Federation of Astronomical Societies

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

Obituary for Graham G. Bryant, FRAS, 1957 — 2022

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continued overleaf...

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Obituary

Amateur astronomer, FAS Vice-President, Hampshire Astronomical Group (HAG) President, a highly-respected, genuine good egg and retired nurse, Graham George Bryant will be fondly remembered by all who knew him. Graham died peacefully surrounded by his family on 21st June 2022, the Summer Solstice, following many years of battling with cancer.

Graham was born on 11th June 1957 in Hartlepool, County Durham and, following several house-moves by his parents, he eventually ended up in Clacton-on-Sea where he spent most of his childhood.

Aged eleven and following the death of his father, the family moved to Portsmouth where his mother's family had originated and it was during this time that Graham developed his enduring passion for astronomy. As an early sign of the seemingly limitless enthusiasm and energy that would characterise whatever he did, he joined the school astronomy club at the Portsmouth Technical High School. The top of the four-floor building block had an observatory that had been made by the school in their workshops.

Despite being what would now be thought a health and safety nightmare, people at that time didn't seem to worry too much and they spent their lunch times building telescopes and observing the sun from that observatory using the telescope each had made. In the evenings, they would use some of the telescopes and observe from the school campus.

Prompted by his headmaster, Graham met Patrick Moore when he was eleven years old and he took up Patrick's suggestion that he join a local Astronomical Society. Patrick had suggested he join the Portsmouth Astronomical Group but there were two astronomical societies in Portsmouth at that time and he ended up joining the Portsmouth Astronomical Society where he met many people who, after some 55 years and up until the time of his death, remained good friends.

During this time he settled down and brought up a young family and his astronomy interest had to take second place but, as they grew, he was able to rekindle his passion for astronomy.

In January 1989 Graham joined the Hampshire Astronomical Group (HAG, descended from the Portsmouth Astronomical Group) and quickly became involved in the running of the group. He was elected to their committee in September that year and then to Vice-Chairman at their September 1990 AGM which position he held for thirteen years until 2003. He followed this as their Chairman for fifteen years between 2003 and 2018. In 2009, in recognition of his dedicated work for the group, he was very pleased to be elected as a Life Member of HAG.

Graham always had a passion for astronomy; he wanted to spread the word about it to The Great British Public and so took part in as many open evenings and outreach events as he could. He became a very accomplished speaker and gave inspiring talks to an appreciative general public, to rapt schoolchildren and other astronomical societies.

Graham ran the adult education evening classes in astronomy held at HAG's Clanfield Observatory for many years. He was approached by the South Downs Planetarium inquiring whether he would like to help on their management team and to generally support the trustees. He'd known some of the Trustees for many years and accepted their offer and, after finally retiring from work in 2012, spent much of his time between the observatory and the South Downs Planetarium where he eventually became a trustee and regular speaker and also at the Science Centre in Chichester. He made many appearances in astronomical reports on both local and national TV and radio.

Graham became one of the founding members of the Southern Area Group of Astronomical Societies (SAGAS) in the early 1970s, was their Chairman for several years and their Secretary in the years leading up to his death. Graham was a full member of the British Astronomical Association (BAA) where he held several administration posts over the years and also became a Fellow of the Royal Astronomical Society (FRAS).

During the 1980s it was becoming clear that the sky was being degraded by the gradual encroachment of street lighting. Graham, along with several likeminded astronomers, formed the Campaign for Dark Skies with the intention of working with and not fighting against the lighting industry. It later pleased him that several lighting companies stated that the campaign had the greatest effect on lighting policy in the UK at that time. That campaign, now called the International Commission for Dark Skies, continues and remains committed to improving the quality of the night sky. Graham became the South of England representative, voicing the concerns of astronomers and astronomical organisations about light pollution to local, national and international governments. Several years ago, he was the UK's representative at the CfDS international symposium, where he addressed delegates from across the globe.

Part of the outreach work that he and others did at HAG was to work with the University of Portsmouth helping their Mathematics BSc students get through a required project and to provide support for those who chose astronomy. These projects originally date back to 1990 and became much more frequent into the early 2000s. In July 2017 Graham was delighted to be conferred an Honorary Fellowship of the University of Portsmouth, given in recognition of his many years of involvement in the collaboration between HAG and the university as well as his tireless contributions to amateur astronomy. With the introduction of a new Mathematics and Astronomy degree, Graham provided the required observatory experience that formed part of the course. He guided student visitors from the maths, physics, geology, geography and even biology disciplines around the observatory and gave them inspiring talks on the practical aspects of astronomy and, under Graham's leadership, the partnership between HAG and the university has become even stronger.

Graham always wanted to link with many astronomical societies because he felt that a lot of societies were struggling with the same issues in regard to running their society. Over the years he had often attended the FAS conventions each year remembering fondly those held at Herstmonceux and more recent conventions. During their AGM, it was clear that the organisation had a problem with some advice for societies in respect to child protection. As he had been closely involved with this matter in his day job

he volunteered to write a child protection policy for the FAS. Child protection can be quite an emotive subject and getting the policy through the council was not easy however it was eventually accepted and is available to all societies today. In addition to this policy, he wrote a number of other policy documents which societies can use instead of having to write them themselves.

Following that work, he became more involved with the FAS and was eventually elected to the FAS Council as its Vice-President where he served for nearly five years up to his death. He's been a most valuable and experienced member of the FAS Council, rarely missing a Council meeting, and committed to promoting the aims of the FAS. His thoughtful expert contributions to our team will be very much missed.

Graham worked for 37 years in the NHS until his retirement in 2012. He'd risen to the position of NHS Regional Manager in the Department of Psychiatric Nursing and Substance Misuse but his last job roles were to manage a number of community hospitals. Some of the stories he told about that time were shocking but, with his usual cheeky smile, he especially delighted in recounting those with a risqué element or one-upmanship over a difficult colleague.

