



The Newsletter of the Astronomy Section of La Société Guernesiaise

Summer 2020

Forthcoming Events

Public Open Days

These will comprise a talk or film show and observations if clear. The first half hour each evening will be a presentation about Guernsey astronomy history as part of *Heritage75*.

Thursdays evenings from 23rd July (from 8.30 pm) to 27th August (from 8.00 pm in August).

Thursday, 22nd October, 6.30-8.30 pm.

Additional open days, especially for solar observing, and talks will be arranged and will be announced via the media, on the Astronomy Section website, www.astronomy.org.gg, and on the Section's Facebook pages.

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Section meeting

The Section meets at the Observatory every Tuesday evening at 8.00 pm, sometimes with a discussion topic. Also the last Saturday evening of each month, if clear, except summer, for observing and photography.

The next astrophotography meeting will be on the 27th of July.

Observatory

Rue du Lorier, St Peter's, Guernsey
Tel: 264252

www.astronomy.org.gg

Material for, and enquiries about *Sagittarius* should be sent to the Editor: tharvey303@gmail.com

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La Société Guernesiaise

Candie Gardens, St Peter Port, Guernsey GY1 1UG.
Tel: 725093

www.societe.org.gg

Astronomy Section Officers, 2020

Secretary	Jean Dean
Hon. Treasurer	Peter Langford
Membership	Peter Langford
Editor	Tom Harvey
Group visits	Elaine Mahy
Open Days	Jean Dean
Courses	Jean Dean
Equipment mtce.	Allan Phillips
Public relations	Elaine Mahy
Research	Jason Hill
Library	Clive Stubbings
Imaging	Jean Dean
IT	Owain Catton
Website	Owain Catton

Introduction from the Editor

Welcome to a Summer 2020 edition of the Sagittarius Newsletter, I hope it finds you safe and well in these unusual times. I am pleased to announce that the Observatory is now fully open and the regular Tuesday evenings have recommenced. There will also be an astrophotography meeting on the last Saturday of each month, the next one being on the 27th July.

This is my first newsletter as the new editor of Sagittarius, and I have some very big shoes to fill! The previous editor, David le Conte, has been a member of the Section for over 40 years, and has been the editor of this newsletter for a great number of those years. This newsletter, and indeed the section, would not be what it is without his many contributions. Luckily for me, and as you will notice, David was kind enough to write an article for this edition of Sagittarius. I would like to thank David for all the work he has done for the section, and I hope I will be able to continue his legacy for at least another 40 years!

Thomas Harvey

Annual Business Meeting

On the 14th January we had our Annual Business Meeting and there were a few changes to the committee, we welcomed Jean Dean as Secretary, Clive Stubbings as Librarian and Allan Philips as Equipment Officer. Elaine Mahy has taken over responsibility for Public Relations and Tom Harvey and Anthony Nell as Editors of the Sagittarius Newsletter. The full Committee and contact details can be found on the rear page of the newsletter. The purchase of a 12" GOTO Skywatcher Dobsonian was agreed. The AGM minutes will be available shortly.

David Le Conte retired from all official duties after 35 years spent in various committee posts including Secretary, Public Relations, Editor of the Sagittarius Newsletter and running the annual WEA Stargazing Course for 34 years. He has been instrumental in creating a club that has grown over the years and been highly successful in promoting astronomy within Guernsey. David has also served as President of La Société Guernesiaise and more recently Archivist and Librarian.

Jean Dean

Staying in touch with what is happening

All our regular and public events are listed on our new web site and members and public Facebook pages. In addition, the members Facebook page is an excellent way to find out what is currently going on within the Section.

[La Société Guernesiaise Astronomy Section Facebook](#)

[La Société Guernesiaise Astronomy Section Members Group](#)

Honorary Memberships

The Committee has awarded four longterm members honorary memberships to the Astronomy Section. These were awarded to David le Conte, Geoff Falla, David Falla and Frank Dowding, for their contributions over the last 40 years.

New Logo

We have a new logo, which can be seen on the header of this newsletter, which was kindly produced by Owain Catton. There are a variety of styles depending on the use, and the new logo matches the wider Nature Guernsey branding.

