

# Federation of Astronomical Societies



Editor: Michael Bryce

## Newsletter

[www.fedastro.org.uk](http://www.fedastro.org.uk)

No 117—December 2019

*Note: The FAS Council Reserves the Right to publish articles, events and reports submitted to the Newsletter by FAS Member Societies*

### From Your FAS President: Dr Paul A Daniels FRAS



Well, it's been a very busy few months!

On 14<sup>th</sup> September we hosted our very successful FAS 2019 Convention & AGM at the Institute of Astronomy in Cambridge with about 80 people attending. We had five good speakers covering a wide range of topics: the effects of solar storms on our infrastructure, new insights into Venus and exoplanets, teaching astronomy to schoolchildren, the origins of our universe and an update on the latest Gaia data release and what it tells us about stellar evolution. As well as trade display stands by Spacerocks, Widescreen Centre and

W&W Astro (and many thanks to them all for their donations of raffle prizes) we had society display stands including the British Astronomical Association, Society for Popular Astronomy and the Society for the History of Astronomy and several local societies.

Speaking of local societies, very many thanks must go to helpers from the Cambridge Astronomical Association for providing telescope tours, serving the free refreshments and help tidying up at the end. Thanks also to helpers for the lunch-time tours of the Cavendish Museum.

The day was also an opportunity, at the brief AGM, to elect the FAS Council for the year ahead. The Council positions for 2019-2020 were filled as follows:

	Position	Person	Email
Executive Officers	President	Dr Paul A Daniels	<a href="mailto:president@fedastro.org.uk">president@fedastro.org.uk</a>
	Vice President	Graham Bryant	<a href="mailto:vicepresident@fedastro.org.uk">vicepresident@fedastro.org.uk</a>
	Secretary	Richard Field	<a href="mailto:secretary@fedastro.org.uk">secretary@fedastro.org.uk</a>
	Treasurer	Pat McEvoy	<a href="mailto:treasurer@fedastro.org.uk">treasurer@fedastro.org.uk</a>
	Membership Secretary	William Bottaci	<a href="mailto:membership@fedastro.org.uk">membership@fedastro.org.uk</a>
	Public Liability Insurance (PLI) Secretary	VACANT	<a href="mailto:plinsurance@fedastro.org.uk">plinsurance@fedastro.org.uk</a>
Non-Executive Officers	Publicity & Meetings Organiser	Adrian Roach	<a href="mailto:publicity@fedastro.org.uk">publicity@fedastro.org.uk</a>
	Newsletter Editor	Michael Bryce	<a href="mailto:newsletter@fedastro.org.uk">newsletter@fedastro.org.uk</a>
	Publications Secretary	Neil Mudford	<a href="mailto:publications@fedastro.org.uk">publications@fedastro.org.uk</a>
	Webmaster	Martin Baker	<a href="mailto:website@fedastro.org.uk">website@fedastro.org.uk</a>
	Deputy Webmaster	James Hannan	
Other	Council Member	Shaun O'Dell	
	Council Member	Paul Hackett	
Ex Officio	Midlands Regional Rep	Dave Evetts	
	Yorkshire Regional Rep	Paul Harper	
	Southern Regional Rep	Tony Questa	

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Those in bold green are new arrivals on the Council. I'd like to welcome them to the Council and look forward to working with them and I'd also like to express very many thanks to outgoing Council members Peter Cooke, Phil John, Owen Brazell and Roger Steer for their service to the FAS over past years. Thanks also to last year's Council members who've agreed to continue for this year.

The one major post that we unfortunately didn't fill was that of PLI Secretary. Previous PLI Secretary Tony Questa has had to step down from the position due to pressure of work – many thanks to you Tony for all your diligent efforts!

Can I please make an appeal to our members for someone to join the Council as PLI Secretary as soon as possible but, preferably, no later than early in the New Year. Ideally, it would be best suited to someone with experience of the insurance business or negotiating group insurance policies.

Tony informs me that, in addition to taking part in Council meetings (about ten per annum: 50% face-to-face and 50% Skype alternately), it typically involves about a half-day each week for about six weeks during the busy PLI renewals period in February/March and then infrequent sporadic involvement at other times of the year (for example, dealing with enquiries or for new societies who may join late). Tony has kindly offered to continue to handle PLI in the interim and to provide a handover to the new PLI Secretary.