In his spare time he gave talks to various societies – both astronomical and non-astronomical organisations. He was also asked to be an Aurora tour guide in both Iceland and around Norway. He thoroughly enjoyed these as an opportunity to talk about Astronomy and meet people from all over the world.

With permission from HAG to quote part of the very poignant article Graham wrote for their newsletter as his last President's report: "As time passes, I guess we all begin to evaluate how we might have influenced others, whose candle did we light? What ripples did we make in our little corner of the universe… I do find myself spending time thinking about what I shall have left behind, how many candles did I light?".

All who had the good fortune to meet him can only concur with the words of HAG's Richard Judd – "Graham! You lit more candles than you could ever have imagined old friend; many, many more!!! You will be missed beyond measure - R.I.P"

On behalf of the FAS, the wider astronomical community and all those you helped in their passion for astronomy – Thank You, Graham!

Our deepest condolences to Graham's wife, Terri, and all his family and friends at this very sad and difficult time.

Paul Daniels, July 2022

Note: Should anyone wish to find out more about Hampshire Astronomical Group, their excellent website can be found at:

https://hantsastro.org.uk/

Yearbook of Astronomy Convention
Saturday 29th October 2022

On Saturday 29th October 2022 the famous **Yearbook of Astronomy** will hold its first ever Convention. The event will take place at:

The Idle and Thackley Conservative Club,
Idle, Bradford, West Riding of Yorkshire, BD10 8PY

a venue which has excellent facilities – including a licensed bar.

Presentations on the day include *How it Began: The Origins of Solar System Exploration – 1961 to 1981* by Peter Rea; *Ladies of the Night: Female Astronomers Prior to and Including Caroline Herschel* by Mary McIntyre; *The Meandering Moon and the Calendar* by David Harper; and *Radio Astronomy Around the World* by Rod Hine.

To book a place at just £17.50 including a buffet lunch please visit:

https://www.starlight-nights.co.uk/yearbook-of-astronomy-convention-2022/

President's Spot: Dr Paul A. Daniels FRAS

By now I think most of you will have heard the sad news that FAS Vice President Graham Bryant passed away on 21st June 2022 after many years of battling cancer. The last email we had from him, a permanent, emotional reminder in my Inbox, was on 15th June, saying that he'd "taken a turn for the worse" and sending apologies in case he couldn't make the FAS Council meeting on 18th June. Graham was a very well-liked, highly respected and valued member of the FAS Council and will be truly missed. FAS Webmaster, Martin Baker, has been 'shadowing' Graham's emails for the past year or so and has now taken on the role of Acting Vice-President until the AGM.

On a personal note, I've also been saddened by the unexpected loss of my good friend and former PhD supervisor, Prof David W Hughes (Emeritus, Sheffield) who died suddenly on 6th June 2022 aged 80. He will be very well known to many of you as he was an excellent, regular speaker to local societies and especially if it involved a train journey he hadn't taken before as David was a complete railway fanatic! His wife, known to most of you as astronomy writer Carole Stott, will attest to his passion for collecting railwayana, livery buttons and Dinky toys amongst other things.

With his interest in interplanetary dust, meteoroids, meteors, asteroids and (especially) comets and his involvement in the planning for the Giotto mission to Halley's Comet, David was also 'Mr Comet Man' and he regularly appeared on TV or the radio. Mars-crossing asteroid (4205) David Hughes is named after him.

My wife, Trish, and I attended his funeral in Sheffield on 13th July and, in a tribute read by his daughter, she recalls standing with him at a bus stop where he pontificated on what statistical distribution might best describe the spread of the chewing-gum stuck to the pavement! It brought to mind a conversation I had with him when I was his PhD student which started with my whimsical question: "Isn't it odd that there are no objects in the Solar System shaped like telegraph poles?". His eyes lit up, he smiled, the discussion snowballed… and it led to two published research papers on the roundness and density of accreted dust particles!

On another occasion, a year or so ago, David emailed me to let me know that he'd been looking at works of art that contained the Moon in the sky. His hope was that the phase of the Moon might help to determine a more precise date for the painting. His question was, "How many hours or days do you have to be past a Full Moon before the non-Full phase of the lunar disk becomes obvious?". I spent a day or two knocking-up a web application (go on, try it!) that simulates the phases of the Moon under different lighting conditions but I never found out whether it answered his question.

I shall miss David and my thoughts are with Carole and their children, Ellen and Owen.

Despite my best efforts to arrange the FAS' *ProAm Astronomy* webinar for Saturday, 16th July 2022, I was unable to find enough speakers for the day's programme. At the 9th July FAS Council meeting the decision was made to postpone the webinar until the Spring rather than cancel it completely – more details early next year.

Progress on the FAS' *Women in Astronomy* in-person convention on 12th November 2022 is going well. By kind permission of Prof Ian Shipsey (Head of the Physics Department, University of Oxford), we've been offered use of the Martin Wood Lecture Theatre in Oxford and the FAS Meetings Secretary, Jerry Stone, already has four of the six speakers confirmed. There will also be tours organised during the lunch break. More details to be provided soon – make sure to reserve 12th November 2022 in your diary!

Stay safe and clear skies

Paul

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SATURDAY 8TH OF OCTOBER 2022 @ THE HIVE, SAWMILL WALK, THE BUTTS, WORCESTER WR1 3PD

10.30 TO 16.00

FAS Convention
Saturday 12th November 2022

Women In Astronomy

Following our convention at the National Space Centre, and our online events, here is a chance to get together in-person with other astronomy enthusiasts.

We are delighted to announce our Keynote Speaker:

Dame Jocelyn Bell Burnell

Discoverer of Pulsars in the 1960s. She is founder of the Bell Burnell Graduate Scholarship Fund.

