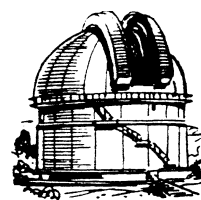

Journal

of the

Nottingham Astronomical Society

October 2018



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Thursday, October 4th

Gotham Memorial Hall

Gotham, NG11 0HE

8 pm (doors open at 7 pm)

This evening we welcome

Dr Jonathan Nichols*

*of the Department of Physics and
Astronomy, University of Leicester*

who will be speaking on

Juno – the Answers

(and if you don't, here's your chance to find out)

***Dr Nichols has kindly stepped in at short notice
as Prof Bunce is busy with the launch of
Bepi Columbo to Mercury**

An 8-day-old Moon



imaged by the Editor with a Canon 450D camera at the prime focus of a 30-cm f5.3 reflector

Sky Notes

October 2018

Compiled by Roy Gretton

All times given below are in British Summer Time (BST)



British Summer Time ends on Sunday 28th October. Clocks should be set back by one hour at 2 am on that date.

PHASES OF THE MOON

| <i>Phase</i> | <i>Date</i> |
|---------------|--------------------------|
| Last Quarter | October 2 nd |
| New Moon | October 9 th |
| First Quarter | October 16 th |
| Full Moon | October 24 th |
| Last Quarter | October 31 st |

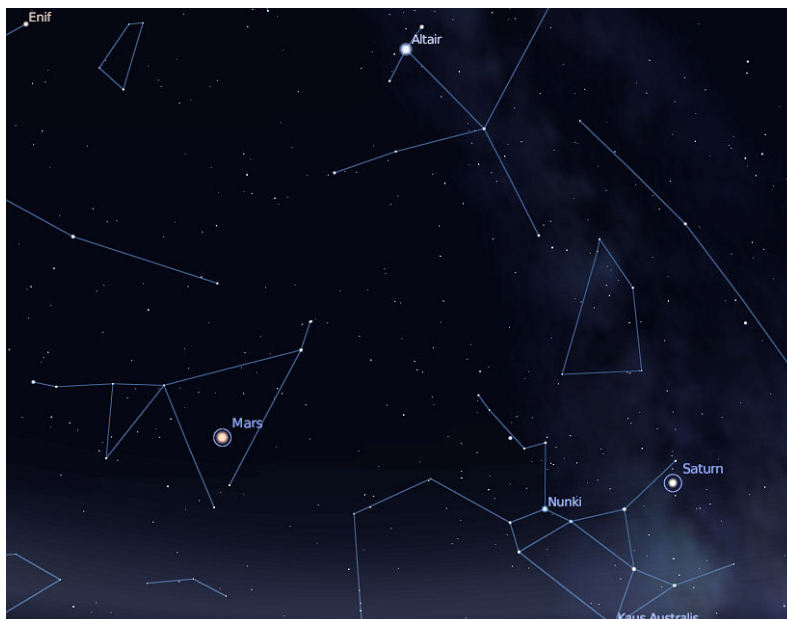
This month the Moon is closest to Earth on the 5th, and furthest on the 17th.

THE PLANETS

Mercury will be an evening object throughout this month, but will be very badly placed for observers in the northern hemisphere, being south of the celestial equator for the whole period.

Venus has now disappeared from our sky and won't be visible again until it appears as a morning object in November. It passes through inferior conjunction on October 26th.

As October begins, **Mars** has diminished in angular diameter to 16 arcseconds (after reaching over 24 arcseconds in late July/early August. Even so, it remains relatively bright (around magnitude -1), and appears as a bright orange "star" low in the southwest in the evening. At the end of the month it will still be shining at magnitude -0.6 .



*Looking south
at 8pm
on October 7th*

Jupiter has now disappeared from the evening sky as it heads toward conjunction with the Sun in November.

Saturn, still nearly 23 degrees south of the celestial equator, will be setting in the southwest at 9 pm (BST) in mid-October. At magnitude +0.5 it is not particularly prominent, and is a challenging object to observe in detail.

