Breckland Astronomical Society

Affiliated to the British Astronomical Association and the Federation of Astronomical Societies

EXTRA TERRESTRIAL

Newsletter July 2020

Registered Charity no, 1044478

Copy is always needed for this newsletter. Articles with an astronomical theme are welcome but anything of likely interest to the membership will be considered. Text or Word documents preferred but handwritten submissions also welcome.

Chris Bailey is the newsletter editor. newsletter@brecklandastro.org.uk

Mick Ladner has kindly stepped in as visitor organiser. **visitors@brecklandastro.org.uk**

The society would benefit greatly from having a local area advertiser, please contact the chairman if you are interested.

Chairman's Notes July 2020

This is a second Summer Twilight edition of our now monthly newsletter frequency. I hope this provides a bit of interest and/or entertainment for you all. Feel free to suggest items to include or avoid. It is still too light to do proper deep sky work, but plenty to see. Jupiter and Saturn are nicely placed now, and will come to opposition during this month, at 15 and 16 degrees above the horizon. This is not a very good altitude for seeing detail, but catch them while you can! Mars appears later on and much further round to the East and is still distant and tiny. Venus is emerging at dawn, although this is at the witching hour of 3am. It is visible above Aldebaran on the 11th. Mercury is visible at 4am around the 25th at which point Mars will reach the dizzying altitude of 35º, the first time it has been visible that high for years. And finally for the Solar Astronomers, the Sun had a little spot from cycle 25 in mid June.

I discovered another good satellite application especially for viewing the Star Link satellites, as it is up-to-date after each launch. Star Link have come up with a solar shade technology to make their satellites much fainter. The batch I observed in early June appeared as a fairly dim line (5th magnitude maybe) except for one at the centre that was much brighter (1st magnitude). See: https://james.darpinian.com/satellites/

We have a new comet that may look good from late July C/2019 U6 Lemmon. It should be visible in the twilight in the North West climbs and moves slowly to the left and fades over the next few months. C/2020 F3 NEOWISE is a name to search for as it may be visible from mid July. Check out www.aerith.net Seiichi Yoshida's comet page and the BAA comet section at https://people.ast.cam.ac.uk/~jds

Our facebook group is here: https://www.facebook.com/groups/176906152365752/

I finally reprocessed The Tour of the Spring Sky in 2019 from raw images taken with the Atik Infinity camera on the 20 inch telescope to give a movie. I have uploaded it to YouTube. It is a one-take movie recorded over half an hour, sped up by a factor of 5, and appears a bit rough and ready, rather than nicely processed and stacked. https://youtu.be/La2UsnY0H5A

We are planning to use this camera for socially distanced astronomy following an extensive risk assessment that Andy Jones has adapted; it is fair to say that Andy is an experienced safety officer in his current job.

Talks

June's Virtual Talk from Steve Tonkin was most entertaining, 26 computers or users or devices were present. Steve had analysed the risk to us on Earth from space, in 10 ways the Universe tries to kill you. I won't spoil it, as we have a recording that I have put up here https://youtu.be/ct654oyLC_I (took me ages as I'm a novice at this)

I would like to thank Steve as he kindly offered to take no fee but suggested we donate to Campaign for Dark Skies. Please look at his website, which has links to his book on Binocular Astronomy and his monthly newsletter. https://www.binocularsky.com

If you enjoyed his talk and wish to donate we can pass on any profit to Steve's cause. This can now be done via PayPal (cards or PayPal accepted) using the button that we now have at the bottom of our webpage. http://www.brecklandastro.org.uk

We invited the King's Lynn society (KLADAS) to the above talk, and in return some of us got to enjoy their fascinating Zoom talk about the Lost Constellations by Frank Dutton. Apologies for such short notice and limited distribution.

We cannot anticipate the turnout of July's monthly talk, and think it may be a wasted journey for such a prestigious speaker to travel across the country, especially under these circumstances. He has instead offered to do a talk via Zoom. The same platform and log in details can be used as were used in June. Contact chairman or treasurer for log in details if you don't have them. Please also invite others, we can hold up to 100.

Professor David Southwood is not necessarily a famous name, but a guaranteed great storyteller. He was the outgoing chair of the UK Space Agency Steering Committee, a post now held by Dr Sally Howes OBE. He has many fascinating tales of Mars in "*Personal Stories from Mars Exploration: Delirium, Delight and Disasters*". I particularly like the use of the alliteration following the colon there.

In August, we will wait to hear from our speaker and if we go ahead with a physical meeting, we shall then hold our AGM on August 14th. The talk will be on the Green Flash, by Mike Frost, who is an active member of the BAA (History Section).

Re-opening

The government guidelines that apply from July 4th 2020 mean we could now fit our usual audience into the hall providing we wear masks when under 2m and have adopted expected standards of hand hygiene. We cannot afford other measures such as perspex screens of course. We will also need to use hand sanitiser and keep a record of who attends. Obviously, if you have COVID-19 symptoms you are not permitted to attend. Performances (at the time of writing) are still banned due to breathing being more pronounced, however minimal this risk is in our circumstance, but this is likely to be lifted in time for August.

The committee have decided it is possible to re-open the observatory from Tuesday July 7th and then each Tuesday thereafter. The monthly open nights can *probably* resume from Friday August 28th. Members will have seen that Andy, who is an experienced safety officer, has prepared a detailed set of instructions and done a risk assessment about using the observatory.

To summarise:

- Outdoor based astronomy or meeting
- Use of Observatory Eyepieces not permitted. We shall use Camera Assisted Astronomy viewable in the sitting room.
- Maximum 2 persons with social distancing still in place in main room, dome, 1 in kitchen/toilet area.
- Hand sanitiser should be used.

- Disposable or own brought mugs for coffee and disposable cutlery/towels.
- One keyholder to open up and prepare outdoor space and to manage sign in book.