Lectures:

Jocelyn Bell:

"Discovering Pulsars" and "The Bell Burnell Graduate Scholarship Fund"

Grace Burthom

A secondary school student

"A Young Person's Guide to the Universe"

Mary McIntyre

Amateur Astronomer and Astrophotographer:

"A History of Women in Astronomy — Part 1"

Becky Smethurst

Astrophysicist, Science Communicator and Author:

"A History of Women in Astronomy — Part 2"

Venue: the Martin Wood Lecture Theatre, Clarendon Laboratory,

Parks Road, Oxford OX1 3PU.

Doors open to attendees at 9:15am, with the programme running from 10am to 5pm.

During the lunch break there will be time to visit the Museum of the History of Science or the Natural History Museum.

Tickets:

	FAS Member Societies	Public
Adults	£10.00	£12.50
Family	£15.00	£25.00
Under-16 / Student	£ 5.00	£ 5.00

*Note that the event will **not** be live-streamed. **You need to be there!***

For full details, go to **https://fedastro.org.uk/fas/convention/**

Mid-Kent Astronomical Society

Mid Kent Astronomical Society

Meetings Programme

Friday 9 September

Speaker—TBC

Friday 30 September

Will Joyce: The Outer Planets

In this presentation Will summarises our current understanding of the outer planets in our Solar System and their most interesting natural satellites using recent imagery from telescopes and spacecraft.

Friday 14 October

MKAS Tribute to Peter Parish and Chris Sherwood

Tonight we will be paying tribute to two much loved and respected former Members - Peter Parish and Chris Sherwood who passed away in 2020 and 2021 respectively.

Friday 28 October

Family Space Night

An exciting evening of talks and displays about astronomy and space with some hands-on activities for the younger children. There will be plenty to occupy the adults too!
Come along and learn about Space, Astronomy, and Rockets and weather permitting go outside and look at some interesting astronomical sights through a selection of telescopes.

Meetings at 8:00 pm at **Bredhurst Village Hall,** Hurstwood Road, Bredhurst, Gillingham, Kent ME7 3JZ.

Website: midkentastro.org.uk

Paul Sutherland (1952—2022)

On June 20, 2022, the amateur astronomery community lost an experienced science writer, a knowledgeable astronomer and a cheerful friend. With a lifelong interest in astronomy, Paul Sutherland contributed in many ways to astronomy. His main commitments were with the Society for Popular Astronomy (SPA) where he was a very active member for more than half a century. In 1971 he became a SPA section director and later took care as editor of the SPA magazine for almost ten years and he served as a SPA Council Member for many years.

A complete obituary can be found on the Meteor News website:

https://www.meteornews.net/2022/06/30/in-memoriam-paul-sutherland-1952-2022/

Hertford Astronomy Group

The Hertford Astronomy Group

announces its new programme for 2022-23

Starting with a Publicity Day on

Saturday 10 September

at The Howard Centre, Welwyn Garden City

Our meetings take place on the 2nd Wednesday of each month from September to June, and are now held at The Lindop Building Lecture Theatre at the University of Hertfordshire

College Lane, Hatfield, AL10 9AA

Topics this season to include *Discovering and Imaging Planetary Nebulae, Star formation, The Last Men on the Moon, Reaching for the Sun*

Plus our popular astronomy evenings

"My Telescope Doesn't Work"

on 29 October and 11 March.

Doors open for meetings at 7:30pm

Membership is just £10 for the year

with free entry to meetings.

£2 for visitors. Free to under-16s and full-time students.

Also streamed on YouTube

Find more information and to book places

visit http://www.hertsastro.org.uk

Webb Captures Stellar Gymnastics in The Cartwheel Galaxy

Following the first dramatic images released on the 12 July (see page 7), the Cartwheel Galaxy, a rare ring galaxy once shrouded in dust and mystery, has been unveiled by the state of the art imaging capabilities of the NASA/ESA/CSA James Webb Space Telescope. The galaxy, which formed as a result of a collision between a large spiral galaxy and another smaller galaxy, not only retained a lot of its spiral character, but has also experienced massive changes throughout its structure. Webb's high-precision instruments resolved individual stars and star-forming regions within the Cartwheel, and revealed the behaviour of the black hole within its galactic centre. These new details provide a renewed understanding of a galaxy in the midst of a slow transformation.

The NASA/ESA/CSA James Webb Space Telescope has peered into the chaos of the Cartwheel Galaxy, revealing new details about star formation and the galaxy's central black hole. Webb's powerful infrared gaze produced this detailed image of the Cartwheel and two smaller companion galaxies against a backdrop of many other galaxies. This image provides a new view of how the Cartwheel Galaxy has changed over billions of years.

The Cartwheel Galaxy, located about 500 million light-years away in the Sculptor constellation, is a rare sight. Its appearance, much like that of the wheel of a wagon, is the result of an intense event – a high-speed collision between a large spiral galaxy and a smaller galaxy not visible in this image. Collisions of galactic proportions cause a cascade of different, smaller events between the galaxies involved; the Cartwheel is no exception.

The collision most notably affected the galaxy's shape and structure. The Cartwheel Galaxy sports two rings — a bright inner ring and a surrounding, colourful ring. These two rings expand outwards from the centre of the collision, like ripples in a pond after a stone is tossed into it. Because of these distinctive features, astronomers call this a "ring galaxy," a structure less common than spiral galaxies like our Milky Way.

The bright core contains a tremendous amount of hot dust with the brightest areas being the home to gigantic young star clusters. On the other hand, the outer ring, which has expanded for about 440 million years, is dominated by star formation and supernovas. As this ring expands, it ploughs into surrounding gas and triggers star formation.

Other telescopes, including the NASA/ESA Hubble Space Telescope, have previously examined the Cartwheel. But the dramatic galaxy has been shrouded in mystery – perhaps literally, given the amount of dust that obscures the view. Webb, with its ability to detect infrared light, now uncovers new insights into the nature of the Cartwheel.

