

# 7 January 2022 Meeting Report

January 8, 2022

We opened our programme for 2022 with a return to on – line meetings as a protective measure due to the prevalence of the new Omicron strain of Coronavirus.

We had a good audience on Zoom as well as through our YouTube channel, with members and visitors enjoying a fascinating talk by Rebeka Higgitt of National Museums Scotland, on “Nevil Maskelyne and the global projects of 18th-century astronomy”.

We learned of the enormous contribution of Nevil Maskelyne who rose from relative obscurity to become Astronomer Royal for 46 years at the Royal Observatory in Greenwich. As Rebekah pointed out, the position of Astronomer Royal was more about refining the measurement of astronomical phenomena than simply stargazing.

These improvements in measurement, techniques and instruments were all directed towards the great projects of the 18th Century – establishing distance in the Solar System and in the Universe through parallax, finding longitude at sea and establishing the shape and size of the Earth. Of course the pursuit of knowledge for it’s own sake also played a part.

A gifted observer and mathematician, Maskelyne was a driving force in the great expeditions to observe the transit of Venus from different points on Earth and in the operations of the Board of Longitude, which had such a profound legacy for accurate navigation at sea and the birth of Britain as a great maritime power. His own regularly published “Greenwich Observations” and “Nautical Almanac” were in themselves a tremendous practical contribution by science to the daily life of the nation.

Alan Pickup followed the main talk, giving his usual expert insights into “The Sky in January”. This presentation is a really indispensable opener for the month, alerting us to the major events, sights and opportunities

for photography and observation in the night sky during the coming month.

After this, our own Will Joy took us through the results of his Meteor “Right” and Meteor “Wrong” competition in which he had asked members to correctly identify meteorite samples he had shown in his presentation from last year.

Objects 4 and 1 were meteors.

And finally, our President took us through the 14 entries for our newest feature, the Image of the Quarter”, and announced the winner of the first competition – Fran Goodman, who won with her evocative night scape entitled “The Hunter Rises”. As Mark commented, Fran’s image of the constellation of Orion rising above the tree line, really captured the wonder of the night sky, which is why we all do what we do.

You can see all the entries in this [PDF document](#)

*Nigel Goodman*



# Back to physical/hybrid meetings

January 20, 2022

Due to the lifting of restrictions, from our [next talk on 4 February](#) we will be back at the Augustine United Church (AUC), George IV Bridge Edinburgh, as well as streamed online. We hope to see as many of you there as possible.

The Scottish Government is [lifting restrictions](#) on indoor events from 24 January. The AUC is a large building so chairs will be well spaced out so that you can continue to keep your distance if you want to.

From the [Scottish Government website](#):

*From 24 January:*

- *there will be no limits on attendance at indoor public events*
- *there will be no requirement to have physical distancing between different groups in indoor public places*

We hope that there will be no more restrictions and that our normal pattern can continue:

- normally the first Friday of each month will be hybrid – at the AUC and online
- the second meeting will be a Friday in the middle of the month and will be ONLY online

As always, any ASE members who can't make it can join us via Zoom and visitors are always welcome to join us on our YouTube channel.

# 21 January 2022 Meeting Report

January 22, 2022

What an excellent and clearly explained talk we had from Dr Elizabeth Stanway on “Building galaxies one star at a time”.

Watch the video if you missed it.

# The Banks Transit Table and Telescope

January 23, 2022

I recently took this instrument out of storage to check on its condition and thought it would be useful to members to produce a short paper on what we know about it.

The background to the Society's ownership if that was bequeathed by a former president, John W Sinclair, to the ASE on the 4th August 1940.

A plaque attached gives the details.

BEQUEATHED TO  
THE ASTRONOMICAL SOCIETY OF EDINBURGH  
BY  
JOHN W. SINCLAIR  
PRESIDENT 1936-37  
Died 1940 AUGUST 4

The telescope is 1.5" aperture and 14" in length. It is illuminated by a spirit lamp attached to the side allowing the light to shine through the axis of the scope via a small glass window. Although no Crosshairs are visible through the eyepiece, it is likely that these were made from spider web 'silk', a common practice at this time. As such they would have perished sometime ago. (*For more information on the use of this material see <https://adsabs.harvard.edu/full/1992JATSo...1...10T> )*

There are vernier thumbwheel adjusters and eyepieces to move and read the vernier scales on the circle and the table. A lower eyepiece is missing and its holder broken. A spirit level on top of the telescope allows the table and telescope to be levelled. The brass work is tarnished but could be cleaned and the NMS has been contacted for advice about this.

The mahogany box has two carrying handles and is 13.5" x 13.5" x 23"

The maker, Robert Banks, has signed the circle as 'Banks of London'

Rebekah Higgitt of NMS noted that: *Gloria Clifton's Directory of instrument makers has Robert Bancks 1796-1831 based on the Strand and Piccadilly as an optical and mathematical instrument maker and known to have sold telescopes and theodolites. The business became Robert Bancks & Son 1831-1834, based at New Bond Street.*

Brian Stevenson on his [work on Robert Bancks](#) says:

*Robert Bancks (also written "Banks") was a well-regarded manufacturer of microscopes and other optical and scientific instruments. He was designated Mathematical, Optical, and Philosophical Instrument Maker to George, the son of King George III, who was Prince of Wales (until 1811), Prince Regent (1811-1820), then King George IV (1820-1830), and also his successor, King William IV. Among Bancks other renowned customers were Charles Darwin (who took a Bancks microscope on his Beagle trip) and Robert Brown (who described "Brownian" motion).*

*Bancks is reported to have begun his shop at 440 Strand, London, in about 1795. In 1805, he moved to 441 Strand. His eldest son, also named Robert, joined as a partner during the mid- to late-1820s, forming Bancks and Son. In 1829, they moved to 119 New Bond Street. The son died there in November, 1830. The elder Bancks continued at that location, retaining the name of Bancks and Son. He evidently retired in 1834-35, and moved to a house in Knightsbridge.*

So we have an interesting and historically important instrument. I have found no other similar instruments other than one sold by Bonhams. Which has a very different construction.

Below are the images I have taken

Andrew Farrow  
Vice President ASE

# How to record an eclipsing binary transit light curve

January 27, 2022

As well as trying to take nice images of night sky objects, why not use your imaging skills to capture real science data. Perhaps not so pretty but quite mind-blowing if you think about the stellar processes going on. Here's an example of something you could try – and it's not as tricky as you might think. Create a light curve for an eclipsing binary star system.

*You can also use the same technique to get an asteroid's light curve as it tumble through space – with one additional step – see below.*

The basic process I went through is this:

1. Choose your object – probably best to choose something relatively bright and with a short period to start with.
2. Find you object – using you telescope's goto capabilities with plate solving certainly helps here.
3. Calculate the length of exposure to use to give a good dynamic range without saturating the star.
4. Take a large number of exposures (lights) throughout the transit – ideally with a V filter but full colour or mono are also fine.
5. Take darks, flats and bias as you would normally for imaging.
6. Pre-process your lights.
7. Identify your target star and one or more comparison stars.
8. Perform photometry on all your lights.
9. Graph your results.

You should [download and install AstrolmageJ](#) as this is the software we will use to automate a lot of the steps.

Here's a video showing just what's happening in a binary system and why the light curve looks like it does:

Credit: ESO/L. Cal

In more detail, some [test data](#)

### 1. Choose

There is a very u  
[Mt. Suhora Astron.](#)



ps. And here's  
ng.

nary stars: the

Pick a constellation from u. We well placed for you for some hours. Then choose a star from that page – one that is sufficiently bright for your setup and one with a short period. The star I chose is in **Cassiopeia** and the star is **V0523 Cas**. It is a **W Ursae Majoris** type of variable, also known as a low mass contact binary. The two stars are actually in contact with each other and orbit very fast!