If you feel that you'd like to join Council as PLI Secretary then please contact me at [president@fedastro.org.uk](mailto:president@fedastro.org.uk).

On a different note, some sad news: I'm sure many of you will already have heard of the death of Prof John Brown, Astronomer Royal for Scotland, who passed away in the early hours of Saturday, 16<sup>th</sup> November from a heart attack. He was on holiday at the family holiday cottage on the Isle of Skye.

John was *very* approachable and had spoken to many of the UK's astronomical societies. He was also a member of the Magic Circle and I fondly recall my wife and I meeting him for dinner in a hotel in London and spending time in the bar beforehand being amazed at his card tricks – he even offered to cut my wife in half at the next lecture he gave the FAS! He'll be missed and, on behalf of FAS members, I've sent condolences to his family.

Finally, happier news: on 29<sup>th</sup> October I attended a planning meeting for the National Astronomy Week 2020 to be held the week of 14<sup>th</sup>-22<sup>nd</sup> November 2020. That week was chosen after some careful research by Robin Scagell: it comes a couple of weeks after Mars' opposition (about mag -1.4 and 17 arcsec diameter), allows some observation of the Moon towards the end of the week (New on 15<sup>th</sup>) and, if you're quick, Jupiter and Saturn will be visible low in the SW. We've also chosen the planet Mars to be a theme for NAW2020.

I hope you'll all be planning something extravagant for the week – think Stargazing Live on steroids!

Clear skies!

**Dr Paul A Daniels FRAS**  
FAS President

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## From Your New FAS Newsletter Editor: Michael Bryce

At the FAS AGM in Cambridge on Saturday 14 September I volunteered for the role of FAS Newsletter Editor after the previous Editor, Owen Brazell decided to step down from the role. As this is my first "Newsletter" I thought you, the readership, would like to get to know me.

I have been interested in Astronomy from a very early age and I was influenced and encouraged by my mother to engage in the hobby. Although I don't quite remember this my I was allowed to stay up to watch the Apollo 11 Moon landing. At school I remember being able to watch the later Moon landings in the school hall at break times on the schools large 26" colour TV!

Whilst still at Secondary School I joined Wolverhampton Astronomical Society to further my interest and get to know other like-minded people. During those early years I met long standing member Barbara Russell who was teaching Astronomy "O" level as private tuition at home. I took the opportunity to join her astronomy class and in 1976 I achieved my "O" level astronomy, a full one year before I took my own CSE exams at school. I enjoy announcing that the only "O" level I have is in Astronomy!

I remained with WAS for some 35 years and took part in the running of the Society taking positions on the Council of Secretary, President and Editor and gave occasional talks to the group.

In 1993 I travelled to the USA to visit Florida and the Kennedy Space Center as an amateur reporter for the Wolverhampton AS's Newsletter "Lyra" to cover the first Hubble Space Telescope Servicing Mission for the group.

I was quite surprised when the Application to NASA HQ in Washington DC came back as "Accepted". I travelled there with my friend the late Andy Salmon from Birmingham AS who was reporting for Astro Info Services.

In 2001 I organised a day long astronomy conference at Wolverhampton Science Park with four professional Astronomers giving talks along the theme of "Ground Based Astronomy", to celebrate the Society's 50th Anniversary.

I am currently a member of Carolian Astronomy Society in Kidderminster where I have held position of Vice Chairman and Chairman

and I now run the Society's web site. I am also a member of Bromsgrove AS.

Since 1993 I have been editor for Midlands Spaceflight Society covering the space exploration side of my astronomical interest.

For my professional career I left school in 1977 and I joined South Staffordshire Waterworks Company as an Office assistant in the accounts department. Then in 1983 I changed direction and took a draftsmanship job with the same company after studying the skill in my own time. In 1990 after achieving a HNC in Civil Engineering which was done through Day Release from SSWW, I joined British Rail Civil Engineering department. I had the opportunity to experience different roles in the department but eventually, and after various reorganisations I settled into a Maintenance Planning role. With this role I worked in Birmingham, Gloucester and Worcester before moving to Network Rail Stourbridge Maintenance Depot in 2009. After 28 years in the Rail Industry in late 2018 I took early retirement to take the opportunity to follow my own interests mainly of astronomy and space exploration and photography.