We're not expecting another Bournemouth beach and luckily the return has coincided with warm months. Astronomy is an outdoor pursuit so we welcome bringing own telescopes to be set up outside.

We welcome new member Darrell Brown who had previously found us on the facebook group and subsequently joined Tuesday's virtual observatory zoom meetings. It is nice to see such enthusiasm and talent for astrophotography, something our Society has a lot of!

Sad News

Barrie Keenan, a fine, friendly fellow who you will all know from monthly talks has sadly passed away. We wish his son and family all the best in these hard times. Barrie was really dedicated to showing up for the talks and he will be missed. I loved his sense of humour when it came to collecting his often won raffle prizes.

Dan Self

SPA information for Breckland Astronomical Society

We have a number of online events coming up for you to enjoy.

Joint webinar with the BAA
On **Wednesday 15 July** at 7 pm there will be the first-ever joint meeting of the SPA and the BAA via Zoom.

Speakers will be **John Rogers**, Director of the BAA Jupiter Section, on the current opposition of Jupiter; and **Greg Smye-Rumsby**, specialist lecturer for the Royal Observatory, Greenwich, on Myths and Illusions – a talk that he was due to give at the cancelled April SPA meeting.

The Zoom link for the webinar is https://us04web.zoom.us/j/548739039. If you have not used Zoom before, please click on the link in advance to install the software. Alternatively, you can view the meeting on the BAA's YouTube channel. For more information about the meeting please visit our website:
www.popastro.com/main_spa1/meetings-and-events/forthcoming-meetings/

SPA meeting on Saturday 25 July
We are pleased that our intended speaker for the London meeting originally planned for this date, **Dr Susanne Schwenzer** of the Open University, will now give her talk online using Zoom. The meeting will start at 2 pm and further speakers will be announced nearer the time. The link for the meeting will be sent to members in a subsequent newsletter.

Asteroid Day
Each year, 30 June is designated Asteroid Day, to raise awareness of asteroids, including the threat to Earth and also what they can teach us. This UN-sanctioned event will be celebrated online this year with several days of videos and asteroid-related material. Go to asteroidday.org/ to find out more.

Funny mugs
We have extended our range of astronomy-themed mugs with some unique designs too humorous to mention, with a special sale price for a limited period only. Go to the SPA shop to see the range and to order:
www.popastro.com/main_spa1/shop/

Cosmology Quiz

10 Questions – Answers Page 47 . Multiple choice.

1. What was discovered by Penzias and Wilson in 1964 after they ruled out pigeon poo as being the cause?
a. Dark Matter b. Microwave Background Radiation c. First Black Hole d. Pulsars

2. What is the Hubble Constant? (in kilometres per second per megaparsec)
a. either 67.4 or 73.5 b. 13.7 c. somewhere between 49 and 62 d. 42

3. Stephen Hawking discovered a Black Hole's Entropy is proportional to what?
a. volume within event horizon b. spin c. area of event horizon d. temperature

4. What portion of the total energy of the universe is directly visible to us using today's technology? a. less than 1% b. ~ 4% c. ~ 16%, d. ~ 26%

5. What was the Temperature of the Universe 1 second after the Big Bang? (Kelvin)
a. 10^{31} (10 nonillionº) b. 10^{13} (10 trillionº) c. 10^{10} (10 billionº) d. 10^{7} (10 millionº)

6. Which of the following cannot be used as an accurate measure of distance?
a. Cepheids b. Redshift c. Brightness d. Supernovae

7. In General Relativity, Einstein's main equation says what?
a. Mass tells spacetime how to curve, spacetime tells mass how to move.
b. Gravity is caused by a massive object exerting a force.
c. Energy is mass times the speed of light squared.
d. Nothing can go faster than the speed of light.

8. What theory did Alan Guth develop in 1980?
a. The Big Bang Theory b. The Multiverse c. Bubble Universes d. Cosmic Inflation

9. What was the most recent probe to measure the Cosmic Microwave Background?
a. COBE b. BOOMERanG c. WMAP d. Planck Surveyor

10. What does the word anisotropy mean?
a. type of anomaly b. heterogeneous c. not the same in all directions d. an imbalance

11. Bonus: what cosmologist is now astronomer royal (2020)?

Dan Self

JOHN'S NEWS BITS
July 2020

Unless you haven't noticed, on 31st May Elon Musk's Space X reusable rocket with the Dragon capsule took off from the Kennedy Space Centre with two astronauts, Doug Hurley and Bob Behken and successfully docked with the ISS. A first, as up until now, NASA has been using the Russian Vostok rockets. The Dragon is amazingly modern, very spacious with a massive touch screen for the controls, looks like a spaceship. Not bad for someone who made his money from electric cars!

There is concern that changes in the earth's magnetic field may cause malfunction of satellites and spacecraft.
Apparently, over the last two centuries Earth's magnetic field has lost 10% of its strength. ESA's swarm satellites have been used to investigate the regions of weakness that appear to be localised in a belt stretching from S. Africa to S. America with a second centre known as the S. Atlantic anomaly. Reason for this change is unknown.

Another first for NASA, a Martian helicopter will be attached to the belly of the Perseverance rover due for launch on July 17th. The landing will be at the Jezero crater on Feb. 18th 2021.
The helicopter weighs less than 4 lbs. to enable lift-off in the sparse Martian atmosphere. It can fly for 90sec. At an altitude of 980 feet.

As reported in SciTech Daily, Images from the Dark Energy telescope have revealed up to 355 gravitational lens candidates using the DESI, Dark Energy Spectroscopic Instrument.
These gravitation lens candidates provide ways of precisely measuring distance to remote galaxies in the ancient universe by tracking supernovae via the lens effect.
Most of the mass responsible for the lensing effect is thought to come from Dark Matter.
These lensing regions can be up to 100 billion times the mass of our Sun causing light from distant objects in the same path to magnify and split into multiple images.

