



Aries

The Journal of the Derby and District
Astronomical Society



The Moon and Blossom on a Tree

Image Credit: Dr Michael Lancaster

Summer/Autumn 2026



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Editorial

Welcome to this Summer/Autumn edition of Aries. Apologies for the long wait for this issue, but, once again, life gets in the way. Now with things having calmed down a bit, I could find the time and the energy to get this edition of Aries out.

It has been quite a busy Summer, parts of Europe experienced a total solar eclipse on Wednesday 12th August and here in the UK, we experienced a 90% partial solar eclipse. A group of us went up to the Observatory to observe and image this event, a few members went overseas to witness this event (see the Society News section for more details). Also we were invited again to have a stall at the Duffield Carnival on Saturday 27th June (also please refer to the Society News section).

The two pieces of news that caught my attention over the Summer was the funding announcement, made at the end of July, from the UK Research and Innovation Agency (UKRI), which has an annual budget of £10 billion, to make cuts to the funding of astronomy, nuclear and particle physics research over the next four years. The second news story was the launch of the Nancy Grace Roman Space Telescope, which was launched on 30th August (please see "In the Footsteps of Hubble and Webb – The Nancy Grace Roman Space Telescope" article in this issue). At least there was some good news to be had.

The story concerning the announcement of cuts to astronomy, nuclear and particle physics funding made by the UK Research and Innovation Agency (UKRI), was very disturbing and appalling news. Its consequences are dire and could spell the end of UK leadership in a number scientific disciplines. So what do these cuts actually mean? Well, the cuts will see that the UK will no longer be an active participant in research undertaken at the James Clerk Maxwell telescope, based at Mauna Kea, Hawaii. Funding has been cut for the UK's involvement in two instruments for the Extremely Large Telescope (ELT) currently under construction in Chile, and, also UK contributions to the upgrades to the Large Hadron Collider (LHC) in Switzerland.

These are appalling swings of the axe, but they do not stop there as, Jodrell Bank is also in the cross hairs. The UKRI will cut the annual 2.8 million budget for Jodrell Bank, that will mean that, if further funding from another source cannot be procured, then Jodrell Bank will shut down in 2028. This is very alarming and sad news, but the effect of switching off the Lovell Telescope and the Mark II telescope at Jodrell Bank, will also signal the death knell for the E-MERLIN (Multi-Element Radio Linked Interferometer Network) system of which Jodrell Bank is the hub.

The E-MERLIN system comprises of seven telescopes, the Lovell and Mark II telescopes at Jodrell Bank, Cheshire, Darnhall in West Cheshire, Pickmere near Knutsford, Cheshire, East, Knock in Shropshire, Defford in Worcestershire and Cambridge at the Mullard Radio Astronomy Observatory (MRAO). With the shutdown of Jodrell Bank, the E-MERLIN network would have to cease operations as well, so the loss of Jodrell Bank has downstream consequences.

Jodrell Bank is also the world headquarters of the Square Kilometre Array (SKA) network currently being built in Australia (low-frequency) and South Africa (mid-frequency). The UK was one of the seven founding members of this international collaboration. How the funding cut to Jodrell Bank will affect this project remains to be seen.

These cuts have a human cost as well, 28 people are directly employed at the Jodrell Bank site and upwards of 3,000 researchers use Jodrell Bank for their scientific investigations, what of their future? Jodrell Bank, apart from being a working scientific instrument, it is also a UNESCO World Heritage site and it attracts tens of thousands of visitors a year, many of us have visited Jodrell Bank many times over the years. It is also, dare I say it, a part of our national culture and a national treasure.

When the plan to cut the funding was announced Labour, Business Secretary, Jonathon Reynolds was quoted on the BBC News website saying that "the UK's world class research was absolutely central to creating a better future for the UK."

In the same article he went on to say, “ I am committed to working with the UKRI to ensure that the UK remains able not only to sustain its world-leading research capabilities, but also to invest in the next generation of scientific facilities and infrastructure that will underpin discovery, innovation and growth in the years ahead.”

How do you do that by cutting funding to astronomy, nuclear and particle physics? Eh, how? Also these cuts could be the ‘starting gun’ for a mass exodus of researchers, both established and new, if they cannot carry on with their research projects, they will go somewhere else where they can be funded and that means overseas institutions and those institutions will benefit from that exodus. If you are a new researcher, a post-doc, trying to get into a research project to advance your career within your field, “er, sorry Old Chap, a bit short with the old cash at the mo! Hard luck.” They will look overseas, if that happens we will not be the ‘world-leader’ that Reynolds is crowing about, far from it. Once again, a British government has taken a short-sighted view and has decided that this County can do without astronomical, nuclear or particle physics research.

There is another way to look at this, places like Jodrell Bank, inspire and excite, both young and old alike. How many researchers within this field were inspired to get to where they are? Jodrell Bank and places like it are hallowed ground, they are the places where science and culture meet, this is where you can visit and see science in action. I have been to Jodrell Bank many, many times and not once on any of those trips have I not experienced a shiver of excitement and awe go down my spine at my first sight of the Lovell Telescope, I am awed by it and amazed at the engineering brilliance required to build it.

A few days from the announcement from the UKRI, a group of 200 scientists and celebrities came out to protest and call on the Government to reverse this decision, this group includes names such as Professor Brian Cox, Professor Jim Al-Khalili, Sir Brian May and the Astronomer Royal for Scotland, Professor Catherine Heymans. Former Astronomer Royal, Sir Martin Rees has also made his displeasure known when interviewed by the Times Radio podcast. But here’s the thing, the current Astronomer Royal, Professor Michele Dougherty has not said a word, in fact, if I have this correct, Prof. Dougherty was a member of the panel that made the decision on the funding cuts. Prof. Dougherty is the Chair of the Science and Technology Facilities Council (STFC). The excuse for these cuts is stated as “due to escalating physics and research costs”, she has publicly defended the necessity of the cuts despite rising condemnation and protest from the scientific community and the general public alike. I find it absolutely incredible that a sitting Astronomer Royal would defend such a move.

The ‘current’ Prime Minister, Andy Burnham, has weighed into this and has said that he will do all he can to save Jodrell Bank, talking is one thing Prime Minister, doing, is a different matter and what about the situation with the James Clerk Maxwell Telescope, the two instruments for the ELT and our involvement in the Large Hadron Collider, do they figure in ‘all you can do’ Prime Minister? We will have to wait and see what happens.

UPDATE: As this edition of Aries was being completed, the BBC News Website published a story on 15th October saying that the Government was ‘exploring’ the long term options for Jodrell Bank.

The report quoted the Business Secretary. Jonathon Reynolds MP, informing the House of Commons that Jodrell Bank had a “Secure future” and that he had met with the University of Manchester, who operate Jodrell Bank, to explore potential solutions. He went on to say that there had been a “science-based” decision to move from the E-Merlin network to the Square Kilometre Array (SKA) project, which is headquartered at Jodrell Bank and is being built at sites in Australia and Africa. The Business Secretary said that he recognised the strength of feeling, this follows widespread criticism from both the scientific community and the general public. There is a Change.org online petition titled “Save Jodrell Bank – Protect a national treasure of science, heritage and inspiration.” As of writing this update (19th October) the petition has 31,677 signatures.

