

Federation of Astronomical Societies



Editor: Michael Bryce

Newsletter

No 136: February 2024

fedastro.org.uk

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23 January 2024

Let me start on a positive note by wishing you all a happy, prosperous and healthy New Year before I switch mode:

Grumpy Old Man Rant Mode **ON**. [FX: Stepping creakily on to his old soap-box]

Do some things positively make you fume?

I have a list of things that irritate me: near the top of the list is those lazy journalists who start their articles with phrases like "Scientists say..." as though *all* of those with a scientific background can be categorised into the same generic group. We don't expect a Biologist peering into the private life of slugs to comment reliably on the latest breakthroughs in metallurgy, a Botanist working on growing virus-resistant strains of wheat to expound expertly on the chemistry of the transuranic elements, a Computer Scientist developing quantum computers to jump into debates on the latest work into latex technology nor do we expect a Cosmologist researching dark matter to communicate learnedly about deep-sea creatures. They're all scientists, sure, but why not credit a scientist with the appropriate title of their field of work or study?

If we want to have the huge diversity of STEM career options laid out before young people so that they can see what they're interested in and have a goal to aim towards, we should be distinguishing between Biologists, Chemists, Physicists, Mathematicians and Engineers and the dozens of nuanced sub-fields within each of those subjects. Yet those indolent hacks, writing unedifying puff pieces in the popular daily press, just refer to all those talented, educated people as "Scientists" without differentiation and so amplify the misconception that scientists all come from the same mould, all wear white coats and have tousled white hair and big moustaches! What a sad way to down-play the wonderful, intricate richness of human scientific endeavour!

And, whilst I'm on my soap-box, another thing... my good chum Arnab (yes, the same one that got me started thinking about Dyson Spheres – FAS Newsletter #132) posted a link to [a video on the Financial Times' YouTube channel](#). Go on... watch it... I'll wait... 😊

The video starts off well with lots of boilerplate cheerleading for the future of travelling to and living and working on the Moon. It's at about 8:30 minutes into the video that I start to smoke from the ears when they talk about Project Moonlight which plans to put a constellation of communication satellites into orbit around the Moon (perhaps ruining the option of Moon-based observatories sited there to avoid the satellite-polluted skies around Earth) and, at about 16:53 minutes into the video, they discuss possibilities for mining the lunar surface for Helium-3.

I see it as something of a tragedy that we still know so little about the Moon and the processes that both formed it and are still shaping it and yet there are people planning to exploit its pristine

beauty before proper research is carried out (the same mentality is also planning to scrape the bottom of Earth's relatively unexplored deep oceans for commercial purposes). It's telling that, near the end of the clip, it's the astronaut that said he was "longing" for humanity to go back to the moon and *explore* whilst the NASA chap, entrepreneurs, writers and space consultants all talked about the commercial aspects.

It's the drive for exploitation of the Moon's resources that will create conflict and raise tensions (one of the speakers used the phrase '...war for the Moon...'). What if both the US and China decide to go to the bottom of the same crater to extract water? Well, perhaps governments will attempt diplomacy to resolve the conflict (or maybe they won't) but what if those 'water miners' were both from the US but different companies? They'd both feel they'd made a commercial investment in getting there with all their equipment and would both feel *entitled* to mine the surface. Would we see factionalism between those companies, the start of inter-company lunar sabotage or assassination, long periods of stagnancy whilst machines lie dormant and commercial lunarnauts™ sit in their space habitats expensively twiddling their highly-paid fingers as legal battles are fought on Earth? Why would the companies restrain themselves when they might consider the lunar surface outside US jurisdiction?

To avoid this conflict we need to have international treaties in place before commercial activity starts – but why would the big space-faring nations, already well-advanced in their plans and development and their race towards dominance of the lunar commercial sector, sign up to such a treaty? We have to convince them that's it's in their commercial interests to do so, that trending towards potential conflict means walking towards potentially huge future commercial risk and may also mean engendering forceful rather than diplomatic resolution.

What if the US decided to take military action against, say, a Chinese lunar base they thought was supporting commercial activity that threatened US commercial interests? Maybe they could deny involvement, passing it off as an unfortunate celestial event – a rogue meteorite – or an equipment failure? Without monitoring (radar, CCTV beamed back to Earth, etc) the Chinese wouldn't be able to prove whodunit. Mindful of this we might expect lunar bases to start carrying radar and defensive missile shields and... hell on Earth has become hell on the Moon! Already [we see calls](#) for the US military to fund development of cis-lunar infrastructure to secure future US commercial interests.

Failure of wide acceptance of the [Moon Treaty](#) (and see [here](#)) was a missed opportunity for future harmony. The US, UK, China, Russia, etc will never sign up to it as they have too much invested in racing to exploitation of the Moon and other celestial bodies (e.g. asteroids) when they get the chance.