The development of ESA's first ever lunar lander will launch on an Ariane 64. It will deliver materials and logistics to the Moon of up to 1.5 tonnes.
Known as EL3 or European Large Logistics Lander, it will be run uncrewed supply missions to the Moon for the Artemis programme starting late 2020's..

An international team of a astronomers have now confirmed that the Earth-sized planet on Proxima Centauri, our nearest star, named Proxima b is precisely 1.17 times Earth size and orbiting the star every 11.2 days.
They used the ESPRESSO, a new spectrograph at the VLT telescope in Chile with an accuracy of 3 times that of HARPS, the instrument that had been used to discover hundreds od exoplanets over the last 17 years. Although much closer to the star, it still receives the same amount of energy as Earth…possible life there?
Now for the bad news, it receives 400 times more x-rays than we receive from the Sun.

John Gionis

Latest news.
Scientists from the international XENON experiment announced on June 17th that data from XENON1T, the world's most sensitive Dark Matter experiment showed an excess of events. There is no claim that Dark Matter has been found. The observed unexpected rate of events from a source not yet understood could be due to some new particle, most probably hypothetical axions produced by the Sun or possibly a previously unknown particle such as a WIMP (Weakly Interacting Massive Particle).
Also a remote possibility of contamination, so early days yet,
The XENON experiment is a 3,500kg (3.2 tons) ultrapure liquified xenon detector whose purpose is to search for Dark Matter It is operated deep underground at the Italian INFN laboratory.
Further details from a variety of sites including the XENON Experiment.

Achondrite meteorites and their planetary origins

The oldest, most primitive meteorites – the chondrites – formed by the accretion of smallish spherical objects called chondrules. These, in turn, clumped together to form larger and larger masses: the asteroids, many hundreds of minor planets and the major planets and their satellites.

It is now widely acknowledged that many of these bodies have been the source of some of the three hundred or so tonnes of meteoric material that reaches the surface of the Earth every day. (Remember: the great majority of meteorites are undifferentiated common chondrites that have been drifting virtually unchanged around the solar system since its formation over four billion years ago.)

Chemical and physical factors within and on the surface of the planets and larger asteroids has altered the lithology and structure of their compositional minerals, eradicating all evidence of chondrules (Despite Dan Brown's contrary statement in his novel *'Deception Point'*)
Meteorites originating from these bodies are therefore known as achondrites: or, to turn things around, any meteorite with a fully differentiated composition must have originated on a planet-sized body. Smaller

asteroids and planetissimals may still retain primitive, less equilibrated lithologies, any meteorites deriving from them displaying only a few large chondrules

Here is a list of some such meteorites and their suggested parent bodies: those in red are strongly suspected, but unconfirmed at the time of publication.

Meteorite class	Origin
Shergottites	Mars
Nakhlites	Mars
Chassignites	Mars
Kaidun	Phobos
Angrite	Mercury
Brachinite	Earth
Lunaites	Moon
Carbonados	Uranus / Neptune
Aubrites	Nysa
Aubrites	Eger
Howardites	Vesta
Eucrites	Vesta
Diogenites	Vesta
L4 chondrites	Eros
CM2 carb. chondrites	Ceres
CR carb. chondrites	Pallas
H chondrites	Hebe
L chondrites	Boznemcová
LL chondrites	Boznemcová
Brachinites	289 Nenetta
Pallasites	246 Asporina

Two questions will immediately suggest themselves:

- How have meteorites 'escaped' from these bodies?
- How can we assign a definite origin to a meteorite?

The solar system, it will be recalled, condensed from a cloud of dust and gas: the major planets, accreted by collisions in which all the material in their regions of space was 'hoovered up' (It is for this reason that Pluto is no longer considered to be a planet: it has failed to do this!)
The asteroids and Kuiper-belt objects occupy areas of the solar system where gravitational forces prevent accretion from occurring. (Contrary to popular belief, the 'Asteroid Belt' is not the debris field from a shattered planet!)

Since the formation of the solar system, gravitational interactions have occasionally shifted bodies out of their orbits, allowing collisions to occur. It is generally accepted, for example, that the Earth-Moon system is the result of such a collision. Additionally, a vast cloud of icy comets orbits the Sun out at the very limit of its

gravitational attraction (around 30 trillion kilometres!) For as yet undetermined reasons, these occasionally tumble out of their orbits and enter the inner solar system, where they may collide with the Sun, the planets or asteroids, or swing around on a parabolic path that takes them back out into the depths of space.

These impacts generate immense energies that spall huge amounts of material into space: it's worth reflecting that the escape velocity of a small planet such as Mars is so low that even a volcanic eruption could project rocks into space!