I have lived in Stourbridge, West Midlands for most of my life. In 1995 I married Lynda Williams of Stourport-On-Severn, Worcestershire and we lived in Kidderminster. Unfortunately Lynda sadly passed away in 2011 due to MS. Then I met Pauline and we got married in 2015. We moved to Stourbridge to live in my previous family home.



**Michael Bryce**  
FAS Newsletter Editor  
Stourbridge, West Midlands  
Carolian Astronomy Society (Kidderminster) and  
Bromsgrove Astronomical Society

## FAS – Declares “No life on MARS”

We want to acknowledge that we’ve listened to your comments regarding our MARS Membership system. For the next renewal period, we will be switching over to a new and simpler system for renewing your membership called **MemberMojo**.

**MemberMojo** uses an email login system so you will no longer need to remember any passwords. You simply go onto the MemberMojo FAS website (link will be on the FAS website and emailed to you) and then a secure link will be sent to the email address we have on record. Simply click on that link and you can then update your details. If any of your details change throughout the year it will also be easy to log in and change them. The usual payment methods will be available but with the addition of PayPal. With an updated system it will also allow us to update member society details on our website too.

The image below shows what the page will look like, allowing for a quicker and more efficient renewal process

When you first log in you will see that some of your details have been transferred across from the old database: please check these carefully. Also, for us to be able to get the database transfer to be accepted you’ll see that your society name has been copied into the primary contact name field. Please change this so we know who to refer to when we contact your society. If you do not have a listed email address for your society, please contact us ASAP at [council@fedastro.org.uk](mailto:council@fedastro.org.uk).

James Hannan  
FAS Council Member

## Future Events

### British Science Week 2020

British Science Week takes place between 6<sup>th</sup> to 15<sup>th</sup> March 2020 - a ten-day celebration of STEM (Science, Technology, Engineering and Mathematics). Grants are available for Societies and Organisations organising events during this British Science Week. See [www.britishscienceweek.org](http://www.britishscienceweek.org) for updates.

### FAS AGM and Convention 2020

Your FAS Council is working towards next years' Convention which is planned be held at the Institute of Astronomy in Cambridge on Saturday 19<sup>th</sup> September. Confirmation and more details will be announced on the FAS Web Site at [www.fedastro.org.uk](http://www.fedastro.org.uk) and in the next Newsletter in March.

### National Astronomy Week 2020

National Astronomy Week is back in 2020 and the date is 14<sup>th</sup> November to 22<sup>nd</sup> November, to take in both weekends, and the Theme is “The Planet Mars”. Mars is at opposition on 13<sup>th</sup> November 2020 and the Moon is New on 15<sup>th</sup>, allowing lunar observations during the week. For more information see the NAW 2020 web site at [www.astronomyweek.org.uk](http://www.astronomyweek.org.uk).

## Newsletter

The FAS Council have agreed that going forward the FAS Newsletter will be published four times per year in December, March, June and September. Copy deadlines are to be the 15<sup>th</sup> of the previous month and sent to [newsletter@fedastro.co.uk](mailto:newsletter@fedastro.co.uk).

Previous issues of the Newsletter can be found on the FAS web site at:

<http://fedastro.org.uk/fas/publications/newsletter-back-issues/>

Michael Bryce  
FAS Newsletter Editor

## British Astronomical Association Meeting "Back to Basics" Workshop Hosted by The Hull and East Riding Astronomical Society

Saturday 7th March 2020

at the Civic Hall, 1 Market Green, Cottingham HU16 5QG, nr Hull.

Doors open 9.00 am until 5.30 pm

The cost of the meeting will be £5.00 for BAA members and under 16's

Non BAA members £6.00. Price includes refreshments.