Uranus is at opposition to the Sun on October 24th, hence will be due south at 1 am BST on that date, and nearly 50 degrees above the southern horizon, so well-placed for observation from the UK. Its magnitude is 5.7 and its angular diameter 3.7 arcseconds.

Neptune, in the constellation of Aquarius, is an evening object, observable with a suitable telescope (magnitude 7.9).

METEORS

October's main shower is the **Orionids**, which result from debris left by Halley's comet. They are fast-moving meteors with a tendency to leave trails that can remain visible for a second or two. This year their maximum activity (up to 25 events per hour) occurs between October 21st and the 24th – the date of Full Moon, so conditions this year are about as bad as they can be!

FOR SALE

VINTAGE TOWA 339 LONG FOCUS ACHROMAT, REFRACTOR TELESCOPE

A classic Japanese TOWA 339 Achromat , a fine collector's item.
80mm, f15, 1200mm F.L. Air spaced (uncoated) Doublet Objective.
Probably made late 60's – early 70's. Excellent condition.

Full kit includes:

- OTA in immaculate condition, with smooth R&P Focuser.
- Finderscope with removable reticule eyepiece.
- Equatorial mount with wooden tripod, EP tray and chains.
- Set of 5 Kellner 0.96" Eyepieces, prismatic Star Diagonal.
- 2x Barlow. Image inverter for terrestrial use.
- Sturdy wooden case with polystyrene moulded packers.

£100. Contact John Hurst at: president@nottinghamastro.org.uk
for more pictures and details.



DIARY DATES 2018

Monthly Meetings of the Nottingham Astronomical Society

1) Meetings at Gotham Memorial Hall

Nottingham Road, Gotham, NG11 0HE

Held on the **FIRST Thursday** of each month except **August**

Doors open at 7pm for 8pm start.

These events are normally centred around a talk by a visiting speaker, except Open Evenings, when NAS members provide the activities.

*Normally we have a **Library** and a **Helpdesk** open at each meeting.*

| <u>Date</u> | <u>Topic</u> | <u>Speaker</u> |
|--------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------|
| October 4 th | Juno – the Answers | Dr Jonathan Nichols <i>University of Leicester</i> |
| November 1 st | A Cheese and Wine Evening with a brief AGM | |
| December 6 th | Transient Events in Astronomy or <i>Things that go bump in the night</i> | Prof Dame Jocelyn Bell Burnell DBE, FRS, FRSE, FRAS |

2) Social and Practical Astronomy Meetings at the Burnside Memorial Hall, Plumtree

Church Hill, Plumtree, Nottingham, NG12 5ND

Held on the **THIRD Thursday** of each month from **7:30pm**

These meetings are of a more informal nature, providing opportunity for members and guests to share their hobby over a cup of tea or coffee, as well as listening to a short talk.

The next meeting will be on September 20th (see further details below)

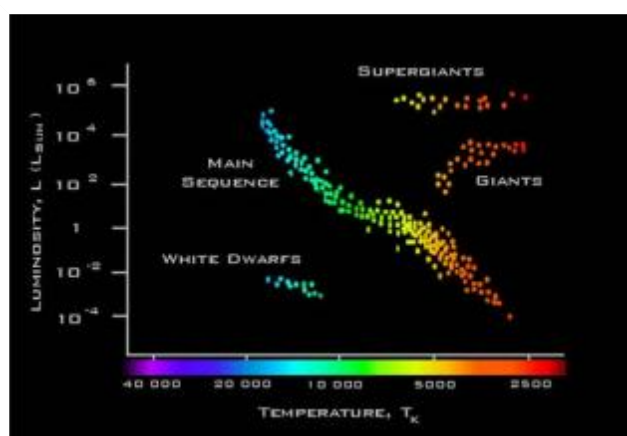
Check our website: www.nottinghamastro.org.uk
for the latest information about the Society's meetings
and for further information about the talks and speakers