The Near-Infrared Camera (NIRCam), Webb's primary imager, looks in the near-infrared range from 0.6 to 5 microns, seeing crucial wavelengths of light that can reveal even more stars than observed in visible light. This is because young stars, many of which are forming in the outer ring, are less obscured by the presence of dust when observed in infrared light. In this image, NIRCam data are coloured blue, orange, and yellow. The galaxy displays many individual blue dots, which are individual stars or

For the latest releases from the James Webb Space Telescope please visit

esawebb.org

pockets of star formation. NIRCam also reveals the difference between the smooth distribution or shape of the older star populations and dense dust in the core compared to the clumpy shapes associated with the younger star populations outside of it.

Learning finer details about the dust that inhabits the galaxy, however, requires Webb's (MIRI). MIRI data are coloured red in this composite image. It reveals regions within the Cartwheel Galaxy rich in hydrocarbons and other chemical compounds, as well as silicate dust, like much of the dust on Earth. These regions form a series of spiralling spokes that essentially form the galaxy's skeleton. These spokes are evident in previous Hubble observations released in 2018, but they become much more prominent in this Webb image.

Webb's observations underscore that the Cartwheel is in a very transitory stage. The galaxy, which was presumably a normal spiral galaxy like the Milky Way before its collision, will continue to transform. While Webb gives us a snapshot of the current state of the Cartwheel, it also provides insight into what happened to this galaxy in the past and how it will evolve in the future.

More information

Webb is the largest, most powerful telescope ever launched into space. Under an international collaboration agreement, ESA provided the telescope's launch service, using the Ariane 5 launch vehicle. Working with partners, ESA was responsible for the development and qualification of Ariane 5 adaptations for the Webb mission and for the procurement of the launch service by Arianespace. ESA also provided the workhorse spectrograph NIRSpec and 50% of the mid-infrared instrument MIRI, which was designed and built by a consortium of nationally funded European Institutes (The MIRI European Consortium) in partnership with JPL and the University of Arizona.

Webb is an international partnership between NASA, ESA and the Canadian Space Agency (CSA).

NIRCam was built by a team at the University of Arizona and Lockheed Martin's Advanced Technology Center.

MIRI was contributed by ESA and NASA, with the instrument designed and built by a consortium of nationally funded European Institutes (the MIRI European Consortium) in partnership with JPL and the University of Arizona.

Image and text: NASA Press Release
NASA, ESA, CSA, STScI
https://www.nasa.gov/feature/goddard/2022/webb-captures-stellar-gymnastics-in-the-cartwheel-galaxy

esawebb.org

Frederick William Herschel (1738 – 1822)

Astronomer and Composer — A Merseyside Connection?

By Gerard Gilligan

This year marks the 200th anniversary of the passing of noted astronomer and accomplished musician Frederick (Wilhelm) William Herschel. A celebration of his life and works is to be held during this year in many parts of the UK in the form of, exhibits, public visits, museum openings, together with special musical concerts of his many works composed during his lifetime. Although William spent most of his life in England he was in fact born in the Electorate of Hanover, Germany in November 1738, the third son of Isaac and Anna. He did follow his father into the military band of Hanover, but became a refugee at the age of nineteen and escaped to England along with his brother Jacob in 1757.

However the money used to pay for their passage to these Islands was borrowed and the two brothers found themselves almost destitute when they reached London. In time William was able to obtain work copying music or training other musicians and during this time William travelled to Scotland and Northern England for work, for example spending four years in Leeds as the director of public concerts. He also held several jobs in the North East of England, in Durham and Sunderland

In December 1766 he was appointed as organist at The Octagon Chapel in Bath, which official opened the following year, with William performing at the opening ceremony. William's sister, Caroline Lucretia Herschel had been born in 1750, and was to become a very accomplished astronomical observer on the same par as her brother. However being the youngest daughter of a family of ten her mother, Anna, had decided that she become a household servant. She was not allowed the same level of education as her older brothers, and it was only due to her father's additional tutoring while her mother was away that Caroline had any additional education. She was allowed to learn dressmaking, but sadly most of her Germany home life was undertaking household duties for the family.

In March 1767, William and Caroline's father died, and this may have been the signal for William and the other Herschel brother Alexander to put a plan together to bring Caroline to England, and not for an extended visit. One idea was to use Caroline's undiscovered talent as a singer. By 1772 Caroline had joined the household of William and Alexander in Bath England. To abandon her mother and brothers in Germany without permission went against Caroline's thinking and understanding. But the temptations of a better and improved life in England were just too great, so the now famous astronomical partnership began. William's interests had partly switched from music to astronomy soon after the arrival of Caroline, and William's purchase of books on astronomy and optics resulted in him wishing to see the stars and planets for himself. Thus by 1773 he began to construct his own simple refracting telescopes, and to also grind and polish mirrors.

***Image above**: William Herschel as a young man date c1764.*

(From Family Archives)

***Image above**: A Victorian Lithograph of William grinding a telescope mirror, while Caroline is supplying the grinding paste from a tea cup.*

(© c1896 Leverhulme collection)

Soon his year had been divided into two halves, in winter he was a professional musician, directing concerts, with little time to view the night sky, but in the summer, with the help of brother Alexander he was a telescope maker and occasional observer. Some days William would spend 16 hours making and grinding telescope optics. Caroline was yet to become her brother's full time astronomical assistant, but soon she too had followed in the steps of her brother, as she had given up on William providing her with additional singing lessons. She assisted William with his astronomical observations, charting and recording them in detail and was from 1783 awarded her very own Herschel constructed telescope. At the same time Caroline also managed and organised the day to day Herschel house hold.