[www.heras.org.uk](http://www.heras.org.uk)

## Society Focus

## The HOYS-CAPS Citizen Science Project

Dirk Froebrich (University of Kent)

### The place to Showcase your Astronomical Society

Any Society wishing to promote their group here should email details to [newsletter@fedastro.org.uk](mailto:newsletter@fedastro.org.uk)

#### South East Kent Astronomical Society

SEKAS was founded in 1972 by Paul Andrew, our president. There are currently something over 100 members. We meet every month at Alkham Village Hall on the 2<sup>nd</sup> Saturday, and at our observing site south of Canterbury. Members come from all across East Kent.

We hold a variety of meetings with external FAS speakers or speakers from within the group. Recent talks have been on themes like “The Dish”, “my Apollo 11 memories,” “Voyager II at Neptune” and “Astronomy in Tenerife.” Meetings are open to anyone, and always include what’s up next month and an observing challenge. This month’s challenge is to observe an Algol minima.

We have an observatory at a reasonably dark sky site which includes a C11 and a 16” Dob. Members have free access to this site and the equipment, including smaller instruments for loan.

SEKAS members include skilled observers, sketchers and imagers, and new people just getting started. Several members have home built observatories.

SEKAS supports public outreach with regular attendance and assistance at the Simon Langton (Boys) Star School evenings, the UKC summer Space School, and as many Cubs, Guides, schools & public events as we can manage. Using Facebook we conduct ad hoc sidewalk astronomy events where we set up a telescope on the street and encourage passers by to see the Moon, or Saturn, or whatever makes you go Wow! Just this week we showed an entire primary school the Transit of Mercury under (thankfully) pretty clear skies.

Details about SEKAS including contact info can be found at [SEKAS.co.uk](http://SEKAS.co.uk). Members get access to our Facebook site where additional private events are created.

Ben Harding (SEKAS)  
[www.sekas.co.uk](http://www.sekas.co.uk)

The Hunting for Outbursting Young Stars with the Centre for Astrophysics and Planetary Science Citizen Science project aims to bring together amateur astronomers from around the world to monitor the brightness of around 20 young and nearby clusters and star-forming regions in the northern sky using various optical filters (U, B, V, R, Ha, I). The ultimate goal is to have a sufficient number of participants so that we can obtain an image of every region in every filter about once or twice per day.

Most of our targets are well-known, photogenic objects (e.g. Orion, Rosette, Cocoon, Pelican, Elephant Trunk, and Cone Nebula) that amateurs already observe and photograph. We are collecting and analysing new as well as historic images of all of these regions; all of our data is publicly accessible from the HOYS-CAPS server.

We are actively recruiting new participants since 2018. So far, almost 70 observers from more than 10 different countries are delivering data. There are now more than 12,700 images with ~100 million accurate brightness measurements. All the data together corresponds to ~775 hours integration time on a 1-meter-diameter telescope.

The project does not require a large amount of time; either (filtered) CCD or DSLR images are acceptable. Our internal self-calibration in the photometry database automatically corrects possible colour terms in the data.

The scientific goals of the project are plentiful: First, by identifying and characterising the material that’s accreting onto and occulting the young star, we can study the properties and structure of disk material, at a resolution more than 100 times better than what can be achieved with direct observations. The light curves may even reveal periodic signals hinting at the presence of accreting proto-planets crossing in front of their host star. Observations also provide the stars’ rotation periods. The multi-wavelength nature of our data further allows us to characterise the temperature and sizes of hot and cold spots on the surface of the stars. The long term observations further enable to study how the spot properties change over time and how they move on the surface of the objects. Finally, observations will help identify and characterize the brightness, duration and frequency of these young stars’ outbursts.

#### Further resources:

HOYS-CAPS website: <http://astro.kent.ac.uk/~df/hoyscaps/index.html>

HOYS-CAPS Facebook group: [https://www.facebook.com/groups/342831266192555/#\\_](https://www.facebook.com/groups/342831266192555/#_)

### Carolian Astronomy Society (Kidderminster) Annual Martin Humphries Memorial Lecture:

Every year the Carolian Astronomy Society in Kidderminster holds a Public Lecture Meeting in Memory the Founder Member of the Society The Late Martin Humphries. This year The Society welcomes Robin Davies, Head of Systems and Control, at Reaction Engines, the Company behind the innovative SABRE Engine. The talk is entitled:

#### “Reaction Engines: Unlocking the Future of Space Access and Hypersonic Flight”

What if you could climb into a winged aircraft, take off horizontally and fly into space.