Mr Reynolds went on to say “It’s important, given that we have a very significant research and development budget in the UK, that scientific decisions are made on the basis of the Science. That is consistent with making science-based decisions on the prioritisation of that funding. I have met with the University of Manchester just a few days ago about this, and the local MPs of the area have been incredibly supportive in finding a solution”

For its part the University of Manchester has launched a public fundraising campaign and is exploring diversified revenue streams. The University emphasizes that retaining the E-Merlin network is vital because it is a facility over which the UK maintains complete sovereign control, unlike international projects.

The future for UK involvement in the James Clerk Maxwell Telescope on Hawaii and the UK involvement with the Extremely Large Telescope (ELT), including the two instruments that the UK has promised, plus UK contributions to the upgrades to the Large Hadron Collider (LHC) in Switzerland, are still in doubt. – Source: BBC News Website.

Now on to happy news. 30th August saw NASA launch the next great space telescope, the Nancy Grace Roman Space Telescope. It was originally named Wide-Field Infrared Survey Telescope (WFIRST) and, in 2020, NASA Administrator Jim Brindenstine approved the changing of the telescope's name to honour Nancy Grace Roman, who was NASA's first Head of Observational Astronomy, she was invited to take up that position by NASA. She then became Chief of Astronomy and Solar Physics from 1961 to 1963. She became known as the "Mother of Hubble" as she played a pivotal role in the planning of the Hubble Space Telescope.

The telescope features a 2.4 metre (7.9 foot) primary mirror with a wide field of view. The Roman telescope will be able to produce images, especially deep field images, that used to take Hubble days, Roman can do in hours. This wide field of view will be useful for exo-planet detection and asteroid surveys. It is also hoped that Roman will help characterise Dark Matter. The Roman telescope will be stationed at L2, a million miles from Earth and it will have a neighbour in that location, the James Webb Space Telescope. It will take Roman three months to travel to L2, during that time, instruments and communications equipment will be deployed and engineering tests and calibrations will be conducted. The Roman Telescope is planned to remain operational for 5-years, but as I write this Editorial (09/10/2026), Roman's operational lifespan has been increased to 22 years, due to the small amount of fuel that has been used so far during the journey to L2. The Roman Telescope is due to arrive at L2 in early December. But, so far, everything is proceeding well and the spacecraft is in good health. It has even taken its first engineering calibration images which are being worked on to bring Roman's imaging system into sharp focus.

An article concerning the Nancy Grace Roman Space Telescope appears in this issue of Aries.

So, what do we have for you in this issue of Aries?

We have the usual Society News section, which features pieces on the Duffield Carnival, the Partial Solar eclipse and the Persied Meteor watch and a write up on the September 2026 trip to the Aberbrân Fawr Campsite in the Brecon Beacons.

We have an article on the launch and mission of the Nancy Grace Roman Space Telescope by Anthony Southwell, a very interesting article by Jim Sarsgard concerning how to observe the planet Mercury with binoculars, safely! We, also, have two book reviews in this issue, one by Brian Dodson and the other by Malcolm Neal.

All in all a packed edition of Aries to dive into. So find a comfy chair and a hot drink and immerse yourself within its pages, the Universe awaits you!

Onwards!

Anthony Southwell

Editor

Society News

Duffield Carnival – Saturday 27th June 2026

We were invited, for the second year running, by the organisers of the Duffield Carnival to have a stall at the event on Saturday 27th June. The Society had just purchased a new larger Gazebo for just these kinds of events. The Duffield Carnival was to be its first use.

I arrived onsite with Mike Dumelow around 11 am and the Gazebo was in the process of being set up. To say that the erecting of the Gazebo was an “interesting” experience would be an understatement. The Gazebo was very large indeed and had a great number of poles, connectors, and fixtures not just for connecting the poles together but also the fixtures that supported the roof and the connectors that fixed the Gazebo’s ‘walls’ and roof to its frame. I don’t remember seeing any instructions at the time. It was a test of logic, patience and, to be quite honest, sanity, to get that Gazebo up and secured. It took nearly two hours to set it up. Thanks must go to those intrepid architects that did battle with that Gazebo and were victorious:

Brian Dodson
Mike Lancaster
John Hill
Peter Branson
Donald Anderson
Mike Dumelow
Anthony Southwell



Our gazebo/stall at the Duffield Carnival.

Image Credit: Brian Dodson



DDAS Members and members of the Public at the DDAS stall.

Image Credit: Dr Michael Lancaster

Once we had the Gazebo up, we began to set up our stall/display. There were a couple of smart telescopes present, courtesy of John and Alison Hill. The Society’s Dobsonian telescope, the ‘JK-40’ brought along by Mike Dunelow, who made the telescope from a primary mirror and secondary mirror set, donated by our founder member Mrs Jane Kirk at the DDAS 40th Anniversary event on 21st June 2014. Peter Branson was projecting the Sun’s image on to a white board to allow the public to do some solar observing in a safe way. The Sun did not disappoint, as there were a number of sunspots visible.

The Society’s Moon Globe was also present and, again, was a huge crowd puller. I had my Apollo lunar spacesuit model on display next to the Moon Globe. Below the Moon Globe was my Apollo mission patch medallion collection. Also on display next to the Moon Globe was my 9.8 gram lunar meteorite fragment. I

never cease to be amazed by the looks on people’s faces when you tell them that they are looking at a piece of the Moon, and then, their reaction to you when you ask them if they would like to hold it. People’s eyes go wide as saucers, everyone, young or old, had the same reaction. A lot of the people who held my lunar meteorite had their pictures taken whilst holding it.

In addition to that I had three books on display, all concerning themselves with the planet Mars. The first was “A City on Mars: Can We Settle Space, Should We Settle Space, and Have We Really Thought This Through?” by

Kelly and Zack Weinersmith, the second book was (put title in here) by Rod Pyle and focuses on the robotic exploration of Mars. The third book was "The War of the Worlds" by H. G. Wells. I also had my vial of Martian regolith simulant to demonstrate what the real Martian 'soil' would look like.

Towards the end of the table there was my Sky and Telescope Night Sky globe, which showed the night sky for both the Northern and Southern hemisphere. Finally there were my 3D printed models of the Transiting Exoplanet Explorer Satellite (TESS) spacecraft, James Webb Space Telescope (JWST) and New Horizons spacecraft. Our collective display was, in my opinion, a very impressive and interesting one.

The Carnival itself was very busy with lot of people walking about looking at the other stalls or watching the events that were happening in the main Carnival arena. The weather was absolutely lovely, bright sunshine, with wispy clouds and it was quite warm, perfect weather for a Carnival.