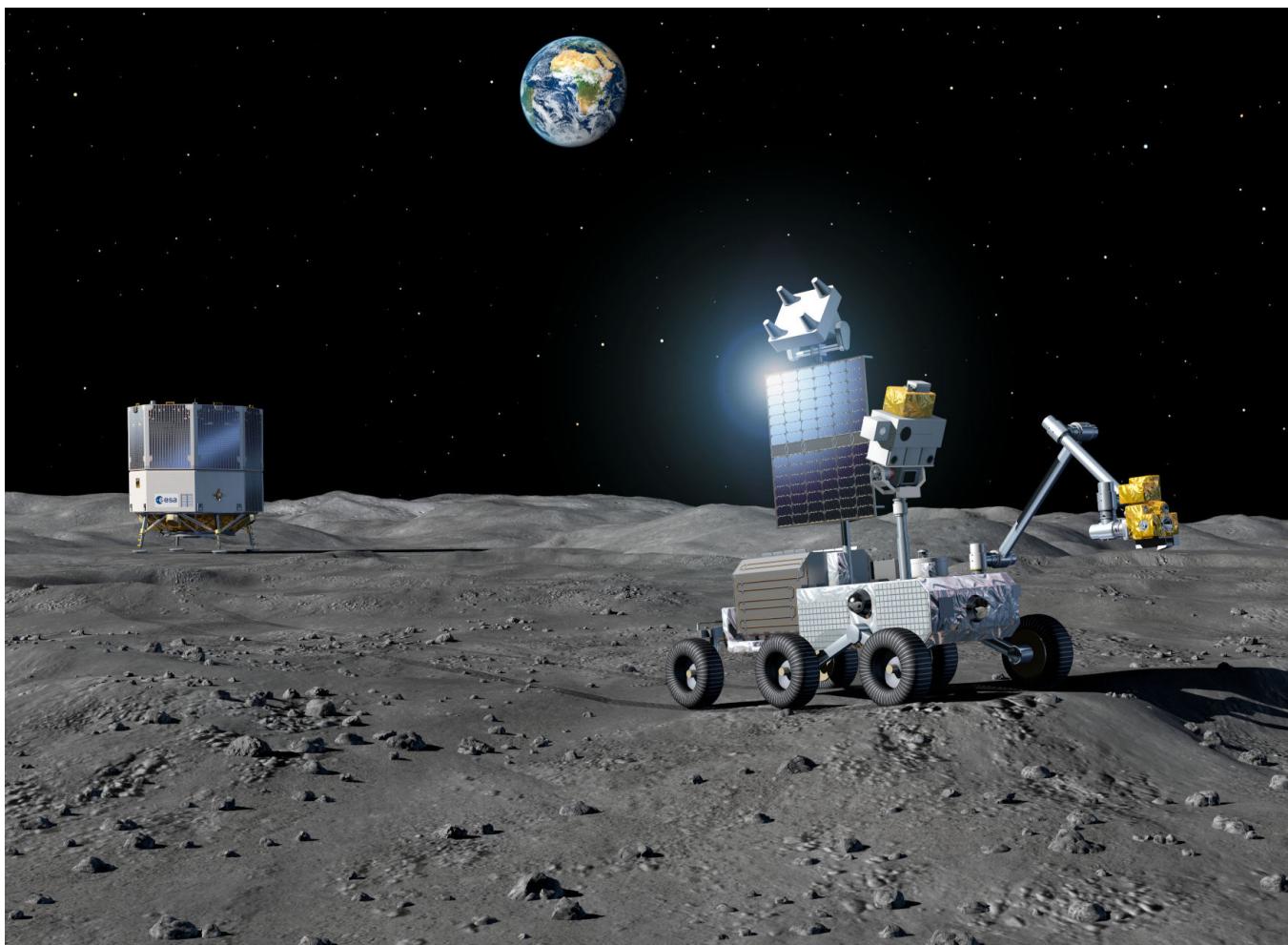


Image Above: Prospecting: artist's impression of a Moon lander and rover.

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esa.int

business.esa.int/funding/open-competition/lunar-economy-applications

Elon Musk has a lot to answer for. He's clearly a genius and visionary but also an unconstrained maverick with enough money to push into unregulated areas. He's keen to get to Mars and [has already said](#) that he doesn't see why SpaceX's Mars colonies would need to conform to Earth laws. This cavalier 'Wild West' approach is infecting other organisations and national thinking when space, a global commons, should be regulated by the UN – paper tiger that it is (sadly)!

Finally (if you believe that!) there are the proposals for launching satellites that will allow direct satellite to mobile-phone connections. Necessarily, these satellites will have huge antennae; the early versions Bluewalker 3 (at just over 500 km altitude) and the Bluebirds 1 to 5 will have 64 m² antennae with later versions being larger. Along with the concerns about the Starlink and similar proposed megaconstellations we now have to be [concerned about these very bright satellites](#) (and [here](#)) being mini-moons and illuminating our upper-atmosphere and reducing the blackness of the sky.

And (did I say finally?), let's not forget the plans for generating solar power from orbiting satellites (SBSP – Space-Based Solar Power) and beaming that power down to the Earth's surface. The planning by ESA ([SOLARIS project](#)) and [NASA](#) is already well

advanced and the first demonstrators of the principle have been tested. These satellites will have *huge* light collecting areas (1-2 km²) that will dwarf Bluewalker 3 and the Bluebirds but, as they'll be in a Geosynchronous orbit, they'll appear as new, *very* bright stars fixed in the night sky.

Now, *really* finally, don't get me started on how [shrinkflation](#) means that my favourite chocolate bars are no longer 'chunky' enough to be worth buying!

[FX: Steps down from creaky old soap-box]

Grumpy Old Man Rant Mode OFF.

Stay safe and clear, dark skies (while we still have them anyway)

Paul

Equipment Review:

ZWO Seestar S50 All-In-One Smart Telescope

By Cath Adams
Wolverhampton Astronomical Society

I have been using Dobsonian telescopes for many years now but recently decided I wanted to try out imaging deep sky objects. I read different articles about the various Smart Scopes and something about the SeeStar S50 caught my eye, it sounded a perfect way to start my journey before committing to a full rig set up.

The SeeStar S50 is lightweight and compact making it very easy to take anywhere. The set up is simple and takes little time to do. I can usually be imaging within a couple of minutes of putting it outside. An added bonus for me was the Solar Filter that was included!

Technical Details

The SeeStar S50 is a single unit that comprises a telescope, astronomical camera, electric focuser ASIAIR intelligent controller, altazimuth mount and a filter switch device. It is controlled using an app that is downloaded to your smartphone or tablet. Please check that your device can support the SeeStar app as older smartphones and tablets may not support it. You connect to the SeeStar using Bluetooth or Wi-Fi if you prefer.

Aperture – 50mm
Lens – Triplet Apochromatic
Focal Length – 250mm
Focal Ratio f/5
Mount – Altazimuth Mode

The SeeStar S50 has three inbuilt filters and comes supplied with a clip on Solar Filter allowing you to capture the Sun in white light. It also has an inbuilt dew filter.

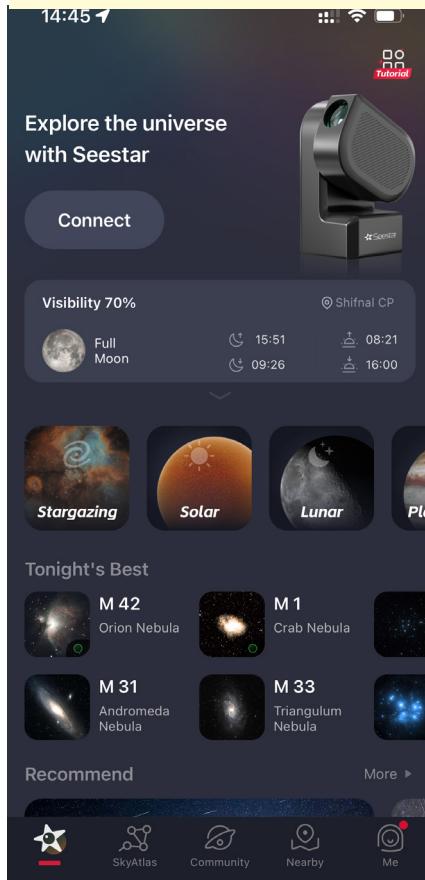
The tripod supplied is carbon fibre and extends to a height of 363mm.

I have found the App easy to use, the first thing to do when you power on your SeeStar is to connect to it using the app by clicking Connect, this normally takes just a few seconds. Once connected the first



Image Above: The Seestar S50 All-In-One Smart Telescope.

Image Below: The Seestar Smart Phone App.



thing I do is turn on the Dew Filter if I feel I need it.

The Seestar App

The app has all you need to find the targets you wish to image it includes a section showing you the best targets visible that night, called Tonight's Best. There is a Sky Atlas which is broken down into sections, Moon, Sun, Planet, Comet, Galaxy, Nebula, Cluster, Messier, IC, NGC, SH2 and Named Star.

In each section you will find a list of targets, it is also indicated if the target is currently visible or invisible, and gives its altitude and position in the sky.

Once you have decided which target you wish to image you simply click on the Gazing icon, the SeeStar will then automatically move to the position of your target and begin the process of locating it.

For deep sky targets, once your chosen target has been located you will hear the message "Object is centered", next click on the Stargazing icon and click the AF icon to autofocus, once this process is completed you will hear the message "autofocus completed". Following this you click on preview, the latest firmware update has a new feature where horizon calibration takes place before you can start imaging, this takes around 2 minutes to complete. Once this is done you can begin to take your image, there are options to take 10, 20 or 30 second exposures. The SeeStar automatically stacks the exposures and produces a live image on your phone/tablet of your chosen target.