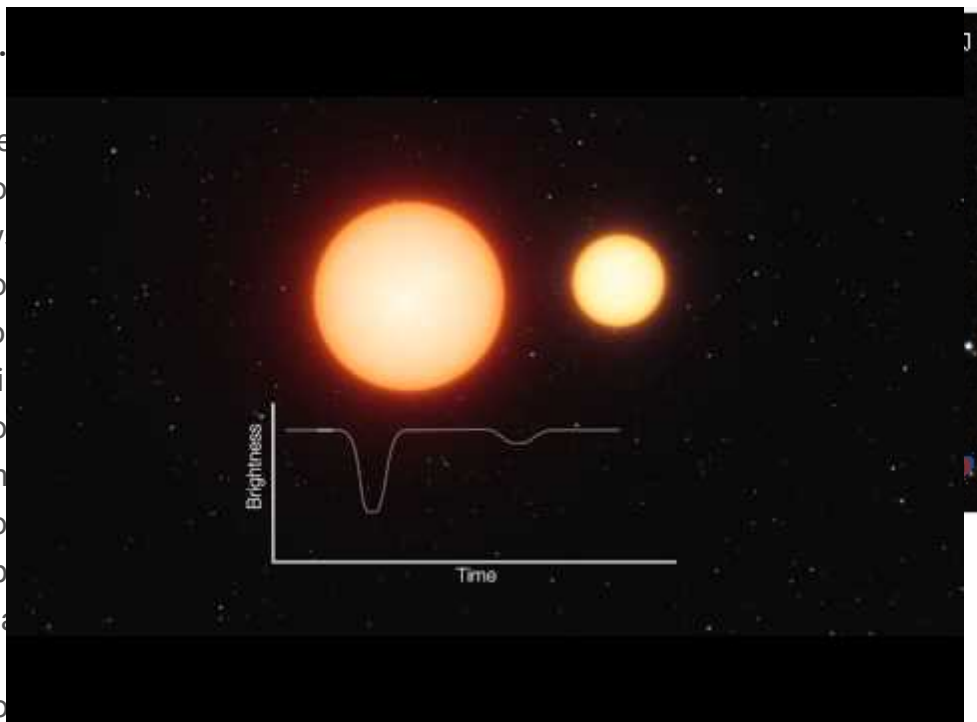
|        |                           |              |             |    |       |           |  |
|--------|---------------------------|--------------|-------------|----|-------|-----------|--|
| 180520 | <a href="#">V0520 Cas</a> | 23h 42m 7.4s | 55° 54' 38" | EW | 12.25 | 0.4898315 |  |
| 180523 | <a href="#">V0523 Cas</a> | 0h 40m 6.3s  | 50° 14' 15" | EW | 10.91 | 0.2336933 |  |
| 180527 | <a href="#">V0527 Cas</a> | 1h 2m 47.8s  | 70° 39' 2"  | EA | 11.27 | 4.860280  |  |

It has a V magnitude of 10.91 and a period of 0.2336933 days. So you should get a full curve approximately every 5.5 hours – 1 primary and 1 secondary minima.

2.

He  
co  
sy  
so  
yo  
wi  
co  
on  
co  
ab  
tha

Yo  
star.

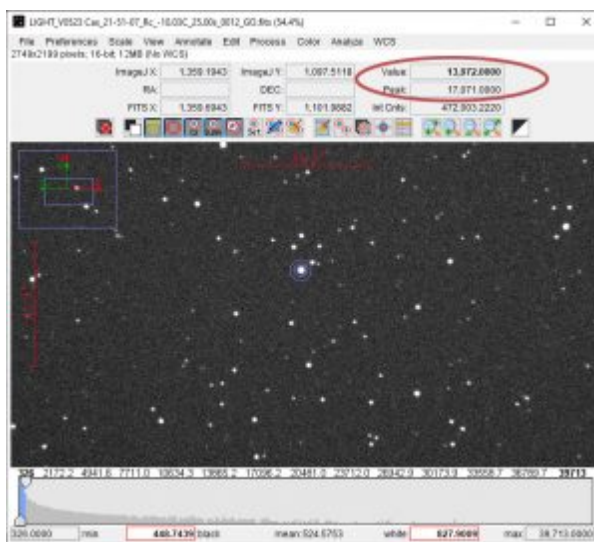


Another useful resource that we will use later is the [AAVSO Variable Star Plotter](#). With this you can create a finder chart plus a list of useful comparison stars for your object. These we will use in step 7.

Create your chart by entering the name of the star (V523 Cas without the extra "0") plus other parameters as shown:

### 3. Calculate the length of exposure

This is a bit of hit-and-miss to start with unless you know your setup well. I know that for a 10th magnitude star, a 25s exposure will not saturate the pixels but I tried 10s and 40s; each pixel will have a maximum value of 65535. You want to aim for the target star being less than three quarters of that, where your chip has a linear response. Take a series of exposures of different length, examine the target star and work out it's value. You may already have something that does this. For example NINA, Nebulosity and Siril all have this feature and others will too.



In AstrolmageJ, load the FITS file into the program and hover over the target star. The pixel value will be displayed top right. Two values are shown: the value under the cursor (13,972) and the maximum value within the apertures (17,071). So this is an OK exposure for this star – possibly aiming for a little higher would have been better. Aiming to get around 50% is ideal, but it must be in the region where your camera sensor's response is linear and you have to take into account the brightnesses of comparison stars but ideally they should be similar anyway.

## 4. Take a large number of lights

The number depends on the exposure, the length of time you want to observe, when your minima occur and which part of the curve you want to catch. Using a V filter (from UVBRI) is standard for this type of photometry but we are just after a simple curve here, so anything should do fine.

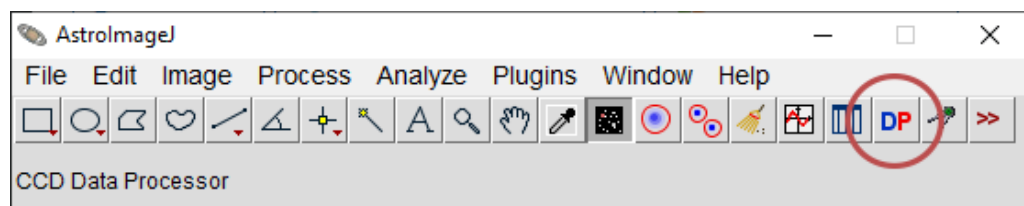
Try and keep the star as central as possible during the session. Autoguiding is ideal. Also, defocusing the star a little can give better results as the star is spread across more pixels which averages out the varied response of each pixel and also stops the star from saturating.

## 5. Take darks, flats and bias frames

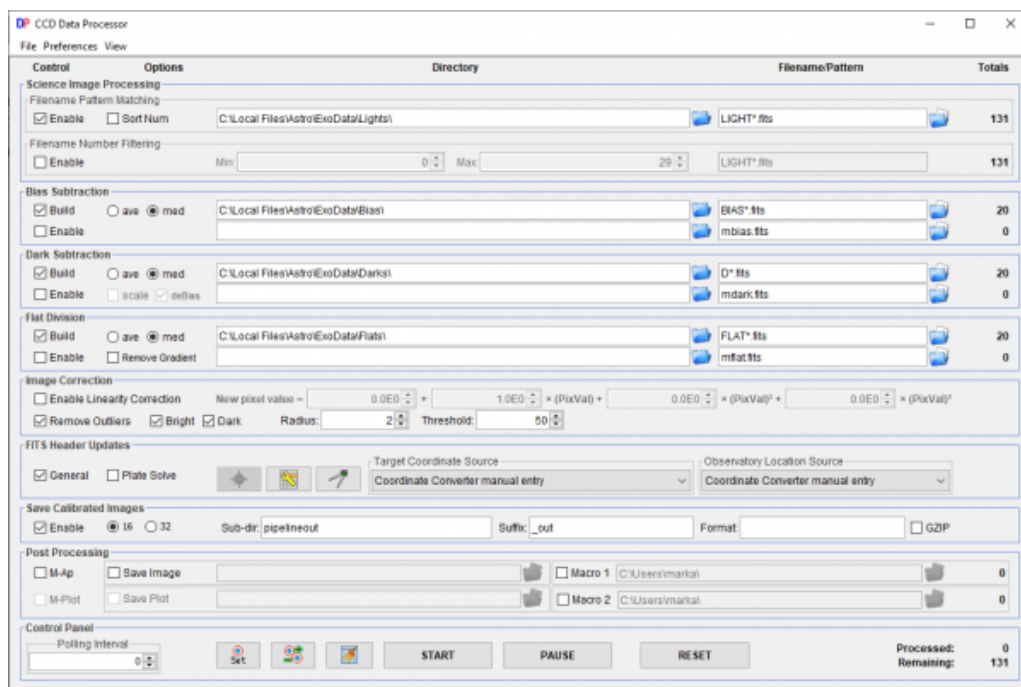
This is what you would normally do for imaging. 10 – 20 of each will be sufficient.

## 6. Pre-process your lights

Separate your lights, darks, flats and bias frames into separate subfolders for convenience. Open up **AstrolmageJ** and select the **DP button** – CCD Data Processor.