By the time William had located the planet Uranus in March 1781, he had been a successful musician for about 45 years. But when he added a new member to our solar system, the first planetary discovery with a telescope, he was immediately turned into both a local and national celebrity. Herschel became well known to fellow astronomers, the public but also the Royal family. George III appointed him Court Astronomer, or "Kings Astronomer". He was elected as a Fellow of the Royal Society, and this helped him obtain grants so that he could construct even large telescopes. 20 foot and 40 foot focal length mirror reflectors were to follow after 1785, and he was able to supplement his income by the construction and selling at least sixty complete telescopes from 6 to 10 inches

in diameter. However Herschel could not improve on the results provided by the 40 foot telescope which was cumbersome to use and not ideal to produce clear images, and telescope developments did not improve until Victorian techniques in precision engineering of large speculum metal telescopes.

Herschel examined the correlation of solar variation and the solar cycle and climate. He successfully observed and recorded Sunspots over a 40 year period between 1779 and 1818, noting their number, formation and how they changed in size. He discovered two moons of both Saturn and Uranus, mapped the size of the Martian polar ice caps. He also studied the proper motion of stars and the structure of the Milky Way, suggesting a possible model of the galaxy based on his own observations and measurements. During his most active time with astronomical observations William was assisted by his dutiful sister Caroline. It should also be noted that in April 1800 Herschel discovered infrared radiation in Sunlight while he was testing different filters. Passing sunlight through a prism to measure the different colours using a thermometer, he took a measurement of temperature just beyond the red end of the visible spectrum. Just one degree over for the red light he could see falling on the blub of the thermometer.

From as early as 1783, Caroline had been making her own observations and indeed her own discoveries, with the telescope that William had built for her. During an astonishing period while making vertical sweeps of the sky, she discovered M110 (NGC 205), and discovered or observed nine comets, fourteen new nebulae, and also updated Flamsteed's work on the position of 560 stars. One of the Caroline's comets was observed by members of the Royal family, and the King, George III using one of William's telescopes but terming it "my Sister's Comet". For her work as her brother's assistant, she was granted an annual salary of £50 (over £5,000 to-day). Her appointment made her the first female in England to be honoured with a government position, and the female to gain a salary as an astronomer.

The Herschel's moved from Bath in June 1785 to Clay Hall in Old Windsor, then to Windsor Road in Slough. It is here that William was to live until his death in 1822 becoming known as "Observatory House", but sadly demolished in 1963. When William married the window Mary Pitt (nee Baldwin) in 1788, this changed the domestic life for Caroline, and she lost her managerial and social responsibilities

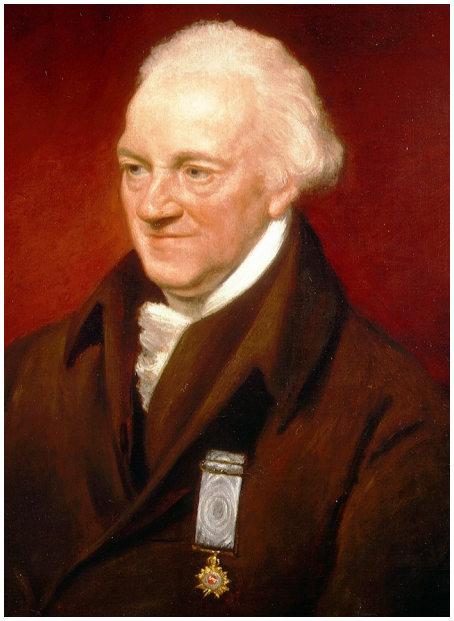


***Image above**: Sir William Herschel 1738 – 1822 from a portrait dating from c1819 by the Artist William Artaud. Commissioned by his son John Frederick. Sir William is shown wearing The Royal Guelphic Order.*

©Herschel Collection, Royal Museum Greenwich.

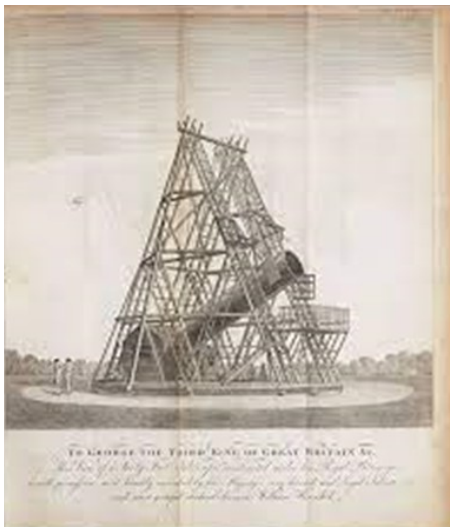


Image above: Herschel's 40-foot (12 meter) reflector from a 1795 engraving.

© Linda Hall Library.

within the household. Caroline moved to her own house, but did continue to assist William in his observations. However she did destroy her own astronomical notes and personal journals dating from 1788 – 1798. But when Mr & Mrs Herschel were away from Slough, Caroline looked after the home and arranged for it to ready for their return. In later life Lady Mary Herschel and Caroline exchanged many letters which indicated that any family rift had been repaired. William and Mary had one child, John born in March 1792 and was to become a very accomplished astronomer and man of science as his father, and John was to pass on the same wisdom with his children. In the meantime, later in life William was showered with awards and titles from learned organisations, Universities, and was knighted by the Prince Regent, which did not carry the same equivalent as a British knighthood, but was allowed the title as "Sir" William Herschel from 1816. In 1820 with William now in his early eighties he was approached to become the first President of the newly organised and formed Royal Astronomical Society, a new organisation that could supply the needs of astronomers more so than the Royal Society. William did agree but only with the understanding that his position was purely nominal.