The process for Lunar and Solar images does not involve all the steps above, once you click on the Gazing the SeeStar will simply locate the target, once it is located it will appear in the middle of the screen, you then click autofocus, once that is done you have the option to take a photo or a video.

The images produced are automatically saved to the SeeStar and to your phone/tablet. For anyone wishing to do some post processing there is the option to save FITS files which can be downloaded to your computer. You select this option in the Advanced Features on the app. The results of this are most impressive from what I have seen on various forums and social media groups.

So far I have not downloaded any files for processing but I have seen what can be achieved by doing this by others online and the results are very impressive. I am a beginner to deep sky imaging so for me it is one step at a time. I simply sharpen the images using the features on my iPhone 13.

In summary the SeeStar S50 is a great little scope, which has far exceeded my expectations, when I saw the image of The Orion Nebula appearing I couldn't believe

my eyes! I am having so much fun using it and would thoroughly recommend it to anyone. I think it is especially suited to those who are beginners to astro imaging as the SeeStar does most of the work for you. It is also ideal for anyone who does outreach work with groups as the results are instant and the images can be shown easily using a tablet screen.

The Results!

A selection of images with total exposure time, all taken with my SeeStar S50. The images have been cropped and sharpened using the features on my iPhone 13.

Cath Adams



Image Above: M42 – The Orion Nebula – 10 minutes



Image Above: M51 – The Whirlpool Galaxy – 30 minutes



Image Above: M81 – Bodes Galaxy – 60 minutes



Image Above: The Sun. Single image. As you can see Sunspots show up nicely.

About Cath

I've always been fascinated by space, all my life I have loved to look up at the Moon and stars, my interest started as a child when I would spend time looking up with my Dad.

I'm a keen amateur astronomer with a particular interest in the Moon, more recently, since purchasing my SeeStar, I have found a love of deepsky objects. I enjoy doing outreach work with local groups in the area I live in.

I'm the current President of Wolverhampton Astronomical Society and the Merchandise Manager for The Society for Popular Astronomy.

Wolverhampton Astronomical Society

wolvas.org.uk

Society for Popular Astronomy

popastro.com



ZWO Seestar S50

seestar.com

£539.00

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Astronomical Equipment
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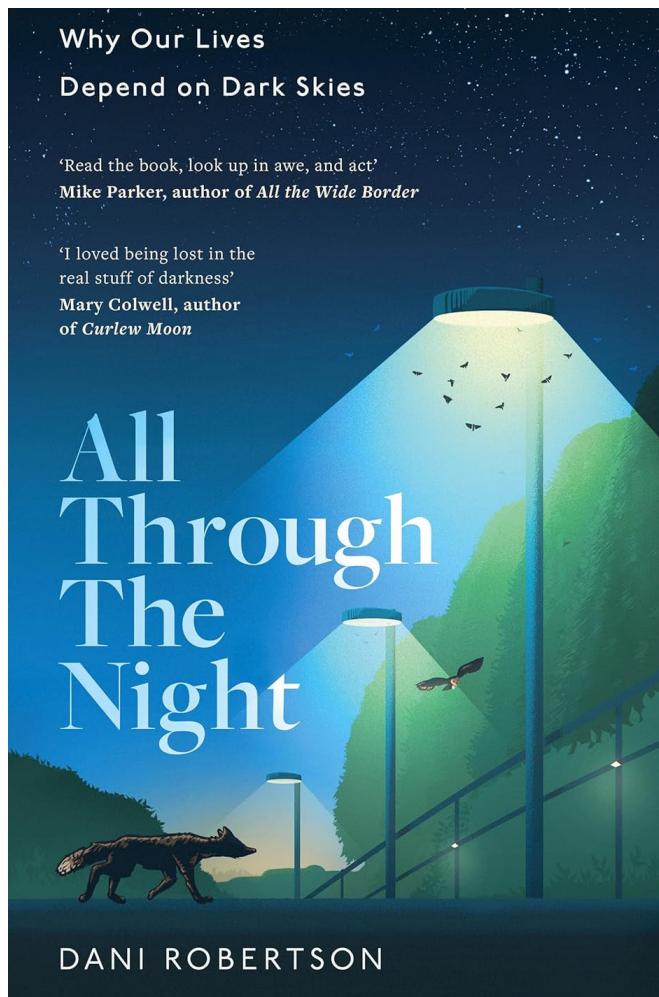
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Book Review:

"All Through the Night": Dani Robertson

Reviewed By Steve Tonkin FRAS

FAS Dark Skies Advisor



It is a truism that books work best when the author plays to her or his strengths; as *All Through the Night* shows, one of Dani Robertson's strengths is bringing stories to life.

There is a phenomenon, experienced by anyone who has tried to change another's opinion by presenting data and sound logic, called "motivated reasoning": if such information challenges what somebody already feels about something, it is human instinct to see it as a threat, to question the motives or reliability of the source of the new information.

Night is a phenomenon which has shaped evolution of a vast majority of living things on this planet but, despite the mounting – one might even say overwhelming – body of evidence that we need to address, as a matter of some urgency, the threat to darkness from artificial light at night (ALAN), too little is done. Even as astronomers, we appear to be hard-wired to see light as

intrinsically good and darkness as a threat. To a large extent, the presentation of data has failed to motivate us.

There is another phenomenon, best summed up in the phrase "Stories beat Statistics". This is what makes Dani Robertson's book so important. Most books and articles on light pollution and its consequences are rich on robust information, but somehow they don't appeal to a uniquely human part of us.

This is not to say that *All Through the Night* is not factually rigorous; it is, but the facts, data and statistics *inform* the narrative without *being* the narrative. For this book is essentially stories; stories of the author's experience of light and darkness, of her recognition of the importance of darkness, of the way it has shaped our cultures, of the way it affects us and other living things, and of how we can start to reverse the tide of harm caused by ALAN. Throughout this, her passion and humour shine through her prose.

It is an eminently readable book. Ms Robertson's style draws the reader in to her perspective so thoroughly that it is a difficult book to put down. To her, darkness is an old friend, and she welcomes you into that friendship. Almost in the manner of a good thriller, it repeatedly triggers the question, "What's coming next?"

Another very important part of *All Through the Night* is that it was written by a woman, from the perspective of a woman. Those of us who advocate for responsible lighting are aware that women and girls in particular are concerned about night-time safety and, whilst we've been aware that most men and women experience dark differently, I was not aware of the extent of this until I read the chapter *Women of the Night*. Needless to say, Ms Robertson indicates how we can create comfortable spaces at night for women and girls.

This book is unique. Where other books on ALAN will furnish you with more than enough data and statistics, *All Through the Night* will touch that part of you which data and statistics cannot reach.

Dani Robertson is the Dark Sky Officer for Eryri (Snowdonia) National Park.