Equipment

I would like to remind members we have two portable GOTO telescopes, a Celestron Nexstar 8" SCT and a 12" Dobsonian, both give excellent views of the night sky. If you would like to learn how to use

either of these then come along on a Tuesday club night and once you can set them up then you may come along and use them at any time.

New telescope building and mount

The Committee are excited to announce that we are looking at replacing our telescope building with a new slide-off roof structure and will also be replacing the mount that supports the Meade. The current building and mount have served the club well over the years but they are showing their age and now is the time to look at replacing them with something that will last the club another 30 years and will be up to date with regard to the electronics and control systems. Once we have finalised the details, we will release more details and start a fund-raising campaign.

Astrophotography

This is the Cygnus Wall which is part of the larger emission nebula NGC 7000, commonly called the North America Nebula in the constellation of Cygnus which is about 1,500 light years away. The 'W' shaped ridge spans about 20 light years and is sculptured by energetic radiation from the region's young, hot, massive stars. The dark areas comprise cool gas and dust with new stars most likely forming within.

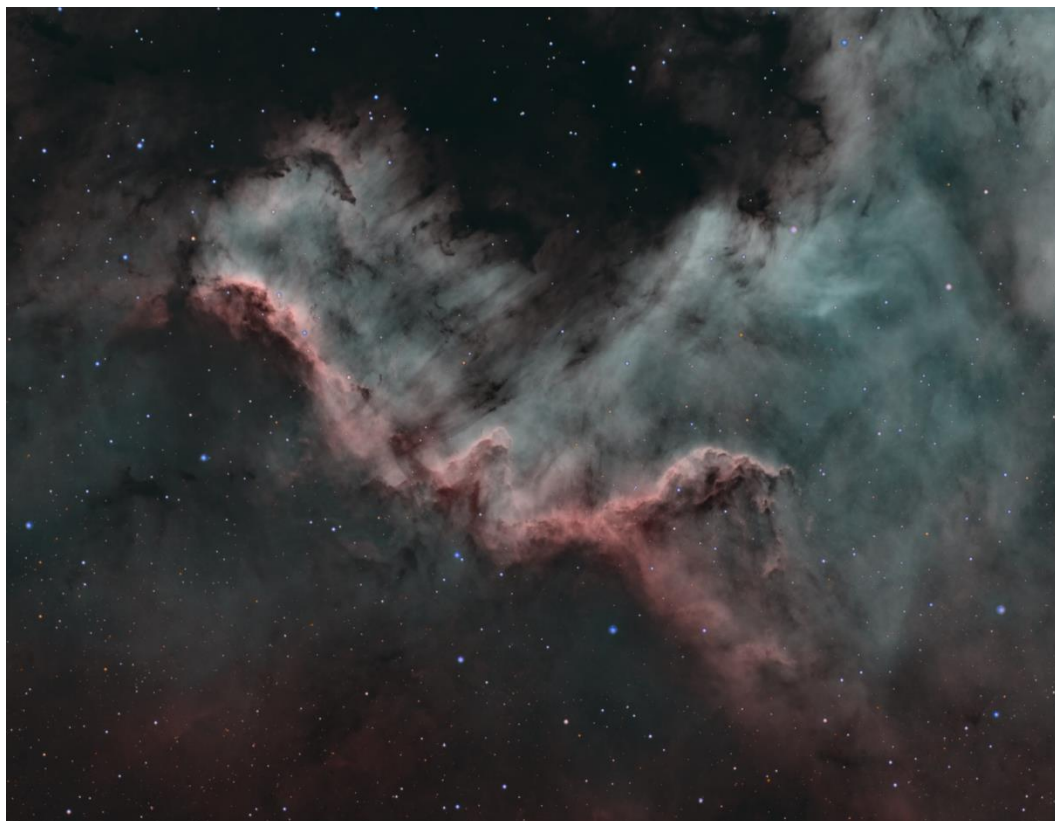
If you turn the image upside down it looks like a fire breathing celestial dragon!

This was taken during May 2020 with a 106mm diameter refracting telescope and monochrome CCD with LRGB and narrow band filters. It comprises:

20 x 20 minutes Ha, 20 x 20 minutes OIII, 36x 20 minutes SII, 15 x 2 minute in each luminance, red, green and blue and 5 x 4 minute in each red, green and blue. The total integration time was 28 hours 20 minutes.