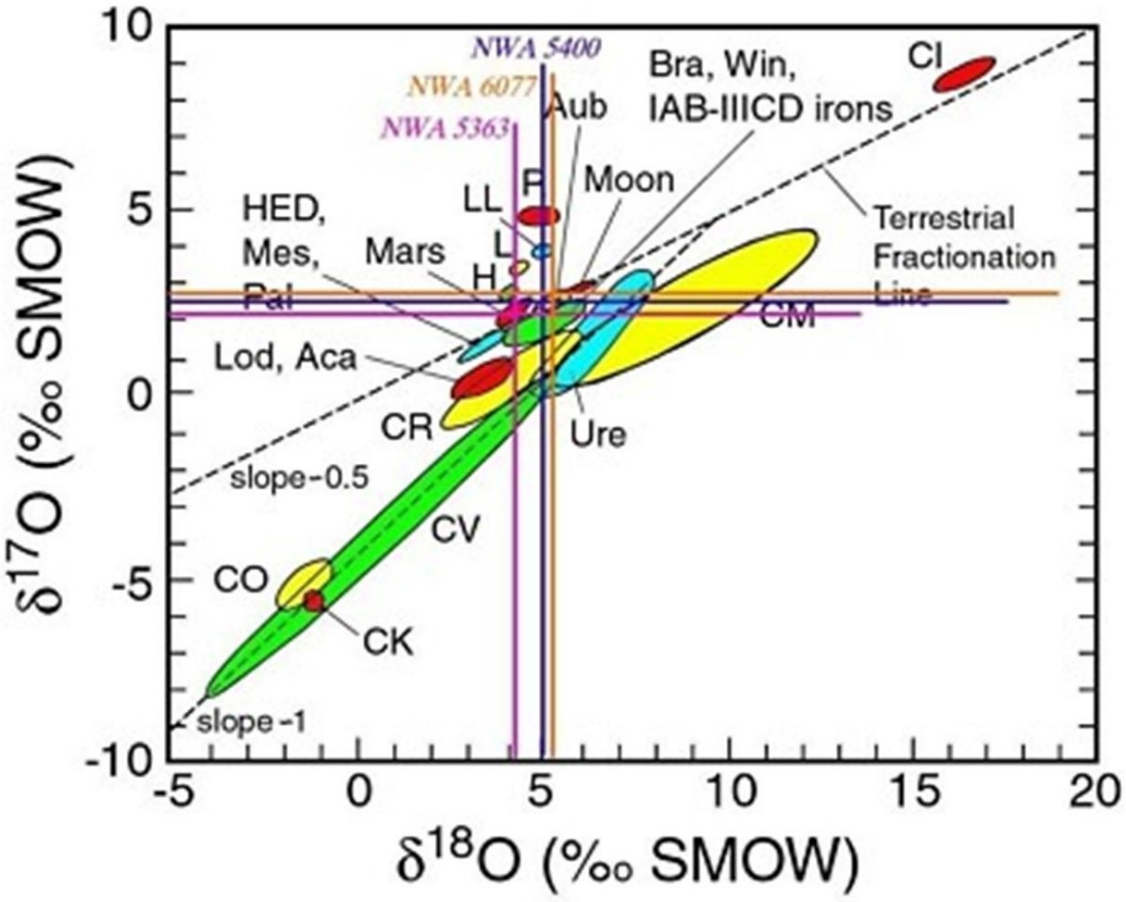
As to the assignment of an origin: this is broadly based upon three techniques:

- Petrological investigation
- Relative oxygen isotope estimation
- Spectrography

It has been demonstrated that the composition of the solar nebula varies with distance from the Sun: very light elements and compounds tend to have been driven outwards by radiation and the

solar wind. It has been assumed that refractory minerals (rich in, for example, calcium and aluminium) were, for this reason, scarce in the region of the solar system where the planet Mercury accreted: the angrite NWA 2999 is considered by many to have a Mercurial origin.

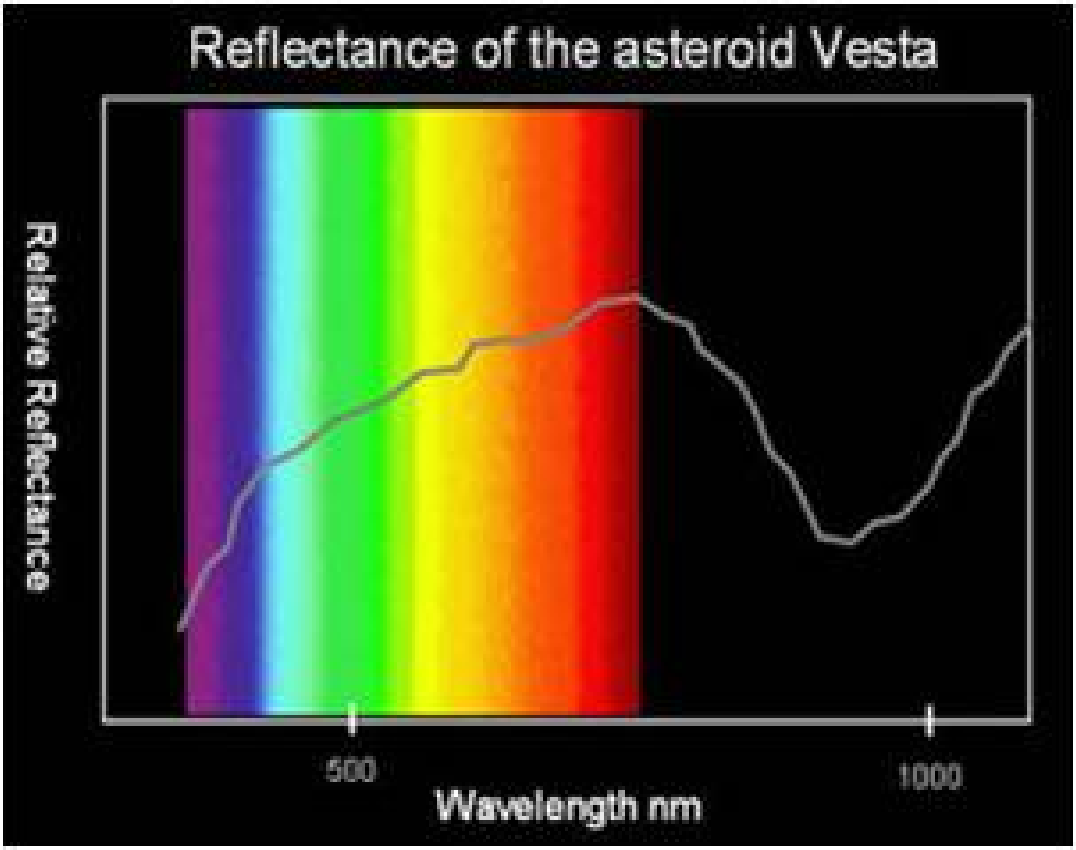
The smallest particle of any element is an atom: this always has the same atomic number (the number of protons / electrons) but can display variable atomic mass depending upon the number of neutrons found in the nucleus. There are three natural isotopes of oxygen: ^{16}O, ^{17}O and ^{18}O. Of these, ^{16}O, and ^{18}O are by far the most abundant. A graph of the relative abundance of each of these on Earth (as a percentage of Standard Mean Ocean Water values) can be used to plot the known results from
meteorites, rocks returned from the Moon by the six Apollo missions that landed there and samples gathered by robot probes to Mars.

