

Kielder Observatory Newsletter

TWO FAT grey legs poised uncertainly at the bottom of what could have been a decorator's ladder. Carefully they tried a step upwards—just to be sure of getting back.. Then with a small jump a blurred, hump-backed but essentially human figure stood erect on the surface of the moon.

It was like having an armchair seat to watch Columbus arrive in the West Indies. Or Tasman coming upon the mysterious southern continent of Australia.

But as the swollen, ungainly figure with its elephantine limbs went loping out on to the cratered surface it was much more even than that.

By taking his foot off that ladder, Neil Armstrong had set mankind's foot on another, more glittering rung—the first of an infinite series which leads beyond the stars.

HOSTILE

If ever there was a moment when the grand venture, the John Wayne heroics might have been forgiven, it was at 3.56 in the small hours of today when Armstrong clambered down in to the most hostile environment a man has ever faced.

At any moment he might have fried, frozen, exploded, curled up with radiation, or been smitten by some terrible unknown sickness.

There was no breast-beating from Neil Armstrong. Instead he paused, like all good tourists to admire the view. Then switched over to shatteringly cool scientific observation.

ATHLETIC

Moving with all the grace of a slow-motion athlete, Armstrong disappeared from view for a couple of minutes while he collected his first vital sample of moon dust and stuffed it into his pocket.

"OK, contingency sample is down," he radioed. "It's a very soft surface, but here and there I ran into very hard pieces. It appears to be very cohesive material of some sort."

They didn't talk like that in Jules Verne or H. G. Wells. Or in Destination Moon. And it certainly was not what Cortez said before moving off to explore South American civilisation.

As they set to work setting up scientific experiments—moving as they did so across a temperature difference like that between steam and ice—they poured back reports on light intensity, rock composition and the problems of balance.

Endless craters stretching away over a barren plain made it look like a self-film set. You had to keep telling yourself this was real, not just an ultra-late-night offering from Hollywood.



NINE RUNGS DOWN A LADDER and Neil Armstrong earns his place in the pages of history. Man's dream to set foot on the moon became reality at 3.56 a.m. yesterday when Armstrong gingerly pressed his boot into the fine and powdery surface and said in a voice slightly shaking with emotion: "That's one small step for man, but one giant leap for mankind."



NEWS

North of Tyne
contract

NIGHT SKY

Highlights
Aug/Sept/Oct

ART MEETS SCIENCE

Helen McGhie
describes her work

APOLLO

A lookback at the
programme



EDITORIAL

Plenty in this edition! With all the excitement in the media over the Apollo 11 anniversary, our treasurer looks at the background to the Apollo programme and its legacy. The images on the front and rear covers are taken from some of the 21 scrapbooks he made on the early space programmes! On a more practical note, Robert Williams goes meteor hunting. Meanwhile, artist Helen McGhie, whose is undertaking a PhD in collaboration with the Observatory, looks at the relationship between astrophotography and art.

Nigel Metcalfe

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Kielder Observatory Astronomical Society

Registered Charity No: 1153570.

Patron: Sir Arnold Wolfendale 14th Astronomer Royal

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

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KOAS NEWS

The trustees have been very busy lately as this is the time of year when the budget has to be set for the next financial year (which starts in September) - we can report that the finances are in a healthy position! There has also been the small matter of recruiting a new CEO - interviews have taken place and we are anticipating having someone in post in the next month or so, so look out for more about that in the next newsletter.

Meanwhile we are still looking at plans for our planetarium, which will be sited close to the existing observatory buildings and will provide an 'all-weather' experience for our guests. Outline planning permission has been granted, but finance still has to be raised. We are also preparing for the detailed implementation of the North of Tyne contract (see Observatory News) - for example we have already authorised the buying of 60 small telescopes to give

to schools as part of the programme. We are also engaging again with the Tees Valley Mayor about doing some further schools work for his STEM projects.

The office lease at Prestwick Park has been renewed for another 5 years, and we are now very close to signing the lease for the Observatory with the Forestry Commission.

The trustees will be having another 'away-day' in August.



Universe Full of Stars – July 2019

Despite the sky being cloudy and a complete lack of stars the staff who work there were so informative and interesting and also entertaining that we thoroughly enjoyed our evening. We will definitely be back another year although probably more in September time. It is definitely worth the trip from Suffolk. Again a massive congratulations to the staff. It's a tough gig to keep a group happy (which they did) when the main event is not happening!!

Gabrielle, Suffolk



OBSERVATORY NEWS



©KOAS/Hayden Goodfellow

In June we witnessed several incredible displays of noctilucent clouds. Often known as the 'Summer Aurora', these clouds are caused by ice crystals high up in the Earth's atmosphere.

KOAS has been successful in striking a partnership arrangement with the new North of Tyne Authority. This exciting and innovative project will involve the KOAS science team supporting improvements in the quality of science education and student outcomes from Key Stages 1 to 5 in Newcastle, North Tyneside and Northumberland. This will involve direct teaching and deployment of the portable planetarium to 60 school sites by August 2022. All school partnerships will receive an astronomy starter kit that will include a

telescope as well as training in the use of the equipment. Team members are currently developing curriculum materials to cater for the needs of pupils throughout the age ranges including a dedicated website that will support teachers in their lesson preparations and enable follow-through study by pupils.

On the staffing front, we have two new science communicators joining us. Eleanor McDonald started employment with us on 24th June, so we invited her to



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say a little about herself:

"I have just graduated from the University of Warwick with a BSc in Mathematics and Physics. In my final year there I took a module that was all about communicating science. I also started paying attention to things that science communicators, such as Dr Katherine



Trustee Jurgen Schmoll is an instrument scientist by trade, and has been giving some tender loving care to the corrector plate of one of our telescopes

Mack (@AstroKatie on twitter), were saying about the importance of communicating science to the public and I realised that this was something I could do. I was very fortunate to find the opening at Kielder and I applied immediately. It was miles away from any family and I didn't know anyone up here, but I knew I wanted the job. The opportunity to speak to members of the public about the night sky and our universe in this setting was too good to pass up! I have immensely enjoyed my first few weeks here, I think in part due to the number of clear (and nearly clear) nights I have been lucky enough to experience. Going forwards I am excited to really get stuck in with the events at here at Kielder, to build my own presentations and write my own talks. I also wait, perhaps more with trepidation than excitement, to see what the weather has to hold going into autumn and winter."