Steve Tonkin
January 2024

Call to Protect the Dark and Quiet Sky from Harmful Interference by Satellite Constellations:

https://cps.iau.org/documents/42/Draft_IAU_CPS_position_statement_9Z8xE01.pdf

Book Review:

2024 Yearbook of Astronomy: Brian Jones

Reviewed By Michael Bryce

FAS Newsletter Editor

More than a Night Sky Guide

Continuing the tradition begun by John Guy Porter and Patrick Moore over 60 years ago, Editor Brian Jones has produced this excellent latest edition for eagerly-awaiting astronomers both at home and abroad. The book follows the similar format that readers have enjoyed for many years. In an A5 footprint, this handy book contains all the information required to satisfy the astronomical observer for the coming year. If you need to find out something for a particular month, this is the guide for you.

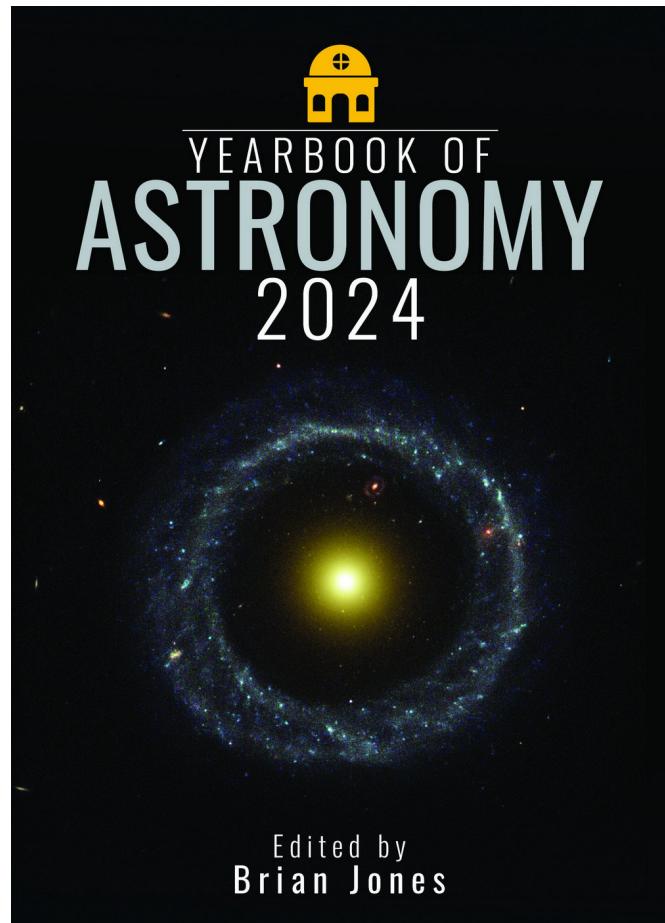
The beginning of the book contains traditionally styled star charts for both Northern and Southern Hemisphere observers, after which the regular Yearbook contributors David Harper and Lynne Stockman have provided detailed information and maps showing the different positions of the major planets throughout the year.

Following the Lunar Phenomena and Eclipses pages, the Monthly Sky Notes provide an observing paragraph for each planet for every month together with apparition charts, compiled by David Harper, for Mercury and Venus. Details of comets, minor planets and meteor showers visible throughout the year are compiled by Neil Norman.

Each month a short article by a popular writer is included to keep the astronomy and space enthusiast occupied on cloudy nights, the authors this year including Neil Norman (The Great Comet Crash of 1994); Jonathan Powell (Cave Art, The Buran Soviet Space Shuttle and the Fate of Beagle 2); David Harper (Chaos in the Solar System); Gary Yule (The History of the Smith-Clarke Reflector); and John McCue (Where are the Sunspots?), to name but a few. The main section of the book follows, and contains articles on a wide range of topics including, among others, Recent Advances in Astronomy; Recent Advances in Solar System Exploration; Riccardo Giacconi: X-ray Astronomy Pioneer; Things Fall Apart – Chaos in the Solar System; Astronomy in Antarctica; Male Mentors for Women in Astronomy; Tracking Older Artificial Satellites; Inner Lives of Dead Stars; and A Triumvirate of Telescope Makers – Thomas Cooke, Howard Grubb and Alvan Clark.

The Yearbook of Astronomy 2024 provides a fantastic all-in-one snapshot for the astronomical observer to plan their observing activities throughout the coming year, and is available from all good booksellers for just £19.99. You can also obtain your copy from a number of online sources, or ordering direct either from the publisher at pen-and-sword.co.uk (UK and Europe) or the US distributor at casemateipm.com (USA and Canada) and searching 'Yearbook of Astronomy 2024'.

Michael Bryce



The World at Night

An International Astronomical Union (IAU) supported PDF document about the night sky and the importance of keeping it dark available for free from here:

portals.iucn.org/library/node/51414

Direct link to .pdf:

portals.iucn.org/library/sites/library/files/documents/PAG-033-En.pdf

Route de la Belle Etoile - Route of the Beautiful Star

A documentary photobook about pro-am in astronomy

Dan Homer

It was early 2019 when I chanced upon a news article, its detail now long forgotten. Still, the feature, championing the work of an amateur astronomer, left a lasting impression. What followed were four years of intense research punctuated by a pandemic, with many a self-funded journey to photograph amateur astronomers, who in some way contribute to professional research.

I am no astronomer, it must be said. But my interest runs deep – and has sustained since I was a boy, when my grandfather would hoist me atop his shoulders, point upwards and name the constellations. In my encounters with these amateur astronomers, I felt a degree of kinship, our lives intertwined by a zeal for the stars, not to mention the frequency with which *Star Trek* cropped up in conversation.

My forthcoming book Route de la Belle Etoile <https://www.kickstarter.com/projects/gblimitededitions/route-de-la-belle-etoile-route-of-the-beautiful-star> attempts to reflect the global gossamer thread of amateur scientists, and I did my utmost to reach them, photographing amateurs in the UK, France, Germany, Belgium, The Netherlands, India, Australia, and Canada. If I had a bit more money that list would be longer. If I had a lot more money, this project may have never ended.

As the end of 2019 beckoned, (and before the pandemic made 2020-2021 'research' years) the project was well underway, as I found myself driving solo for hours towards the Canadian border from Spokane in the USA. Later that evening, I was perched on

Jack Newton's rooftop home observatory overlooking Osoyoos, with a moon underlit by soft earthshine. We discussed the unlikely possibility of extra-terrestrial visits to Earth with other guests in tow in his eclectic astronomy-themed and wallpapered B&B. Jack's supernova work is familiar to those in the know - of particular note his efforts in search of the Progenitor of the Type Ib Supernova 20100 in Arp 299, for which he was granted time as an investigator on the Hubble Space Telescope. The B&B sadly closed its doors for good in 2023.

Armed with his 20" Meade RCX400, Jack is a classic example of the lone amateur, remotely partnering with the professionals. From a photographer's perspective, documenting this kind of intimate yet behind-the-scenes collaboration can be a challenge, so I was keen to find a visual opportunity that would illuminate it more emphatically.

It came in 2021, strolling amongst the domes of L'Observatoire de Haute-Provence, France. I arrived in Provence to the warm embrace of a French summer evening. I was there for five nights to attend the Spectro Star Party, organised annually by instruments manufacturer, Shelyak. I disembarked my taxi to a field littered with telescopes, ghoulishly covered against the harsh sun, sat squat in anticipation of the night. As the light dimmed, amateurs and professionals worked in unison. Common targets of interest were 10 Lac and Deneb, but observers freely pointed their instruments on targets that took their fancy.