During late 1821-22 William became frail and for several years he had done less and less observing. Caroline had to reassure her brother that his precious observing notes and records were safe and kept under lock and key. Sadly on the 25th August 1822 he passed away, and was buried two weeks later under the tower of the church of St Laurence, Upton-cum-Chalvey, near Slough. Caroline was deeply distressed by his death, and soon after his burial she moved back to the family home in Hanover, after living in England for fifty years. However she continued her own astronomical work, organising and cataloguing nebulae

In 1828 she became the first women to be awarded the Royal Astronomical Society Gold Medal, which was not awarded to another woman until 1996.

In later years she worked on a major autobiography, but after 1845 her letters to family and friends finish and on 9th January 1848 she passed away at the grand age of 98.

The Merseyside connection comes from one of the many letters sent to family and friends, plus astronomers of the day, held in the Lord Leverhulme collection held by the National Museums Liverpool, and at

the Lady Lever Art Gallery. The letter dating from January 1790 was from William Herschel to the then Astronomer Royal, Rev Dr Neville Maskelyne. The fifth person to hold the post. Both William and Caroline had corresponded with him over many years, and he had visited the brother and sister team several times to share astronomical observations both in Bath and later in Slough.

Caroline Herschel had received a fairly rudimentary education, and was badly treated in her early life by her mother and other family members. It is to her brother, musician and astronomer, Sir William Herschel, that she became a highly respected and honoured astronomer, which is quite an achievement for a woman of her time.

There is also the story of a Herschel 10 inch telescope once owned by a past President of the Liverpool AS who found it being used a walking stick and umbrella stand. But that is another story for another newsletter!

***Image above**: Caroline Herschel 1750 - 1848, pictured in later life C 1845 by Sheila Terry*

© Science photo Library

Further Reading

***"The Herschel's of Hanover"* by Michael Hoskins – pub 2007 Science History publications Ltd.**

***"William Herschel; Discover of the Deep Sky, The epochal work of the greatest visual observer and his talented sister Caroline"* By Wolfgang Steninicke – pub 2021 Books on Demand**

***"William Herschel 1738 – 1822" – © Wikipedia* online pages. https:// en.wikipedia.org/wiki/William_Herschel**

***"A letter from William Herschel"* - © 2021 Stories National Museum Liverpool, for National Women's Day, March 2021. https://www.liverpoolmuseums.org.uk/ stories/letter-william-herschel**

Herschel 200 Exhibition

Herschel Museum of Astronomy, 19 New King Street, Bath BA1 2BL

Saturday 16th July until 31st December 2022

The Herschel Museum of Astronomy will be exhibiting some incredible artefacts on loan from the Royal Astronomical Society and Herschel Family Archive which will showcase William's achievements.

The exhibition will also acknowledge the important contributions of those working with William, including his sister Caroline Herschel.

On Thursday 25 August this year, on the date of the 200th anniversary of William Herschel's death, we will unveil a new piece of stonework for the garden.

This will commemorate the anniversary and mark the location where the planet Uranus was discovered, also acting as a level platform for telescopes in the garden.

This aspect of our project enables us to work with a local artist-maker and support an independent creator based in Bath.

For more details about the 200th Anniversary Exhibition, please visit the website:

herschelmuseum.org.uk

Solar Imaging from the West Country

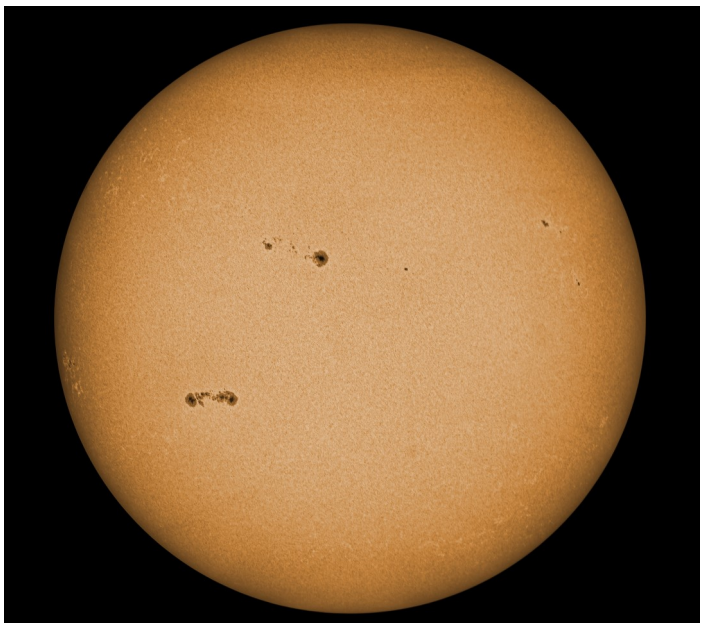
A big **Thank You** to Roger Hyman, Amateur Astronomer, from Sparkford in Somerset, for sending in these fantastic images of our local star, the Sun recently. The images show how active the Sun is at the moment with a number of sunspots visible.

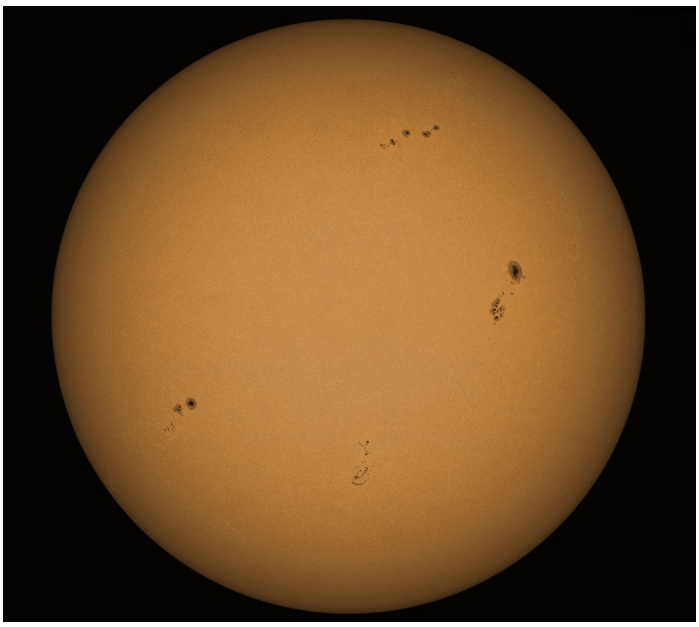
The images were all taken on a William Optics Zenithstar 126 refracting telescope. (5" in old money). Equipment used to obtain the images: Baader Solar Film to the front of the telescope to block out 99.95 % of the light. Altair Solar Contrast Booster Filter 8nm 540nm Continuum. (A green filter to boost the contract of the surface and enhance spots and granulation), Altair 183C Pro camera. Captured with SharpCap Pro 4 as a 1000 frame ser video format. Processed in Autostakkert and using best 15% from video to produce a tiff image. Adjusted in Photoshop to taste. The image is originally green due to the filter but changed in Photoshop to a yellow hue.