We have also recruited Naz Jahanshahi, who will start sometime in August.

The news in July was, of course, full of the celebration of the Apollo 11 moon landing. The Observatory played its part; as well as our special evening events on July 20th, we were featured twice on BBC Breakfast on July 16th, during an item



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from the National Space Centre in Leicester. The crew came and filmed a piece about generations experiencing the moon landing, and the effects it had on interest in astronomy. A variety of members of our science presenter Dan Pye's family were present. Meanwhile, trustees Stuart Kitching and Trevor Robinson were interviewed live on BBC Radio Newcastle on July 19th.

At the beginning of July the Observatory was represented at the National Astronomy Meeting (NAM), which this year was hosted by Lancaster University. NAM is the annual conference of the Royal Astronomical Society (RAS), where astronomers from around the UK (almost exclusively researchers) assemble to discuss the latest topics. However, the RAS is also keen to promote education and outreach (indeed NAM has a nominated Education and Outreach day), and so the organisers kindly agreed to waive the registration fee for one person



Hayden in front of our stand at the National Astronomy Meeting

from Kielder to represent the Observatory at the conference, due to its charitable status. Hayden Goodfellow went along to represent us, and his report on the conference will appear in the next newsletter.

Not been to Kielder Observatory 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/our-events/> or call us on 0191 265 5510. We can also be contacted at admin@kielderobservatory.org



ASTRONOMERS' TALES

Apollo – before and after

Over the past month or so, we have been celebrating the 50th Anniversary of the first Moon Landing. Something that I still remember well, as I was 18 in July 1969 and I stayed up all night to watch Armstrong and Aldrin walking on the Moon.

This article, though, is not about Apollo 11 itself, which has been well covered in the media. It is about what happened in the lead up to Apollo 11 and what happened, or didn't happen, afterwards.

Many people know that what became known as Project Apollo originated with a speech made by President Kennedy. At a joint session of Congress on 25th May 1961, he announced that “this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to Earth”. Why did he do this?

During the 1950s there had been a growing concern in the USA about what was viewed as the USSR's increasing superiority in missile technology, and the 1957 launch of Sputnik 1, the world's first artificial satellite, did nothing to dispel that feeling. There was a fear that the Soviet

Union would take control of the space around Earth, and maybe establish a military base on the Moon, unlikely as that may seem now. It should also be noted that Kennedy's speech was made only six weeks after Yuri Gagarin had become the first man in space, an event that had taken the US Government completely by surprise, adding to the fear of being behind the Soviets in missile and space technology. After all, a rocket that can put a manned capsule in space can send a nuclear warhead a rather long distance.

Lyndon Johnson, then the vice-president and later to become president after Kennedy's assassination in 1963, said on one occasion that “I, for one, don't want to go to bed by the light of a communist moon”. In fact, Kennedy had made the perception that there was a gap in missile capability between the USA and the USSR a central feature of his presidential election campaign in 1960, although he knew in private that the Soviets did not have as many long range missiles as the Department of Defence had estimated in public.

So did the Soviet Union have superior rocket and satellite technology to get a human mission to the Moon before the USA? The short answer is no. The real



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underlying US political reasoning was to show that the largest capitalist economy and self-proclaimed leader of the free world could beat the inefficient command and control Soviet economy, by taking the massive step of setting up a project to land a man on the Moon.

The Soviet government did not immediately respond to the establishment of the US Lunar Landing program, as they initially thought that it would fail. Only after three years was there a political decision to initiate a Soviet program. In August 1964 the leaders of the Soviet space program were instructed to develop a manned Moon flyby project, with a planned first flight by the end of 1966, and a separate Moon landing program with a first flight by the end of 1967. This changed after Nikita Khrushchev was deposed as Communist Party chairman in October 1964, and further affected by the premature death of Sergei Korolev, the senior Soviet rocket engineer, in January 1966. By February 1967, the first manned flyby was scheduled for mid-1967, and the first manned landing for the end of 1968.

However, the programs were subject to many technical difficulties, and after the successful lunar orbital missions of Apollo

8 and Apollo 10, and the subsequent landing missions, the Russian program effectively ran out of steam in the early 1970s.

The US space project itself was largely successful through the 1960s. Most of the many different programs were designed with the intention of planning and practicing for the Moon landings. Project Gemini flew 10 crewed flights in 1965 and 1966, testing the techniques that would be essential for a successful moon landing, including Extra Vehicular Activity and orbital rendezvous. The last three Gemini missions, Geminis 10, 11 and 12, docked with an Agena rocket and used it to boost the capsule into higher orbits. The only significant project failure was Gemini 8 (commanded by Neil Armstrong) in March 1966, which had to return to Earth early because of a fault with the attitude control thrusters.

Other successful supporting missions included the Ranger series, which took photographs of the moon before crash-landing, and the Surveyor missions, which soft-landed onto the lunar surface. Both these programs had some failures, but enough experience was gained to inform the Apollo mission planning.



ASTRONOMERS' TALES

In the final run up to lunar landing, the only serious set back in the Apollo program was the Apollo 1 accident in January 1967, in which the crew of three died in an onboard fire while carrying out a simulated launch in preparation for the actual launch planned for the following month. The resultant investigations led to a complete redesign of the Apollo Command Module, and the first manned Apollo mission, Apollo 7, did not take place until October 1968.

That was followed by Apollo 8, which had originally been planned to be an Earth orbit mission to test the Lunar Module (LM) and orbital rendezvous. However, the LM preparation was delayed, and there was also a belief that the Russians were planning to carry out a manned lunar flyby mission before the end of 1968. The Apollo 8 mission objective was therefore changed, and in December 1968 the crew became the first humans to orbit the moon. This mission was also the first time that a Saturn 5 rocket was used with a crewed Command Module.