Image Above: Amateur Astronomer | Spectro Star Party, L'Observatoire de Haute-Provence, France



Image Above: Home of Peter Anderson | Brisbane, Australia



Image Above: Hankasalmi Observatory, Finland



Image Above: Olivier Garde | L'Observatoire de Haute-Provence, France



Image Above: Nyrölä Observatory | Jyväskylä, Finland

Some collaborations hit sweeter notes; married couple Christian Buil and Valérie Desnoux, sat side by side, night after night, in quiet spectroscopic observation. On its website proclaiming the event, Shelyak promised participants much merriment: “you may not have time to do everything, because there is also a swimming pool on the site, hiking trails in the scrubland around the site, singing cicadas, some opportunities to take a nap... It will give an excuse to return the following year.”

When it comes to amateurs collaborating with each other, the so-called “Finnish Pro-am Network” is a self-organised standout. They operate a three-observatory mission spanning the girth of the country, mostly focused on variables. Amateur astronomer Arto Oksanen proved a generous guide for the course of my stay in the country in late 2019.

Trying to maximize the science output of observations, those from the network are, for example monitoring the recurrent nova M31N

2008-12a for nova outburst – taking a deep image every clear night to check if the nova is visible or not.

In tandem with other observers around the globe, they also make observations of other high interest targets like eclipsing cataclysmic variables – combining light curves that can be several days long – something a single professional telescope cannot do.

Two years later though, and roughly six thousand kilometres south-east of Finland - I was in a decidedly moister Pune, India. It was there I met another variable-observing group, members of Jyotirvidya Parisantha which claims to be the oldest such astronomical society in the country. On a nondescript rooftop in Pune, their blue, domed observatory sits as a beacon to amateur science against the disorder of the cityscape.

Using a 12" 1200mm scope, JVP members make variable star observations and submit them to the AAVSO (American Association of Variable Star Observers). They tend to use an 11" 3000mm for planetary imaging and also report asteroid occultation data to the IOTA (International Occultation Timing Association), and on top of that – they coordinate the IOTA-India.

Only a month or so earlier, I was on the other side of the world in Australia, having driven more than eight hours from Melbourne to the frontier home of Trevor Barry in Broken Hill. Trevor's is a name etched in many a memory – forever associated with Saturn. His custom 408mm F4.5 Newtonian is imprinted with care, attention, and NASA stickers. We sat in his office as Trevor chronicled his recent collaborative efforts observing a cyclone at 50°N in the atmosphere of Saturn – the source of eight separate convective storms. Back in 2018, in a broadcast interview, he had articulated how many a space scientist invariably describe their work: “what does it make me feel? Insignificant.”

This is a small excerpt of the stories of the people and places featured in this extensively researched photobook, understood to be the first visual monograph spotlighting the global patchwork of amateur astronomers who contribute to professional astronomical research. <https://www.kickstarter.com/projects/gblimitededitions/route-de-la-belle-etoile-route-of-the-beautiful-star> via Kickstarter (live now) will support the printing of the work by renowned publisher GOST books and help make this book accessible to a wider audience. And as part of the campaign, there is a “reward” created with astronomical societies in mind - an in depth behind-the-scenes talk about the making of the book!

Oh, and the title! Route de la Belle Etoile (the route of the beautiful star) is a road in Grenoble, France. Amateur spectroscopist Olivier Thizy lobbied his local authority successfully for the name change.

This article originally appeared in the Journal of the British Astronomical Association. (britastro.org).

Dan Homer
danielstephenhomer.com

Essex AstroFest

By John Press

East Essex Astronomy Club

As chair of the East Essex Astronomy Club, I had often thought about reaching out to other groups around the county about a get together. In April 2023 I did just that. I already knew members of North Essex Astronomy Society, Castle Point Astronomy Club, Thurrock Astronomical Society and Havering Astronomical Society so I dug out contact details for the others and let the emails fly. I proposed that we organise a mini astronomical festival under the premise that we would get together and each group would provide a speaker.

Pretty much instantly Clare Lauwers from North Essex Astronomy Society (NEAS) and FAS vice president, replied to let me know that this very initiative had just been discussed at FAS, so that boded well. Over the next few weeks each group got back to me with confirmations that they would participate or that they would put to their committee. Within a month all 8 Essex groups had agreed to join in. In between Ian and Clare Lauwers put together a check list of things we needed to think about for the event. These ranging from the basic insurance for the event and the most important who is going to do the teas? In short order we had a plan and the administration progressed.

Next stop was a location. I'd estimated that each group would have around 20 individuals attend so we would need space for about 160. Car parking would be important as would access to local amenities and public transport. Turns out that the hall that the EEAC use in Burnham on Crouch met these requirements. Burnham also had the advantage that it is relatively central to the other groups (yellow spot on the map). I developed a rough schedule which allowed each group a 30-minute slot and 10 minutes for Q&As and change over and then a 20-minute break between pairs of speakers. A 50-minute lunch was set half way. I also built in a small buffer at the end of the day to allow for over running and 10 minutes to close the meeting. An hour either end was provided in the schedule to set up and clean away. From this we had a day of 10 hours. This was important to know the costs which would need to be covered (the hall charged by the hour). We had decided from the outset that we would sell tickets in advance of the event so knowing the cost of the hall would help set the price, which turned out to be a reasonable £5.

An itinerary was developed to reflect the schedule. The groups closest to Burnham would speak first, just in case of travel issues of those coming from further afield. Parking for those with mobility issues was addressed. We also had a request for set reservations for an individual who needed to lip read to enjoy the day. I did arrange a small PA system but it turned out that we didn't need it, but it was worth the thought. We also allowed space for displays as a NEAS member kindly offered to show and tell his spacecraft models and a couple of groups had displays to put up.

Between us we set a date of Saturday 7th October and got the ball rolling for speakers to write their presentations. We now had a location and a date so I designed some rudimentary tickets and allocated 20 to each group.



We held a Teams meeting the week before the event just to make sure we hadn't missed anything and all was well. We had arranged to have all the presentations sent through to me ahead of time to make sure that they all ran on my laptop as this would mean that we wouldn't be swapping between different PCs and have the usual IT issues. It also meant that the more forgetful of us wouldn't, well, forget to bring their PowerPoint! Here its worth knowing that We Transfer provide a free method of sending large files which turned out to be useful.

The day arrived bright and sunny and we started to arrive at the hall in Burnham at 8am to start to set up. NEAS had brought their most important asset, the tea urn, and set up in the kitchen. Others started to lay out chairs, set up displays and the IT system. Here EEAC had a small projector which worked well for the smaller groups we usually run but wasn't quite strong enough for the larger

hall. Luckily Jim Vincent from CPAC had brought theirs so we set that up which worked well. One thing we hadn't counted on was the hall committee had removed the black out curtains so judicious application of bin liners and duct tape saved the day. By 9am we were ready and the visitors started to take their places in the hall. All the presentations were pre-loaded to my laptop along with a slide of the itinerary. At 9:20 I called the hall to order, made my introductions and housekeeping bits and we were off with a talk on the Exoclock project by EEAC's Martin Crow.