Science fiction? No, today Reaction Engines Ltd are building the first prototype of a revolutionary air breathing rocket engine that will allow just that.

A single stage to orbit in a fully reusable spaceplane. The hypersonic SABRE engine is also applicable to high speed air transport, cutting the time to travel between London and Australia to around four hours.

This talk will look at the engineering behind the project and show where we are going to make this engine a reality.

Venue: King Charles 1 Lower School, Borrington Road, Kidderminster DY10 3ED. 7:30 pm, Wednesday 11<sup>th</sup> March 2020.

Everyone Welcome, entrance is free but please reserve a place at <https://carolian.eventbrite.co.uk/>

[www.carolianastro.co.uk](http://www.carolianastro.co.uk)

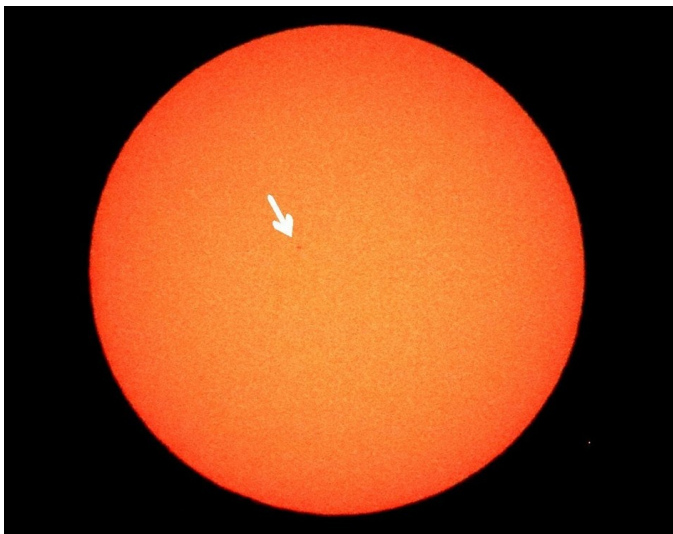


# Transit of Mercury

**Many Astronomical Societies took the opportunity to view the planet Mercury crossing the face of the Sun on Monday 11th November 2019. A few observations are published here but we will have to defer a number of reports to the next issue.**

## DASH Astro, Suffolk

At the start of the transit, we were covered in thick cloud and rain, with the forecast saying it was set to clear late afternoon. The Cloud Gods were kind to us in our part of the UK. the rain stopped around 1:30ish and a gap appeared and a quick sighting with a white light filter on the 90mm Refractor. Bingo.... there was this tiny speck. Our society had planned a public outreach from 12:00 till sunset at the local National Trust site at Dunwich Heath, on the Suffolk Coast, so a few of us travelled and set up. The clouds had cleared even more and apart from two members of staff, we were alone on a bitterly cold ( 4 Deg C ) exposed area. We lasted around 1/2 hour before the cloud started to build again. so packed up and headed home. I took a number of photos, but the 1000 Oaks filter film is not conducive to good contrast. so mercury appears as a smudge just off centre. May be November 2032 will be clear. I'll only be 85... god willing.



