmospheric turbulence. This is the reason that stars appear to twinkle when viewed by the naked eye, particularly when close to the horizon, where there is a longer path through the atmosphere. The Centre for Advanced Instrumentation at Durham University undertakes research into methods to compensate for the effect 'seeing' has on image quality. However,

Firstly, we need to understand what causes 'seeing'. The density of air is not constant, changing in response to localised temperature and pressure changes. This in turn means that the refractive index of the atmosphere is not constant, and can be modelled by assuming the atmosphere is comprised of many individual cells of air with constant density. Since the refractive index



## SCIENCE SPOT

of air varies with density, and the speed of light varies with refractive index, these cells result in a varied travel time for starlight as it propagates through the atmosphere. Light rays travelling along



**Fig 2: The dome used at Kielder.**

slightly different paths (e.g. reaching different sides of a telescope mirror) arrive at slightly different times, leading to image distortion, and hence reduced image quality. This effect is particularly pronounced close to the ground, and the mixing of air between the telescope dome and the outside contributes significantly to this, so any way of reducing this mixing should prove beneficial.

This is not a new idea: Air curtains are used at shop entrances, and in refrigerated displays, to keep cool and warm air separated. However, Kielder Observatory is now the first astronomical observatory to use an air curtain to separate the outer atmosphere from air inside the telescope dome! These two regions of air are usually at different

temperatures and pressures and so likely to mix. An air curtain drives air across the aperture of a dome at a higher velocity than the surrounding air, as shown in Fig. 1. This reduces the pressure in the flow, and traps the the two atmospheric regions on either side. All we have to hope is any turbulent mixing inside the air curtain itself is small enough so that image quality is not reduced.

Kielder provides an ideal location to test an air curtain as the dome does not have a curved aperture so an air curtain is easier to temporarily install. We visited Kielder for an initial site visit, in order to adapt our air curtain inlet and outlet so they could be installed on the dome. This visit, although cold with recent snowfall up the track, proved useful and we developed a method of mounting the air curtain without having to modify (or harm) the dome structure (!).

We then returned on evening of the 10th March to undertake the experiment itself. We used the central dome (Fig. 2), since it allowed for use of a Meade LX200 16 inch ACF Telescope and is connected to the "warm room" which could be used to induce greater temperature variations to see how the air curtain performs in differing conditions.





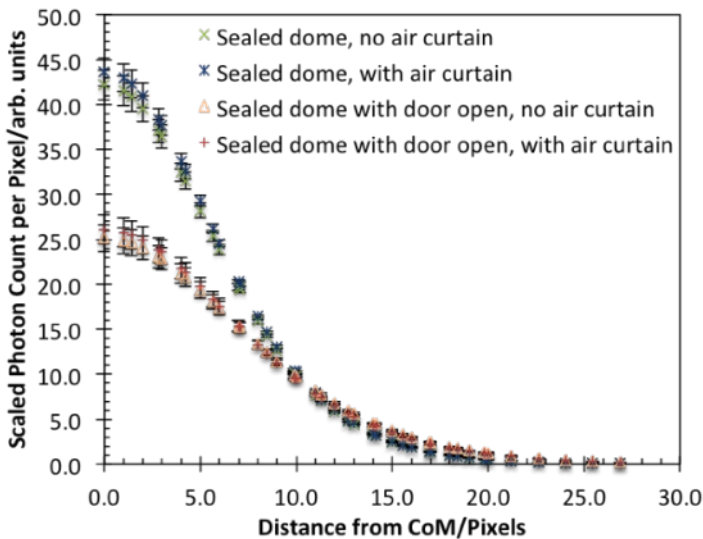
## SCIENCE SPOT

The air curtain was positioned horizontally. A fan provided the air curtain flow, connected via ducting. The remainder of the dome aperture was sealed. Multiple reference stars were imaged using a CCD camera on the Meade to quantify whether or not the air curtain improved the image quality.

worse when the dome door is opened.

However, the effect of the air curtain is significantly less, although an improvement is still seen.

The relatively small improvement in image quality seen when using the air curtain probably means at Kielder it would likely not be sufficiently beneficial to



**Fig 3: Star profiles measured with the Meade under various conditions.**

**(my advice is don't leave the door open - ed.!)**

One of the clearest ways of analysing any improvement is to investigate the behaviour of the point spread function (PSF) of a star. This is the drop in intensity of the image of a star, from its centre outwards. A greater PSF width means poorer image quality. Fig. 3 shows how the PSF varied when the warm room door was open or closed and the air curtain on or off. Clearly the 'seeing' gets

justify installation, although it might show more benefit in winter! However, there are reasons for thinking that at larger observatories this technology may well prove more useful. One thing we did demonstrate is that the air curtain does not make things worse, which is a key finding.