Events in the coming months open to everyone
(follow hyperlinks for more information and how to book)

| | |
|-------------------------------|--------------------------------------------------------------------------------------|
| 26-30 th September | Gravity Fields Festival 2018 , Grantham |
| 29 th September | BAA Variable Stars, Photometry and Spectroscopy Workshop , London |
| 29 th September | SPA Special Meeting , Cardiff |
| 6 th October | BAA Back To Basics Workshop , Bexleyheath |
| 12-13 October | International Astronomy Show , Stoneleigh, Warwickshire |
| 27 th October | Society for the History of Astronomy, Autumn Conference , Birmingham |
| 27 th October | SPA Meeting , London |
| 21 st November | Science of Security X-ray Imaging , Nottingham Trent University |
| 8 th December | BAA Christmas Lecture , London |
| 26 th January | SPA Meeting , London |

Social and Practical Astronomy, Plumtree

The **September** meeting at Plumtree looked at the colour of stars. Thanks to Leigh and Julian who gave an interactive talk on why some stars appear different colours. After outlining how the human eye detects colour, we learnt how stars were classified using spectroscopy and how the [Hertzprung-Russell Diagram](#) (right) came into being. Some examples of stars of different spectral class and colour were then given (below).



We were shown the [M13](#) globular cluster in Hercules and saw the mixture of blue and

| Spectral Class | Temperature (K) | Example |
|----------------|-----------------|---------------------|
| O | 28,000 - 60,000 | Alnitak |
| B | 10,000 - 28,000 | Rigel, Spica |
| A | 7500 - 10,000 | Sirius, Deneb |
| F | 6000 - 7500 | Procyon, Canopus |
| G | 5000 - 6000 | Sun, Capella |
| K | 3500 - 5000 | Aldebaran, Arcturus |
| M | < 3500 | Antares, Betelgeuse |

yellow stars; we learnt how the cluster itself is very old (hence the presence of many yellow stars), but also that collisions of these old stars was likely responsible for the much younger blue stars which probably had formed from these collisions; they are referred to as [blue stragglers](#). We also learnt that by slightly defocusing a star in binoculars or a telescope allows the colour of the star to be more obvious. We were shown an image of [Alberio](#), until recently regarded as a double system,

where one star is yellow and the other blue. The subtle differences in the colour of stars can also be evident in star trail photographs. If you want to read more about the colour of stars, Leigh has identified some links on the internet for the [beginner](#) and for the more [advanced](#) amateur.

The **October** meeting will be delivered by Gareth Davies. Gareth is going to tell us about the project he has undertaken to try and image all of the planets in our solar system from his back garden. We'll hear the highs and lows of this venture and practically he has gone about planning and executing this project, and also hear how far he has got with it. My own attempts to image any of the planets other than Mars, Jupiter and Saturn have been disastrous so I will be looking forward to hearing how Gareth has been getting on.

The **November** meeting will be a talk by John Hurst entitled "Going South", and Professor Merrifield is going to come in December to talk about the Science of Christmas.

James Dawson

NAS Helpdesk

helpdesk@nottinghamastro.org.uk

Aiming High! – one of our youngest members

Two of our members, **Rhiannon** and her mum, **Sam Coupe**, went to York University to their Astrocampus to check out the facilities there.

Rhiannon has completed her GCSEs and has achieved 5 grade 9's (A**) in all of her Sciences and Maths subjects, and is well on her way to pursue a career in Astrophysics. So, armed with camera (and many questions), they visited one of the potential universities that Rhiannon is looking at for her Physics and Astrophysics degree beginning in September 2020.

The Astrocampus at York is a hub for astronomy and astrophysics which is based at the southwest part of the university. There is a main dome that houses a 14" reflector. There are two radio telescopes, one of which is 3 metres in diameter and can detect hydrogen gas. There is also a hut with a rolling roof with three optical telescopes, one of which is a solar telescope. There is also an "astrocapsule", where the astrophysicists work and document all their findings.

