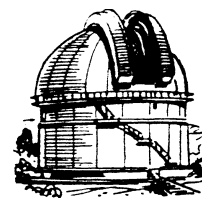

Journal

of the

Nottingham Astronomical Society

October 2019



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Thursday, 3rd October

**Gotham Memorial Hall
Gotham, NG11 0HE**

8 pm (doors open at 7 pm)

Tonight we welcome

Dr Steve Barrett



of the University of Liverpool

who will be speaking on

“The 200 at 70”

**The construction and history of the
Hale 200-inch Telescope**



**A portion of the
Moon's southern
hemisphere
with the
crater Clavius
top-centre**

*Imaged by the
Editor using a
30-cm reflector
with eyepiece
projection*

Sky Notes

October 2019

Compiled by Roy Gretton



All times given below are in British Summer Time unless otherwise stated

British Summer Time ends on October 27th. Clocks should be turned back one hour at 2 am on that date.

PHASES OF THE MOON

Phase	Date
First Quarter	October 5 th
Full Moon	October 13 th
Last Quarter	October 21 st
New Moon	October 28 th

This month the Moon is closest to Earth on the 26th, and furthest on the 10th.

THE PLANETS

Mercury is an evening object throughout October, but so low in the western sky that it must be regarded as essentially unobservable this month.

You might just be able to spot **Venus** (magnitude -3.9) very low in the southwest in a bright sky after sunset in October. (But from these inconspicuous beginnings, the current apparition will build up to *a truly brilliant display next spring*. By the end of March, the planet will be 40 degrees above the western horizon at sunset, and shining at magnitude -4.3 . Definitely worth waiting for).

Mars (magnitude $+1.8$) remains an inconspicuous object in the morning sky, rising less than an hour before the Sun as October commences.

Jupiter is still fairly prominent in the southwest after sunset as October begins, but by the end of the month it will be harder to spot – although the crescent Moon will be close by on Hallowe'en.



Looking
southwest at
7pm on
October 23rd

Saturn (magnitude +0.5) is still observable low in the southwest, setting about four hours after the Sun as October begins. It won't reach conjunction with the Sun until early next year.

Uranus, about 13 degrees north of the celestial equator in the constellation of Aries, reaches opposition to the Sun on October 28th. It will be visible all night, shining at magnitude -5.7 , so theoretically a naked eye object (though few people have claimed to have seen it with unaided sight).

Neptune, shining at magnitude 7.8, is an evening object in the constellation of Aquarius, about 6 degrees south of the celestial equator.

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 20 events per hour) occurs on the night of October 22nd-23rd with a Third Quarter Moon, so conditions should be reasonably favourable before the Moon rises.

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 link to the NAS Journal, and a copy of our SkyNotes, 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*

DIARY DATES 2019

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 3 rd	The 200 at 70 <i>The Hale Telescope</i>	Dr Steve Barrett University of Liverpool
November 7 th	Annual General Meeting with a Wine and Cheese Social	
December 5 th	Voyages to the Sun <i>Probing our nearest star</i>	Prof Lucie Green University College London

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 October 17th (see further details below)

Other forthcoming events for the amateur astronomer:

Sunday 29 th September	Asteroids & Remote Planets Section Meeting , Hampshire
Saturday 12 th October	BAA Observers' Workshop - Solar, Aurora & NLC, and Deep Sky, Scotland
Saturday 26 th October	BAA Back to Basics Workshop , Rickmansworth
Saturday 26 th October	SPA Meeting , London
Saturday 26 th October	Society for the History of Astronomy Autumn Conference , Birmingham
Saturday 26 th October	Ancient Greek Astronomy , Bromley House Library, Nottingham
Sunday 17 th November	BAA Equipment & Techniques Section Meeting , Bedford

Social and Practical Astronomy

The **September** meeting at Plumtree was devoted to comets. We had a very good turnout and everyone said what a great evening it had been.

The evening started off with Julian donning his lab coat and safety goggles and making a comet; the “experiment” was filmed and has been edited by Richard and can be watched here: <https://www.facebook.com/nas.org.uk/videos/767230230413714/>



We then divided into five groups and rotated around five different stations, each devoted to one particular aspect of comets.

Julian talked about the origins, composition and the anatomy of comets.

Gareth talked about the orbits of comets and comet debris.

Leigh talked about surveillance of comets and near earth bodies.

Roy talked about observing and imaging comets.