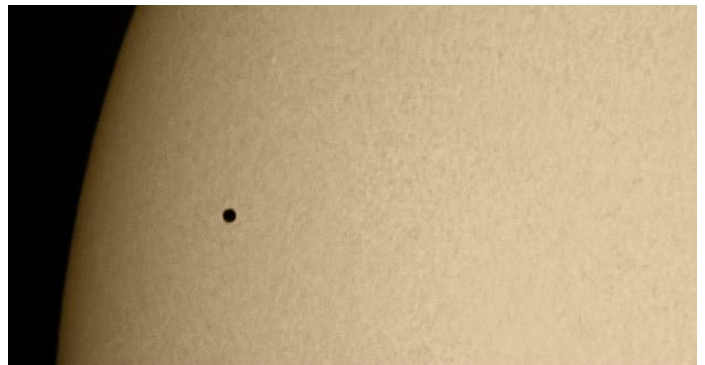
Jim Slight  
DASH Secretary

## Usk Astronomical Society

I setup a Skywatcher ED80 refractor with a 1.25" Herschel wedge and with a Lunt 35THa piggybacked, in Abergavenny before 12:30 hoping to capture the 1st and second contacts. Everything was set to go, the weather was sunny and clear and then 5 minutes before it was due to start clouds suddenly appeared and it started to rain! It continued for around 10 minutes, by which time of course the transit was well underway. We were compensated by a largely clear sunny afternoon and had some very good views of Mercury. I had a steady stream of visitors through the afternoon from Usk AS and Abergavenny AS.

The image reproduced here was taken with a monochrome Philips ToUcam with an Astronomic ProPlanet 742 pass filter to stabilise

some quite wobbly seeing (composite image). Images were captured for around 10 seconds and processed in Registax 6.



Nick Busby  
Chairman Usk Astronomical Society

## West Yorkshire Astronomical Society

The Society had an Outreach day at The Discovery Centre, Anglers Country Park, Winterset, Wakefield. A local nature reserve which attracts up to 300,000 visitors per year. Aurora Planetarium was set up in the Discovery Centre which was doing free shows for members of the public throughout the Transit.

The weather was not fully on our side and by the time the Transit had started the clouds had begun to roll in and we had about 40 minutes of mixed cloud and occasional clear spots to photograph the event.



Colin Daley  
Chair, West Yorkshire Astronomical Society

Continued on back page...

# *What is so special about 1969?*

*By Neil Mudford*

**Of course, for those that are space nuts, it is the first of what proved to be 6 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 is 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 on British Television.

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 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 (20<sup>th</sup> 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 14<sup>th</sup> 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 19<sup>th</sup> 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 Agenda 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.

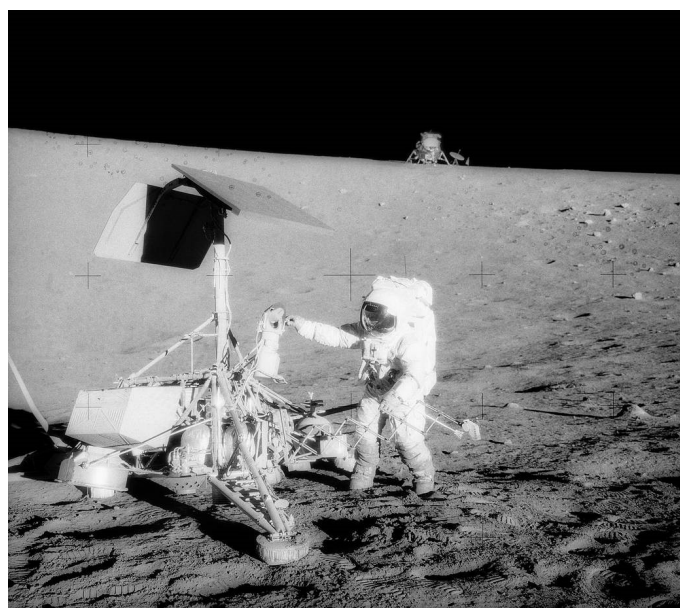
Did NASA get to the moon? My personal opinion is an unequivocal 'Yes' simply because there are far too many variables outside the direct control or responsibility of the necessary tight cadre of NASA executives for any serious attempt to fake any part of a flight and keeping it secret for fifty years 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**  
**FAS Publications Officer**  
**Nottingham Astronomical Society**  
**Mansfield and Sutton Astronomical Society**



*On April 17<sup>th</sup>, 1967, NASA's Surveyor 3 spacecraft launched from Cape Canaveral Air Force Station, Florida, on a mission to the lunar surface. A little more than two years after it landed on the moon with the goal of paving the way for a future human mission, the Surveyor 3 spacecraft got a visit from Apollo 12 Commander Charles Conrad Jr. and astronaut Alan L. Bean, who snapped this photo on November 20<sup>th</sup>, 1969.*