This will bring up CCD Data Processor window:



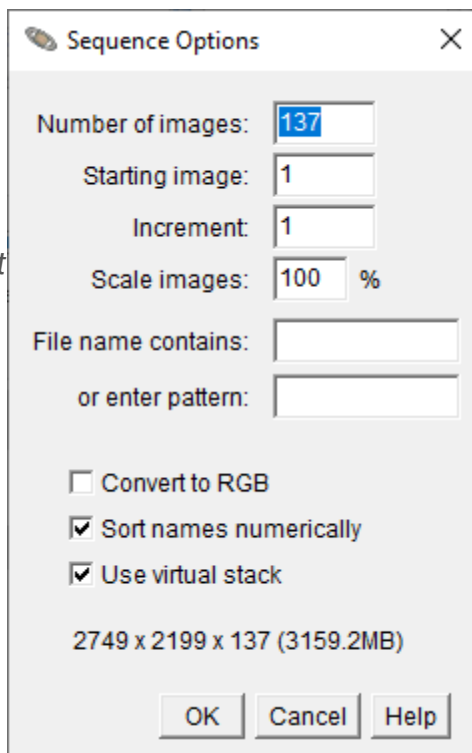
Set the folders and filename patterns for each of your lights, bias, darks and flats as shown. If you have them set correctly, the number of each type of file will be shown on the right. Click START and your lights will be pre-processed using your flats, darks and bias frames. Masters will be created and the processed lights will be placed in the specified folder (pipelineout).

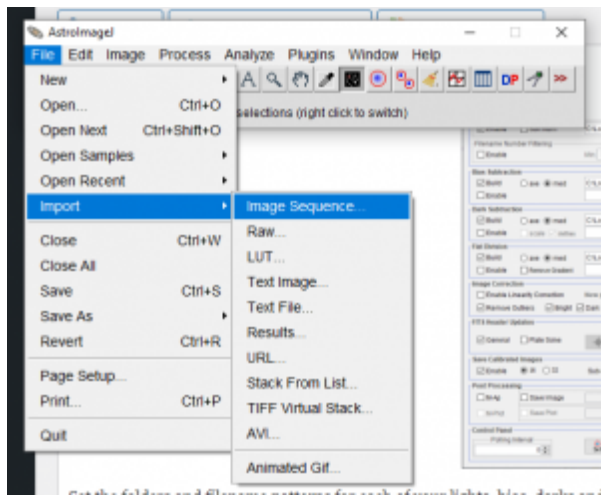
## 7. Identify your target star and comparison stars

Now we need to load up all the pre-processed images into a virtual stack. From the main toolbar select **File – Import – Image Sequence...**

Select the first image in the *pipelineout* directory.

Make sure you select **Use virtual stack**. Click **OK**.





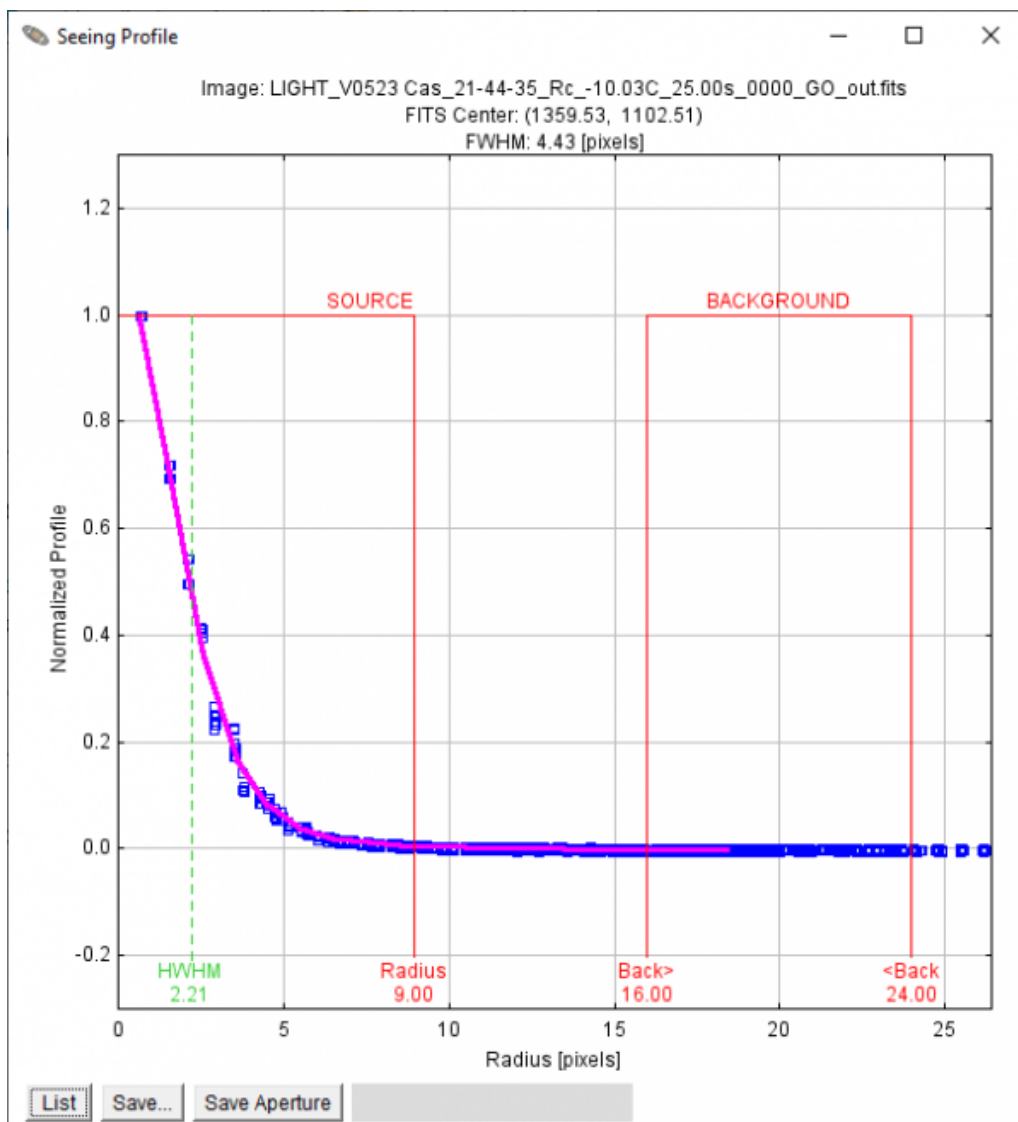
## 8. Perform photometry on all your lights

The first image in the stack will be displayed. Use the chart above to identify your target and comparison stars. You can use **View – Invert X / Invert Y** to get the

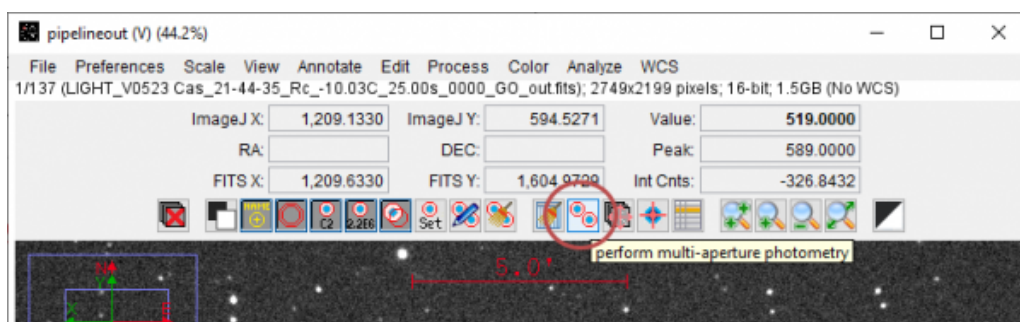
image to look the same as the finder chart above.

First you need to identify the size of apertures to be used for the photometry. You can zoom in and out using your mouse scroll wheel.