James talked about comets in art and history.

Thanks to all our speakers and to Richard for keeping us all [mostly] to time and for the video.



Montage of images of the September Plumtree meeting on comets

The **October** meeting at Plumtree will be devoted to transits and occultations. On Monday 11th November 2019, Mercury will transit in front of the Sun and we are using the Plumtree meeting as an opportunity to talk about this and hopefully give people time to prepare to observe the event for themselves.

James Dawson

NAS Helpdesk & Plumtree Meetings

helpdesk@nottinghamastro.org.uk

The eyes have it

... or maybe they don't !

I'd like to share these thoughts with the visual observers among you. Dedicated imagers can skip this article and go on to the next one.

If you are viewing a deep-sky object (outside our solar system), those precious few photons from it will have travelled more than a million million million centimetres before reaching you. Assuming they have navigated your telescope successfully, there remain only the last 2 centimetres between cornea and retina, and that is where most of the trouble lies. Countless kilometres of interstellar dust and even the depredations of Earth's atmosphere are as nothing compared with the cataracts, floaters, blood vessels, constricted irises and the rest of the obstacle race awaiting those photons at the very end of their journey.

Assuming that you don't want to go over to electronic imaging (as many of our co-hobbyists are doing these days), what can you do about it?

First of all, you can ensure that your telescope and accessories are set up to make viewing as comfortable as possible. This is not the place for me to advise you on how to choose a telescope, but you should select one that is easy to operate and enables you to view from a comfortable position and an easy angle. Then choose eyepieces with a wide field of view and generous eye relief. All these things help to make things easier for you at the viewing position.

Having sorted out your scope, what about yourself? It might help if I describe the measures that I myself have taken.

I wear spectacles and have done so for a very long time, thanks to very short sight and big differences between my left and right eyes. In recent years I've also acquired mild astigmatism (differences in the focal length of each eye as measured in the horizontal and vertical planes). These defects are easily measured by opticians and can be corrected with suitable specs. I always wear my specs when at the scope and consequently always choose eyepieces with decent eye relief, preferably up to around 20 mm if possible.

Nowadays I also wear varifocal specs which enable me to read comfortably through the bottom part of each lens of the specs while preserving distance vision through the top part. This is fine for everyday use but not so good for astronomy, as I don't want the "reading" part of the specs to intrude into the viewing of celestial objects. So I acquired a separate pair of specs, coated and made of glass instead of the usual plastic, and incorporating the corrections for astigmatism but not the varifocal capability. These are fine for astronomy though not for everyday use.

Now to the question of which eye to use. I briefly flirted with a binoviewer but couldn't cope with it, as I found it very difficult or impossible to merge the images, maybe because of my eyesight defects and the big differences between my two eyes. So I've decided to concentrate on conventional single-eye viewing. For more than half a century I always viewed with the left eye but then found its performance with celestial objects to be markedly inferior to that obtained with the (supposedly much weaker) right eye. This is probably caused by a cataract which my optician first detected a few years ago but which (he reckons) is not yet serious enough to merit early removal. So I've now broken the habit of a lifetime and am now viewing with the right eye. This has required some retraining, but I think I'm getting there!

As a final measure to make single-eye viewing more comfortable and to avoid screwing up the unused eye, I've made a simple device to place over the specs. This consists of a clip-on flip-up pair of sunglasses with the right part cut off and with a piece of black plastic card stuck over the left part. I can now view comfortably with the right eye without screwing up the left eye. If I move away from the scope, e.g. to look at a star chart, I simply flip up the sunglasses and use both eyes (with specs) as normal.

Having concluded that one's eyes are the worst part of the viewing chain, I'm wondering whether to acquire a Revolution Imager - an adapted video camera that is claimed to produce workable images in almost-real time. Has anyone got any experience of this product?

Thank you for reading thus far. I hope I've stimulated some thought among other astronomers of a certain age and encouraged you to continue viewing even after our ophthalmic equipment has seen better days.

Sam Boote

1969

What is so special about 1969?

Of course, for those that are space nuts, it is the first of what proved to be six moon landings in all, but for others it might well be:

- The last public performance of the Beatles on top of Abbey Road Studios and the famous zebra crossing photograph of the group taken.
- The Boeing 747 makes its first commercial flight.
- The half-penny is withdrawn.
- Chappaquiddick & Mary Jo Kopechne add more colour to Senator Edward Kennedy's life.
- The Harrier enters RAF service.
- Woodstock.
- Richard Milhouse Nixon and Muammar Gaddafi came to power.
- Monty Python's Flying Circus and Sesame Street first air.