*Alastair Basden, Tom Hudson, and Richard Myers*



## NIGHT SKY

### APRIL 2015

(times in BST)

#### Lunar phases

Full moon	04/04/2015	13:05
Last quarter	12/04/2015	04:44
New moon	18/04/2015	19:57
First quarter	26/04/2015	00:55

#### PLANET SUMMARY

Mercury is too close to the Sun. Venus is a wonderful evening object setting some 4 hours after sunset. Mars is low in the west after sunset. Jupiter is visible for most of the hours of darkness. Saturn is a morning object. Uranus is too close to the Sun.

#### THE STARS AT 10PM (BST)

North – The Great Bear is upside down near the zenith, with the Little Bear below it. Cepheus is nicely placed with Cygnus low in the north-east. Venus in Taurus is low in the north-west.

East – Bootes and Hercules are nicely placed. Virgo is in the south-west and Lyra is low in the south-east. Ophiuchus skirts the horizon.

#### The Planets 15/04/2015

	Sun	Mercury	Venus	Moon	Mars	Jupiter	Saturn	Uranus
Rise	06:08	06:20	07:20	04:36	06:38	12:47	23:28	06:01
Transit	13:07	13:30	15:43	00:06	14:08	20:34	04:36	12:37
Set	20:08	20:43	00:04	15:43	21:38	04:25	08:00	19:13

South – Virgo, Leo and Cancer – with Jupiter - are nicely placed. Hydra skirts the southern horizon. Coma lies above Virgo.

West – Cancer with Jupiter, Gemini and Leo are nicely placed. Perseus is low in the north-west and Venus is close to the horizon in Taurus.

#### METEOR SHOWERS

The April Lyrids are active this month. The best time to see them is on the 22nd of April. With the Moon being a thin waxing crescent then viewing after moon-set should show these nice shooting stars. The radiant point is near Vega. See this website for more details

<http://www.spaceweather.com/meteors/lyrids/lyrids.html>

or book for the Observatory's Meteor Night!

#### COMETS

Comet C/2014 Q2 (Lovejoy) is fading, but still visible in telescopes.



## NIGHT SKY

### MAY 2015

#### Lunar phases

Full moon	04/05/2015	04:42
Last quarter	11/05/2015	11:36
New moon	18/05/2015	05:13
First quarter	25/05/2015	18:19

#### PLANET SUMMARY

Mercury will be visible for about 1 hour after evening twilight. Venus will be nicely placed in the western sky for about 2 hours after twilight. Mars will be low in the west in the evening twilight. Jupiter will be visible for about 3 hours once the sky has got dark. Saturn is near opposition so well placed for observation.

#### THE STARS AT 11PM (BST)

North – Auriga and Perseus are low in the north-west. Cassiopeia and Cygnus are low in the north/north-east. Cepheus is quite nicely placed and the Bears are high overhead. Venus in Gemini is low in the north-west.

East – Hercules and Lyra are nicely placed. Ophiuchus, Sagitta and Vulpecula are low down. Saturn – near the

Scorpion's claws is low in the south-east. South – Virgo is nicely placed with Hydra, Sextans, Corvus and Crater – of the southern hemisphere - low down. West – Virgo, Leo, Cancer and Gemini straddle the sky. Here you can find Jupiter [Gemini] and Venus [Cancer] and compare the two for brightness.

#### METEOR SHOWERS

The only shower of this month are the Eta-Aquarids on the 5th and 6th of May. A waning gibbous Moon will make it difficult to see all but the brightest shooting stars of this shower. Aquarius rises at around 0300 and the Moon sets at 0900 so it will be a challenge to see any of this shower.

#### COMETS

Comet 88P/Howell will be visible moving through Aquarius and Pisces during May, at magnitude 9. This will best be seen before dawn, low down in the east.