We had a steady stream of visitors come and look at our stall and to have a look at the display and the telescopes, and, even to have a quick look at the Sun's projected image. Those who came to our stall stayed for a time and asked us questions, some people stayed to talk with us for twenty minutes or more. All who came to our stall left with their questions answered and with a new perspective on our cosmic backyard.



Answering the questions from the attendees at the Carnival

Image Credit: Dr Michael Lancaster



DDAS Member Peter Branson's telescope set-up projecting the Sun's image and showing sunspots.

Image Credit: Dr Michael Lancaster

Finally I would like to thank all those who turned up on the day, whose contributions made this DDAS event such a success:

John Hill
Alison Hill
Brian Dodson
Donald Anderson
Mike Lancaster
Peter Branson
Mike Dumelow

Anthony Southwell

DDAS Fuddle BBQ (4th July 2026)

This year's BBQ at the Flamsteed Observatory was turned into a fuddle, basically, bring your own, pre-cooked food, due to the dry weather we experienced prior to the BBQ date. It was decided that we would not have an open BBQ as a fire precaution.

There was enough food for everyone who was in attendance, in fact, we probably had too much, as most of us returned home with a majority of the food that they had brought to the fuddle. The attendance at this year's BBQ/Fuddle was good, we did not use the observatory for observing as the weather was not too good, it was overcast and a little drizzly. I can't remember if the weather began to improve when we were leaving the Observatory site.

Anthony Southwell

DDAS Observing the Partial Solar Eclipse of Wednesday 12th August 2026.



DDAS Members and guests at the Flamsteed Observatory enjoying the late evening sun waiting for the Partial Eclipse to reach its maximum.

Image Credit: Dr Michael Lancaster

The month of August was going to spoil us for on the 12th – 13th, if the weather played ball, we would experience two astronomical events, a partial Solar Eclipse and, in the late night of the 12th and the early hours of the 13th August, there was the maximum of the Perseid meteor shower. We decided to go up to the Flamsteed Observatory to observe these two occurrences as an exclusive Society event.

The eclipse was partial across the UK and it was total in Spain, a few DDAS members travelled out to Spain along the path of totality to observe the total eclipse. Some DDAS members observed the event from their own backyards.

I got a lift up the Observatory from Brian Dodson, we also picked up Elliot Fountain on the way. By the time we got there, people had set up their equipment and were starting their observations and taking images. First contact was expected at 6:15 pm BST and third contact was to happen at 8:05 pm BST.

Mike Lancaster had his Canon EOS 50D, with its 400 mm Tamron lens and Seymour solar filter already set up and trained on the Sun ready to go. John and Alison Hill had their smart telescopes, with solar filters attached, also pointing towards our home star. I hastily set up my tripod and my Celestron 8 x 10 Solar Binoculars to observe the event and what an event was it was.

There were at least two sunspots visible on the solar disk, I could not discern them in my solar binoculars, but they were imaged by Mike Lancaster. As we go closer to mid-eclipse with the Moon taking up about 93% of the solar disk, the ambient light levels began to dim and colours began to look a little washed out and it got decidedly cooler, which was a blessing, as it gave a bit of respite from the high temperatures we had been experiencing of late.

I moved my solar binoculars to get a better view of the partial eclipse as the Sun was setting and the surrounding foliage was becoming a bit of an impediment to further observation. So I moved my tripod and binoculars to a different location. I moved to the entrance door side of the



An image of the Partial Solar Eclipse taken with a Canon EOS 50D with a 400 mm Tamron lens and a Seymour Solar Filter.

Image Credit: Dr Michael Lancaster



An image of the open dome of the Flamsteed Observatory during the partial solar eclipse maximum.

Image Credit: Anthony Southwell

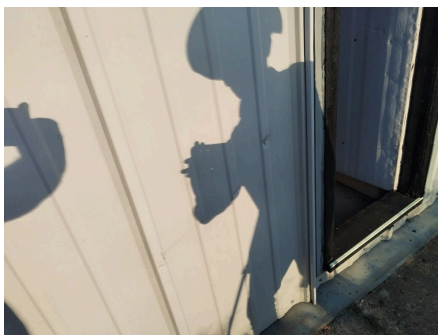
Observatory and I was greeted with a rather peculiar scene. Ahead of the Observatory building was a small stand of trees and the setting Sun was shining through this vegetation and casting a shadow on the wall of the Observatory. Interspersed with the shadow of the trees, there were multiple images of the crescent Sun, the leaves were 'projecting' multiple images of the partially eclipsed Sun, it was almost like they were acting like a pinhole camera. A striking sight to see, so I got my mobile phone out and took a few pictures of this phenomenon. While I was doing that, Mike Lancaster put his hands out



Multiple images of the partially eclipsed Sun during the eclipse maximum period.

Image Credit: Anthony Southwell

and crossed them, fingers almost closed and managed to produce four images of the partially eclipsed Sun, I took a couple of pictures of that as well.

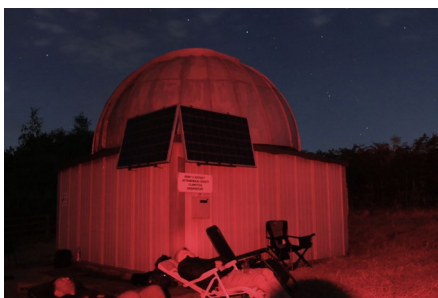


Mike Lancaster using his hands to produce four images of the partially eclipsed Sun.

Image Credit: Anthony Southwell

The whole event was absolutely stunning, everyone who was there was totally blown away by what they had just witnessed and imaged, but, for some of us, our time at the Observatory was not yet over. The Persied Meteor Shower maximum now beckoned.

Anthony Southwell



Dr Mike Lancaster and Elliott Fountain observing the Persieds.

Image Credit: Brian Dodson

Persied Meteor Shower Maximum – Wednesday 12th to Thursday 13th August 2026

After the excitement of the partial solar eclipse, a few of us stayed behind to observe the Persied Meteor Shower maximum. Myself, Mike Lancaster, Brian Dodson and Elliott Fountain, stayed at the Observatory and waited for the sky to grow darker. I had put my solar binoculars back in my rucksack and had taken out my trusty Canon EOS 1200D DSLR camera, because I had a sudden rush of blood to my head and decided I would try to image the odd Persied meteor. Brave boy, brave.

So with my Canon camera installed on my tripod, with its cable release fitted and ready to go, all I had to do was ensure that settings on my camera were correct for what I was about to image and to wait for the sky to get darker. The seeing conditions were pretty good, the



A view of Ursa Major over the Flamsteed Observatory.

Image Credit: Brian Dodson

faintish line. This image features in the Perseus Meteor Shower 12th to 13th August entry in the past activities section of the DDAS website. Even though I am pleased that my image made it on to the DDAS website, however, I am not sure if I caught a meteor or a satellite, personally, I think I captured a satellite trail.