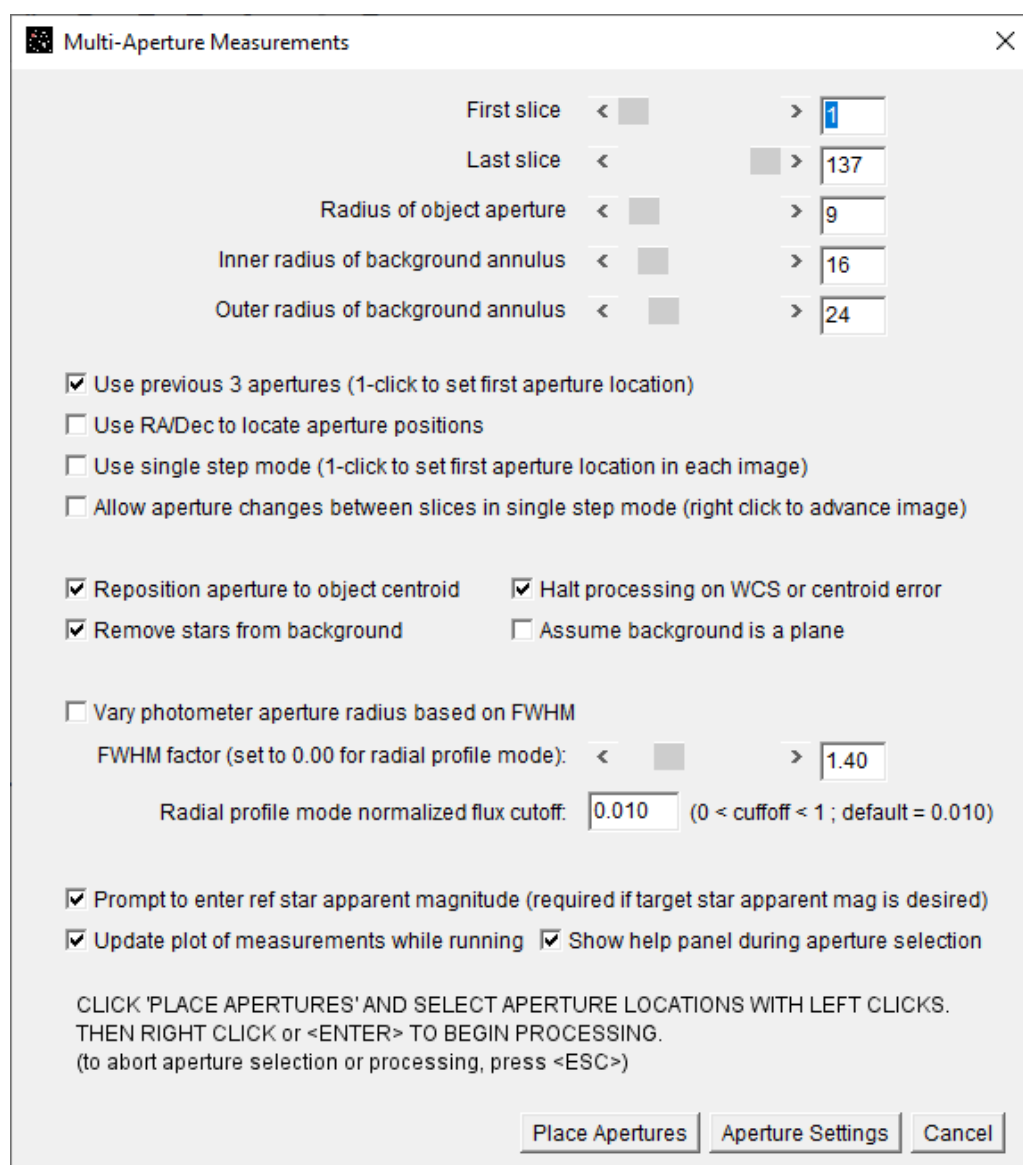
**Alt-left-click** on your target star. This will display the Seeing profile window.



Click **Save Aperture** and close the window. Now we need to place the apertures around the Target and Comparison stars. Click on the **perform multi-aperture photometry** button.



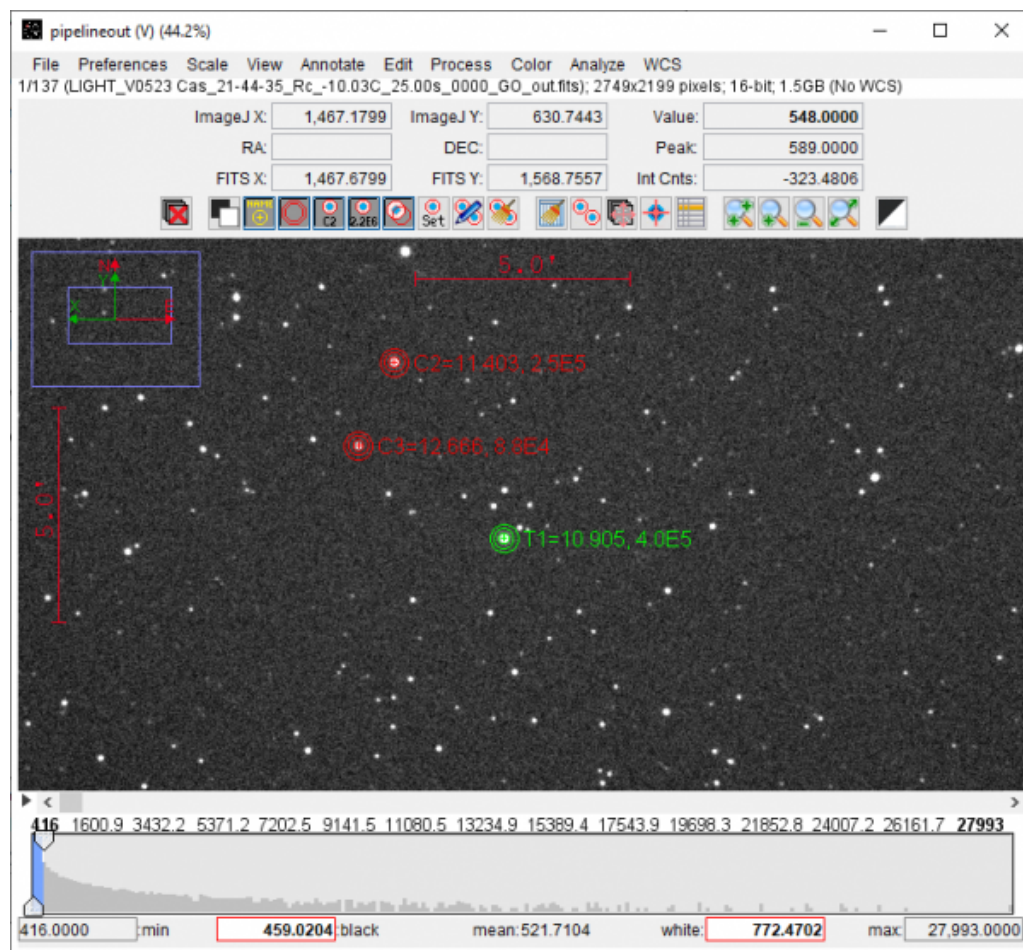
Here you will see the apertures have been saved. If you select **Prompt to enter ref star apparent magnitude** then you will be able to get an actual magnitude rather than just a relative curve. In this case it doesn't matter but it can be useful.



**NB For asteroids** – since the target changes position between frames, you'll need to also select the **Use single step mode** option and click on

the asteroid in each frame to identify it in the next stage after hitting the **ENTER** button.

Now we need to place the apertures. Click **Place Apertures**.



Left-click once on your target star. This will place green apertures around it and mark it T1.

Left-click once on each of the comparison stars chosen, C2, C3... If you chose to enter magnitudes you will be prompted to enter them each time. Here you can see the magnitude displayed for each star after the = sign. The magnitude of the target star is also calculated and displayed.