#### The Planets 15/05/2015

	Sun	Mercury	Venus	Moon	Mars	Jupiter	Saturn	Uranus
Rise	05:07	05:46	07:22	04:01	05:28	11:01	21:19	04:06
Transit	13:04	14:19	16:12	10:40	13:37	18:44	01:40	10:45
Set	21:01	22:52	01:02	17:34	21:46	02:31	05:56	17:25



## NIGHT SKY

### JUNE 2015

#### Lunar phases

Full Moon	02/06/2015	17:19
Last quarter	09/06/2015	16:42
New moon	16/06/2015	15:05
First quarter	24/06/2015	12:03

#### PLANET SUMMARY

Mercury and Mars are too close to the Sun this month. Venus and Jupiter are visible in the evening twilight. Saturn is visible for about 2 hours after sunset.

#### THE STARS AT 11PM (BST)

North – Auriga, Perseus and Andromeda are near the horizon. Camelopardalis and Cassiopeia are nicely placed along with Cepheus.

East – Cepheus, Cygnus, Lyra and Hercules dominate this view. Scutum – the shield is low in the south-east.

South – Ophiuchus and Virgo are prominent, with Libra [Saturn] and Scorpio near the horizon. Serpens straddles Ophiuchus.

West – Jupiter and Venus in Cancer are low down. On the 20th of June they are

joined by the crescent Moon as it pass through the same part of the sky in the days before and after the 20th.

On the 30th June at 23:00 BST Venus and Jupiter appear to become one object as Venus passes in front of its much larger interloper.

#### METEOR SHOWERS

There are a few minor showers in June.

#### COMETS

Look out for Comet C/2012 Q1 Panstarrs at magnitude 4.5 low in the west at 11pm BST – not too far away from Venus and Jupiter.

*Night Sky credits: Lunar and planetary data sourced from Cybersky 5*

#### The Planets 15/06/2015

	Sun	Mercury	Venus	Moon	Mars	Jupiter	Saturn	Uranus
Rise	04:38	04:08	08:20	04:16	04:34	09:24	19:05	02:06
Transit	13:08	11:49	16:22	12:09	13:06	16:59	23:25	08:48
Set	21:38	19:30	00:25	20:10	21:39	00:37	03:48	15:30



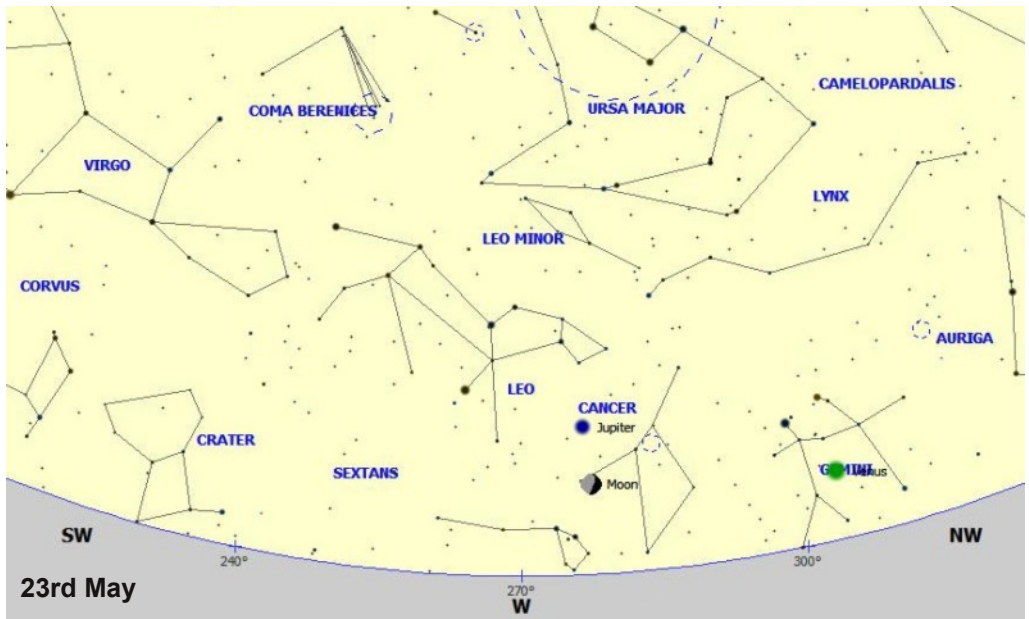
## NIGHT SKY

### The Planets are coming

In Autumn and Winter 2014 and into early 2015, the sky was mostly devoid of good opportunities to see the Planets – the only exception being Jupiter. But now to make up for it the remaining months of 2015 will be awash with bright Planets and these will have some interesting interactions – scientifically known as conjunctions - with other Planets and with the Moon. In total there are 10 conjunctions that are fairly easy to see – if the sky is clear – along with a Total Lunar Eclipse – which is visible in late September. So, this is a run down of the events up until the end of July. Some of these events take place with the lighter skies of Summer and a few are early morning events. As with any conjunction event it is best to start observing a few days before the actual date described so you can see the dance of the Planets.