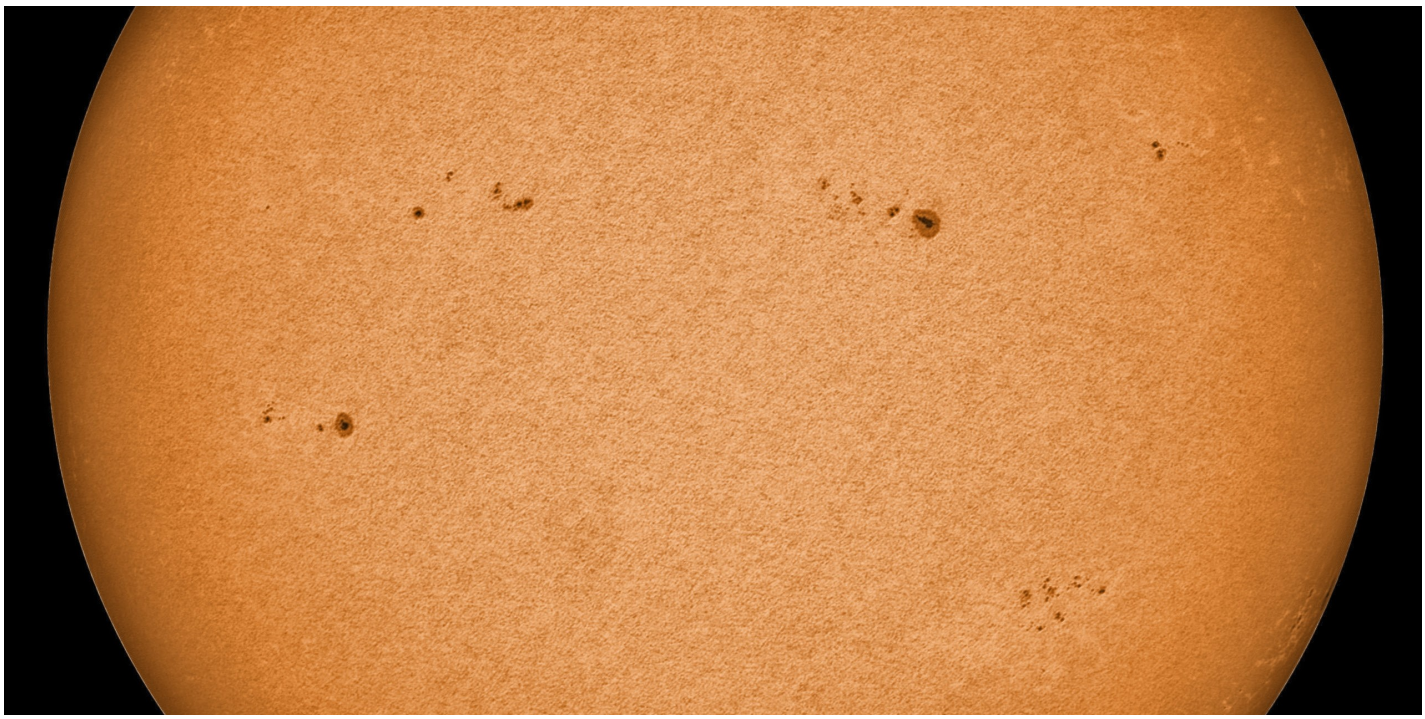
Roger is a member of **Bath Astronomers** and **Havering Astronomical Society**.

If anyone would like to see their work published in the Newsletter, please send by email **newsletter@fedastro.org.uk**.

Michael Bryce (Editor)







Countdown to launch: British-built satellite completes line-up for first launch from Spaceport Cornwall

A research satellite from RHEA Group, built by Open Cosmos, completes the line-up of satellites set to launch from Spaceport Cornwall this year.

- Named 'DOVER', RHEA Group's first satellite will fly into space on Virgin Orbit's maiden UK launch, sharing a ride with five additional satellite missions, including the first ever satellite to be built in Wales.
- This announcement confirms the UK is on track to become the first country in Europe to launch satellites into space from home soil this year, a key ambition of the Government's National Space Strategy.

A new research satellite from international engineering firm Rhea Group, built in Oxfordshire by space company Open Cosmos, will be launched from the UK later this year.

Virgin Orbit will launch the 'DOVER' pathfinder satellite from Spaceport Cornwall. The satellite will transmit an innovative new signal, specially designed by engineers at RHEA, to provide data from space that can be used on the ground to obtain a position or an accurate time. It will broadcast these new signals so that their performance can be tested as part of the research project.

This new satellite completes the line-up for the UK's first launch, which also includes satellites from organisations such as Space Forge, the Satellite Applications Catapult and Horizon Technologies, as well as the Prometheus-2 research demonstration satellites. Prometheus-2 was co-funded and designed with Airbus Defence and Space and assembled by In-Space Missions, as part of a collaboration between the UK's Defence Science and Technology Laboratory (Dstl) and international partners, including the US National Reconnaissance Office.