I say that for one very good reason, the sky has become 'infested' with satellites. We observed them almost constantly during our meteor watch. Most of them were probably Starlink satellites launched by SpaceX. We observed them coming from all directions and with differing brightness levels, which would indicate their 'altitude' above the Earth. We observed three satellites proceeding through the constellation of Cygnus and they appeared to be moving in 'formation' as they formed a line in the sky, with the same 'gap' between them. I think that they were a group of recently launched Starlink satellites. I was stunned, I just could not believe how much junk we are putting up there, so that people can watch Netflix, send a text or check their bank balance.



Another view of Ursa Major over the Flamsteed Observatory with a satellite trail within it.

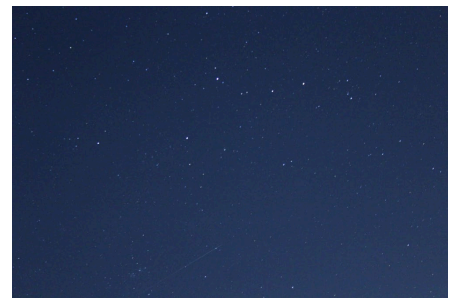
Image Credit: Anthony Southwell

nothing much seems to be done about it. I fear that ground based astronomy will become untenable in the next ten to fifteen years or so, sad, very sad.

But back to the Persied watch 2026, I noticed that Brian was taking a

atmosphere seemed to be steady enough, not much in the way of star 'twinkling.' I took a couple of test shots, the sky was not properly dark enough, but I wanted to make sure that my camera was in focus. Once that was sorted out the waiting for the Persieds began.

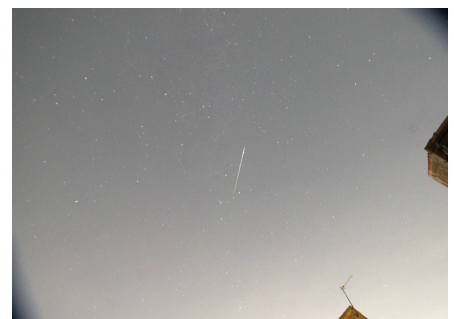
That observing session in the late hours of 12th and the early hours of the 13th August was probably one of the best observing sessions I have been to. As soon as it was dark enough, I began snapping away. I chose a 15-second exposure time, that way I would avoid any noticeable trailing of the stars, as these images were unguided. I took images of Perseus and Cassiopeia region in the hope of catching a Persied. There were a number of sporadic meteors that I missed, both visually and photographically (being pointed in the Perseus and Cassiopeia region of the sky). I did manage to capture something with my Canon camera. There was a feature, just below Cassiopeia, there was a



A possible Persied? Or, more likely, a satellite trail imaged below Cassiopeia.

Image Credit: Anthony Southwell

I remember being up at the Observatory for a Perseid meteor maximum watch in August 1989, with Neil Breakwell, Mike Dumelow, Mike Lancaster and John Holmes. We were sitting on the observing deck, the observatory dome was yet to be built and installed, so we had a complete 360 degree view of the sky. I remember that there were a lot less satellites in the sky then, now, some 40-odd years later, the sky is nearly full of them. It is a sad state of affairs, not only do we have to combat light pollution, we now have to deal with the visual intrusion of satellites spoiling our view of the night sky as well. This issue affects amateur and professional astronomers alike and



A striking image of a Persied taken by Dave Selfe from his backyard.

Image Credit: Dave Selfe

few shots of Ursa Major over the Observatory dome and they looked very good, so I followed suit and I got some good shots. In these series of images I captured, not just Ursa Major, but a satellite and a plane going 'through' the constellation, whilst I was imaging it. All in all the Persied maximum meteor watch was a complete success and the weather was kind to us. There is nothing better than going to a 'dark' sky site and watching the Persieds.

Anthony Southwell

DDAS Brecon Beacons Camping Trip 12th – 14th September 2026



The DDAS at the Aberbran Fawr Campsite.

Image Credit: Anthony Southwell

September once again saw a group of us travelling to South Wales to the Aberbran Fawr Campsite, which is three miles from the town of Brecon, in the Brecon Beacons National Park.

There were four of us who made the trip this year, myself, Mike Dumelow, Mike Lancaster and Brian Dodson. Mike Lancaster did not stay at the campsite, as he had rented a small cottage for the week, just down the road from the campsite. Brian had brought his caravan and Mike Dumelow, who I travelled to campsite with, towed a horse trailer with him and that was to be his accommodation for the trip, he had fitted it out with a sleeping place, a kind of a bunk bed arrangement and below that he had a storage area for his camping supplies and equipment and one of his telescopes that he had brought with him.

I had brought my Trespass four man tunnel tent, I have had this tent for about 11 years and it has only been used twice, both during events at Whistlewood Common in Melbourne, which the society was involved in. It is a huge tent with an interior sleeping area, which is isolated from the outer tent structure and it has a porch area with an associated ground sheet which you have to attach, so there is plenty of room for your camping kit and supplies. This tent, due to its size is a difficult exercise in tent 'construction' shall we say. It is a nightmare to put up and take down by a single person, as I found at Whistlewood, much to my fellow DDAS members amusement.

So, with this in mind, last year, my first time at the Aberbran Fawr campsite, I had bought a three-man pop-up tent, it had a frame which you deployed and the tent would 'pop' out and deploy, but it did not have a porch, so I had to put all my gear inside the tent, so there was not much room in for me and the door was quite low. My Trespass tent porch area was tall enough to let me stand up. This pop-up tent caused much amusement amongst my fellow DDAS campers back in 2025, especially when watching me enter and exit it. So this year I decided to use the Trespass tent.

Myself and Mike arrived at around 6:30 pm, Brian, who had arrived the day before was set up and was in his caravan with Mike Lancaster having a cuppa. Mike Dumelow parked his horse trailer and then gave me a hand to get my tent set up, Brian and Mike came out of the Caravan to lend a hand as well.



Anthony Southwell's tunnel tent.

Image Credit: Anthony Southwell

I got the tent out of its bag, the outer 'skin', the inner sleeping compartment, ground sheet for the porch area, tent poles and pegs. I laid the outer shell on the ground and we pulled it taught and pegged it out ready to put the tent poles in place, when I realised that we may have the outer tent upside down, so we turned it over and tried again, only to discover that we were right in the first place, so we turned it over again! All this was done in the rain, which

continued for the entire night. Once I had the tent sorted out I got my camping gear out and sorted out my sleeping arrangements and got my evening meal cooking on my camping stove, ah, the glamour of the camping life!



The River Usk which flows next to the campsite.

Image Credit: Anthony Southwell

After I had eaten, myself and Mike Dumelow took up Brian's invitation to visit his caravan and we spent the rest of the evening chatting away. There was not much observing done as it was raining and it was quite windy. I decided to call it a night at around 10:30 pm, so I returned to my tent and settle down for the night, which was going to be eventful. The weather was awful, the rain, was not constant, it seemed to come in episodes of heavy rain, and then to slack off for a while, and then come back at full force, the wind did the same thing. Laying there in my tent listening to the rain lashing at it, sounding like a thousand small drums and, the tent, shaking like it was being rattled by a giant hand, I was really pleased that we had properly tensioned the guy ropes, as the tent seemed to cope with the conditions. But there was to be a problem, I didn't sleep much due to the weather and my sleeping mat was making me feel like I was going to roll off it. I decided at 3 am to go to the toilet, which meant a short walk to the onsite toilet/shower block, so I got dressed and put my walking boots on. It had stopped raining at this point, so I had a window of opportunity to stay dry on my journey to and from the Loo. I unzipped the door to the porch area, torch in hand, and, it was then that I saw it; I had Lake Superior in my Porch area! It was like a swimming pool. I was taken aback. What is going on? I decided to sort it out in the morning.