#### Event 1: 23rd May Moon and Venus/Jupiter

On the 20th May the 2-day-old Moon will be a thin crescent in the constellation of Orion – near his Club [Nu Orionis]. Venus will be in the centre of Gemini near the star Omega and Jupiter will be near the star Pi Cancri. Over the next 4 nights the Moon will wax and move across the sky passing by both Venus and Jupiter.



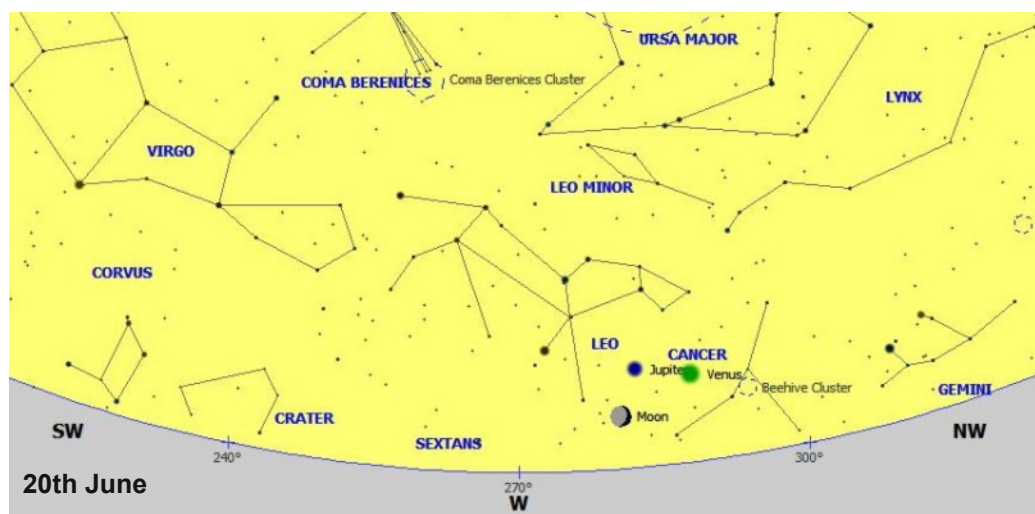
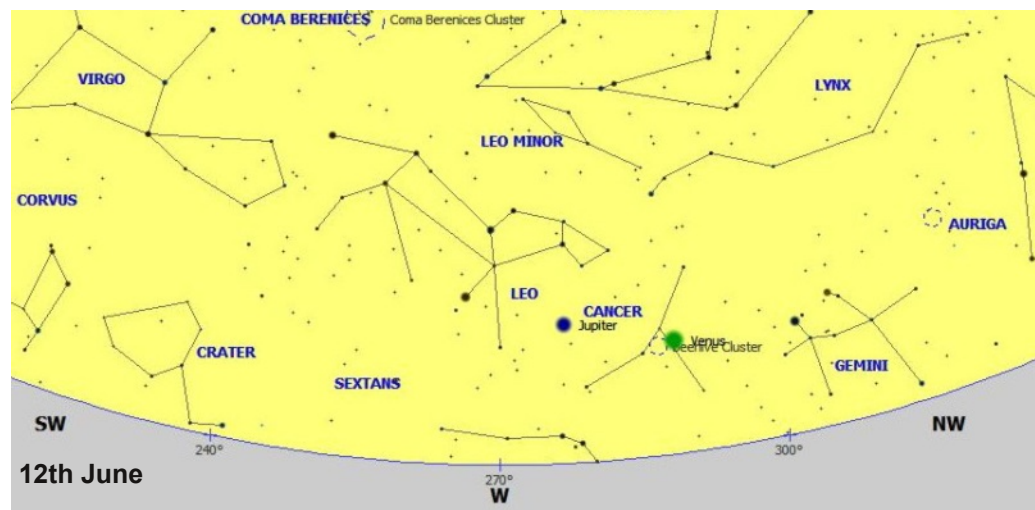