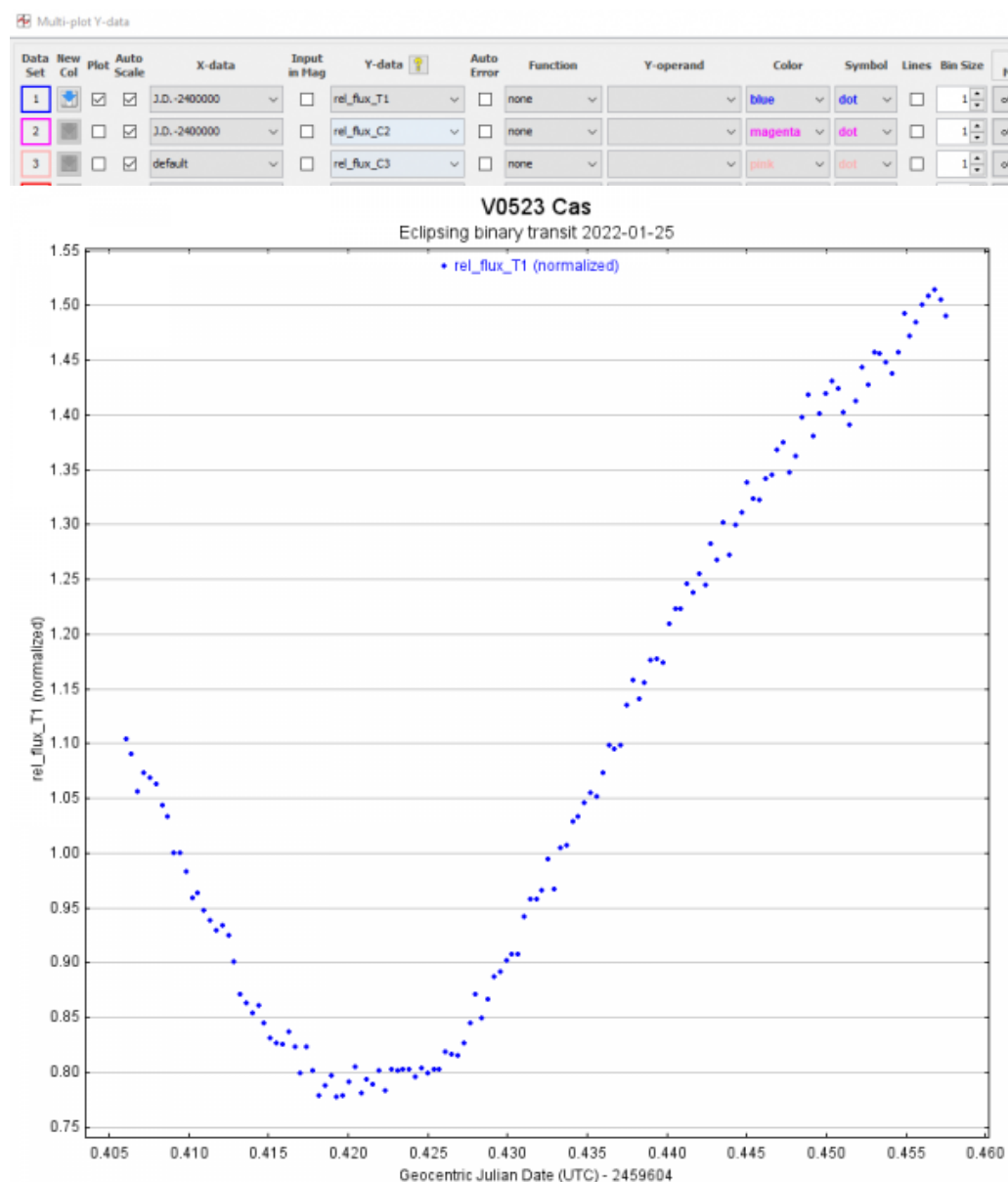
Comparison stars should be close in angular distance, brightness and colour to the target star for accurate photometry.

To remove a star, click on it again.

## 9. Graph your results

Once you are happy with the selections, hit the **ENTER** button on your keyboard. This will perform the photometry, create a Measurements.txt file containing the data and start to display the graphing functions.

Select options similar to these to create a graph of the curve. (For an asteroid you'll need to click on the asteroid in each frame.)



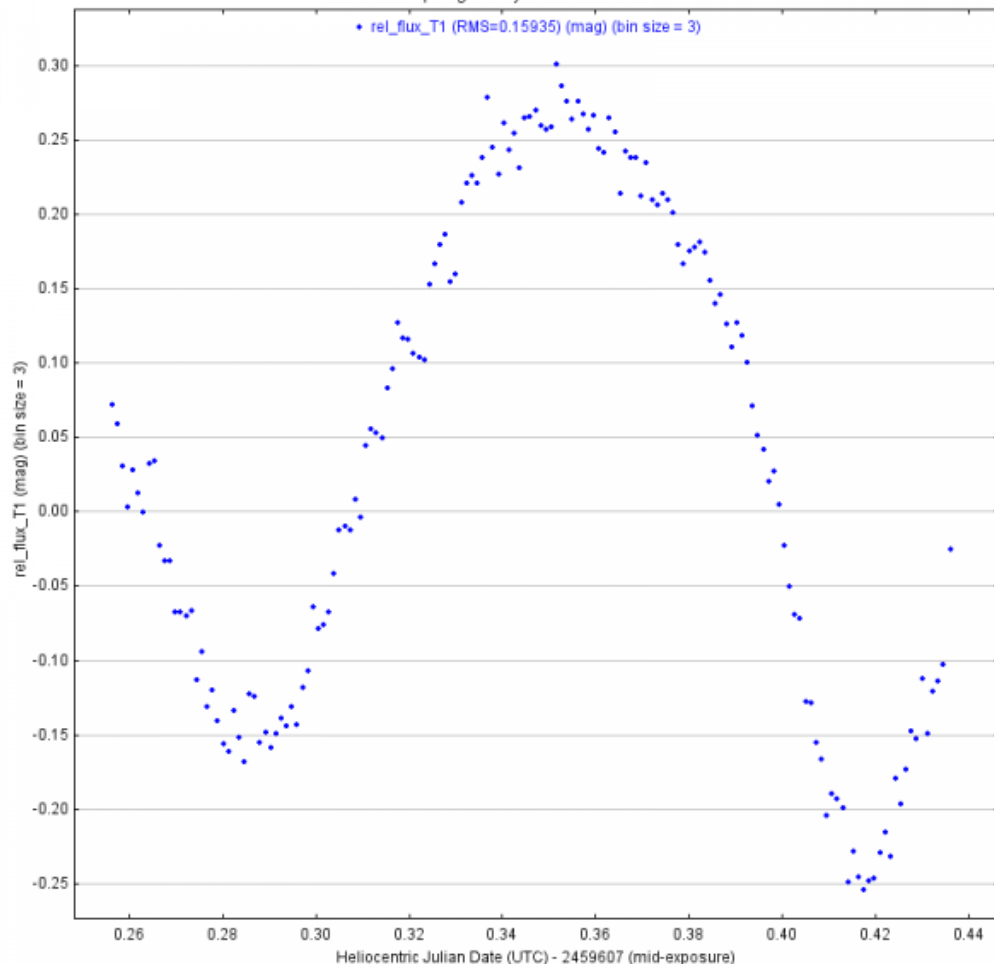
You can play around with the controls to display the curve as you wish. Choosing different **Bin Sizes** can smooth out the curve.

If you want to play around with the graph functions at a future stage, you can simply load the Measurements.txt file again rather than repeating all the other processing steps.

If you monitor an eclipse for long enough you can get both primary and secondary dips and peaks.