At the end of the tour, Rhiannon and Sam were very impressed with the facilities and will hope to visit there again soon.

The Astrocampus is open to the public once a fortnight throughout the winter months (October- March). Visitors are treated to tour of the Astrocampus and given an introduction to the night sky. And even if the weather is not great, they will still give you handy hints and tips of finding your way around the night sky.

Visit <http://www.astrocampus.org.uk/visit/> for more information.



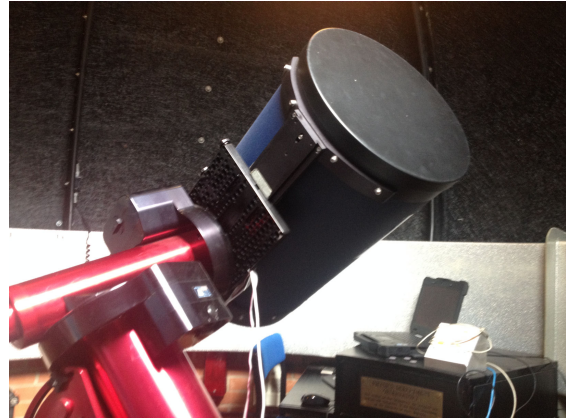
Rhiannon at York



The rolling roof hub



The dome



Telescope inside the dome



Radio telescopes

***Splendid news Rhiannon!
We wish you every success in pursuing your goal.***

The Nottingham Astronomical Society: E - SERVICES

Whether or not you are a NAS member, you can keep up to date with details of the Society's meetings and other events by visiting the NAS website:

www.nottinghamastro.org.uk

NAS on Facebook

You are welcome to connect with other members and friends of the NAS on Facebook by going to: <http://www.facebook.com/nas.org.uk>

NAS on Twitter

The Society has a Twitter account at <https://twitter.com/NottinghamAstro>

NAS Journal e-mailing list

To register for your monthly e-mailed copy of the NAS Journal, just e-mail secretary@nottinghamastro.org.uk

You don't have to be a Society member to take advantage of this service.

If you happen to change your email address, please remember to inform the Society by emailing us at treasurer@nottinghamastro.org.uk

Federation of Astronomical Societies AGM 2018



The [FAS](#) AGM this year was held at the University of York on Saturday 22nd September.

The purpose of the FAS AGM is to combine educational lectures with an annual general meeting. The AGM component of the day was short and the FAS committee set out what they have achieved in the last 12 months, and what their plans are for the next 12 months. Most astronomy clubs and societies in the UK sign up for membership with the FAS as the FAS provide public liability insurance. The current committee of FAS are keen to extend the usefulness of FAS, and look to help member societies in other ways too; for example with tax issues, charity statuses, safeguarding etc. The FAS produce a newsletter two to three times a year; as a member society we get sent copies of these and you will often see Lorraine or Richard have these on the NAS Library table at our meetings.

The first talk of the day was by Professor [Mike Cruise](#) on *The Gravitational Sky* (right).

Professor Cruise is the current President of the Royal Astronomical Society and Professor of Astrophysics and Space Research at the University of Birmingham. The talk was very informative, and opened with a table comparing electromagnetic waves with gravitational waves, comparing a number of properties, including: wave propagation, frequency, wave effects, polarisation, wave carrier, brightness of easily detected sources, and source complexity. It was amazing how similar the two came out. He talked about the sources of gravitational waves, and the tools we have, and are developing to detect them.