## NIGHT SKY

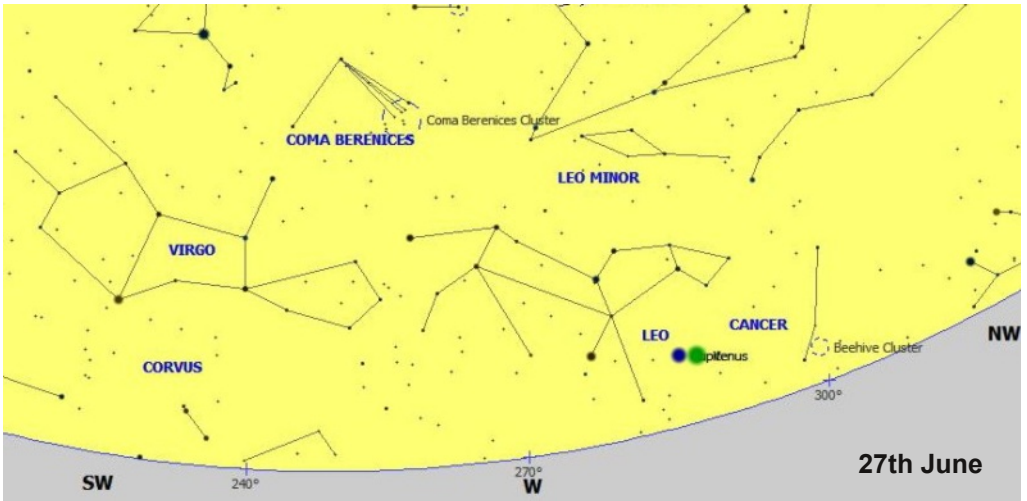
### Events 2 and 3: 12th to 30th June Venus and Jupiter in Cancer/Leo

From 8th June Venus will drift through the constellation of Cancer passing very close to Praesepe, the Beehive Cluster M44, on the 13th June. Later on it will be joined by the crescent Moon on the 19th June and then the Moon will pass close to Jupiter in the 20th June. On the 30th June Venus and Jupiter will be in conjunction near the star Psi Leonis





## NIGHT SKY

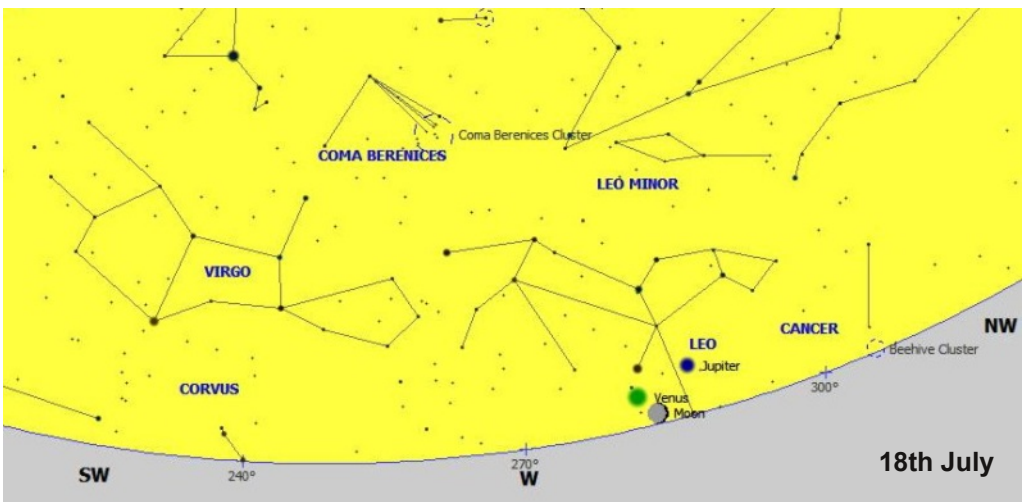


### Event 4: 1st to 9th July, Venus and Jupiter

Venus slowly pulls away from its conjunction with Jupiter on the 30th June.

### Event 5: 18th July, Moon, Venus and Jupiter

You will need a good western horizon for this – as the crescent Moon moves near Venus and Jupiter at around 10pm – very low down near Regulus in Leo. This is only 30 minutes after sunset.