Further test missions were carried out with Apollos 9 and 10. Apollo 9 was the LM test flight that had originally been planned for Apollo 8, and Apollo 10 tested the LM in lunar orbit, with the two astronauts in

the LM descending to as low as 14km above the Lunar surface.

The rest, as they say, is history. Apollo 11 landed on 19th July 1969, and the moonwalks themselves took place the following day. President Kennedy's target had been achieved, with over 5 months to spare. At its height there were some 400,000 NASA and contractor staff working on the project, at a total cost of \$24 billion. Interestingly, at today's prices, that equates to a cost of around \$150 billion. In £ sterling at today's exchange rates that would be roughly £120 billion. Compare that with the latest estimated cost of up to £85 billion for the HS2 train project. Makes you think!

So what about after Apollo 11? The original schedule had allowed for about three moon landing missions a year, leading up to Apollo 20. Apollo 20 was cancelled in January 1970, because its Saturn 5 rocket would be needed to launch what became Skylab in 1973, and Apollos 18 and 19 were cancelled in September 1970 due to NASA budget cuts. The final Moon landing mission was therefore Apollo 17 in December 1972.

NASA at one point had a detailed program of missions for extended lunar



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exploration, known as the Apollo Applications Program (AAP). It had four phases:-

- Phase 1: 1969-1971 – this included the first four lunar landing missions, which would have corresponded to the Apollo 11 to 14 missions that actually flew (recognising, of course, that Apollo 13 failed because of a Service Module explosion on the way to the Moon and the crew only just managed to return safely to Earth).

- Phase 2: 1972-1973 – this would have been the Lunar Exploration Phase, consisting of four flights of the Extended Lunar Module, a modified LM allowing extended stays on the lunar surface of 3 to 4 days. This Phase would have corresponded to the final three lunar landing missions of Apollos 15-17.

- Phase 3: 1974 – this would have been a 28-day Lunar Orbital Survey Mission

- Phase 4: 1975-1976 – This would have been a 14 day extended lunar exploration mission.

There were also plans for more extended

missions, leading to one where 6 men would have spent 180 days on the Moon. But of course, none of this extended programme was delivered. It was cancelled when President Nixon reduced NASA's budget; he was not particularly interested in space exploration and wanted to make major savings from the NASA budget to fund other things that he saw as being more important. The very last Apollo to fly was the Apollo-Soyuz Test Project in July 1975. This was a joint US-Soviet mission and was widely considered to mark the end of the so-called Space Race that had started with the launch of Sputnik 1 in 1957. Which is more or less where we came in.

And now, after a gap of nearly half a century, we have another plan, initiated by President Trump, for a crewed Moon landing in 2024. This is even more ambitious than President Kennedy's plan, which took nine years to achieve. So watch this space!

Trevor Robinson
KOAS treasurer

(You can see some of Trevor's extensive collection of newspaper cuttings from the space race on the front and rear covers)



OBSERVERS' SLOT

The bright Meteor showers and viewing conditions for the next few years

What is a meteor? - essentially it's a piece of outer space that just gets a little too close to Earth and then, sometime later, burns up as it transits Earth's atmosphere.

When can you see them? - on any clear night you may see a few meteors every hour, but on a number of special nights there is a chance to see tens, hundreds and occasionally thousands or tens of thousands per hour.

Do you need any special equipment to see them - no, the unaided eye, suitably dark adapted, is all that you need, although nowadays you can 'see' many more by doing a bit of DIY radio-astronomy.

Where do meteors originate from? - the particle streams that create meteor showers originate from comets [mostly] and a few come from asteroids.

What do we know about the relationship between comets/ asteroids and shooting stars? - until about 20-30 years ago not much, but two American scientists, McNaught and Wilson, took an in-depth look at the Leonid meteor shower [of mid-

November] and discovered that the shower was intimately linked to the position of the parent comet [Comet 55P Temple-Tuttle] and they started to make predictions of the showers activity both in the past and in the future.

The Leonids are a special shower. McNaught and Wilson discovered a 33-year period of rising and falling activity with significant peaks in years when the comet was near its closest approach to Earth. Over many hundreds of years the intercept distance between Earth and comet Temple-Tuttle - at closest approach - varies and as a consequence the cycle ebbs and flows over each 33 year period. The comet leaves a vapour trail/particle stream as it orbits the Sun and, as the Earth crosses this stream, the cometary particles fall to Earth as meteors. Each stream is of different dimensions, different ages and different particle size distribution, so each yearly meteor shower differs in activity.

In 1899, a shower of about 1 million per hour was witnessed. In the following 32-34 years the activity dropped until 1916 when there was about 100 per hour.



OBSERVERS' SLOT

The activity then rose until in 1933 when it reached many tens of thousands of meteors per hour. Each maximum peak is different. There was another good peak in 1966. By 1999, the shower had been so well studied that not only was it possible to predict the peak activity [a zenith hourly rate of around 8600] but also where was the best place to see it [Sinai, Egypt]. I was lucky enough to go on a trip to Sinai in November 1999 and over a space of four clear nights around the maximum [16-17-18-19 Nov.] I estimated that I saw upwards of 20K shooting stars [20,000! - I basically lost count]. Not only that, during the same period of mid-November 1999, the Northern Taurids meteor shower was active. I didn't see many of those, but I did see a magnitude -10 fireball [as bright as the full moon!] that left a glowing vapour trail that persisted for at least 30 minutes. In subsequent years [2000 and 2001] there were further predictions for other locations [America and then Micronesia] and intrepid meteor watchers did go to see the shower in both locations.

What next for the Leonids? - in 2019 we are just on the upswing from minimum activity so expect to see around 50-100 per hour. The next big peak is still some

years away [2031, 2032 or 2033] so there's no need to rush and book a hotel room just yet!

If you want to get ahead of the game then bookmark this link, [WGN] Journal of the International Meteor Organisation Vol 35, No.1 (2007), which has predictions for the Leonid rate until the year 2100.