All went well and we made it to the first break. NEAS on refreshments. Here we asked for donations to cover the costs of these with an honesty box. Part 2 commenced on time; I did have to call for order around the end of breaks to keep us to schedule but as an ex-teacher this wasn't an issue. The next pair of talks went extremely well and we made it to lunch. Here I provided a map of Burnham on the screen showing places where sandwiches may be obtained. I did however miss a trick, as I don't drink myself, I'd not included the detail of adding local pubs to the map! During the lunch break Ian from NEAS showed off his (then newly released) SeeStar and displayed live images of the sun. Others had brought H- α telescopes and Jack from CPAC demonstrated a rather nifty spectrometer where all the absorption lines of the sun could be viewed.

We continued after lunch with 4 more presentations headed by Les Brand from HAS and we managed to finish on time. After closing the meeting, I asked if we should repeat the event in 2024, this was supported by a unanimous show of hands. The day was a great success and a good time had by all. As a bonus, donations for refreshments and the proceeds from the door came to £300 which was duly donated to the Essex Air Ambulance, a worthy cause that benefits all of the attending groups.

The planning for the 2024 Essex Astro Fest is underway.

John Press
East Essex Astronomy Club
eeac.co.uk

Society Links

North Essex Astronomy Society

northessexastro.co.uk

Castle Point Astronomy Club

cpastro.club

Thurrock Astronomical Society

thurrockastronomysociety.com

Essex Astronomical Society

havastro.co.uk



Image Above: Jim Vincent from CPAC sets up their projector, NEAS at the rear setting up their display and application of bin liners to the windows.



Image Above: Les Brand from HAS presents variable stars.



Image Above: Martin Crow from EEAC sets the ball rolling.



Image Above: A room full of amateur astronomers.



Forthcoming Meetings:

Our meetings take place on the 2nd Wednesday of each month from September to June, and we also have additional events throughout the year. Doors open at 7:30 and the meetings begin at 8pm. Alternatively you can watch the event on Zoom. In either case, go to the society website to book a place.

We meet at The Lindop Building on the College Lane Campus in Hatfield, AL10 9AB

14 February: "Rainbows"

by Alan Davies, University of Hertfordshire

13 March: "Beyond Einstein and Modifying Gravity"

by Ruth Gregory, Head of Physics at Kings college, London

10 April: "Island Zero: A first step in producing large-scale space habitats"

by Jerry Stone, Spaceflight UK

8 May: "Our Island Universe - the Milky Way Galaxy and its place in time and space"

by Ian Morison, Jodrell Bank (Retd)

12 June: "Looking for life on Mars and Habitability of Jupiter's moons"

by Andrew Coates, UCL / MSSL / SPA VP

For details and other information, go to hertsastro.org.uk

History And Philosophy of Physics (HAPP) one-day conference

"Physics and the Science of Living Things"

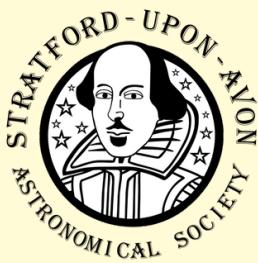
Saturday 24 February from 10:30 am until 5:00 pm GMT in the University Museum of Natural History

This conference will review how physics has contributed to the science of living things from antiquity to the present day through a survey of the milestones in how this knowledge has been gained.

Full lecture programme is available at:

stx.ox.ac.uk/event/happ-physics-and-the-science-of-living-things

HAPP Centre, St Cross College, 61 St Giles, Oxford. OX1 3LZ



Stratford Upon Avon Astronomical Society

The Stratford upon Avon Astronomical Society meet every 1st and 3rd Tuesdays at 8pm (doors open at 7.30pm) at Alderminster Village Hall. Everyone is welcome, especially beginners and those wanting to learn more. The first Tuesday is a Club Night, in February that will be on 6 February and the speaker on the third Tuesday, which is on 20 February 2024 is due to be Doctor Sarah Horst from Johns Hopkins University of Baltimore in Maryland, with a talk called '**Toxic Titan**'. Please note that the speakers usually start quite promptly at 8pm.

Each month one of our members offer pointers to what to look for in the sky during the coming weeks. This month it is the Winter triangle

One of the most obvious winter constellations, is Orion, but it forms part of another star pattern (or asterism) called the winter triangle. This is made up of Betelgeuse, Sirius and Procyon and other interesting objects.

Betelgeuse is the shoulder of Orion and is bright red. This is the top left of the equilateral triangle.

The bottom star of the triangle is Sirius, The Dog Star. Other than the sun it is also the brightest star visible (obviously not including planets). It's twice the mass of the sun, but 25 times brighter. Sirius has a binary companion, The Pup star, which is a white dwarf, (a star much further into its life cycle) which has a greater mass even though it's much smaller and less bright than the Sirius. You would need a large telescope to separate them. Just below it is a star cluster M41,

just visible to the naked eye, but best viewed through binoculars.

Top right of the triangle is Procyon, it is 11.6 light years away and it also has a companion in a binary system.

Another interesting star close by is Rigel, which is foot of Orion. This is a blue giant and monstrous in mass and brightness. It is a mere 8 million years old (our sun is 4 billion years old), but it is estimated to be half way through its life cycle as it is losing mass at 10 million times as much as our sun. It's living the rock stars life style, live fast, die young, and is expected to go supernova and will end up as a neutron star or black hole.

Club nights offer more information on what to look out for each month and if it is clear we do some observing just outside the Village Hall, so please join us. There is no charge initially to come along and find out more, but if you do want to become a member then the fee is JUST £15 A YEAR and it's free if you are in full time education. For more details go to the website <http://www.astro.org.uk> or contact the Chairman John Waller john.waller@astro.org.uk or on 07703 192188. Happy Observing!

Adrian Wakeham

Dave Benton

Stratford Upon Avon Astronomical Society

astro.org.uk



Space Oddities Live!

Space Oddities Live! Is a weekly YouTube show featuring an International panel of Astronomers who get together for a chat and discussion about the latest news in Astronomy and Space Exploration. We have Special Guests; Night Sky Notes; Viewers' Gallery; and more

We livestream every week on YouTube and Facebook. We are an international panel of amateur and professional astronomers. Panel Members are from the UK, Spain, the US and Canada. We chat about anything relating to the Universe and space exploration, keeping our audience up to date with the latest news. We also present interesting presentations on a huge variety of astronomical subjects and also create our own space-related videos for all levels of astronomical knowledge.