So morning came and I got up at 7 am and moved all my stuff out of the Porch and detached the ground sheet and carefully pulled it out and turned it over to get rid of the accumulated water. I decided not to put it back in case it rained again. The problem, as it turned out, was that some parts of the ground sheet jutted out from the outer skin of the tent and the rain ran down the fabric and into these areas and made its way into the Porch and once there produced my lovely 'indoor lake.'

Once that task was completed I put everything back in the Porch and got some bacon butties sorted. The itinerary for the day (Sunday 14th) was to pick up Mike Lancaster and we all spend the day in Hay on Wye, the 'book town' and the venue for the long-running literature festival, which is held each May.

We had a good day walking around the bookshops, including the Cinema Bookshop, which, as its name implies, was once a Cinema, it is huge! I bought a book on the history of Derbyshire which was published in 1883, I love vintage books. We also visited Richard Booth's book shop, which is equally as big. Richard Booth is the person who started the literature festival that has put Hay on Wye on the map. We all bought some books, at the end of our visit; I had bought 10 books, both second hand and new. There were a lot of astronomy and spaceflight books in my purchases obviously. Hay on Wye is a brilliant place, the books shops are great, not all were open as we visited on a Sunday and we stopped off at two cafes during the day to have a coffee and a bite to eat. Hay on Wye is a brilliant place, the people are nice, both locals and visitors and it is clean, I have never seen any scrap of rubbish anywhere on both my visits there, I thoroughly recommend that you visit Hay on Wye, you will not be disappointed.

The weather was overcast and it was a bit drizzly in the morning, I had brought my Celestron solar binoculars and photographic tripod with me in the hope that I could do some solar observing, as it turned out, they were not going to be needed. It was still quite overcast when we got back to the campsite. We went back to our respective 'homes' and got an evening meal going. Mike Lancaster joined us in Brian's caravan and we spent the evening having a pleasant conversation. The weather was still overcast and drizzly and around 11:30 pm Mike Lancaster said that he was calling it a night, so we all went outside to see Mike off and the clouds were beginning to break, not enough to get any equipment out to observe. Mike left and myself, Mike and Brian stayed outside and kept watching the sky. It was starting to clear up, Brian mentioned that the campsite owner said to him that next year he could make the bottom field available to us as it is a darker area and is shielded from the light of the rest of the campsite and the toilet/shower block. Brian expressed an interest in taking up this offer next year.

Brian suggested that we take a walk down to this field to have a look, by this time the sky was almost completely clear and when we got to the field, what I was to see, blew me away. I looked up and I have never seen a night sky like it. I was mesmerised by the sight, the sky was literally full of stars, so many, that for a time, I got lost; I found it difficult to navigate from one constellation to another! And the Milky Way, oh, the Milky Way! It was a bright band of starlight stretching across the sky. The sky was so good in that field that you could easily make out the dust lanes in the plane of the Milky Way. At the Flamsteed Observatory you can see these features, but you must look for them, as they are not as prominent due to the surrounding light pollution, it could also be my eyes, I am not getting any younger.

There were so many stars, they seemed to 'pop' out at you and the Milky Way was a sight to behold, I wish I had the presence of mind to bring my Canon EOS 1200D camera and my tripod with me to record this absolutely stunning sky, but I did not, they were still packed away unused, which is a bit ironic as I had purchased two spare battery packs for the camera so I would have enough power for all the images of the night sky I was going to get. That field is where we should be setting up next year and, if the weather gods are kind, we will be rewarded with one of the best views of the sky that many of us have seen, that is certainly true for me.

I highly recommend going to this campsite, it is a lovely spot, the River Usk flows next to the campsite. Once you set up, depending on when you arrive you can go off and explore for the day, hike around the Brecon Beacons, visit the town of Brecon itself or pop to Hay on Wye, there is plenty to see and do in the area, much more than I can list here. Come along next year, you won't regret it.

Anthony Southwell

Articles

In the Footsteps of Hubble and Webb – The Nancy Grace Roman Space Telescope

– Anthony Southwell



The launch of the Nancy Grace Roman Space Telescope from Kennedy Space Center, Florida on 30th August 2026.

Image Credit: Wikipedia

proposal cited higher priorities for NASA, such as the manned space programme and the Artemis Lunar Programme. The proposed 'defunding' of the spacecraft was met with criticism by professional astronomers, who noted that the US astronomical community had given WFIRST the highest priority space mission status for proposed mission launch for 2025. The American Astronomical Society (AAS) expressed its "grave concern" at the proposed 'cuts' to the funding for this mission.

The US Congress agreed with the criticisms raised and, approved a fiscal year 2018 increase in funding for the spacecraft, which was in excess of NASA's request for that year. The White House signed off on that request on 23rd March 2018.

On 2nd March 2020 NASA announced that it had approved WFIRST to proceed to implementation, the development cost rose to \$3.2 billion (expected figure), with a maximum cost of \$3.9 billion, with five years of science operations planned into that cost.



Nancy Grace Roman (1925 - 2018)

Image Credit: Wikipedia

On the 30th September 2026 NASA launched its next 'Great Observatory,' the Nancy Grace Roman Space Telescope atop a SpaceX Falcon Heavy launch vehicle from Launch Complex 39A at Kennedy Space Center in Florida.

The telescope was proposed in 2010 as part of the US National Research Council Decadal Survey. The project was approved for development and launch in February 2016. The spacecraft was originally known as the Wide-Field Infrared Survey Telescope (WFIRST), and also, the Joint Dark Energy Mission (JDEM) as it shared some design features for the Joint Dark Energy Mission Proposal between NASA and the Department of Energy (DOE).

In 2012, the National Reconnaissance Office (NRO) offered NASA a spare 2.4 metre (7.9 foot) primary mirror for the WFIRST telescope project, which helped the development and construction of the telescope.

In February 2018 the first Trump administration proposed a fiscal year 2019 budget that would have delayed the funding for the telescope, the



The Nancy Grace Roman Space Telescope.

Image Credit: Wikipedia

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On 20th May 2020, NASA Administrator, Jim Brindenstine, announced that the telescope would be renamed the "Nancy Grace Roman Space Telescope to honour Nancy Grace Roman, who was the former NASA Chief of Astronomy. Nancy Grace Roman (16th May 1925 – 25th December 2018) was an American astronomer who made important contributions to stellar motions. She was invited to join NASA in 1959 as the head of observational astronomy. She created NASA's space astronomy programme. She then became Chief of Astronomy and Solar Physics at NASA from 1961 to 1963.