For anybody reading this article and were around at the time their particular choice might include more astronomical events such as an eclipse.

For me, a fifteen year-old sprog, 1969 had one event (of many) during the summer school holiday that was to come back to haunt me 22 years later – I met my future wife though neither of us knew it at the time and we 'clicked', as they say, on what turned out to be a rather unusual blind date – don't ask and I'll not tell!

Politically, in 1968, America was having a very rough time with a liberalising President Johnson about to be replaced by Nixon in early 1969 having had to deal with three assassinations – President Kennedy, Dr. Martin Luther King & Robert Kennedy – along with growing popular unrest with his presidency mainly due to the excessive establishment

reaction to civil rights disruptions and the Vietnam war increasingly being seen as an expensive military (mis-) adventure in terms of material, money and life.

A proposed Equal Rights Act abruptly floundered when it was pointed out that the rather broad legislation would expose women to the Draft – a much hated conscription lottery. Just to make the comparison, from late December 1968 through to the end of April 1970 – a period of less than 17 months – we were treated to six fully-stacked Saturn V launches (Ok, there were internal differences on two of them) with the first four taking place in the eight months between late December 1968 and July 1969. No wonder that funding began to be questioned once the original justification and prime objective of getting (and returning) a (hu)man to the moon had been achieved in the minds of the US taxpayers by the time Apollo 13 returned. Whilst on this particular topic, '69 saw four crewed launches, five in one year if you start it with Apollo 8, which I think still counts as some sort of record if not equalling Gemini's.

For NASA 1968 ended with a great high – **Apollo 8**. The original flight schedule lost one flight to achieve Kennedy's timetable with enough flexibility to delay (or repeat) the moon landing should the need arise after the near two-year crewed flight hiatus following Apollo 1's cabin fire. As it happened, the first flight-worthy LEM was not going to be ready for its low earth orbit test flight scheduled for December '68 and there were two crewed LEM-less Saturn V flights to be accomplished before the main event – the first flight of a moon-capable Saturn which also was slated to test the projected 'free-return' transit to the moon and a second flight to do a circum-lunar flight. As all the rocket stages had been tested on previous launches, the risk of equipment failure was minimal but the selected launch window for the now combined flight would put NASA in a very difficult political situation if the SPS rocket motor failed to fire during Christmas Eve for the return journey.

As we all now know the flight was an unmitigated success right down to the combined apt reading of the opening verses from Genesis and the 'Earthrise' picture. For a few months the crew (Borman, Anders & Lovell) became the three people who had travelled the furthest from Earth – a feat Jim Lovell was to repeat when the ill-fated **Apollo 13** swung by the moon 16 months later slightly further out.

Apollo 9 was not a great media event as it was constrained to low earth orbit testing the LEM. **Apollo 10** largely repeated the previous lunar flight with the addition of a non-landing LEM excursion to 15.6 miles above the surface becoming largely relegated to a 'mentioned in despatches' type of event in the media.

However, the next flight, **Apollo 11**, couldn't be much different with every detail pontificated and dissected to death. The landing commenced from a position behind the moon which, in spaceflight terms was 'nominal' except for the guidance computer throwing out two ignored 'wobblies' (the computer overloaded and automatically reset itself due the operational but unrequired ascent radar demanding attention.) NASA had set the schedule for prime-time US TV consumption for that Sunday (20th July 1969) – the UK was some six hours ahead of NASA-time which meant that the UK saw the landing coverage during the late evening and the subsequent moon walk from just before 03:56 the next morning.

Apollo 12 launched in November and suffered a lightning strike during launch causing communication problems which were resolved whilst in the parking orbit before firing the S-IVB to go to the moon. Media-wise the flight was an early victim of what is now referred to as the 'T-Shirt' treatment (been there, done that, bought the T-Shirt) as far as I remember along with coverage of the launch of the next mission, which attracted even less media other than reporting problems with second stage's centre engine during launch – so much so the scheduled broadcast from space about 54 hours into the mission wasn't carried on any US channel. Boy, was that to change a few minutes later! Europe woke up to the news on April 14th of the SM's problems that occurred in our early hours.

For the following three and a half days NASA increasingly dominated the news to the point that most of the world stopped for the re-entry and splash down.