As well as our weekly shows we also go live for important space launches or other special events. We have a lot of fun, so why not join us? For livestream details, please visit our YouTube Channel at

[youtube.com/@spaceodditieslive](https://www.youtube.com/@spaceodditieslive)

For inclusion in our weekly viewers' gallery, please send your images to

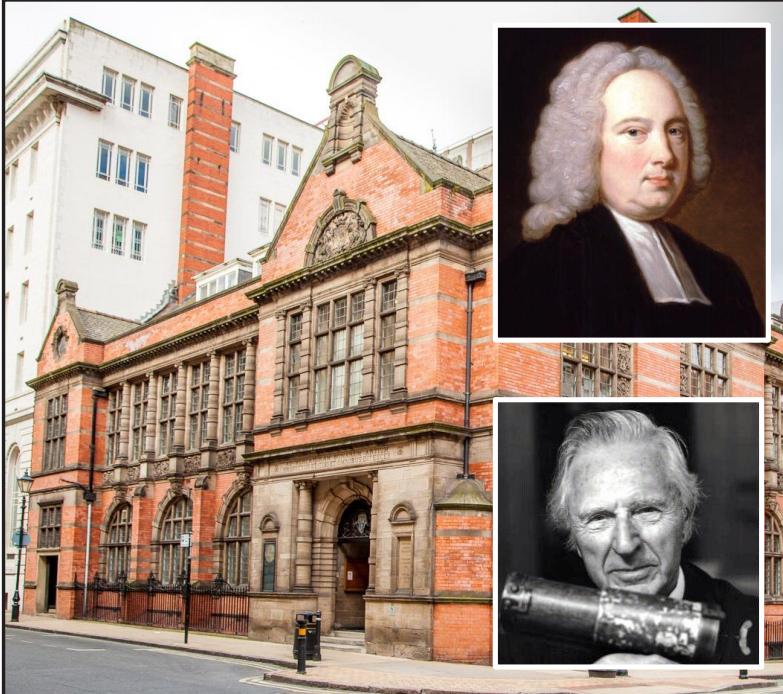
spaceodditieslive@gmail.com

Please include your name, location, equipment, processing details etc
One image per email please, entitling it "Gallery Entry"

Society for the History of Astronomy



Society Spring Conference 2024
Theme for the Day - "Astronomers Royal"
From 9:30am Saturday 20th April.



Lyttelton Large Lecture Theatre
Birmingham & Midland Institute
Margaret Street, Birmingham B3 3BS

The Michael Hoskin Lecture:

"James Bradley: The Man Who Moved the World"

Main Speaker: Dr John Fisher FRAS. Other Speakers Confirmed;

Dr Emily Winterburn FRAS, Dr Lee Macdonald FRAS,

Dr Peredur Williams, Professor Richard Ellis C.B.E., FRS

Booking in Advance at £15 per person for SHA members.

£20 per person for non-members.

More details and pre-booking only. Please Contact

Meeting Secretary – meetings@shastro.org.uk

images. © Google Images

The Society for the History of Astronomy



Society for the History of Astronomy



SHA Annual 2024 Spring Conference

Theme for the day - "Astronomers Royal"

Saturday 20th April Doors open 09:30

**Large Lyttelton Lecture Theatre, Birmingham & Midland Institute
Margaret Street, Birmingham B3 3BS**

Time	Speaker	Subject	Note
09.30 to 10.00		REGISTRATION & Second hand Book sales open. Freebee desk available. SHA Library open for Members	Tea & coffee and biscuits will be provided In lecture room.
10.00	Ms Carolyn Kennett FRAS SHA Chair.	Welcome to the BMI & SHA Conference.	Venue Health & Safety Notice & Other House Keeping.
10.30 to 11.30	Dr Emily Winterburn FRAS, SHA Hon Vice-President.	<i>"Sir William Christie, the Greenwich computers and Carte du Ciel project"</i>	Dr Winterburn was the first SHA Chair in 2002.
11.30 to 12.30	Dr Lee Macdonald FRAS	<i>"The man who slowed down the Earth: the work of Sir Harold Spencer Jones, tenth Astronomer Royal"</i>	SHA member since 2006 and author of forthcoming book on history of ROG
12.30 to 13.30		LUNCH BREAK https://bmi.org.uk/wp-content/uploads/2018/03/catering-menu.pdf	The BMI has an excellent café which has been opened especially for to-day's meeting.
13.30	Ms Carolyn Kennett FRAS SHA Chair	Welcome back	
13.30 to c14.30	Dr Peredur Williams Inst for Astronomy Uni of Edinburgh ROE	<i>"Ralph Copeland, third Astronomer Royal for Scotland"</i>	The subject being one of Scotland's most interesting of ARs.
c14.30 to 15.30	Prof Richard Ellis CBE University College London (UCL)	<i>"Arnold Wolfendale and the development of UK observational astronomy"</i>	Arnold Wolfendale was an international leader in cosmic-ray & gamma-ray astronomy.
15.30 to 16.00		AFTERNOON REFRESHMENTS	Available in Lecture room. Tea/Coffee and cakes.
16.00 to 17.00	Dr John Fisher FRAS, MA, MSc	<i>The Michael Hoskin Lecture</i> <i>"James Bradley; The Man who Moved the World"</i>	John has recently published his long-awaited biography of Bradley.
17.00 Approx	Ms Carolyn Kennett FRAS SHA Chair.	CONCLUSIONS & DISPERSAL	Safe Journey home

For this meeting we will be using current Covid-19 safety advice from both venue & using current government guidelines. Hand cleaning spots, face coverings and safe distance protocols will be in place, and optional for you to use if you wish.

All times and speakers are subject to change.

The above programme offers an interesting insight into past AR's that should appeal to all.
Please Book in advance, at £15 per person for members, £20 per person for non-members,

to subsidise room hire and catering, helps enormously to facilitate arrangements .

to pre-register use booking form attached or contact meetings@shastro.org.uk

If you would like to give a talk at the next conference, October 2024 do please contact the

Meeting Secretary; meetings@shastro.org.uk © 03.01.24

Leap Day Solar and Lunar Eclipses

By Alex Vincent

Not many eclipses occur on Leap Year Day (bissextile day) February 29. Only 26 take place on this date between the years -2000 and +3000. February 29 would not have existed before 46 BC and so the dates given are from the Julian calendar. The Julian calendar is used up to 1582 and then the Gregorian calendar thereafter. The BC years are given astronomically e.g -1436 is the same as 1437 BC. The AD years are given as + up to 1000 AD in this article e.g +956 is 956 AD. Astronomically the year 0 is used, but not historically.

Some of these eclipses take place on 28/29 February and some February 29/March 1. When mid eclipse is on February 28 or March 1 the start or end of the eclipse can occur on bissextile day or it is bissextile day in some part of the world where the eclipse is taking place. For this reason our next bissextile day eclipse will be an annular solar eclipse on February 28 2044. Here the very beginning of the partial phase will occur on February 29. The solar eclipse of February 28 2864 is total in Britain, but no part of it occurs in the eastern hemisphere where it is already February 29. These ones are omitted from this article.

The Moon's phases take place on or near the same date every 19 years. This cycle is known as the Metonic cycle, which was discovered by Meton in the 5th century BC. For this reason eclipses can occur on these dates every 19 years. For example there was a total solar eclipse on July 22 2009 and will be repeated again on July 22 2028. This will only occur for four to five consecutive eclipses every 19 years then 19 years later it will be full or new Moon and the eclipse will occur one month earlier.

In the case of eclipses occurring on Leap Day, this can only take place in 76 years. The only case with solar eclipses in the 5000 year period given here were in +108 and +184 and both were partials. In the case of lunar eclipses the only case is -664 and -588, which are both penumbral. There are a few lunar eclipses in this 5000 year period where there is a period of 84 years.

Solar Eclipses

Between the years -2000 and +3000 there are eleven solar eclipses, which take place on the bissextile day February 29 in some part of the world. Two of these are total, four are annular and five are partial. Below is a table of these eclipses.