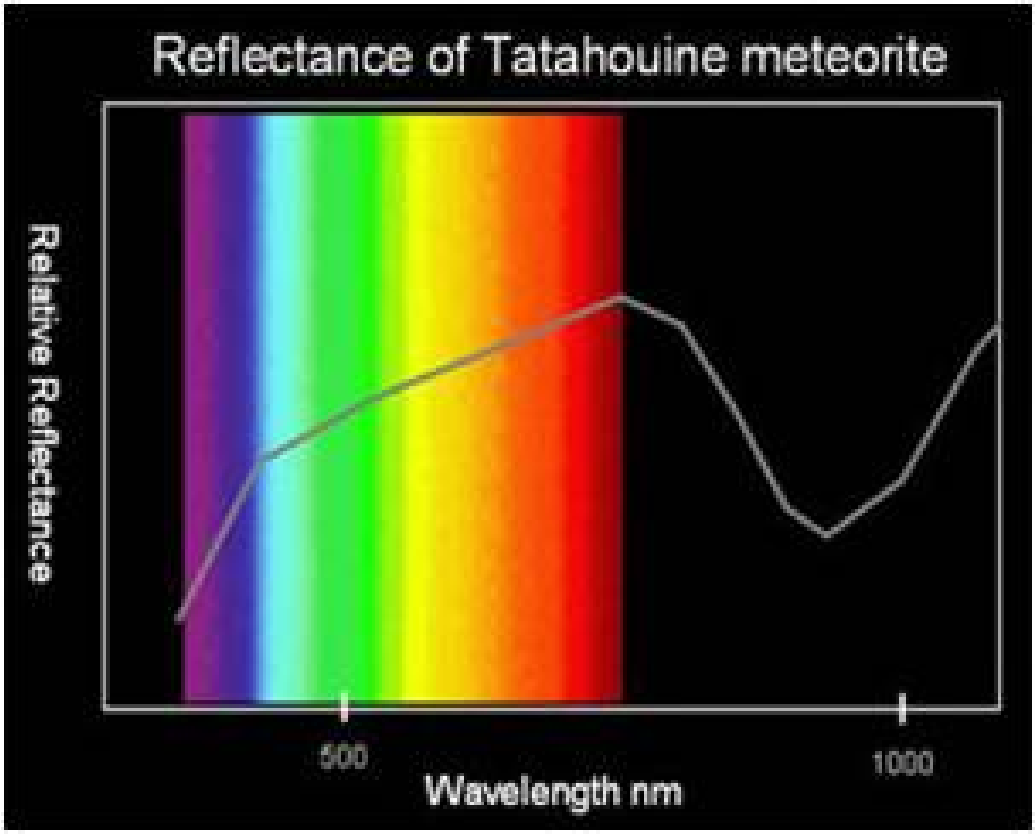


As can be seen, the results from all Earth rocks lie along the Terrestrial Fractionation line: interestingly, so do the relative oxygen isotope results for three recently-analyzed brachinites.

This graph rapidly enables meteoricists to assign a classification to any newly-found meteorite and a planetary origin to many.

Finally, and conclusively, the light from any visible object can be analyzed spectroscopically to see how much radiation is emitted or reflected at each frequency.
The resultant spectrograph is like a fingerprint or DNA profile: each Asteroid has been found to have its own unique reflectance spectrum. Astonishingly, these can be exactly matched by the reflectance spectra of many meteorites: this is how we know with certainty that the HED achondrites originated on Vesta.




Reflectance of Tatahouine meteorite
Relative Reflectance
500
1000
Wavelength nm

Constructing an Observatory

Part 1

The Building.

Design Considerations

This is a description of the construction of my observatory which was built in 2015 and therefore has had 5 years of use, so any problems have made themselves apparent. The construction is somewhat unusual due to the specific characteristics of the site.

The design considerations included :-

1/ The Northern aspect blocked by trees and bushes.

2/ A road on the Northern side which, although not busy and being in a dip, had previously shown that light from headlights was reflected from the trees.

3/ Had to be visually acceptable as it is very visible from the house. Screening was not practical.

4/ It was preferable to have a warm room attached and also to have enough space around the telescope mount to operate both safely and without too many contortions.

A dome was considered but to make it fit all the considerations it would have needed to have been larger and certainly higher. Also it did not fully comply with 3/ above; it would normally be white and therefore stand out even more. It was finally decided that a shed type of construction would be preferable. A roll off roof type was considered but that would have increase the footprint with the structure to roll open onto. Also it was envisaged that the warm room would have a skylight to be able to easily keep an eye on the cloud conditions/rain. This meant that a roll off roof could not be parked in the open position over the warm room.

To visualise sizes the outline and dividing wall were laid out on the ground and adjusted to get the best fit with space around a portable mount. Also taken into consideration when deciding the final size, were the sizes of materials available. The overall size decided upon was 2.3metre X 3.6metre with a maximum height of 2.1metre (this is also a planning requirement for a structure close to a boundary. Taking into consideration of the lights from the road and to ensure maximum visibility angles, the telescope roof section was split horizontally. The top section would hinge up to provide a light screen and the lower section would slide away to give maximum view to the lowest angle.