[Katherine Blundell](#) is a Professor of Astrophysics at the University of Oxford, and the title of her talk was *Black Holes & Spin Offs*. Katherine covered the basics of black holes [there is nothing basic about black holes in my book], and showed images of jets of matter being ejected from black holes. Katherine described how it would be useful to observe these jets in real time; one issue with this is the need to be able to continually observe a specific part of the sky throughout the complete sidereal day. Katherine has set up a project and built several observatories around the globe so she can in effect have a telescope trained on a certain patch of sky continuously. Katherine has been very hands on building these observatories, and many are linked to schools and in developing nations. She talked about the trials of building in remote sites and overcoming issues such as power cuts and cable-eating rodents. The project allows local children to use the telescopes before local bedtime, and after the children have gone real scientific work can be undertaken, largely by remote access. For her work she has been awarded an OBE. You can learn more about the project at the website www.globaljetwatch.net

[Brad Gibson](#), Professor of Astrophysics from the University of Hull gave us a talk on *How the Universe Will End...* Brad, like Katherine, does a lot of outreach work with youngsters and he talked about some of this. The main thrust of his talk though was describing the

various ways in which “it will all end”. Moving forwards in time, Brad built up a story of the different ways in which life on Earth may be destroyed (starting with war, viruses, another extinction event meteor impact), and then progressed to how the Earth itself may be destroyed. It sounds morbid, but he delivered the talk in a very jovial way and the audience were laughing at several points. Ways in which the Earth may be destroyed included: disruption of the Oort Cloud sending comets and meteors into erratic orbits and colliding with the Earth; a star going super nova; a rouge star Gliese 710 roaming into the Milky Way and causing havoc; the merger of the Milky Way and the Andromeda Galaxy; the stabilising effect of the Moon lessening as the Moon drifts further away from the Earth which will have an adverse effect on the tilt of the Earth; the cooling and solidification of the Earth’s core with resultant loss of magnetic fields etc. It was fascinating.

[Charles Barclay](#), from Marlborough College then gave a talk on the *Astronomy and Astrophysics Olympiad*, an international competition for those under 19. The event has been running for several years, but the UK first joined in 2015 and came second out of 44 nations. Charles described the stringent selection process to screen the very brightest students and the training the select few go through in preparation for the extensive testing they will eventually face. If you want to test yourself some of the past papers are available on their [website](#).

[Professor Ian Robson](#), now a semi-retired professor, formally based at the Royal Observatory Edinburgh talked on *The Changing Scene in Astronomy*. Professor Robson outlined how our detection of starlight has progressed from using the naked eye, increased capture using optical systems, the ability to record observations on photographic emulsions, and then using single pixel photosensors to the modern CCD with millions of pixels. This advancement has not only helped to improved our understanding of the Universe, but also now presents us with vast amounts of data. The age of big data is here and we are already unable to store all the data we capture – some systems are designed to pre-filter the data as it is collected as there is just insufficient means to store it all. This was a fascinating insight into the issues new probes and instruments pose to scientists.

A really interesting day in a very nice venue; I’d not been to the University of York before and I can thoroughly recommend it as a pleasant campus – there was also a lovely Indian Bean Tree in one of the courtyards (right).

James Dawson
NAS Helpdesk
helpdesk@nottinghamastro.org.uk





Members from Nottingham Astronomical Society attended **Nottinghamshire Wildlife Trusts Science Festival** at the Attenborough Nature Reserve on Friday 21st September. Clear skies gave superb viewing through members telescopes of a 90% illuminated moon, Saturn and Mars. The event open to the public, also included a fantastic talk by Leicester Space Centre on the planet Mars. Following the lecture, the audience was thrilled to see the planet through our telescopes. As an added bonus NWT allowed us to trial a Celestron NexYZ 3 axis universal smartphone adapter. This proved hugely popular with visitors allowing them to use their own phone camera to take home a picture of the moon. Images below show the Celestron adapter and an image of the moon.

The event also included **a lunar occultation of the star Gamma Capricorni** – Nashira in the constellation Capricornus. We even managed to record the event live, allowing visitors to watch the occultation as it happened. The recording can be viewed at

<https://twitter.com/rsevern7/status/1043237514365083648?s=12>

The Science Festival is a partnership between the Wildlife Trust and the National Space Centre which NAS have been attending for several years, with the event getting ever popular each year. This year a family told us they came especially to see through our society scopes, so it was fortunate we had clear skies after the afternoon deluge of rain!