Other significant showers during the year are the Perseids, peaking on 12th/13th August, the Orionids [20th/21st October] and the Geminids, peaking on 13th/14th December. There are also a few less active showers sprinkled throughout the year. Anyway to whet your appetite, the table on the next page has a few general predictions for some of the more significant meteor showers for 2019/20/21. Get out and look up!

And one final thing - there's no need to wear a safety helmet! Meteor particles are only the size of a grain of sand. Even the -10 fireball I saw in 1999 may only have been the size of a pea or small marble, although it was traveling at around 40 km/sec at the time (at which speed it would cross from Newcastle to Kielder in 2 seconds).

Robert Williams



OBSERVERS' SLOT

The bright Meteor showers and viewing conditions for the next few years

<u>Showers</u>	<u>Date Start</u>	<u>Date of Maximum</u>	<u>Date finished</u>	<u>Best time of night to view</u>	<u>Prospects for year.....</u>		
					2019	2020	2021
April Lyrids	19/4	21/4	25/4	after midnight	Poor	Good	Fair
Eta-Aquarids	24/4	5/5	20/5	before dawn (below Lat. 30N)	Good	Poor	Fair
Delta Aquarids	15/7	1/8	20/8	before dawn (below Lat. 30N)	Good	Poor	Fair
Perseids	23/7	12/8	20/8	before midnight	Poor	Difficult	Fair
Pisids	1/9	8/9	1/10	before midnight	Fair	Fair	Good
Orionids	16/10	22/10	27/10	after midnight	Poor	Difficult	Difficult
Taurids	20/10	3/11	30/11	all night	Poor	Difficult	Good
Leonids	15/11	17/11	20/11	after midnight	Poor	Good	Difficult
Geminids	7/12	13/12	16/12	all night	Poor	Good	Difficult

NB Prospects are based on phase and position of Moon relative to the active shower's constellation's radiant point



NIGHT SKY

AUGUST 2019 (times in BST)

Lunar phases

New moon	01/08/2019	04:11
First quarter	07/08/2019	18:30
Full moon	15/08/2019	13:29
Last quarter	23/08/2019	15:56
New moon	30/08/2019	11:37

PLANET SUMMARY

Mercury will be a difficult morning object lost in twilight. Venus is near solar conjunction so not visible this month. Mars is also near solar conjunction and not visible. Jupiter will be visible at around 10pm. Saturn will be briefly visible at around midnight. There are two new moons this month - apparently the term 'black moon' is sometimes used to refer to the second one.

THE STARS AT 10PM (BST)

North – Lyra will be overhead with the two Bears nicely placed along with Cepheus. Auriga will be close to the horizon. East – Andromeda and Pegasus will be nicely placed. Perseus and Cassiopeia are rising. Cygnus is high up.

South – Aquilla, Serpens Cauda and Ophiuchus are nicely placed.

West – Hercules is nicely placed with Bootes.

METEOR SHOWERS

August is well known for the Perseid Meteor Shower which is visible for most of the whole month. In 2019 the Moon will be waxing gibbous on the 12th of August – so will interfere somewhat with the fainter meteors. You should see around 50 meteors per hour. Best seen in the early hours before dawn, once the Moon has set.

COMETS

There are no comets brighter than about 11th magnitude visible this month.

OTHER SKY HAPPENINGS

Noctilucent clouds may still be visible – especially since 2019 has been an amazing year for them so far.

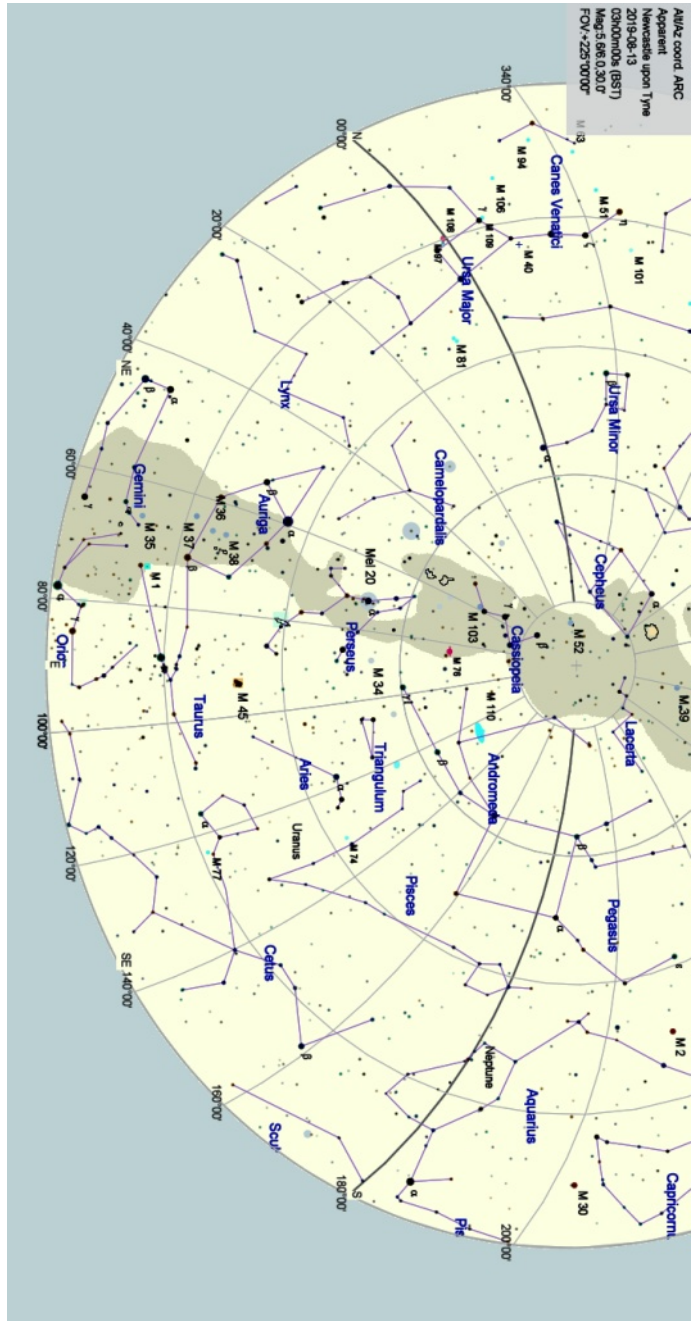
The Planets 15/08/2019

	Sun	Moon	Mercury	Venus	Mars	Jupiter	Saturn	Uranus
Rise	05:39	21:16	03:55	05:37	06:11	16:39	18:52	22:33
Set	20:40	07:23	20:02	20:49	20:57	00:10	02:18	13:12



NIGHT SKY

August 13th night sky at 3am, looking east from Newcastle-upon-Tyne towards the origin of the Perseid meteor shower.