She became known as the “Mother of Hubble,” as she played a pivotal role in the planning for the Hubble Space Telescope (HST).

Development and Construction of the telescope was affected as a result of the COVID-19 pandemic of 2020, which put an extra \$400 million on development costs. It was hoped to have the telescope completed by 2024 with a planned launch date of no later than May 2027.



The Nancy Grace Roman Space Telescope during assembly.

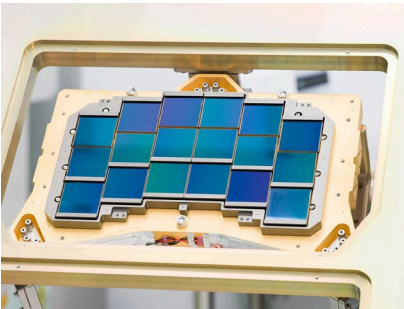
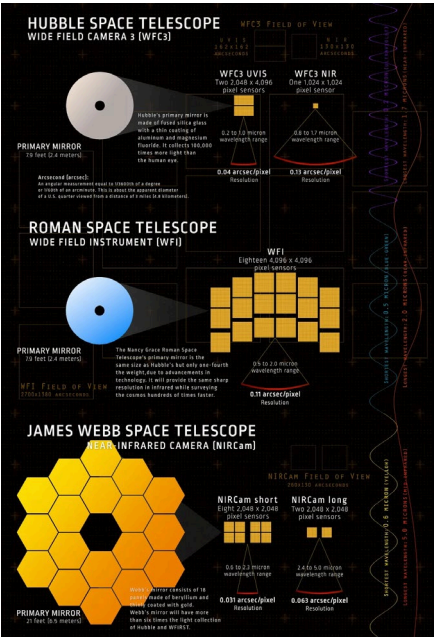
Image Credit: Wikipedia

In September 2024 the telescope bus, the main structural component of the telescope was largely complete, in December the instruments and the mirror was successfully integrated into the telescope. Then, in April 2025, the second Trump administration put forward a proposal to cut funding for the Roman Telescope again, as part of its Fiscal Year 2026 Budget draft. This proposal was part of a much wider series of cuts to NASA’s science budget, from its Fiscal Year 2025 value of \$7.5 billion to \$3.9 billion. This plan would cancel dozens of space science missions and cut funding and staff of a number of NASA centres, such as the Goddard Spaceflight Center in Maryland (where the Roman Telescope would be operated and managed from - Editor). On 31st May 2025 a revised budget was released and it did not include the cancellation of the Roman Telescope.

On 21st Jun 2026 the completed telescope arrived at the Kennedy Space Center (KSC), Florida, to begin final preparations for launch atop a SpaceX Falcon Heavy launch vehicle. During final integration operations at KSC, a commemorative plaque was attached to the telescope which contained a

memory card that held 1,350,144 names submitted by people worldwide as part of a NASA public outreach programme.

The telescope itself comprises of a 2.4 metre (7.9 foot) primary mirror which has a wide field of view. The telescope has two main instruments. The first is the Wide Field Instrument (WFI). This is a 300.8 megapixel multi-band visible and near-infrared camera, providing image sharpness comparable with the Hubble Space Telescope. Roman’s field of view is 100 times as much as Hubble’s. During its 35 years in operation the Hubble Space Telescope has produced 400 terabytes of data. Roman, on the other hand, is expected to generate roughly 500 terabytes of data per year. Here is an example of what Roman’s WFI camera can do, say, the mapping of M31 in Andromeda. Hubble would require hundreds of hours and years of planning to stitch together the collected images. The Roman Telescope can do that same job in about 100 hours, using just 14 combined image tiles to cover the entire galaxy. Another example, sky surveys, mapping 12% of the sky would take Hubble roughly 17 to 20 years to finish. The Roman Telescope is expected to finish such a task in just 17 months.



The Focal Plane of the Wide Field Instrument camera.

The second instrument is the Coronagraph Instrument (CGI). This is a high contrast coronagraph covering shorter wavelengths (575 nm to 825 nm) using dual deformable mirror starlight suppression technology.

The Nancy Grace Roman Space Telescope during Primary Mirror and Camera system comparison with the Hubble Space Telescope (HST) and the James Webb Space Telescope (JWST).

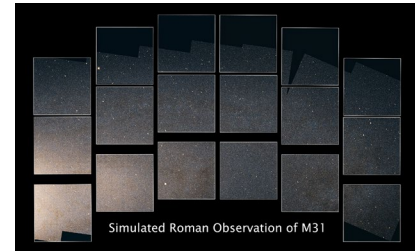
Image Credit: Wikipedia



The Coronagraph Instrument (CGI) colour filter assembly.

Image Credit: Wikipedia

The intention is to achieve a part-per-billion suppression of starlight that will enable the detection and spectroscopy of planets with a visual separation of as little as 0.15 arc-seconds from their host stars. This will be Roman's exo-planet hunting instrument. The Coronagraph Instrument (CGI) is included on the Roman Space Telescope as a technology demonstrator for an exo-planet imaging instrument for a large future telescope, such as the Habitable Worlds Observatory (HWO).



A simulation of a WFI image following an observing run.

Image Credit: Wikipedia

Science Objectives

The Roman Telescope's science objectives aim to address questions in the fields of Cosmology and Exo-planet research, which include:

- Answering the basic questions concerning Dark Energy, which will be complementary to the European Space Agency's (ESA) Euclid mission (which launched on 1st July 2023 – Editor). Questions such as; Is Cosmic Acceleration caused by a new energy component or by the breakdown of General Relativity on cosmological scales? If the cause is a new energy component is its energy density constant in space and time, or, has it evolved over the history of the Universe?

Roman will use three methods to answer these questions:

1. Baryon Acoustic Oscillations
2. Observations of distant Supernovae
3. Weak Gravitational Lensing

- Completing a census of Exo-planets to help answer new questions concerning the potential of life in the Universe. How common are star system like the solar system? What kinds of planets exist in the cold, outer regions of planetary systems? What determines the habitability of Earth-like worlds?

Gravitational Microlensing method will be used to and could find exo-planets down to a mass of only a few times that of the Moon. This exo-planet search could also include 'free-floating' planets (planets that are not part of a star system) with masses likely down to the mass of Mars. The CGI will provide for a direct imaging method that will, for the first time, provide the first direct images and spectra of planets around the nearest stellar neighbours, such as gas giants.

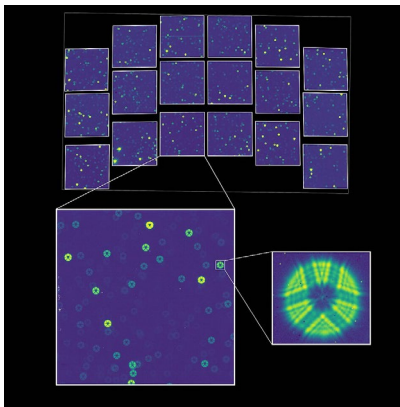
Finally, the detection of primordial black holes.