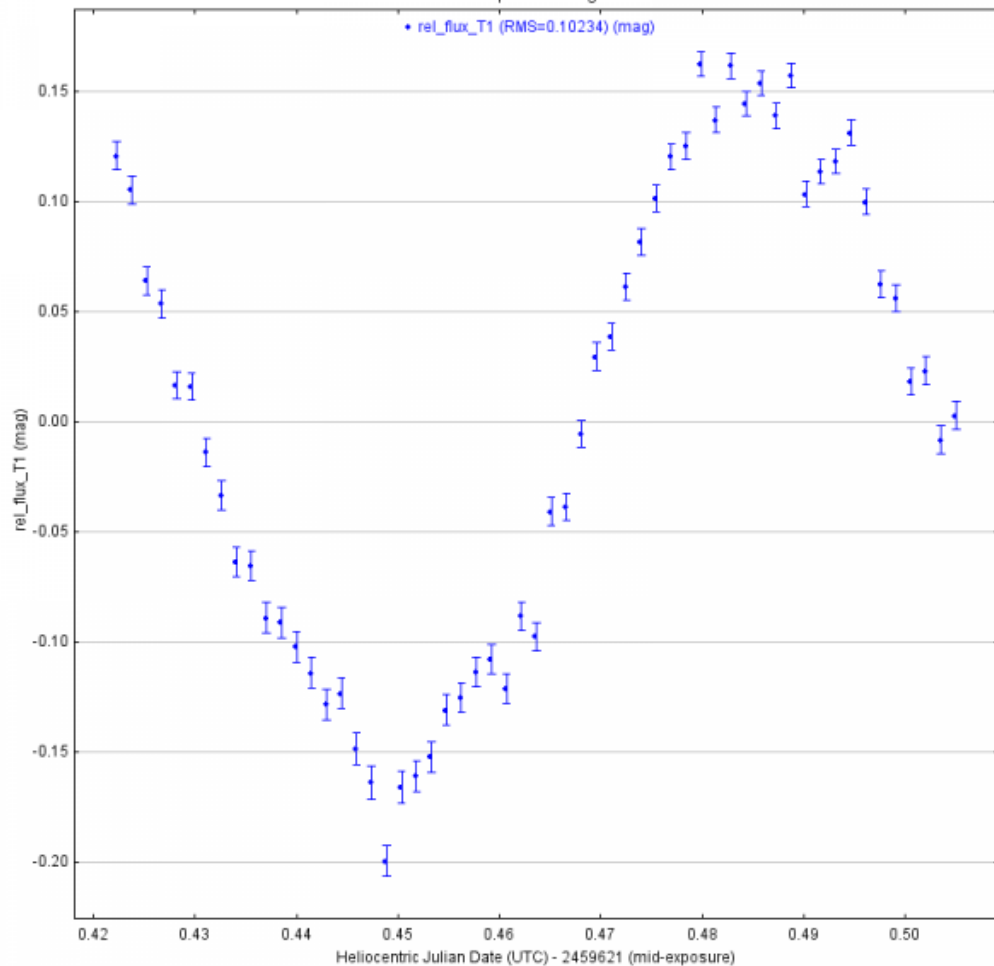
# NR Cam

Eclipsing binary transit 2022-01-27



## (201) Penelope Asteroid Light Curve 2022-02-10

Mark Phillips forthimage.co.uk



*Article: Mark Phillips*

*Banner image credit: ESO/L. Calçada*

*Other images: Mark Phillips, AstrolImageJ*

# 4 February 2022 Meeting Report

February 6, 2022

We were pleased to return to the physical/hybrid meetings at the Augustin United Church on Friday. The invited speaker this week was Professor Giles Hammond from the University of Glasgow who gave an interesting and personal account of his work renovating the 20" Grubb-Parsons telescope. It was next followed by the 'Sky in February' by the society's Horst Meyerderks and then lastly, we had a brief history of one of the society's antique telescopes, the Charles Tulley from Andrew Farrow. Unfortunately, Professor Hammond was unable to make the meeting in person as originally planned, but was able to deliver his presentation via Zoom. We had a large group on Zoom as well as in the church hall and on YouTube.

- [00:05:49](#) Main talk
- [01:02:00](#) Sky in February
- [01:25:21](#) Charles Tulley telescope

Professor Hammond started his presentation with providing the background on the makers and founders of the company Grubb-Parsons. The company was based in Newcastle, but initially founded in Dublin by Thomas Grubb with a reputation for manufacturing high quality optical instruments. In 1925 the company was then acquired by Sir Charles Parsons and traded until 1985. The company is known for building many renowned telescopes such as the Isaac Newton and the William Herschel.

We were next introduced to the Glasgow 20" telescope and its sister telescope that was based in Edinburgh. Professor Hammond provided a background into each instrument's history and then focused on the renovation of the Glasgow telescope. We were then taken through a detailed rebuild of the RA and Dec clock drive of the telescope and the technicalities of the electronics involved. Professor Hammond lastly shared the functionality of the instrument, showcasing the various images/observations made over the years and the teaching projects it has been involved in.

Following the main presentation, Horst Meyerdierks next presented his insights into “The Sky in February”, highlighting what to look out for over the coming month, including the movements of the planets, the star constellations and deep sky objects. This is always a very informative presentation for the society’s keen astrophotographers and imagers.

We ended with a short but intriguing delve into our society’s history and the connection with the Charles Tulley telescope. Andrew Farrow explained through digging into the society’s archives how the ASE had acquired the telescope and further revealed some interesting stories in connection with the makers. The telescope was on display in the church hall and could be seen in greater detail for those that were able to attend the meeting in person.

*Sarah Bulman*

# The ASE Charles Tulley Telescope

February 15, 2022

This is the document produced by Andrew Farrow following on from his presentation at the [4 February 2022 meeting](#).

The ASE Charles Tulley Telescope

# 18 February 2022 Meeting Report

February 19, 2022

The meeting began with Mark, our President, giving us the usual run down on upcoming Society events ( including another of our ever popular Telescope Help Shop events – NOW FULL) and we also welcomed another new member, Jim Aird taking our membership to 169.

Our main talk was from a friend of the ASE, Lyn Smith, Director of the Solar Section of the BAA, who talked to us about “The Red Sun”. With the help of some stunning images and video clips and her normal infectious enthusiasm, Lyn explained the many features of the Sun’s atmosphere – known as the Chromosphere.

Before beginning her tour Lyn quickly covered the type of equipment, which we, as amateurs, might employ to study the Sun for ourselves and made reference to humanities latest investigations using vehicles like the Parker solar probe and ESA Solar Orbiter.

We then plunged, figuratively speaking, into the layers of the Chromosphere, discovering such wonders as Coronal holes, H Alpha Plage, which often herald sunspots and sometimes solar flares, and Spicules – jets of hot gas. We also learned about Fibrils, Flux Tubes, Arch Filaments and Ellerman bombs.

Amateur observers and imagers can also do real science by reporting on all the foregoing phenomena and such events as solar flares, – which are associated with Aurora on Earth, plus Prominences and Coronal Mass Ejections, Lyn gave a fascinating explanation of these and how to classify and measure them.

The talk was enjoyed by 187 participants on YouTube and 45 ASE members on Zoom.

*Nigel Goodman*

Banner image credit: Dave Tyler

# Book review: The Stargazer's Sister by Carrie Brown

February 19, 2022

A few years ago my husband bought me a book called *The Astronomer's Wife*. It was a strange and fascinating biography of Angeline Hall whose husband Asaph discovered the moons of Mars in 1877. It's clear from the account (written by a surprisingly misogynistic son by the way), that his father's discoveries would never have happened without the care, dedication and support of a very remarkable woman. So here I am, an "astronomer's wife", contributing a quick book review, in case any wives, husbands, brothers or sisters out there might be interested in the impact of relationships on the unending study of our universe!

This Christmas a new book arrived, same source as before, this time with the title, *The Stargazer's Sister*. This fictionalised account is the story of Caroline Herschel, sister of the much more famous William. It's a great read and manages to combine a personal and somewhat romanticised life story with some real astronomy.

The story charts an unhappy childhood in Hanover, the ravages of smallpox, the exceptional brilliance of William and the complete and utter devotion of Caroline, who gives her whole life to supporting her brother as he obsessively observes the night skies, building a telescope many times bigger than anything created before, and discovering Uranus in 1781.

My own experience of those moments when I'm enticed out of doors to view the wonders of the night sky is that it somehow always seems to be much more bitterly cold than at any other moment, and I don't tend to stay for long. So I take my proverbial hat off to Caroline (although I'm keeping my gloves and scarf on). Clearly I haven't shown the same level of commitment to my husband's science as she did for her brother, spending her days keeping house for him and her nights recording his observations.

Truth is, Caroline, influenced by her brother, becomes a recognised astronomer in her own right, discovering a number of comets and

becoming the first woman to be awarded a medal by the Royal Astronomical Society.

Are great women of history only to be defined by their relationship to famous men? As well as these stories from science there are of course plenty of parallels in other walks of life. Talented musician Clara Schumann was clearly influenced by her more famous husband Robert, but now music historians are realising that many of her compositions were passed off as his.

Feminist musings apart, in a world where individual achievements are celebrated above all else, maybe both these stories say something profound about how teamwork between people sharing their lives together can lead to immense achievements. Caroline's achievements were recognised at the time and are all the more remarkable because they were achieved counter to expectations of how a woman might succeed.

Astronomer's wife? It's not the only defining thing about me, but it's true and I'll wear it!

*Hilary Phillips*

- [An astronomer's wife; the biography of Angeline Hall](#)
- [The Stargazer's Sister](#)

# 4 March 2022 Meeting Report

March 6, 2022

We had our physical/hybrid meeting of the month take place last Friday at the Augustine United Church in Edinburgh. After a short welcome and introduction from our President Mark, we were handed over to our invited guest speaker, Dr Max Ruffert from the University of Edinburgh. The society members watched the talk from either the Church or on zoom and we also streamed the talk live on YouTube.

Dr Ruffert gave a dynamic talk on gamma-ray bursts, black holes, neutron stars and gravitational waves, and provided excellent practical explanations for his theoretical work. He began with an overview of the history of gamma-ray bursts, starting with the



monitoring for atomic bombs during the Cold War that first led to their detection. He then took us through the current observations as bright and distant flashes that are spread across the universe and the theories of what could be causing them. He provided various theoretical ideas of mergers and collisions of neutron stars and black holes and explained that through these processes both gravitational waves and neutrinos (also known as the ghost particle) were produced. We were taken through simulations that applied these ideas and also audio examples, so that we could hear the sounds of gravitational waves. As observers and astrophotographers we are considering the light from the sky as emitted energy, instead gravitational waves and neutrinos are both elusive and hard to detect and they require many large underground detectors that are essentially 'listening' to measure the waves.