NIGHT SKY

SEPTEMBER 2019 (times in BST)

PLANET SUMMARY

Lunar phases

First quarter	06/09/2019	04:10
Full moon	14/09/2019	05:32
Last quarter	22/09/2019	03:40
New moon	28/09/2019	19:26

Mercury will be visible low in the east during morning twilight. Venus will be lost in the morning twilight. Mars is near solar conjunction and not visible this month.

Jupiter will be visible from around 2100 until 2300. Saturn will be visible from around 2100 until 0100 and will be not too far away from Jupiter during the whole of September. Uranus is a morning object.

THE STARS AT 9PM (BST)

North – Lyra and Cygnus will be overhead with the two Bears nicely placed along with Cepheus. Auriga will be close to the horizon.

East – Andromeda and Pegasus will be nicely placed. Perseus and Cassiopeia are rising. Cygnus is high up.

South – Aquilla, Serpens Cauda and

Ophiuchus are nicely placed.

West – Hercules is nicely placed with Bootes.

METEOR SHOWERS

There are no bright meteor showers in September. There is a faint shower – the Piscids which peak on the 21st September. The Moon will be last quarter and will interfere somewhat with this shower.

COMETS

There are no bright comets this month.

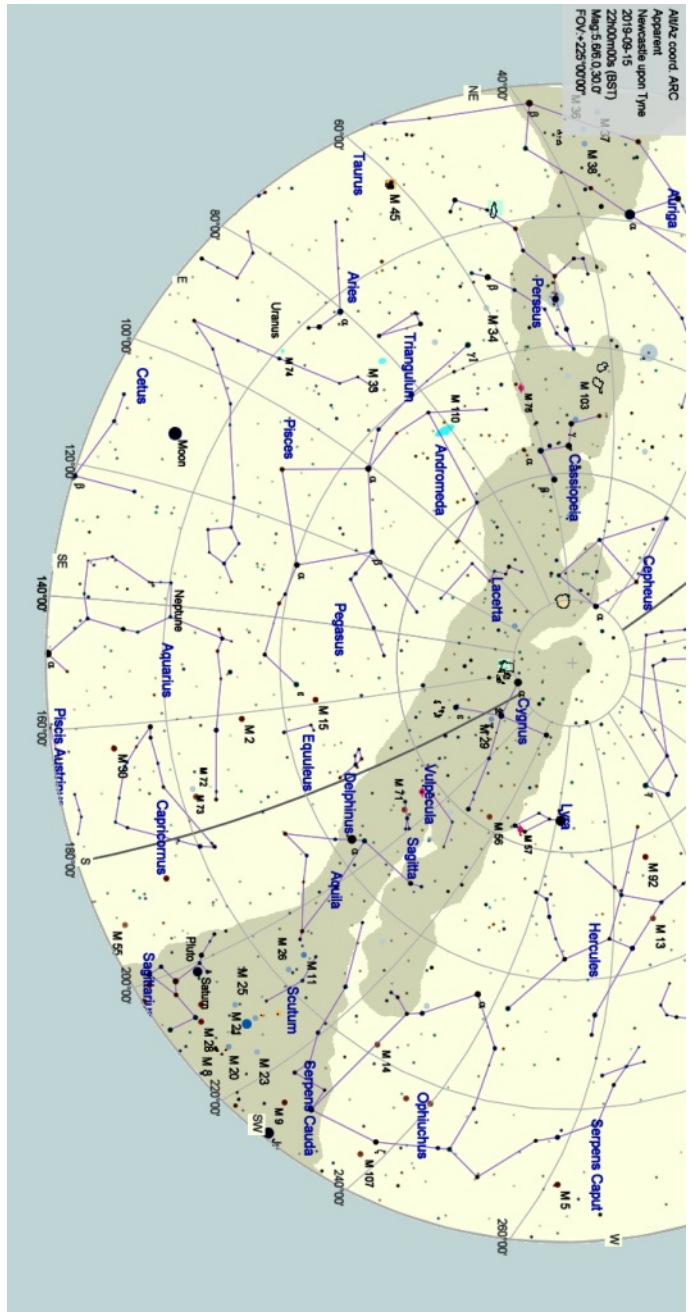
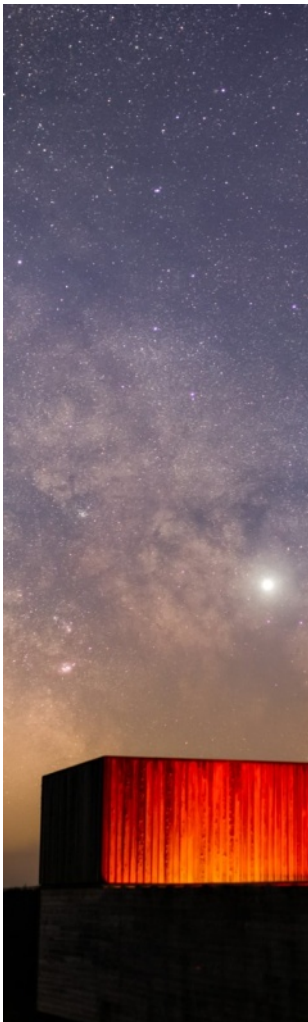
The Planets 15/09/2019

	Sun	Moon	Mercury	Venus	Mars	Jupiter	Saturn	Uranus
Rise	06:38	20:16	07:33	07:26	06:08	14:47	16:47	20:21
Set	20:16	07:23	19:42	19:43	19:23	22:09	00:11	11:07



NIGHT SKY

September 15th night sky at 10pm BST, looking SSE from Newcastle-upon-Tyne.