Pier foundations and support

It was decided that the foundations for the pier should be totally separated from the floor and main foundations to stop the transfer of vibrations between the two. Due to tree roots and also sand/gravel subsoil, it was decided that the pier foundations should go at least 1.0 metre below the surface. A hole was dug out by hand to about 1.2 meters. A template of the pier flange was made and fitted to four 1 metre long threaded rods. Fitted on these rods were several plates held by nuts to give additional security. To get the correct levels two parts of the floor foundation level were fabricated to support the former for the pier.

With the studs fitted the 1st pour of concreate was completed up to a level just below the original ground line. Reinforcing bars were added to increase strength.

With the top cover temporarily removed the top section was cast. Once the final pour had been completed and levelled the template was refitted. This is

probably not absolutely necessary in most constructions, but a reasonable precaution. Do bear in mind that the shuttering has to be strong enough - concreate has a habit of finding any weakness in the shuttering.

Leave for a couple of weeks to cure before fitting the pier, (the longer the better).

Once this has been completed the main foundations can be formed but these must be separated from the pier foundations to stop the transfer of vibration. There are several means of filling this gap to stop weeds growing between the 2 foundations.

Timber framework and cladding

The floor bearers used were 100mm X 100mm treated timber laid front to back at approx. 450mm centres to allow air to circulate under the floor. The floor was laid with 100mm tongue and groove timber that was treated before installation. Wall sections were fabricated on a flat surface. These are from treated studwork timber with 100mm square corner posts.

A Kit form shed

Once all the sections had been fabricated the moment of truth came when erecting on the floor. It may be worth pointing out I included a small section of floor between the front wall and the pier that can be lifted to allow cables to be fitted and modified as needs require. This is boxed in to stop winter residents.

The cladding used was pressure treated ship lap timber. One thing this picture shows is the mains cable which was laid before the main foundation slab was cast.

In the above picture the warm room is this end and the polythene is to allow the insulation to be fitted.

Roof construction

The roof is of specific design due to site but the construction may be of use to others. The roof was constructed of sheet materials covered in fibre glass. This has proven over five years to be very successful with only slight delamination of the edges which is easily rectified.

A rooflight was fitted to the warm room

The two sections of the opening roof are power operated using two recycled stair lift mechanisms. These came from a neighbour of my mother in law and normally cannot be refitted once removed from original location. This means that they should be reasonably easy to obtain, and they make fantastic actuators being both powerful and quiet. These need to be stripped down carefully retaining the parts that are necessary, including the limit switches.

Due to the need to power from one side some assistance is required to balance the un-driven side. For the top section I used a gas strut and for the bottom section a lead counterweight.

The roof sections were fibre glassed and fitted to the building.

It took almost exactly three months to get from starting work to completed building.

I will complete a second article in the fitting and operation of the observatory for a future issue.

Darrell Brown

So let me begin by saying thank you to everyone that has welcomed me to the Facebook group and liked my pictures it's nice to feel part of a passionate group that likes the same things I do.
So a bit about me and how I got started, like most of us that love the night sky I had a fascination with the shapes I could see in the stars from a young age.
I had my first look in a telescope at the age of 10 and that started my journey to where I am now.
So I've had various telescopes my first tracking scope being the Meade lx10 then lx50 onto the lx200 around 20 years ago.
I soon realised that taking images of the things I could see in the telescope made them stand out more and my astrophotography soon took over visual observing.
So around a year ago, I was making tech youtube videos with my superuser techmods channel and decided, you know what I can make videos on astrophotography, that's what I really love and so I made my Astro Imager youtube channel, but I didn't really start to post videos because I was spending more of my time trying to get better results with my images.

At that time I had a skywatcher 200p Newtonian telescope and a skywatcher eq5 mount and cheap guide scope off a known selling site.
I joined a few groups on Facebook where people were posting these amazing pictures and I said to myself how are these pictures so good I want mine to look like these.
Beware this is where it starts lol, watching the big well-known YouTubers and seeing pictures that they had captured with this all singing all dancing equipment made my wallet feel the pain.
Now I'm of mixed opinions to do you really need to spend thousands on equipment or can you just get a camera and a tracking mount, well yes you can if you're happy with strange colours, imperfect images then that's ok your set but if like me you just want to see something a little better then be prepared to spend your kid's inheritance but remember its personal preference when it comes to the pictures you take if you love them that's all that matters.
These days the equipment is expensive if you want perfect pictures, even the second-hand market prices are holding firm.
The more technical your setup the more things can go wrong, I've spent many nights trying to work out why something isn't working as it should only to find that I'd pulled a wire out in the dark, lessons learned to set up in the light!
In the past year I've changed my setup considerably at the beginning of the year I had the 250dps 10in skywatcher Newtonian and moved to the ed80 refractor from Altair Astro.
I had a second-hand neq6 pro mount which had a few issues which I fixed by carrying out a full strip-down replacing the bearings and grease.
I started the year with a canon 80d unmodified which was a nice camera but wasn't bringing out the red in nebulas how I wanted so I bought my first modified canon 1200d and had varied results so opted for the Altair Astro 183c pro.
But tempted by the Altair Astro website I sold my whole kit and decided on the ed102 refractor and the gpcam2 for guiding with a 50mm guide scope.
So I needed a new mount and purchased the skywatcher neq6-r pro which I'm really pleased with.
In the last few weeks, I've updated most of my gear, the upgrades included a pegasus powerbox which powers all of my equipment including the camera and mount, pegasus USB 3.1 hub which works for both USB 2 and USB 3 together which most hibs fail at, a field flattener and my current camera the Altair Astro 269c tec a prototype which I've only used twice for a very limited time but what I've seen so far is amazing.
At this point, I'm considering the focus cube also to fully automate my setup.
Anyone thinking of upgrading won't be disappointed by any of the equipment I've mentioned here most supplied by Ian at Altair Astro and if you do decide to purchase anything don't forget to tell him I sent you.
If I move on to software I'm somewhat stuck in my ways, when something works leave it alone my father used to say which is so true.
I use apt for my image captures and plate solving, like most phd2 for guiding and Stellarium in the background to check what's in my sky at the current time.
But above all it's so important to remember to take from the hobby what you want, even if it's laying down on the floor on a blanket looking up at that big beautiful sky or spending a considerable amount of money photographing it enjoy it before all those satellites crash into one another and the sky is never the same again.