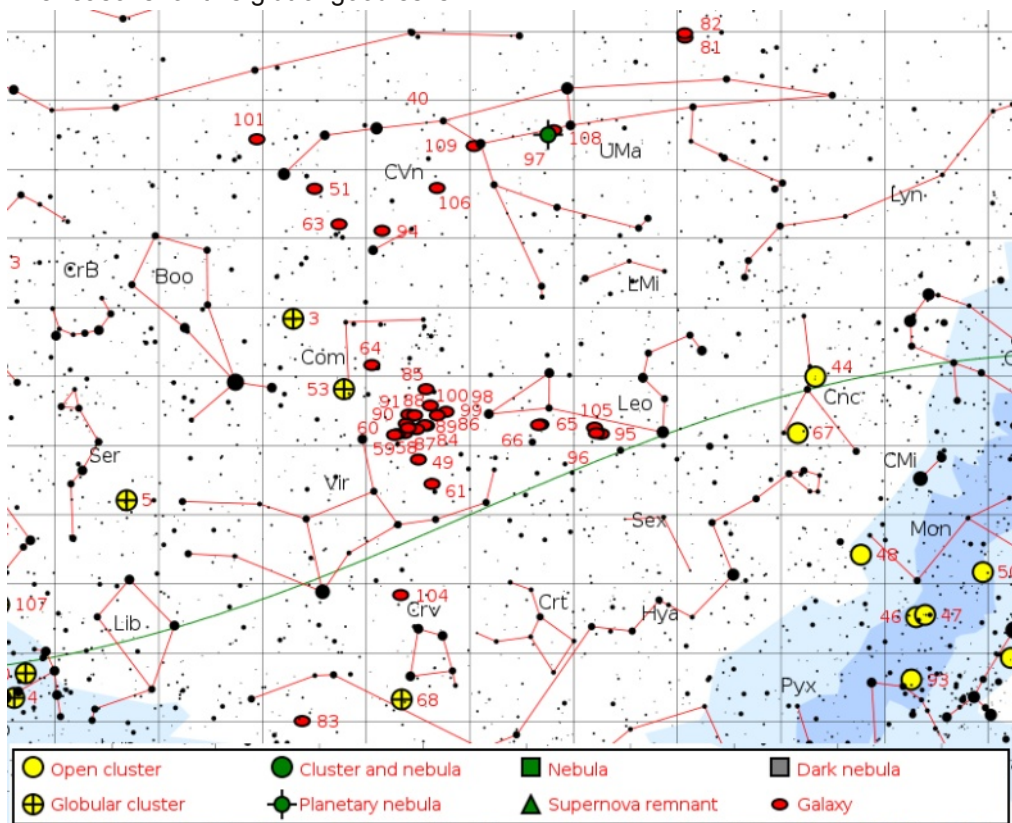
## OBSERVERS' SLOT

### The Realm of the Galaxies

Spring is galaxy season - both for amateur and professional astronomers. Around one third of the objects in Messier's famous catalogue lie in the Virgo/Leo/Ursa Major region, and most of these are galaxies, making it a great time to be out with telescope, camera or even just a good pair of binoculars.

The reasons for this glut of goodies is

twofold. Firstly, at this time of year we are looking out of our galaxy, well away from the gas and dust towards the centre, which although providing some spectacular nebulae to view, completely obscures our view of the distant Universe. Secondly, it just so happens that the nearest great cluster of galaxies lies in the direction of Virgo.



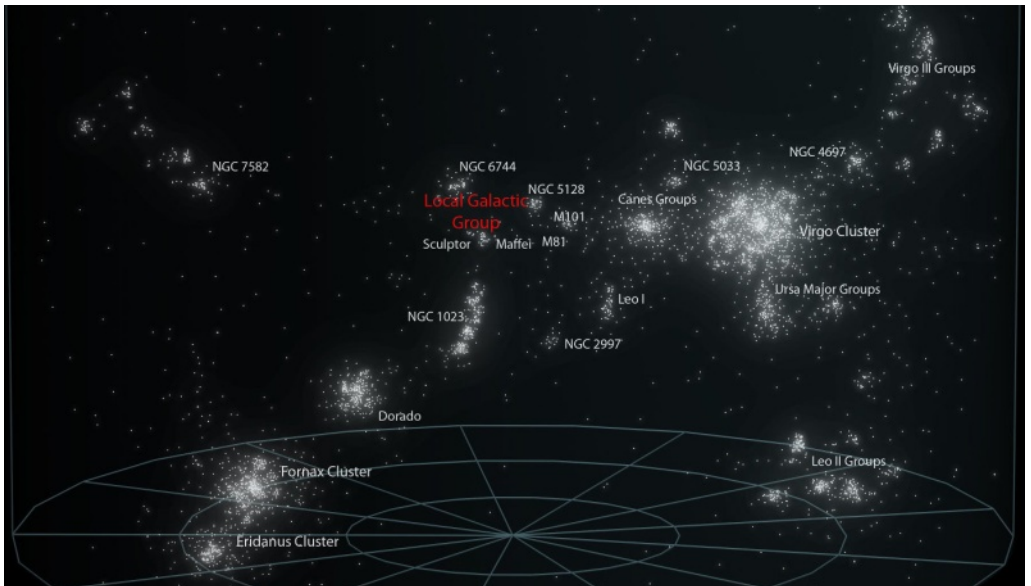
**30% of the Messier catalogue lies in the Spring skies, dominated by the Virgo galaxy cluster.**