*After Surveyor 1's initial studies of the lunar surface in 1966, Surveyor 3 made further inroads into preparations for human missions to the moon. Using a surface sampler to study the lunar soil, Surveyor 3 conducted experiments to see how the lunar surface would fare against the weight of an Apollo lunar module. The moon lander, which was the second of the Surveyor series to make a soft landing on the moon, also gathered information on the lunar soil's radar reflectivity and thermal properties in addition to transmitting more than 6,000 photographs of its surroundings.*

*The Apollo 12 Lunar Module, visible in the background at right, landed about 600 feet from Surveyor 3 in the Ocean of Storms. The television camera and several other pieces were taken from Surveyor 3 and brought back to Earth for scientific examination. Here, Conrad examines the Surveyor's TV camera prior to detaching it. Astronaut Richard F. Gordon Jr. remained with the Apollo 12 Command and Service Modules (CSM) in lunar orbit while Conrad and Bean descended in the LM to explore the moon.*

**Image and text courtesy NASA**

(... Continued from page 5)

#### Adur AS

Robin Durant, the Chair of Adur AS imaged the Transit and image below was published in the Brighton Argus.



Robin Durant  
Chair Adur AS

#### Walsall Astronomical Society

Here in Walsall we managed two outreach events, at a local hospital patients and staff were able to watch the event through a telescope belonging to one of the doctors (the WAS chairman) and many of the other members climbed to the top of Barr Beacon, a local beauty spot and set up half a dozen instruments.

The weather forecast was not good, showers and sunny intervals, on the day it was freezing cold and windy, but fortunately the rain held off till three o'clock. First contact was forecast at 12:35 and as the sky was clear this was spotted first in a Hydrogen Alpha telescope almost a minute before the planet invaded the photosphere. This was the signal for the first of the big clouds to cover the Sun.



Over the next two and a half hours clouds and blue sky raced past giving at least a dozen five minute gaps, lots of images were taken on several cameras before a huge rainbow appeared in the east warning of incoming rain, the first few spots followed causing a rush to get the 'scopes packed away before a downpour.

Alan Ledbury  
Chairman Walsall Astronomical Society

### Astronomy series at Gresham College (free lectures)

Wednesday 29 Jan 2020, 1pm, Museum of London.  
"Shapes of Free Fall"

The shapes of the orbits of many stars, planets and comets are not only circles and ellipses, but also other shapes known as conic sections. This talk will explore how simple changes can make dramatic differences to the shapes of orbits.

<https://www.gresham.ac.uk/lectures-and-events/end-of-matter>

Monday 3 Feb 2020, 1pm, Museum of London  
"What has Einstein ever done for you?"

Albert Einstein's mind-boggling ideas revolutionised our view of the universe. From relativity to curved spacetime, from the Big Bang to black holes and gravitational waves, nothing could be further from our everyday experience than such esoteric concepts, right? Wrong! This lecture will offer a surprising exploration of the wide-ranging consequences of Einstein's ideas, and how they shape our everyday life.

<https://www.gresham.ac.uk/lectures-and-events/einstein>

Wednesday 4 Mar 2020, 1pm, Museum of London  
"Simple Laws, Spectacular Astrophysics"

The laws of physics may be stated in simple and elegant ways that can be made easy to demonstrate and understand on their own. This talk will examine how the combination of simple laws can lead to rich complexity and spectacular phenomena.

<https://www.gresham.ac.uk/lectures-and-events/simple-laws>

#### Editors Note:

Thank you to all Societies that sent me reports from the Transit of Mercury event. Sorry but due to available space I have had to leave these out until the next issue.

Michael Bryce

### Redditch Astronomical Society Presents:

#### "Explore the Cosmos" at the Artrix Theatre, Bromsgrove, Worcestershire

A series of Space and Astronomy Events between 2 March and 6 April, 2020

Space themed Art Exhibition 2 March—6 April

Astrophysical Poetry Slam 13 March

#### Lets Talk Space. A Day of Lectures from local and National Astrophysicists

with Special Guest Dr Chris Lintott (Sky at Night Presenter) 28 March

Tickets £15.00 Each from [www.artrix.co.uk](http://www.artrix.co.uk)

[www.redditchastro.org.uk](http://www.redditchastro.org.uk)