NIGHT SKY

OCTOBER 2019 (times in GMT)

PLANET SUMMARY

Lunar phases

First quarter	05/10/2019	17:47
Full moon	13/10/2019	22:07
Last quarter	21/10/2019	13:39
New moon	28/10/2019	03:38

Mercury and Venus will be difficult objects in the evening twilight, but will be very close together during October. Jupiter will be setting in the west after sunset, in the evening twilight. Saturn will be visible from around 2130 until 2300. Uranus is a morning object visible from 2200 until 0530.

THE STARS AT 9PM

North – Cepheus will be overhead with the two Bears nicely placed along with Cepheus. Auriga will be close to the horizon.

East – Andromeda and Pegasus will be nicely placed. Perseus and Cassiopeia are rising. Cygnus is high up. Capricornus will be low down.

South – Aquilla, Serpens Cauda and Ophiuchus are nicely placed.

West – Cygnus, Lyra and Hercules are nicely placed with Bootes low down.

METEOR SHOWERS

The major meteor showers of October are:

a) Around 8th October – the Draconids – a minor show but can still put on a show – visible all night in the North – with a waxing gibbous Moon setting in the early hours, the best time to see this shower in 2019 will be before dawn once the Moon has set.

b) Around 20th October – the Orionids – The Moon will be near last quarter so will interfere with this shower as they will rise close together.

COMETS

No comets are expected to be brighter than 11th magnitude in October.

Night Sky credits:

Data sourced from Cybersky 5,

<https://www.timeanddate.com/moon/phases/>

and <https://in-the-sky.org/>.

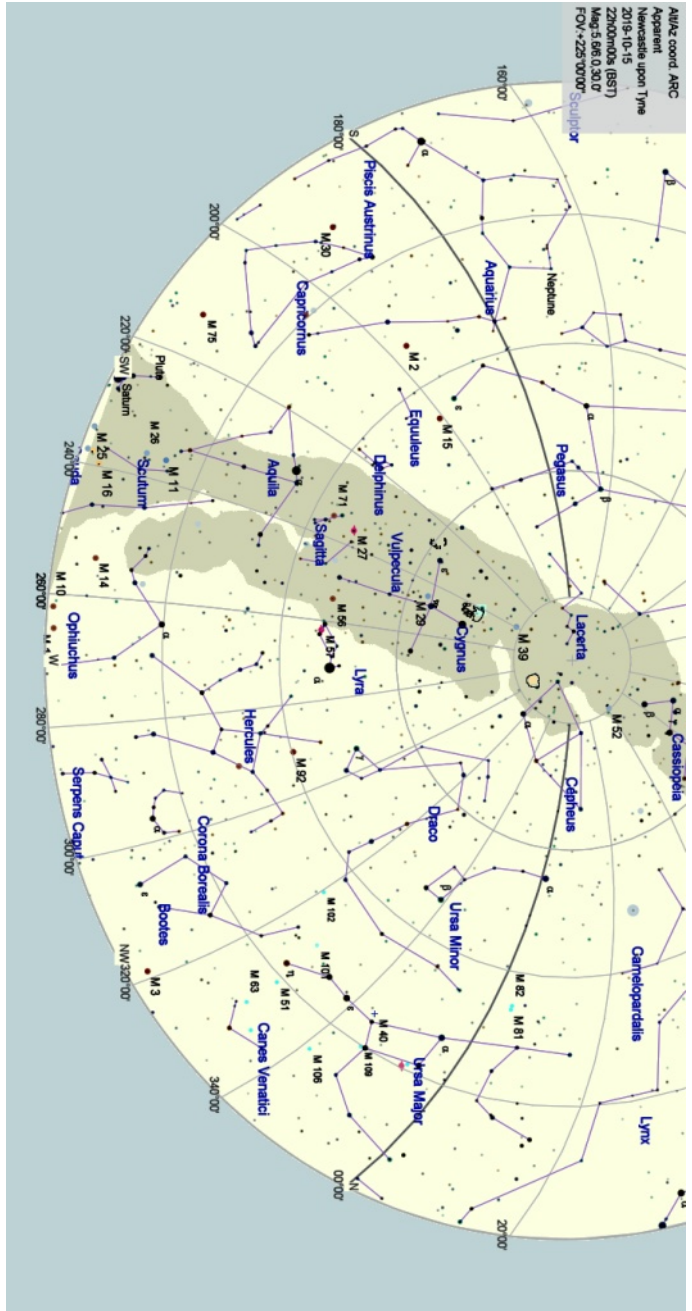
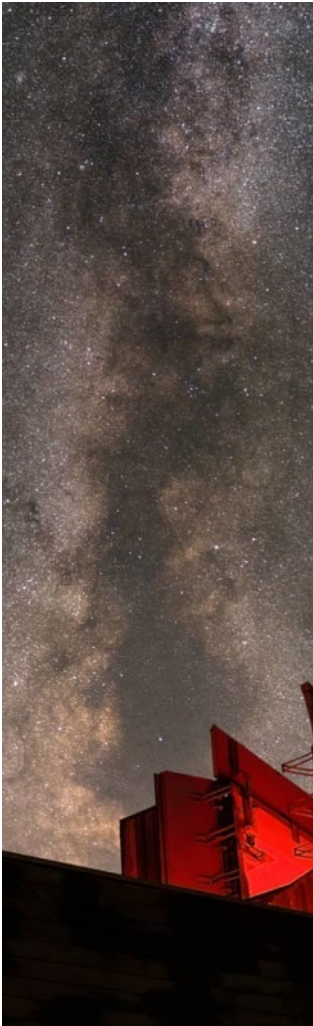
The Planets 15/10/2019

	Sun	Moon	Mercury	Venus	Mars	Jupiter	Saturn	Uranus
Rise	07:33	19:09	10:13	09:13	06:05	13:10	14:52	18:21
Set	18:06	08:40	18:26	18:12	17:51	20:25	22:12	09:04



NIGHT SKY

**October 15th night
sky at 9pm GMT,
looking west from
Newcastle-upon-Tyne.**





STEAM SLOT

Kielder Observatory's Resident Artist

And now for something completely different ...