Darrell Brown aka Astro Imager

Observatory Maintenance

By Mick Ladner

Following on from my short piece last month on observatory maintenance.

As you all know I have been keeping an eye on the observatory during these difficult times and for a couple of weeks last month we had a couple of us over there looking at what needed doing and making a start.

So with restrictions starting to be lifted, (as it stands now we can have 6 people meet in the open, but this may well change again after the next update) and with the better weather now (hopefully) it would be a good time to get some more of the work done.

So, what needs doing.

All of the woodwork around the roof line requires painting /varnishing

Where the guttering is along the front it has been painted black and as you can see is starting to flake.

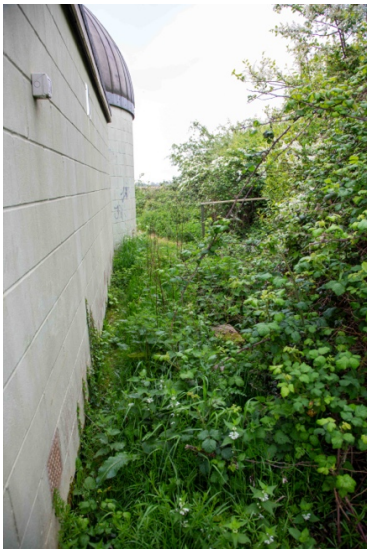
Following the roof around the barge boards now are all bare wood and in a couple of places need some wood filler.

At the back of the observatory the wall has a crack. It looks like it has had some epoxy or the like at some time applied but towards the top the crack is bare, it also looks like it goes right through to the inside. I don't know anything about brick work but maybe it needs a brace.

The gutter along the front has a joint which was hanging off. On inspection the screw holding it was missing and also one of the rubber seals. The gutter has been temporarily fixed until the painting has been done at which time a new seal or a sealant can be applied.

A start has been made on gardening but there is still more to cut down.

But as you can see, we can at least get around the back.



On the inside (no pictures sorry) it has had a considerable dusting and cobweb removal but still more to do, and upstairs in the dome the floor has had a lot of ware and needs a good coat of varnish.

So, what we are looking to do is have a work party one day on a weekend sometime in July/August and would like some volunteers please.

If you could e-mail me mick@stmimages.co.uk with dates you would be available for then I can sort a day that is convenient to all.

Many thanks Mick

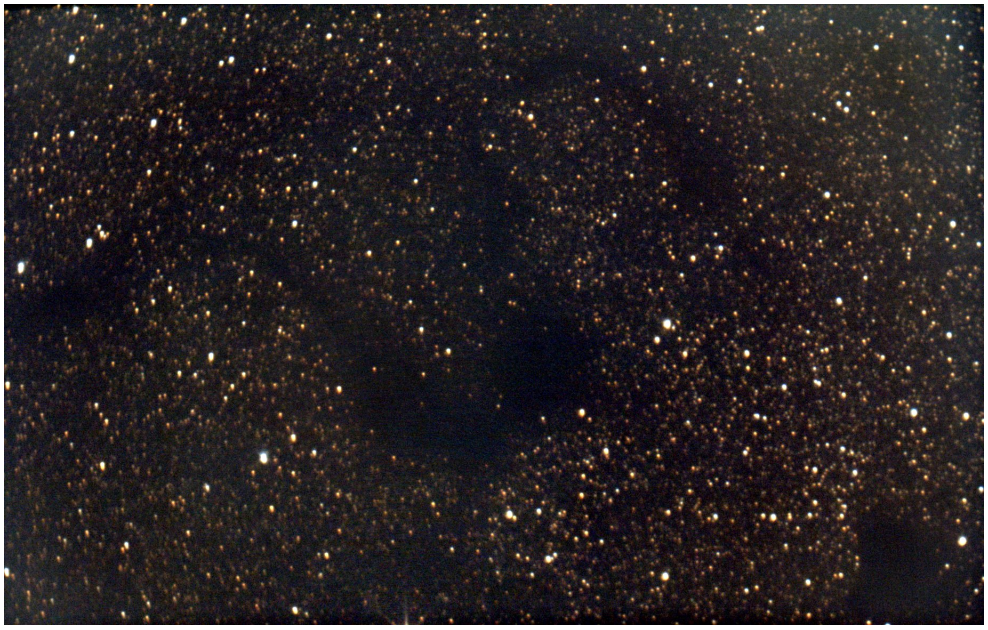
Members images

John Gionis

Globular cluster M5. NGC5904

Located in the Serpens constellation just above double star 5 Ser at lower end of image some 30,000 light years away. Total of 20 exposures ISO800 on a Canon 500D and 10” SNT.

Dan Self



Barnard N 72 Snake Nebula 29X30sec 20” observatory telescope

C2020 F8 Swan May 24th 25X10sec defuse broken nucleus 20”
Observatory telescope

Longmore Tritton 5” Coma Berenices Planetary Nebula

M13 via planetary camera on 8” SCT

M104 Sombrero 29X30sec 20” Observatory telescope

NGC 4993 The famous neutron star merger galaxy 26X30 sec 20” Observatory telescope

Darrell Brown

Andrew Luck

40 hours of HaRGB data collected during the spring nights.

Malcolm James Dent

IC5070 PELICAN Nebula 168 minutes of data so far.

Skywatched EQ6r Pro. Esprit ED100 ASI1294mc pro. EAF ASI Air Pro 55X 3 minute exposures @120 gain.