The Apollo flight program finished with **Apollo 17**'s splashdown on December 19th 1972. However, the 5 ALSEP experiment/sensor packages left by 12, 14, 15, 16 & 17 lasted until September 1977 when they were finally turned off. Amongst the varied and varying sensors was a seismometer which were used to record the 5 S-IVBs from Apollo 13 sent onwards to lunar impacts. The spent upper stages from Apollos 8, 9, 10, 11, 12 entered heliocentric orbits as abandoned space junk – not quite, however. Apollo 12's S-IVB came back into high earth orbit during 2002/3, alternating with a heliocentric orbit approximately which looks like being repeated every 40 years and got issued with the asteroid designation of J0023E before anybody realised that it originated from launch complex 39. Looking quickly at the available data, in order to get six craft to the moon Nasa launched some 62 moon-related vehicles over the 15 years from 1957:

Mercury: 27 (6 manned)

Gemini: 17 flights, consisting of 12 crewed and 5 Agena target vehicles.

Apollo: 36 (excluding Skylab & ASTP), 14 of which were crewed plus Apollo 1.

To tidy the above figures up a bit, Mercury and Gemini flights were launched with man-rated variants of existing military hardware except 'Little Joes' which were largely employed in testing the escape rocket system.

Did NASA get to the moon? My personal opinion is an unequivocal 'Yes' simply because there are far too many variables outside the direct control or responsibility of the necessary tight cadre of NASA executives for any serious attempt to fake any part of a flight and keeping it secret for fifty years especially as loyalties do change with time, change of employer (especially when involuntary) and often with death. It must be noted that NASA heavily relied on ex-US assets such as Parkes, Jodrell Bank, Madrid etc – who would have had no qualms about publicly challenging incorrect statements (or simply withdraw from future co-operation) and possibly releasing a self-congratulatory press release that inadvertently gave the game away. Also, there would be many physical requirements to insert the astronauts back into the capsule after splashdown without alerting seasoned operatives' attention to deliberate anomalies or media coverage just waiting for their 'main chance'. Where would you hide such a large spacecraft in earth orbit? Indeed, during the sixties one school in Kettering was repeatedly reporting Soviet activity long before official (frequently post-flight) announcements and discovered the location of two Russian launch sites (Baikonur and Plesetsk). The school went on to independently detect the lunar orbit path of Apollo 17. NASA might have got away with it once, but not for a total of nine times – that really would be pushing their luck in my view.

For those who are wondering why there were no women selected for Astronaut training until after Apollo the answer is simple: NASA insisted on early applicants having significant jet flight testing experience before joining with some justification – the assigned roles did have either 'Commander' or 'Pilot' in their titles and the environment was rather experimental. Some male scientists were recruited and given pilot training towards the end of Apollo, which put them a year behind those that were pilots and recruited in the same draft. They mainly flew on Skylab and Shuttle missions.

Nearly every treatment of the 'space race' starts with President Kennedy's famous 'by the end of the decade' speech to Rice University in September 1962. In fact, the new president Kennedy first committed the US to the project in a speech to Congress the year before in May 1961, to drum up support for the moon project shortly after Gagarin orbited the earth – the fact was that the US were ready to send Sheppard up in April 1960 but unforeseen problems delayed it till after Gagarin flew just before Kennedy's Congress speech.

Neil Mudford

Advertisements

Meade 8-inch LX90 for sale

The Editor is aware of a **Meade 8-inch LX90 Schmidt-Cassegrain telescope with Autostar** controller for sale. See pictures below.

The owner has a price of around £500 in mind, but is open to any reasonable offer.



If you are interested, in the first instance please contact the Editor at

roygretton@hotmail.co.uk

FOR SALE

Kendrick 8-inch solar filter with custom-made box
£50

Celestron SCT-to-camera T-adapter – item number # 93633
£15

Counterweight 5.2 kg
£10

Observing stool (adjustable height)
£10

Please contact **Sam Boote**
sam@boote.myzen.co.uk or at Society meetings

Telescope offered free to a good home

NAS member Marcus Stone has a 6-inch Newtonian reflector (F8) on a Dobsonian mount which he is offering free of charge to anyone interested. The telescope is in need of some attention, but would be a good start-up instrument.



Marcus can be contacted on **07531989820**

Nottingham Astronomical Society

Affiliated to the **British Astronomical Association**
Member of the **Federation of Astronomical Societies**
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 2019

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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