My name is Helen McGhie, I am a visual artist and a lecturer in photography at the University of Sunderland, where I am undertaking a practice-led photography PhD in partnership with Kielder Observatory. My fine-art project, entitled “Stargazing at the ‘Invisible’: Photography and the Power of Obscured Light – A Research Partnership with Kielder Observatory,” explores the cultural connectedness of astronomy and photography through the experience of astronomical darkness - producing a series of staged photographs, a short film and experimental exhibitions. I consider myself extremely lucky to be funded by the National Productivity Investment Fund (Arts and Humanities Research Council), which is part of the government's Industrial Strategy. As an ‘NPIF’ student working alongside staff, volunteers and visitors, my research will engage and impact Kielder Observatory's mission for educational outreach and will also engage a new ‘arts’ audience; I have a long way to go as my thesis submission date is not until the end of 2023, but I will share my project updates through this newsletter.

As self-titled ‘artist-in-residence’, I began researching photography's relationship with astronomy by considering the early technological advancements in astronomical imaging, including how long exposures spectacularly captured ancient starlight unseen by the naked eye (fig. 1); and how still life photography played a vital role in communicating new visualisations of the moon, such as Nasmyth and Carpenter's photographs of painstakingly accurate plaster models, crafted from astronomical observations (fig. 2). Of course, technology has hugely progressed since these early photographs, now multiple exposures are stacked and images are captured beyond the Earth's atmosphere, one can only imagine the incredible results that will be achieved by the James Webb Space Telescope (if it ever launches, of course!) Contemplating the cosmos has been extremely rewarding - both as an artist and a human - I have spent my first year quite literally lost in [images of] space.

As an early career researcher in the arts, it is my duty to consider the cultural resonance of these images: why do the vibrantly coloured ‘pretty pictures’ of Astrophotography make us feel the way



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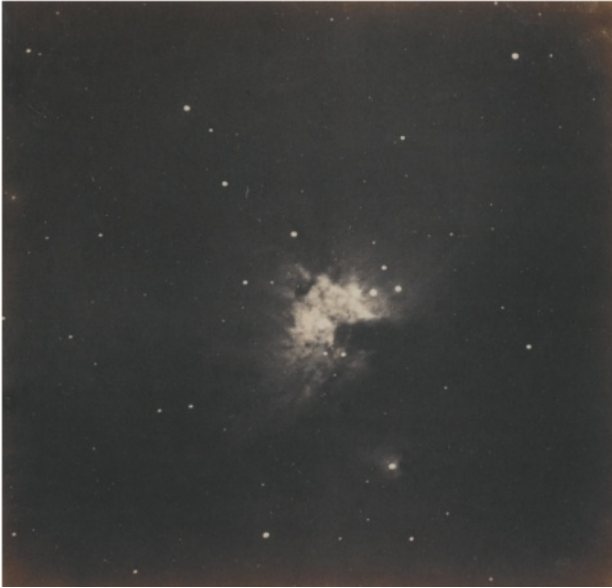


Fig 1 (left): Ainslie Common, A. (1883) *The Great Nebula in Orion* taken with an exposure of 20 minutes, 5 January 1883. [Albumen Print]. Science Museum, London.

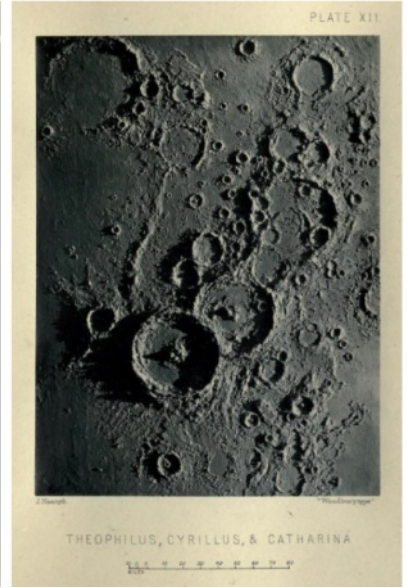


Fig 2 (right): Nasmyth, J. and Carpenter, J. (1885) *The Moon Considered as a Planet, a World and a Satellite*. London: John Murray, pp. 129, illus.

they do? In awe of the cosmos, imagining endless unknowable worlds?

Astro-imaging has been critically explored by Elizabeth Kessler in her 2012 book *Picturing the Cosmos: Hubble Space Telescope Images and the Astronomical Sublime*, where she considers how the visual imaging choices made in image processing (the colours, contrast and composition) mean that “[...] astronomers encourage a particular way of seeing the cosmos” (2012, p. 5), she describes how

visual attributes are similar to the 19th century paintings of picturesque mountains and valleys in the American West where light, tone and contrast are also significant; Kessler’s discussion leads us to consider how these visual likenesses (fig. 3, 4) implicate a sense of belief: the magnificent sites of the American West were once a landmark reserved for explorers, they are now part of National Parks and the American tourist economy;



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Fig 3 (left): Moran, T. (1882) *Cliffs of the Upper Colorado River, Wyoming Territory*. [Oil on canvas]. Smithsonian American Art Museum, Washington.
Fig. 4 (right): NASA (1995) *The Pillars of Creation*. Available at: <https://www.nasa.gov/image-feature/the-pillars-of-creation> (Accessed: 5 June 2019).

I creatively wonder if Astro-imaging similarly places us within reach of outer space? (The west and space analogously seen in the phrase: space, the final frontier). Although intrigued by Kessler's analysis, I ultimately feel that her concept depends on the belief that the photographic image is a truthful and impartial medium, which is problematic when much of Astrophotography's 'sense of wonder' relies on heavy post-production editing - I am considering these ideas as part of my first research question: *as a lens-based artist working with a public outreach astronomical organisation (Kielder Observatory), how can I use photographic art to challenge a*

culturally constructed vision of 'outer space'?