Date of eclipse	Type of eclipse	Magnitude	Saros No.
-1436 Feb 29	Partial	0.9059	7
-896 Feb 29	Total	1.0652	35
-356 Feb 29	Total	1.0628	63
+108 Feb 29	Partial	0.0082	51
+184 Feb 29	Partial	0.6947	91
+648 Feb 29	Annular	0.9257	79
1188 Feb 29	Annular	0.9294	107
1756 Feb 29**	Annular	0.9787	126
2044 Feb 29*	Annular	0.9600	121
2416 Feb 29	Partial	0.1275	127
2872 Feb 29	Partial	0.3864	144

* Mid eclipse occurs on February 28. ** Mid eclipse occurs on March 1

The first of these is the eclipse in -1436, which was a partial only event with a magnitude of 0.9059. As can be seen from the above table, the last total solar eclipse to take place on February 29 was in -356 and there will not be another until after the year +3000.

Lunar Eclipses

Between the years -2000 and +3000 there are 17 lunar eclipses, which take place on the bissextile day February 29 in some part of the world. Some of these are total. Below is a table of these eclipses.

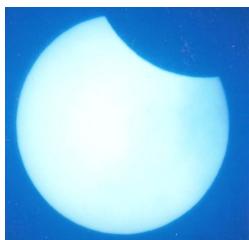
Date of eclipse	Type of eclipse	Magnitude	Saros No.
-1668 Feb 29**	Umbral	1.637	6
-1584 Feb 29**	Umbral	1.0609	17
-1128 Feb 29	Umbral	0.587	34
-1044 Feb 29**	Penumbral	0.660	45
-664 Feb 29	Penumbral	0.405	22
-588 Feb 29	Penumbral	0.163	62
-208 Feb 29*	Penumbral	0.908	39
-124 Feb 29	Umbral	0.816	50
+332 Feb 29*	Umbral	1.275	67
+416 Feb 29*	Umbral	1.454	78
+956 Feb 29*	Umbral	0.081	106

+964 Feb 29**	Penumbral	0.749	77
1420 Feb 29	Umbral	0.167	94
1504 Feb 29**	Umbral	1.101	105
1896 Feb 29*	Umbral	0.872	131
2268 Feb 29	Umbral	1.665	137
2640 Feb 29	Umbral	1.254	143

* Mid eclipse occurs on February 28 ** Mid eclipse occurs on March 1

After 2640 there will not be another lunar eclipse on February 29 until 3012, which will be a partial umbral. There is also a 372 year period where the lunar phases and eclipses occur on or near the same date. For example all the Leap Day lunar eclipses in 1896, 2268, 2640 and 3012 are 372 years apart. Like the Metonic cycle, this only applies to several consecutive eclipses then 372 years later it will be a full or new Moon. The eclipse will take place one month later.

There are more lunar eclipses, which take place on Leap Day in this 5000 year period than that of solar eclipses. The reason for this greater frequency is that lunar eclipses are visible from a much wider area than those of solar eclipses.



Images Above: Solar eclipse. 01.08.08. Saros 126

Images by Alex Vincent



Some Saros series, which have occurred or will take place on Leap Day, are in existence today. For solar eclipses they are Saros No.s 121, 126, 127 and 144. For lunar eclipses they are Saros No.s 131, 137, 143 and 149. The author has seen and photographed those of solar Saros No. 126 and lunar Saros No.s 131, 137 and 149. Below are two examples.

The total solar eclipse (partial in the UK) of August 1 2008 (Saros 126) produced an annular on March 1 1756, but only the end of the partial phase occurred on February 29. The total lunar eclipse on September 28 2015 (Saros 137) will produce a total on February 29 2268, which will be our next Leap Day lunar eclipse.



Images Above: Solar eclipse. 01.08.08. Saros 126

Images by Alex Vincent



About Alex

I was born on 27 January 1955 and have had an interest in astronomy since I was 13 years old after reading something about the planets at the back of an old diary. My specialized subjects are solar and lunar eclipses, eclipsing binary stars and comets. I am a member of Worthing Astronomical Society, Worthing Astronomers and the BAA. In the case of the Worthing Astronomical Society, I will have been a member since May 1974.

I submit a lot of material to the BAA sections (mainly photographic) such as eclipses, eclipsing binaries at maximum and minimum, comets, conjunctions etc. In 1995 I won the John Keedy Award for my work on comets, which I received at the BAA Comet Section Meeting in Cambridge on 8 June 1996.

Besides astronomy my other main interests are archaeology, geology, ornithology and malinology and am a member to these as well. I am also very active in these fields submitting material such as photographs, write-ups, maps and sketches. I am an author of a number of books including Roman roads, tide mills and eclipsing binary stars. One astronomy member said to me that it is amazing that you are able to specialize in quite a few subjects.

Alex Vincent
Worthing Astronomical Society
worthingastronomicalsociety.org
Worthing Astronomers
worthingastronomers.org.uk



Mid-Kent Astronomical Society



Forthcoming Meetings

Meetings Venue:

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

Friday 9 February

Peter Grimley - The European Southern Observatory: over 60 years at the cutting edge of astronomy

The European Southern Observatory (ESO) was established in 1962 to provide astronomers in Europe with access to the southern skies by operating an observatory in Chile's Atacama Desert, via an agreement with the government of Chile. Its five founding Member States have now grown to sixteen, including the UK, which joined in 2002. Since its inception ESO has been at the forefront of technological and engineering development and it now operates a suite of telescopes on three sites, alongside a number of hosted instruments located at ESO's observatory sites. ESO is currently building the biggest telescope ever constructed - the ELT. In this talk I will describe ESO, its history and some of the cutting-edge instruments it now operates, and I will highlight just a few of the remarkable discoveries made with those facilities.

Friday 23 February

Dr Jeni Millard - To The South Pole

No, not our South Pole - the one that's nearly 400,000km away from Earth, yet just as icy, desolate, and dangerous to explore. In this talk, Dr Jeni Millard will explore our celestial companion, what we've been up to since the days of Apollo, and our modern-day efforts to return to the Moon.

Friday 8 March

Doug Edworthy, FRAS - All you need to know about telescopes!

This presentation will suit novices and experienced telescope users alike and will help those thinking of investing in new equipment or upgrading existing systems. Doug Edworthy will start by explaining the differences between different types of telescope and examples will be displayed in the hall. Experienced MKAS members will be on hand to answer questions. Members with particular telescope problems can bring their 'scopes along to get advice at an informal 'telescope clinic'. Please register in advance, if you intend to bring your telescope to request assistance, noting the make and model of your equipment.

Friday 29 March

Tom Field - Spectroscopy

Tom will demystify the science of spectroscopy and explain the art of spectral imaging. Tom says "To capture the spectra, there is no steep learning curve. There's no complicated software processing. There's no need for a lot of math or to have a Ph.D. in astrophysics. And there's no need for expensive equipment or dark skies. All it takes is an inexpensive 1.25" grating, and a small telescope (or DSLR). With a few clicks, you get exciting scientific results. And from those results, you can gain a rich understanding of the life cycle of stars." Join Tom in the meeting to learn more.

**For more information visit:
midkentastro.org.uk/events**