## OBSERVERS' SLOT

The Virgo cluster itself, dominated by the giant elliptical galaxy M87, lies 52 million light years from us, but there are several other groups along this line of sight: Leo I (M65/6, M95/6/105) at 35 million light years, Canes Venatici I (M94) and II (M106) at 13 and 30 million light years respectively, and for good measure we have M81/M82 group at 12 million light years and M51/M101 group at 25 million light years. There are also clouds of galaxies in Ursa Major and Leo which lie at about the same distance as Virgo or beyond, meaning that as well as the Messier objects the area is abundant in fainter galaxies.

Even a small telescope will show most of the Messier galaxies, although don't expect to see much more than a smudge of light. But when you look at them remember that smudge really consists of billions of individual stars and who knows how many planetary systems! If you want to see dust lanes and spiral arms then aperture is the key. You'll get a good view through the Observatory 'scopes! However, scan this area with a 6-10" scope and a low power eyepiece and you will pick up innumerable faint galaxies, sometimes several in the same field of view.



***The local supercluster: Galaxies in Virgo, Leo, Ursa Major and Canes Venatici just happen to line up in a similar direction as seen from Earth (red text).***





## OBSERVERS' SLOT



***M81 (right) and M82 (left) as seen from Kielder. Together with 10 or so fainter NGC galaxies these form a small group about 12 million light year from us.***

Of course, the real beauty of this region is only brought out with astrophotography. As we show overleaf, even a standard DSLR and lens can pick up a multitude of galaxies with just a few minutes of exposure. However, if you are lucky enough to have your camera on end of a telescope then long exposures can reveal much more. Favourite targets include M51, the Whirlpool Galaxy, with its classic face-on spiral arms, which are surprisingly easy to capture; the Leo Triplet, where

M65, M66 and NGC3628 can be framed in the same shot; and the region around M84 and M86 in Virgo, otherwise known as Markarian's Chain. There are plenty of other targets though - some with exotic names such as the 'Whale', the 'Hockey Stick', and the 'Silver Needle'! In fact, given the weather in the UK, and the fact that the amount of darkness is diminishing rapidly at this time of year, there are more than enough targets to keep you going for many years.





## OBSERVERS' SLOT

**Want to help Kielder Observatory become one of the top astronomy attractions in the UK ?**

For just £25 per year you can join the Friends of Kielder Observatory.  
For £75 per year you can have voting rights at our AGM and access to two free events of your choice.

Contact [membership@kielderobservatory.org](mailto:membership@kielderobservatory.org) for further details.



***A favourite target for astrophotographers - Markarian's chain in Virgo. The brightest two galaxies are M84 and M86. Despite the large number of galaxies visible, this is not the cluster centre, which is actually around M87.***

***Credit: Digital Sky Survey.***



## OBSERVERS' SLOT

For the more adventurous, well beyond the Virgo cluster lie several other rich clusters of galaxies in reach of amateur photography. In particular, the Coma Cluster (Abell 1656), some 300 million light years away, is well placed. This has become famous as the place where in the 1930s Zwicky first deduced the presence of what we now call Dark Matter. You might pick up the two central giant galaxies visually as faint smudges if you have dark skies and an 8" scope or larger, but imaging will reveal maybe a hundred galaxies within a square degree or so on the sky. At similar distance (part of the same Supercluster in fact) is Abell 1367 in Leo. Although not as rich as Coma, it does contain far more spiral galaxies. If you feel these are too close to Earth for you, why not try Abell 2065, as shown in the Gallery. This cluster lies over a billion light years away, but it is still possible to



***The Leo Triplet - NGC3628, M65 and M66. ESO VST 2.4m.***

***Credit: ESO/INAF-VST/OmegaCAM.***

pick it up with a DSLR and amateur telescope. It is not so long ago that photographing objects like this would have been a task reserved for some of the largest professional telescopes in the world.

So if you get the chance, give them a go and see what you can pick up!