The Mission

The Nancy Grace Roman Telescope was launched on 30th August 2026 and it is headed to orbit the L2 point some 1 million miles away from Earth, the same point in space where the James Webb Space Telescope is located. It will take three months for the Roman Telescope to reach L2, during that time it will deploy and switch on various systems and instruments and will go through all of the calibration procedures to get it ready for its working life. We should get the first science images back in December.

The mission timeline thus far is as follows:

- 30th August 2026 Launch, Launch Complex 39A, Kennedy Space Center, Florida. Once in space the spacecraft's solar panels and communications were established with the telescope.
- On 31 August 2026, the telescope performed a 3-minute mid-course correction burn.
- On 1 September 2026, the telescope's antenna and sunshade successfully deployed and the Coronagraph Instrument was activated. The telescope then entered a 90-day commissioning phase. It is expected to reach L2 after approximately 100 days or early December.
- On 14 September 2026, NASA announced that the telescope has fuel for at least 22 years of scientific operations, the planned mission duration was for five years.
- NASA announced on 15 September 2026, activation of Wide Field Instrument (WFI) and stretched the Coronagraph instrument limbs after it was activated two weeks ago.
- On 25 September 2026, NASA announced all ground stations were receiving data from the telescope. This included ESA's Australia ground station, JAXA's Misasa deep space station and NASA's Near Space Network in New Mexico.
- On 30 September 2026, NASA announced the guidance system was tested successfully and the Coronagraph took its first observation.
- On 14 October 2026, NASA announced that it had checked out the WFI and sharpened the telescope's focus. The WFI has an error of 63 nanometers RMS (Root Mean Square) against the expected 90 nanometers RMS, resulting in a 30% better performance than predicted by the Roman team.



So, for now we have an operating space telescope on its way to its place of work and, I am looking forward to seeing what the Nancy Grace Roman Telescope will show us.

The first test image from the Nancy Grace Roman Space Telescope using the Wide Field Instrument (WFI). This image was produced on 15th September 2026.

Image Credit: Wikipedia

Observing Mercury with Binoculars – Safely! – Jim Sarsgard

Of all the classical planets, Mercury is the most difficult to observe. It has been estimated that only one person in 2000 has (knowingly) seen this innermost planet. Copernicus noted that from his observatory on the misty Vistula River he saw it “rarely”.

Mercury can be observed near the horizon with binoculars or naked eye at “windows of opportunity” during its brief evening or morning appearances. The time to look is within a few days of its maximum eastern elongation (seen in the west in the evening) or maximum western elongation (seen in the east in the morning), when Mercury’s angular separation from the Sun is at its greatest.

Because this separation from the Sun is never more than 28 degrees and can be as little as 18 degrees, we must take important safety precautions before scanning the sky. **NEVER** scan for Mercury while any part of the Sun is above the horizon! To be safe, follow the thirty minute rule : In the evening, do not search the sky until thirty minutes past the time of sunset. In the morning, don’t observe within thirty minutes of the time of sunrise. Times of sunrise and sunset can be obtained from Timeanddate.com or from the BBC weather app.

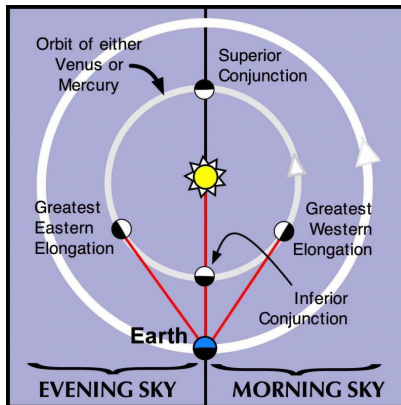


Diagram explaining Mercury's Eastern and Western elongations.

Image Credit: Wikipedia

Mercury's synodic period is 116 days. That is the time it takes to go from one of its phases to the repeat of that same phase. There are three evening elongation phases and three morning elongation phases in a calendar year. In some years there is an extra one, either evening or morning. Nakedeyeplanets.com lists these events with dates of maximum elongation, degree separation of Mercury from the Sun, constellation location, and whether observing is more favourable from the Northern or Southern hemisphere

But not all elongations are equal. For Northern Hemisphere observers spring evenings are much better than autumn evenings. This is because the ecliptic, the path followed by the planets, is at a much steeper angle to the horizon spring evenings. It is just the opposite for morning observing. Autumn mornings are much better than spring mornings. As a memory aid, remember SEAM : Spring Evenings, Autumn Mornings (are best). SEAM applies also to observing the Moon, Venus, and any other planets which are near to the horizon.

Now we know when to look, but where? You will need an observing location which has a relatively unobstructed western horizon (evenings) or eastern horizon (mornings), your back garden or a local park?

Use a planetarium app like SkySafari or Stellarium. With the app showing the sky at observing time (around 45 minutes after sunset or before sunrise), click on the Mercury icon. Lots of information will appear, including the planet's azimuth and altitude (which is constantly changing). Azimuth is the bearing of an object around the horizon, with North equal to 0 degrees, East 90 degrees, South 180 degrees, and West 270 degrees. Use your phone's compass app or an analogue compass to find the indicated azimuth on the horizon. Altitude can be gauged by your clinched fist extended to arm's length, which shows 10 degrees of elevation.

Now (at least thirty minutes after sunset or before sunrise), scan that area with binoculars. Hopefully you will see a star-like object, of first or zero magnitude in brightness, orange-ish or pink in colour. Once you've picked it out with optical aid, you may be able to see Mercury with bare eye. Congratulations. You are now among a small company of people who have seen this elusive planet.

Book Review

First Light: Switching on Stars at the Dawn of Time by Dr Emma Chapman –

Brian Dodson

ISBN 978-1472962942 Published by Bloomsbury Sigma
£16.99 (Hardcover) £10.11 (Paperback)

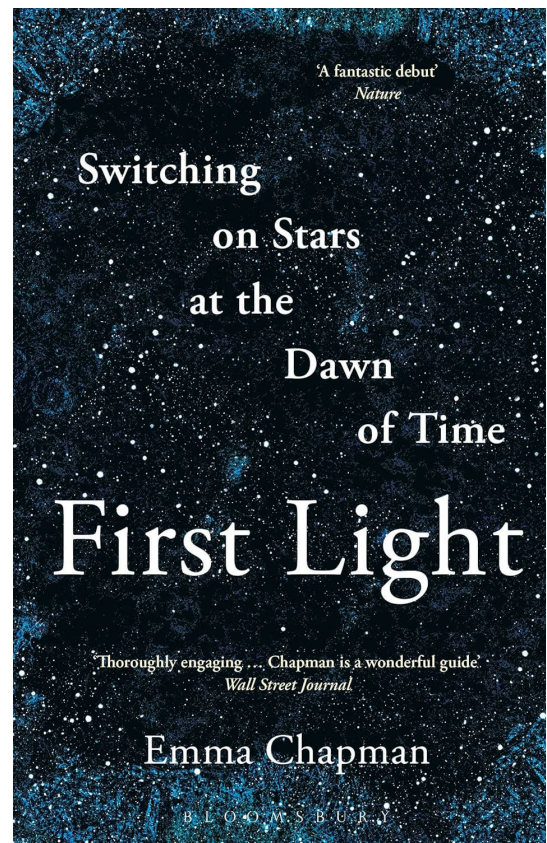
Isn't life funny? When I first started to get interested in astronomy, there was a news report about a breakthrough in cosmology. I told a friend at the time that I wasn't really interested in knowing everything there was to know about the universe. "Some things should be left to the imagination" I said. All I was interested in was looking at the wonder of it all. Here we are, just a mere 15 or so years later, having spent 10 of those years as secretary, booking some wonderful speakers, covering a wide variety of subjects and I now find myself thirsting for more and more.