Following the talk, the members in the room, on zoom and also on YouTube had the opportunity to ask questions, which Dr Ruffert answered very thoroughly. The talk provided much discussion and had a wealth of interest amongst all the groups watching.

Alan Pickup next presented the Sky in March. He took us through the various astronomical objects to look out for this month and as always provided us with interesting snippets of information. The Zodiacal light, is a cone of light reaching from the sun below the horizon and thought to be caused by dust from sources such as meteoroids. Another interesting feature to spot this month that Alan highlighted is the Leo Triplet which is found in the constellation of Leo. The Hamburger Galaxy, is also known as Sarah's Galaxy and alongside M65 and M66 forms the Leo Triplet. Alan informed us that Sarah's Galaxy was *perhaps* named after the poet Sarah Williams, who is known for writing the poem 'The Old Astronomer to His Pupil' and is from the fictional viewpoint of Galileo at the end of his life. Here are a few lines from the poem that Alan shared with us:

*"Though my soul may set in darkness, it will rise in perfect light;  
I have loved the stars too fondly to be fearful of the night."*

Report by Sarah Bulman

# 18 March Meeting Report

March 20, 2022

To begin the meeting our President Mark Phillips gave us a flavour of the upcoming Society programme. Adding to the good news, the Society grew by a further two members !

Our main talk was from a veteran Radio Astronomer based in Anchorage, Alaska, Mr Whitham (Whit) D. Reeve who talked to us about "HF Meteor Trail Reflections Observed at Anchorage, Alaska USA". This is a new field of astronomy for many of us and Whit certainly helped to make the subject understandable.

After outlining his own background, Whit then introduced a number of interesting facts about meteors, including the tiny size of the majority of them ( 2 microns to 2mm ), despite which an estimated 5000 tons falls to Earth each year ! He then explained that the trail of ionised atoms left in the wake of the meteors will reflect radio waves.

This provides a means of recording many details about them for scientific research.

This was done by radio propagation using transmitters widely spaced on the surface of the planet. We were amazed that such a transitory phenomenon was observable and measurable using techniques that literally span the globe, from Hawaii to Colorado !

Whit then gave many examples of the observations made by him using this equipment.

He then wound up his presentation with a number of very useful web links and references for those members who might wish to pursue the topic further. This is a strong possibility given the depth of the questions that followed!

These are the papers he referenced:

[https://www.reeve.com/Documents/Articles%20Papers/Reeve\\_MeteorRadioObsrv.pdf](https://www.reeve.com/Documents/Articles%20Papers/Reeve_MeteorRadioObsrv.pdf)

[https://www.reeve.com/Documents/Articles%20Papers/Reeve\\_SmplHFMeteorTrailReflObsrvdAnc.pdf](https://www.reeve.com/Documents/Articles%20Papers/Reeve_SmplHFMeteorTrailReflObsrvdAnc.pdf)

*Nigel Goodman*

# 1 April 2022 Members Night meeting report

April 3, 2022

We had our first Members Night on Friday 1st April. This was an opportunity for members of the ASE to get together and present a variety of topics of interest. The meeting took place as a hybrid meeting at the Augustine United Church (AUC), Edinburgh and also on zoom for distant members and those that could not make it in-person. We had a packed meeting agenda which started with a welcome from Andrew Farrow and as always a warm welcome to any new members and a run through of the list of upcoming events.

To start the session of talks we had **Pat Devine** run through the practicalities of building and **setting up of an all-sky camera** for monitoring the changing weather patterns and capturing star trails and potential meteor showers over the course of a full night. **Radim Stano** then led a talk introducing his more complex, yet very doable **set-up of a meteor camera**, and the many possibilities and finer details that can be captured. Radim showed us a range of objects he had captured, from geese flying over, to a close range meteor that burnt up in the sky. He also highlighted the thriving community of citizen scientists already recording meteors in the UK, and noted that only a few were currently in Scotland. The talks from both Pat and Radim certainly fuelled interest afterwards with several members expressing an interest in setting up these types of cameras.

Next, **Neil Martin** who leads our Imaging and Observing group (IOG) took us through the entries and announced the winner of the **'Image of the Quarter' competition**, which is open to any of our members to enter. As usual the quality of entries was high and there was a variety of different types, produced via different methods of processing and all accompanying a personal journey of astrophotography. Congratulations to the **winner this time who was Ian Smith with his image of Abell 31 Planetary Nebula** (see the banner) which took at least 10 hours of capturing over 4 nights as well as some serious processing. It was well worth the wait.

You can [see all the entries in a PDF](#).

We were then delighted with the travels of **Ramsay McIver** on his recent excursion to Norway to photograph the aurora borealis or 'northern lights'. He provided his

practical advice on the best location, how to photograph and also the use of time-lapse to capture the event. He showed examples of his images and time-lapse videos and then further answered questions from the group.



The next presentation was given by **Bill Bonar** on his recent purchase of the **Unistellar Equinox**. He provided the details of the ease of use of this equipment and the many possibilities of capturing many deep-sky images in just one session. This equipment has re-inspired Bill in his astrophotography, but he did caveat the expense of the equipment and other limitations that should be considered before purchase. After the meeting many members on zoom were interested in the equipment and asked Bill questions about the set-up and options.

We then had a brief history and overview of a couple of the **ASE's vintage telescopes** that **Andrew Farrow** kindly researched with the help of another member John Murrell. The telescopes were brought into the AUC and it was an opportunity for members attending in-person to see in detail these interesting instruments.

The last presentation of the evening was by our president **Mark Philips** who ended the meeting with **the Sky in April**. These are always very informative presentations, in particular for our astrophotographers and observers, providing what to look out for this month and with interesting facts on the various celestial objects in question.

The eventful meeting ended with a social chat over refreshments for those at the AUC and a continued chat on zoom.

*Sarah Bulman*

Image credit: Abell 31 Ian Smith IOTQ Jan-Mar 2021 winner

# Making a Breeze Block Telescope Pier

April 7, 2022

I wanted to stop having to carry my tripod and mount into the garden and then going through the alignment process every time I used my telescope. Having a mount ready to use will reduce the risk of injury given the weights involved and the time in setting up.

I settled on a breeze block construction for the following reasons:

- It is simple to make
- Is reasonably low cost
- Is quick to complete

The list of items used were:

| Item             | number        | cost           | Supplier     |
|------------------|---------------|----------------|--------------|
| Hollow Blocks    | 3x 215x440mm  | £5.40          | Jewsons      |
| M10 Bolts        | 10            | £2.19          | Tool Station |
| M10 Washers      | 20            | £2.58          | Tool Station |
| M 10 Nuts        | 50            | £2.69          | Tool Station |
| M 12 and washers | 10            | £11.20         | Amazon       |
| Masonry Paint    | 5L            | £26.00         | B&Q          |
| Gorilla Glue     | 270ml         | £14.70         | B&Q          |
| 9mm plywood      | 2x 610x1220mm | £29.94         | B&Q          |
| Cement           | 20kg x2       | £15.58         | Tool Station |
| Cover            | 10-12" Dob    | £156.00        | Widescreen   |
| <b>Total</b>     |               | <b>£266.28</b> |              |
| without cover    |               | £110.28        |              |

The construction took a day and a half including painting etc.

I made a simple pattern for drilling which I reversed when required, to align the holes.

A 12mm masonry bit was used to drill the breeze blocks to allow some 'wiggle room' for the 10mm x 100mm bolts connecting the blocks. In addition I used Gorilla glue to help secure the blocks. (Less belt and braces more bolts and glue).

I used the same drill bit for the 12mm hole to attach the SkyWatcher metal pier extension.

The base block was laid horizontally for stability and two bricks placed inside the holes before concreting. I decided to make a wooden 'sleeve' to cover the blocks:

1. because it looked nicer and
2. to give a smoother surface for the cover to slide over and reduce the risk of tearing the fabric.

I used masonry paint for the blocks to provide some waterproofing and also used this on the wood as well.

I already had a short SkyWatcher pier (21cm high) which was used to give the height required.

The cover was chosen to allow the telescope to be left on the mount or not.

To finish I made a circle around the pier using an edging strip and filled the area with stones to allow drainage and give a nice finish

Details of the cover are: <https://www.firstlightoptics.com/telegizmos-telescope-covers/telegizmos-365-scope-cover-for-10-12-dobsonians.html#specifications>

The Jewson breeze blocks were very roughly cast but good enough given I was covering them with a wooden 'sleeve'. Other suppliers may have smoother blocks which could be more suitable if you don't want to cover them up saving time and money.