If you own a telescope we would really appreciate you joining us at future public observing sessions attended by NAS. We currently struggle to get members to bring their scopes along, meaning long queues form and only allowing limited observing time for visitors. It is hugely rewarding introducing people to the night sky, many of whom have never looked through a telescope before. You don't need to be an expert, so long as you can point a scope at a planet or the moon. If you can help us please speak to either **Richard Severn** or **John Hurst** we would really appreciate your help.



Richard Severn

Moon Named after Legendary Mother of King Minos of Crete and Lover of Zeus

Do you know which moon I refer to ?

It is Europa, the smallest of the four Galilean moons that orbit Jupiter and the sixth closest to the giant mother planet. The other three Galilean moons are Ganymede, Io and Callisto. Europa orbits Jupiter in just over three and a half days, with an orbital radius of about 670,900 km.

Europa is also the sixth largest moon in the Solar System. It is slightly smaller than our own Moon and this tiny object fascinates me endlessly when it is possibly considered it may conceivably harbour extraterrestrial life. Its surface is striated by cracks and streaks, while craters are relatively rare. It has the smoothest surface of any known solid object in the Solar System and the apparent youth and smoothness of the surface have led to the hypothesis that a water ocean exists beneath the surface.

Heat from tidal flexings resulting from Jupiter's huge gravitational pull would cause the ocean to remain liquid, and absorb chemicals from the surface into the ocean below. Sea salt from a subsurface ocean may be coating some geological features. All of this is despite Europa's surface temperature of -160°C .

The Hubble Space telescope has detected water vapour plumes similar to those observed on Saturn's moon Enceladus, which are thought to be caused by erupting cryogeysers (ice cold jet-like projections).

Just because Europa is coated in ice doesn't mean all that ice is the same temperature.

And now scientists have mapped the hot and cold spots on the moon's surface using data gathered from Earth, with accuracy down to 125 miles (200 kilometers). While most of the temperature variations they measured can be explained by sunlight's influence on the ice, there's one unusually cold spot that is stumping the scientists behind the new research.

That spot, which falls on the moon's northern hemisphere, stood out in images taken at different times of the day, which surprised the scientists. They weren't sure what might be causing the local coldness and didn't know of any geologic features there that could be responsible.

So this all suggests the uncertain possibility of life on this apparently insignificant moon. The moon has been examined by a succession of space probe flybys but confirmation of anything will probably require actually landing on the moon but this will be many decades into the future and long beyond my time for certain.

Out of interest, in my youth the famous film Arthur C. Clarke's "2001 A Space Odyssey" appeared. A decade or so later a sequel film arose "2010 The Year We Make Contact" and this film had an important part for the moon Europa where new life appeared there.

Who knows if Arthur C. Clarke will ultimately prove the correct foreteller of our future on Europa!!

Bernie Besnard

Nottingham Astronomical Society

Affiliated to the British Astronomical Association
Member of the Federation of Astronomical Societies
Member of the Society for Popular Astronomy
Supporters of the Commission for Dark Skies

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Meetings

Our formal meetings, often with an illustrated talk by a guest speaker, are held on the first Thursday of each month (except in August) at:

**Gotham Memorial Hall
Gotham
Nottingham NG11 0HE**

Doors open 7.00pm
Meetings start 8.00pm
Meetings end 10.00pm

These meetings are open to the public, and visitors are welcome to attend.

Annual subscriptions 2018

| | |
|----------------------------------------------------|-----|
| Full | £30 |
| Joint rate for partners living at the same address | £45 |
| Under-18s and full-time students | £5 |

Subscriptions become due on 1st January. Half-price subscription is charged if joining after 30th June (minimum subscription £5).

Please make cheques payable to:
Nottingham Astronomical Society.

If you would like more information about the **Nottingham Astronomical Society**, or would like to become a member, please contact the Secretary secretary@nottinghamastro.org.uk or speak to any NAS committee member at one of the regular monthly meetings. A membership application form is inside this issue of the Journal.

The Nottingham Astronomical Society

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