Mick Ladner

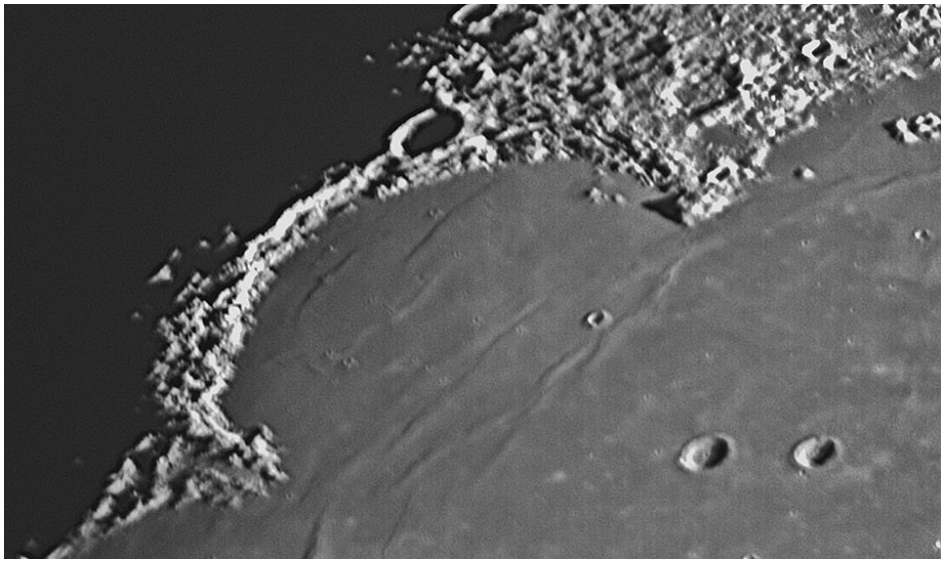
M13 15 10 Sec subs processed in Pixinsight and Photoshop.

Full Moon 5th June 2135 BST

David Murton

Moons occultation of Venus as seen from Kessingland. William Optics 71ED scope and canon 60Da camera plus 2x Barlow.

Chris Bailey



Sinus Iridium (Bay of Rainbows) ETX 125 GPCAM best 50 of 500

ETX 125 GPCAM best 40 of 800.

CONTACTS

Chair Dan Self
Contact **chairman@brecklandastro.org.uk**

Observatory/Visits Mick Ladner
Contact **visitors@brecklandastro.org.uk**

Webmaster Andrew Luck (temporary)
Contact webmaster@brecklandastro.org.uk

Newsletter Chris Bailey
Contact newsletter@brecklandastro.org.uk

Membership/Treasurer Andy Jones
Contact treasurer@brecklandastro.org.uk

Secretary Rebecca Greef
Contact secretary@brecklandastro.org.uk

Please check with any of the contacts in bold before visiting the observatory. Please ensure you are wearing appropriate footwear and clothing and bring a torch (preferably one showing a RED light)

Breckland Astronomical Society Events –2020 7:30pm Great Ellingham Recreation Centre, Watton Road, Great Ellingham, Attleborough, Norfolk NR17 1HX £2 adults £1 children		
Friday July 10th	**Personal Stories from Mars Exploration: Delirium, Delight and Disasters**	Professor David Southwood, Former Chairman of UK Space Agency Steering Committee
Friday August 14th	**The Green Flash + rescheduled AGM**	Mike Frost (BAA History Section)
Friday August 28th	**Public Open Night**	Observatory
Friday September 13th	**Planet Vulcan**	Andy Jones
Friday September 25th	**Public Open Night**	Observatory
Friday October 9th	**Astrophotography**	Nik Szymanek
w/e Fri October 16th	**Haw Wood Star Party**	Dave Murton
Friday October 30th	**Public Open Night**	Observatory
Friday November 13th	**Quiz Night**	Dan Self
Friday November 27th	**Public Open Night**	Observatory
Friday December 11th	**TBC**	
Friday Jan 1st 2021	**Public Open Night**	Observatory
Friday Jan 8th 2021	**The Apollo 11 Mission**	Jerry Workman
Friday Jan 29th 2021	**Public Open Night**	Observatory
Friday Feb 12th 2021	**TBC**	

Quiz Page 7 – Answers.

1. What was discovered by Penzias and Wilson in 1964 after they ruled out pigeon poo as being the cause?
b. Microwave Background Radiation – they checked every source of possible noise

2. What is the Hubble Constant? (in kilometres per second per megaparsec)
a. either 67.4 or 73.5 – there is currently a "crisis in cosmology" due to these two measurements disagreeing by more than the measurement errors.

3. Stephen Hawking discovered a Black Hole's Entropy is proportional to what?
c. area of event horizon

4. What portion of the total energy of the universe is directly visible to us using today's technology?
b. ~ 4% - this includes all the baryonic normal matter and light etc that we know

5. What was the Temperature of the Universe 1 second after the Big Bang? (Kelvin)
c. 10^{10} (10 billion^{o}) – it had been cooling for a whole second!

6. Which of the following cannot be used as an accurate measure of distance?
c. Brightness - it is not reliable as objects can have different intrinsic brightnesses

7. In General Relativity, Einstein's main equation says what?
a. Mass tells spacetime how to curve, spacetime tells mass how to move.. an extremely concise description, coined by Physicist John Wheeler in the 1950s.

8. What theory did Alan Guth develop in 1980?
d. Cosmic Inflation – devised in 1979, seminars in 1980, published in 1981

9. What was the most recent probe to measure the Cosmic Microwave Background?
d. Planck Surveyor – the others were previous versions in chronological order a-d.

10. What does the word anisotropy mean?
c. not the same in all directions – think of photo<u>trop</u>ism in biology, direction of the light.

11. Martin Rees – formally Baron Rees of Ludlow, OM, FRS, FREng, FMedSci FRAS.

If you got 6 or more you're doing well! My quizzes are known for being tough ☺

Dan Self