To answer the above question, I am creating photographic art that seeks to articulate an unconventional experience of dark skies in a new and imaginative way, not illustrating outer space (as per NASA photography), but instead engaging with what Joanna Zylinka describes as the "[...] technological, biological, cultural, social and political flows of data that produce photographic objects" (2016, p. 11). I am interested in making work that engages with observers of the cosmos and the experiences had by astronomers in northern England, who spend extended



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periods of time in darkness. In November 2017, I made my first visit to Kielder Observatory for a dark sky event; on a freezing cold - but fairly clear night - I couldn't believe the quality of darkness, and the way that my hand seemed to disappear as I reached it out before me. The event began and I stargazed through an amazing telescope that whirled in the interior of a red-stained wooden turret; I could see the Orion Nebula wobble behind our planet's atmosphere as the staff explained how stars are created, as we toured the universe together. The dark skies at Kielder are immersive and naturally wild, they provide a different way of experiencing the stars to what I had seen before, in a remote quiet place away from big cities and light pollution.

Darkrooms and dark chambers are embedded in photography's history, and darkness is fundamental to astronomy – these immersive environments are crucial in the technological practice of both processes. Esther Teichmann's 2011 PhD chapter 'Inverted Projections: The Hallucinatory Space of the Darkroom' (2011, p. 81-98) explores the photographic darkroom as a metaphor to examine "[...] the relationship between loss, desire and the imaginary" (2011, p.

1), she combines philosophy, fiction and visual art to consider the 'nocturnal' darkroom as a space where un-fixed photographs both appear and disappear. Teichmann's darkroom provides an experience of dreaming where the act of 'seeing' is transformed, she states:

"Bathed in the silent darkness of night, half-light of red liquid, we see differently here—half blinded, there is clarity within the inverted, hovering projection, within the floating shivering movement of image appearing upon its material support."
(2011, p. 82)

As I often work with analogue photography and enjoy the darkroom process, I am intrigued by Teichmann's thoughts on how we 'see differently' in the dark; my active imagination has always been stimulated by nocturnal happenings, I remember childhood camping trips with the Girl Guides, where hauntings in ghost stories recited on a field in Lancashire became a possibility after the campfire burned out – when sight is reduced, our other senses are heightened and environmental sounds seem to amplify, through this idea I am interested to discover if night-sky observers have had similar experiences in the depths of



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astronomical darkness and wonder (for my second research question), how encounters with this immersive 'wild darkness' might be explored through photographic art?

Rather than focusing on the night's sky as my sole subject, I am interested in capturing dark skies in relation to the observers who gaze in Kielder's landscape, many of whom travel from afar, away from light-polluted towns and cities for a momentary escape to be with planetary objects and ancient starlight. As travel and escapism are highly connected to the practice of observing, and walking is a large part of the visitor experience at

Kielder, I have tried to capture this in my first set of images: a series of portraits entitled 'Wanderers' after Philip Seymour's explanation of the word planets:

"We derive the word 'planet' from the Greek 'planetes', which means 'a traveller' or 'a wanderer'. Whereas the stars kept their distances with respect to one another, and hence could be linked together to form constellations, the Sun, Moon, Mercury, Venus, Mars, Jupiter and Saturn constantly changed their positions against the background stars, and this was why they were called wanderers, or planets." (2014, p. 23)



Fig 5 (left): Helen McGhie, (2019) Wanderer, 19.01.2019

Fig 6 (right): Helen McGhie, (2019) Wanderer, 19.01.2019



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The next stage in the project is to make still-life photographs of the objects that northern Astronomers use for an evening of night-sky observation - anything from a notebook or pair of gloves, to astronomical equipment (I'm particularly interested in handmade astronomy tools, such as those that feature as projects in The Sky at Night magazine: www.skyatnightmagazine.com/advice/build-a-rotating-meteor-shutter/) and I am inviting readers of this article to get involved! Do you have a particular object to aid night sky observation that you wouldn't mind lending to me to photograph? Or could you send me a list of the tools that you couldn't be without? These items will feature in a new series of photographs that will contribute to my PhD and I would greatly appreciate your help! To participate, please email me at helen.mcghie@research.sunderland.ac.uk. I look forward to sharing the results with you in a later newsletter, and if you would

like to keep up-to-date with my project, please visit my blog: www.invisiblestargazing.wordpress.com.

Helen McGhie is a visual artist, PhD student and photography lecturer at the University of Sunderland.

References:

- Kessler, E. A. (2012) *Picturing the Cosmos: Hubble Space Telescope Images and the Astronomical Sublime*. Minneapolis: University of Minnesota Press.
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Night Sky Safari – July 2019

We are from Germany, your team made a very good job! We and also our son (12 years old) enjoyed it very much, all was very good for us to understand, also the introduction presentation.

Thorsten, Germany



GALLERY

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

newsletter@kielderobservatory.org

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



The international space station passing over the observatory in July.



One of the many uses for an iphone! The partial lunar eclipse on the night of July 16/17th taken through the eyepiece of our 16" telescope. This was 50 years to the day since Apollo 11 launched for the moon.

© KOAS/Dan Pye



GALLERY



Who knew that KOAS had an office in Hawaii !?

Image courtesy of our treasurer, Trevor Robinson, who clearly has exotic holidays!



● President Nixon speaking to Armstrong and Aldrin from the Oval Room in the White House as the moon men stood near the American flag. "Because of what you have done the heavens have become a part of man's world" he told them.



● Aldrin getting the feel of his moon legs as he walked away from the ladder. "I'm quite light-footed, he told Armstrong, who had already been on the surface for 18 minutes.

"Superb, informative and beautiful

This is quite a place. You have to book and prepare for chilly temperatures, some midges and no running water! But what you get is fascinating talks and with clear skies, amazing sights. In the summer this won't include the northern lights but we saw Jupiter and its four biggest moons really clearly.

The staff are great - a young enthusiastic team. The building is also special. We hope to return during the winter."

Adrian, Bakewell

KOAS: Your Window to the Universe

<http://www.kielderobservatory.org>

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