The use of the horizontal block was my choice as it was cheap, relatively easy to drill and provided a solid, heavy platform for the pier. It also allowed the concrete to flow into the large holes for extra security and stability.

*Andrew Farrow*  
*3rd April 2022*

# 6 May 2022 Meeting Report

May 8, 2022

To open the meeting our President Mark Phillips gave us the usual highlights of the upcoming Society programme. Adding to the good news, the Society grew by no less than eight new members, taking membership to a record 169 !

Our main talk was from Professor Beth Biller of Edinburgh University who talked to us about “Weird New Worlds”.

Professor Biller’s primary area of research is the direct imaging of Exoplanets, which she likened to taking a picture of a firefly from Edinburgh as it flew round a lighthouse in Dublin !

After outlining a brief timeline for exoplanet research, especially the amazing growth in the number of confirmed exoplanets to over 5,000 today, since the first detection in 1995. Beth then went over the various techniques for discovering the presence of exoplanets including radial velocity, micro lensing and the use of transits, which is currently the dominant method.

Beth also explained the various types of exoplanets we are discovering and the importance of their distance from their host star, especially in the hunt for potentially habitable worlds. Most planets so far found seem to be very very different from the planets in our own solar system – weird new worlds indeed !

Direct imaging of exoplanets, which will allow transit spectroscopy ( characterisation of exoplanet atmospheres), should reveal huge amounts of information about these alien worlds, and also just getting pictures of the such planets, will be given a huge boost in the coming years by the recent successful launch of the James Webb Space telescope and the development of the Extremely Large Telescope. We might even get clues as to the “weather” on exoplanets and their rotational periods !

As usual we finished with a very thorough presentation of “The Sky in May” from Alan Pickup.

*Nigel Goodman*

# 20 May 2022 Earth Explores Mars: 25 years of Discoveries

May 21, 2022

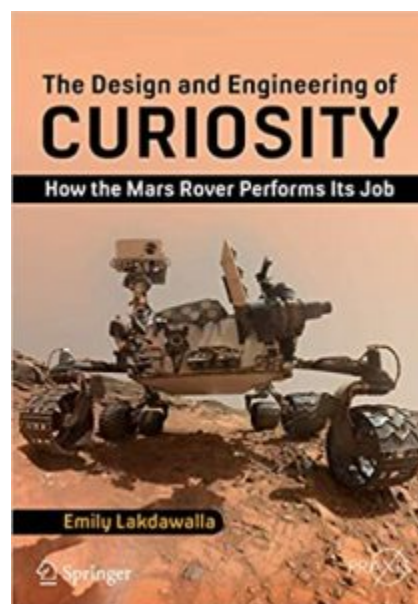
Emily Ladkawalla joined us from the West Coast of America to talk about the development of our exploration of Mars. Having highlighted her early passion for geology and space and her involvement in communicating scientific progress and ideas as an early adopter of 'Blogs', she went on to review the progress made in our understanding of the conditions and geology of the planet.

You can buy Emily's book: ["The Design and Engineering of Curiosity: How the Mars Rover Performs Its Job"](#)

Progressing through the missions she highlighted the instrumentation used for the missions and what they revealed about the geology and climate of Mars, from the orbital surveys through to the ever more sophisticated rovers. Through the exceptional images shown she covered the dominant features of the landscape down to the fine particles of dust identified in the later missions. We were able to see the impact of water on the landscape and what this had done to the chemistry of the rocks. The talk demonstrated what a skilled communicator Emily was and if you missed the original broadcast you really should see it on our YouTube channel.

We were left to appreciate the complexity of the current mission with its aim to return samples of rocks and dust to earth relying on a well coordinated series of activities across agencies and countries.

*Andrew Farrow*



# 3 June 2022 Meeting Report

June 4, 2022

To start the meeting our President Mark Phillips updated us on the upcoming Society programme. This was important because this meeting also included our AGM. Mark also pointed out that our membership now stands at 171.

Our guest speaker was Mr Jim Paterson, a semi – retired lighting engineer based in Moffat, who spoke to us about “The mustard seed which grew into an observatory”, the story of his involvement in International Dark-Sky Association (IDA) accreditation for places as far apart as Orkney and St Helena, and, in the case of Moffat, how that led to a brand new community observatory !

Jim led us through the ins and outs of navigating the “red tape” jungle of creating lighting plans for communities and then persuading local authorities to make the necessary changes and applying for IDA accreditation. In the case of Moffat, this took the best part of 10 years !

This was followed by the fascinating details of the observatory build, utilizing a bespoke kit built garden log cabin and a commercial prefab dome. Funding from SSE plc, clever design and the enthusiasm, hard work and unquenchable spirit of the Moffat Astronomy Club, plus the support of youngsters from Moffat Academy, made the observatory a reality.

I think we were all impressed with Jim himself, who, having already “retired”, had by his own efforts, given back dark skies to over 133,000 people and 4,000 square miles of our planet.

Nigel Goodman gave us the “Sky in June” and reminded us that astronomy is still possible through this season of light nights.

Lastly, our AGM once again thanked the Council and membership of the Society, for a hugely successful year and set the scene for another star-filled year to come.

*Nigel Goodman*

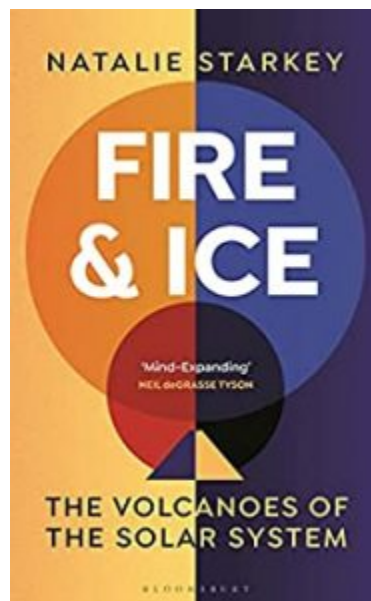
# 17 June 2022 Meeting

## Report

June 19, 2022

We had an extremely embracing and enjoyable talk given by [Dr Natalie Starkey](#), with her lecture entitled: Fire and Ice: The Volcanoes of the Solar System.

- Natalie gave us an extremely well delivered and dynamic talk, in which we were treated to understanding her passion for the study of volcanoes here on Earth as well as for volcanic activity which has occurred in almost every corner of the Solar System, and surprisingly in some of the most unexpected locations!
- After being introduced to her passion for volcanoes (inspired by legendary volcanologists Katia and Maurice Kraft who both unfortunately paid the ultimate price for their extremely high-risk research), Natalie introduced the history, geological properties and different types of volcanic eruptions here on Earth, recounting many from her exciting first hand 'fly by' research site visits.
- Natalie then described her passion for geological space research and takes us on a learning galactic tour of how volcanoes are formed and found in our Solar System. This is full of amazing images with cutting edge geological space information in which we learn about how common ice volcanoes are in our 'icy worlds', as well as the processes and knowledge learnt from our extinct 'fiery worlds' all found throughout our solar system.
- The current known research of the 'ocean worlds' of Europa and Enceladus, describing how plumes have helped form Saturn's rings is then discussed, before finalising by talking about the recent and surprising geological processes found on our furthest neighbour, Pluto. The talk concluded by discussing the big question of whether life may be found on some of these active worlds.



The talk was delivered superbly and full of enthusiasm. The slides are beautifully illustrated and there are some amazing images, including a gif video image of an erupting plume from Io's Tvashtar volcano, which is simply awesome!

This was another terrific talk and is again, one that should not be missed!

And on a final note, I now have [Natalie's two books](#) on my astronomy wish list.

*Natalie Starkey is a geologist and cosmochemist. Following a PhD at Edinburgh University studying the geochemistry of Arctic volcanoes, Natalie's post-doctoral work at The Open University shifted her research focus to comet and asteroid samples. It was at this time she got the chance to analyse samples returned by the NASA Stardust and JAXA Hayabusa space missions.*

*Natalie received a British Science Association Media Fellowship in 2013, the same year she became a BBC Expert Woman, and regularly appears on television and radio internationally, as well as being a science host on Neil deGrasse Tyson's popular StarTalk Radio. Her popular science writing includes Fire & Ice: The Volcanoes of the Solar System, Catching Stardust: Comets, Asteroids and the Birth of the Solar System, and numerous articles for The Guardian, New Scientist, All About Space and The Sky At Night.*

*Will Joy*