### **Not been to Kielder yet?**

#### **Then why not book one of our events for you or your family?**

Advanced booking is essential. Weekend events can fill up several weeks in advance. Please book online at <http://www.kielderobservatory.org/events/> or call us on 0191 265 5510

**SPECIAL EVENT:** On April 26th we will be running a special evening show at the Vermont Hotel in Newcastle.



## OBSERVERS' SLOT



© N. Metcalfe

***The centre of the Virgo cluster photographed with a Canon 1000D DSLR camera and standard 55-250 mm zoom lens (set at 100mm) on a Ioptron Skytracker mount. This shot comprises just 15x1 mins of exposure and shows all the Messier galaxies in this region, plus many other fainter NGC galaxies.***



## ASTRONOMERS' TALES

As Gary noted in his introduction, the Observatory could not exist without its band of willing volunteers. So following on from our last newsletter, here is one more volunteer's tale ...

### VOLUNTEERING AT KIELDER

We first came across Kielder Obs following my friend's visit a couple of years ago, she recommended a visit knowing that my husband is a novice astronomer, so I bought him a visit up to the obsy for his birthday. It was a hit! After that I bought him another trip for his birthday the following year and we had a spectacular night until 4:30 am in the morning, it was absolutely amazing seeing things I had never imagined I would ever see! I proceeded to buy an event for my Dad's birthday who also loved the experience despite not having a truly clear night.

It is fair to say we became hooked! So we decided to volunteer. I have never professed to be knowledgeable of science in any way shape or form, however what I have learnt having been up to the obsy is just amazing. The enthusiasm and heart-warming openness of sharing and learning provided by Gary, Dan & The

team; to the public is well overwhelming! We wanted to be a part of that! So although we live 155 miles away, we decided that it was our turn to share and give something back and become a part of that experience in a more involved way.

We volunteer whenever we can and distance doesn't even come into it for us. Seeing other people enjoy the Obsy in a way that inspired even a science dunce like me, is wonderful! If we can impart the enthusiasm and knowledge that has been imparted to us over the last couple of years then we have contributed to the Obsy's goal – that everyone should be allowed to learn no matter what.

Let's not forget, they are a charity – Yes a charity! They rely on people like me and my husband who want to share their learning and knowledge and encourage anyone no matter what ability to be involved and to learn new things!

So if you have visited before or are curious to be more involved, we urge you to “have a go” I guarantee you WILL be hooked!!!!

*Gemma Smale*





## GALLERY

We would love to display your images here! All the better if they are taken up at Kieler, but it is not essential. Please send them to

[newsletter@kielerobservatory.org](mailto:newsletter@kielerobservatory.org)

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



*A montage from the solar eclipse by Jurgen Schmoll.*



*Following on from the item on gravitational lensing in our last newsletter, here is the double quasar imaged with a Canon 1000D DSLR and an 8.5 inch Newtonian in just 20 mins of exposure!*

**Nigel Metcalfe**

©KOAS





## GALLERY

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*The solar eclipse seen from the observatory.*



*The elusive zodiacal light captured from the observatory - Gary Fildes.*



## GALLERY



***Another shot from Gary - Star trails over the observatory.***



## GALLERY



© Gary Fildes

***The International Space Station cruises over the observatory - Gary Fildes***

***Broadcasting live to the nation, seconds before partial totality on March 20th!***

©KOAS







## GALLERY



***The galaxy cluster Abell 2065. 29x10min, 10" RC, modified Canon EOS 40D, CLS filter, autoguided on an EQ6 pro. Jurgen Schmoll.***

# Bringing Kielder Dark Skies to Newcastle



Starring: Gary Fildes, Director  
Kielder Observatory



Kielder Observatory is 'on tour' to enable more people to be inspired and enthused by this truly remarkable story.

Don't miss YOUR chance to experience the first event of its kind as we bring the wonders of our universe to life for YOU through our inspirational dark sky experience.

Hear about 'searching for ET', 'Astronomy through the ages' and much more as this exciting evening performance unfolds...

**VENUE:** The Vermont Hotel, Newcastle, NE1 1RQ.

**DATE:** Sunday April 26th 7:00pm - 9:30pm

**TICKETS:** £16

**CALL NOW ON:** 0191 265 5510

**FIND OUT MORE:** [www.kielderobservatory.org/events/kielder-observatory-newcastle/](http://www.kielderobservatory.org/events/kielder-observatory-newcastle/)

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