The UK is poised to become the first country in Europe to launch satellites into orbit this year from home soil, a key ambition of the UK Government's National Space Strategy. Spaceport Cornwall is at the heart of a growing aerospace and space cluster and will create 150 jobs in the local area.

The development of a commercial launch capability will give the UK access to the growing global launch market, delivering a further boost to the thriving space and satellite sector, which is already home to more than 47,000 jobs across the country and supports billions of pounds of wider economic activity.

> ***Dr Paul Bate, CEO of the UK Space Agency**, said: The countdown is on to the first satellite launch from Spaceport Cornwall, with a full complement of satellites confirmed by Virgin Orbit for what promises to be a landmark moment for our thriving space sector.*
>
> *It's fantastic that RHEA Group's DOVER satellite is joining the launch, which showcases both our domestic satellite manufacturing expertise and the international interest in the UK as a launch destination.*
>
> *The ability to launch satellites from UK soil will support our work to catalyse investment into the space sector, deliver new capabilities and champion the incredible role of space to benefit life on Earth.*

The 'DOVER' pathfinder satellite

RHEA Group's Dover satellite, the company's first, was co-funded by the UK Space Agency's investment in the European Space Agency's Navigation Innovation and Support Programme (NAVISP). It's named after the Dover Strait, where the English Channel is narrowest and shipping lanes are busiest, as this is a key location for testing new techniques and technologies for Positioning, Navigation and Timing (PNT).

The satellite is a strong example of UK expertise in PNT technology, which underpins vast swathes of economic activity, as well as small satellite manufacturing, with Open Cosmos building the satellite at the Harwell Space Cluster, Oxfordshire.

> ***Emma Jones, RHEA's UK Business Director**, said: This is a momentous event for RHEA. This year we are celebrating our 30th anniversary and it is a great milestone to launch our first ever satellite in the same year. The UK is in the very desirable position of establishing a number of spaceports, and it is thrilling to have a RHEA satellite on board the first launch to take off from UK soil.*
>
> ***Florian Deconinck, Vice President of Institutional Partnerships & Future Missions at Open Cosmos, said**: DOVER is a great example of Open Cosmos' ability to design, manufacture, launch and operate satellites in a responsive manner. The timescales for this future mission are impressively aggressive: 8 months from the moment of first contact with RHEA to getting an operating satellite in orbit. This is the result of a close partnership between Open Cosmos and RHEA, the very reactive support from UK Space Agency and ESA-NAVISP teams, and the possibility of delivering all the phases from a single location, the UK.*

The launch

During the launch mission, a Virgin Orbit 747 will take off from the runway at Spaceport Cornwall, carrying a rocket beneath its wing. The plane will fly out over the ocean before blasting the rocket into space, delivering satellites into orbit around the Earth. In the cockpit will be Squadron Leader Mathew 'Stanny' Stannard, an RAF Test Pilot serving on industrial placement as one of Virgin Orbit's pilots. This will be the first satellite launch from UK soil and Virgin Orbit's first mission outside the US. It follows the successful 'Straight Up' mission, that delivered seven satellites into space from Mojave in California on Saturday 2nd July.

***Image Above**: Virgin Orbit's "Cosmic Girl" Boeing 747 carrier aircraft at Spaceport Cornwall with the LauncherOne rocket attached to the "spare engine" mount under the left wing. The spare engine mount added to Boeing 747 aircraft is used to ferry spare engines around the world for installation on other aircraft should a major breakdown occur.*

Image Credit: Spaceport Cornwall

***Image Right**: From left, Rebecca Evernden, Director of Space at BEIS, Dr Paul Bate, CEO of the UK Space Agency, Prime Minister Boris Johnson, British ESA Astronaut Tim Peake, and Lord Willetts, Chair of the UK Space Agency on the UK Space Pavilion at the Farnborough International Air Show (18 July 2022)*

Image Credit: UK Space Agency

***Dan Hart, CEO of Virgin Orbit, said:** We're very pleased to have been selected by RHEA Group to launch its first satellite. The DOVER satellite, which was designed in Belgium, built in the UK, funded by the European Space Agency, and now will be launched from Cornwall, is a great example of the power that comes with the infusion of space collaboration taking place across the globe.*

The work RHEA will do with their DOVER satellite will help to assure reliable navigation, which touches all of us and can be vital for everything from environmentally-efficient shipping to national security.

***Melissa Thorpe, Head of Spaceport Cornwall, said:** We're thrilled to have 'DOVER' complete the line-up of satellites onboard Virgin Orbit's first launch from Cornwall. Each payload highlights the innovation happening within the small satellite industry, and how it can benefit life on earth, while showcasing the growing collaboration between UK Space and international partners.*

This is another great moment in the countdown to launch from Cornwall.

UK spaceflight programme

With funding first announced at the Farnborough International Airshow in 2018, the UK Space Agency is supporting the development of commercial and sustainable satellite launch operations across the UK, working with a range of partners including Spaceport Cornwall and Virgin Orbit, Space Hub Sutherland and Orbex, and SaxaVord Spaceport, Lockheed Martin and ABL Space Systems.

The space sector has shown remarkable resilience in the face of global challenges such as the pandemic, with more than 1,700 satellites launched worldwide in 2021 alone. These provide vital technologies used every day by people and businesses, including communications, Earth observation and navigation services.

The UK has world-leading expertise in satellite design, manufacturing, data and applications but, until now, has not been able to launch them from home soil.

Images and Text: UK Space Agency Press Release
https://www.gov.uk/government/organisations/uk-space-agency

FAS Newsletter Copy Deadline:

Deadline for items for inclusion in the next FAS Newsletter, No 128 October 2022 is

15th September 2022