One of those wonderful speakers was Dr Emma Chapman from the University of Nottingham, who visited us in 2023. Those of us lucky enough to be there will remember how enthusiastic Emma was about her chosen career path, searching for the first stars in the Universe.

In her book, although published in 2020, she illustrates how frustrating this can be, and still is, something on the tip of your tongue, but you cannot for the life of you remember what. The book, isn't simply about techniques used to find the first stars, but goes through the process of explaining the Universe from the birth of a star such as our own and the processes it will go through until its demise a few billion years in the future, the development of galaxies, Black Holes and the difference between Population 1, Population 2 and Population 3 stars. How Dark Matter plays its part and how detecting 21 cm wavelengths of light from neutral hydrogen in dwarf galaxies is probably the best bet for finding these elusive stars.

Do not be fooled, this is not merely a catalogue of means and methods, Emma explains each chapter with great ease, she uses analogies to explain some things she thinks may be difficult to grasp and after each chapter she summarises what has been discussed, making the whole thing very readable and understandable, and if I can say that, it must be easy. Don't get me wrong, I am at that age now, when new information tends to push other stuff out the other side, so my children have been warned! There is a lot of information in the book and I for one will need to read it at least once more to make sure I'm retaining it all. But I now find myself looking out for those snippets of news that, not so long ago I had been avoiding and hoping that I'm around when such a discovery is made.

To summarise; A very well written and enjoyable read that doesn't tax the mind, (too much) and I highly recommend you add it to your Library.



The front cover of First Light by Dr Emma Chapman

Image Credit: Internet Source

Space Oddities by Harry Cliff – Malcolm Neal

ISBN 978-1529092868 Published by Picador £18.99

Harry Cliff is a particle physicist at Cambridge University and is one of the many people working at the Large Hadron Collider in the LHCb team. He has also been a contributor on BBC science programs. And he has written other books on the theme of particle physics in the popular genre.

The book is as its title suggests about oddities, though not much connected to space, but how those odd happenings have helped the progress of science in making major and minor discoveries and also how those same oddities have lead to some blunders which were more than a little embarrassing for those people who made them, but he is polite enough not to actually name them. However, it would not take much of a search on Google to find their names.

It is a fairly slim hardback book of some 266 pages divided into ten chapters which are quite varied in the subject matter. Most of which cover aspects of his speciality which is Particle Physics and a few others are at the other size extreme that of Cosmology. Thankfully there is no detailed mathematics in the book, which I almost certainly would not understand anyway, but the explanations are lucid and clear.

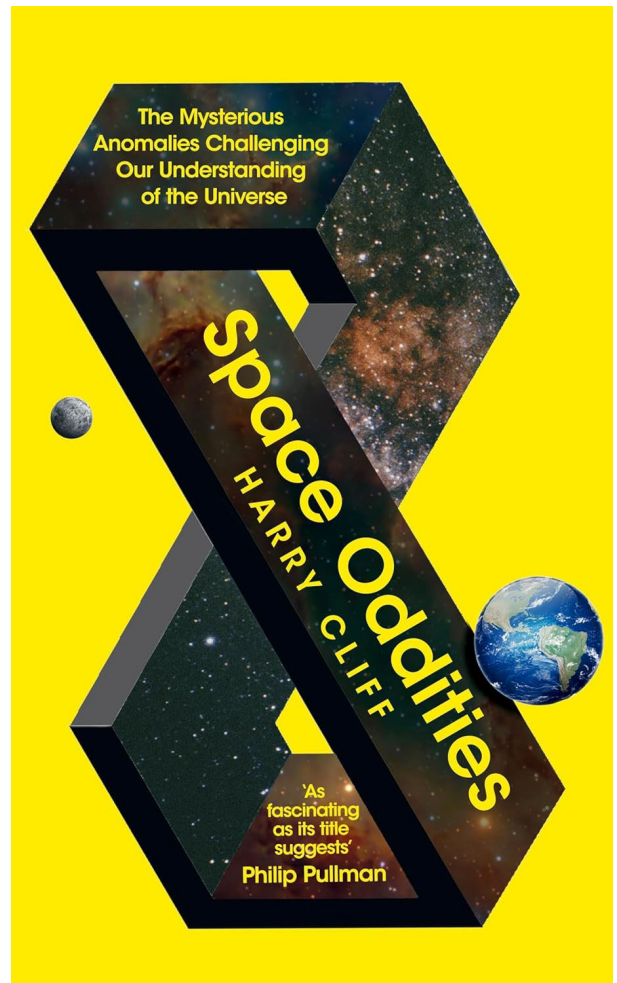
The first mind boggling idea, to me anyway, is that atoms and their components are not as I thought. I had got the idea that an atom is not like a mini solar system but that electrons were in a position that was statistically predictable but could not be tied down. However the book describes all such structures / items as ripple in the quantum field and it seems from atomic components upwards to the largest structures in the universe everything is a ripple or a collection of ripples in the all pervasive quantum field. This idea seems to hark back at least as an idea to the Cartesian Vortex Universe propounded by Descartes, though of course there was no mathematics to back it up and has since been replaced several times by other more provable ideas. Was the idea of “the ether” as a universe filling substance which allowed the transmission / propagation of electromagnetic forces and / or gravitational forces so different???? This is mentioned as somewhat tongue in cheek!

Most chapters are relatively short but two are over 50 pages long and for me, need to be read several times before the ideas became clearer. No doubt if you have a modern physics degree some of these theories / ideas are not new.

Rather than mention the subject matter of other chapters let me just say this is a fascinating read but possibly some chapters of which need to be read at least a couple of times before some of the ideas sink slowly into the mind with any level of comprehension.

The book begins with an Isaac Asimov quote and I will end with it:

“The most exciting phrase to be heard in science which often heralds new discoveries is not ‘Eureka’ but “That’s funny ...”



The front cover of Space Oddities by Harry Cliff

Image Credit: Internet Source

Aries is published by the Derby and District Astronomical Society

Editor: Mr Anthony Southwell

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If a submitted article is too large to be included in one issue of Aries, the Editor reserves the right to split such an article into two parts.

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