Observatory visit

On the 9th June the newly elected La Société Guernesiaise President, Donna Francis, Vice-President Julia Henney and Honorary Treasurer Dave Christopher visited the observatory site and were greeted by Jean Dean and Tom Harvey who showed them the facilities and set up the telescopes up to view the sun. There was a large sunspot present marking the beginning of solar cycle 25 which Tom imaged with the club's ZWO planetary imager.



The Cygnus Wall Copyright Jean Dean

Stargazing 2020

In February and March, the club ran the annual Stargazing Course. It was well attended and the weather was favourable throughout giving the participants a good mixture of visual observing and lectures. In addition, a mono CCD camera and hydrogen-alpha (Ha) filter allowed participants to see

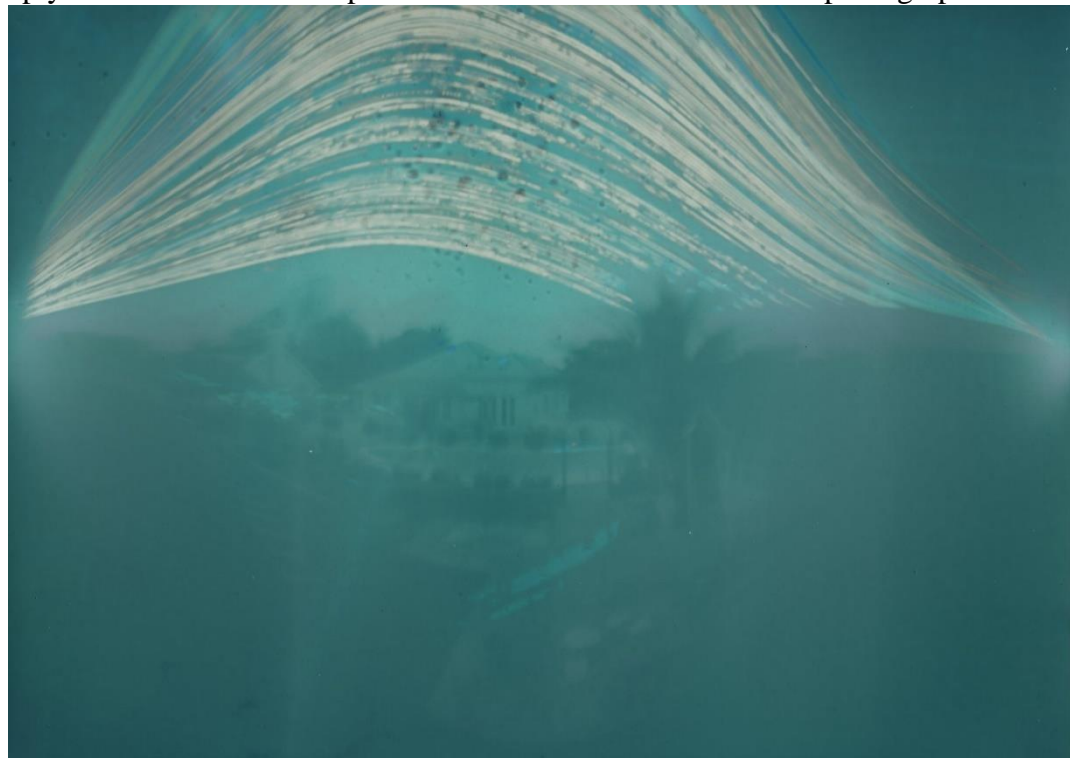


some of the large winter emission nebula, including the Orion Nebula which is a nearby star forming region. The course was very much a team effort by members with lectures given by David Le Conte, Owain Catton, Jason Hill, Peter Langford, Elaine Mahy and Jean Dean. Allan Phillips helped with the observing and Clive Stubbings, Jenny Webster, Stephanie Rice and Tracey Robilliard helped generally and kept everyone supplied with tea and biscuits. Jean Dean, the organiser, would like to thank everyone for their input into making the course enjoyable and successful.

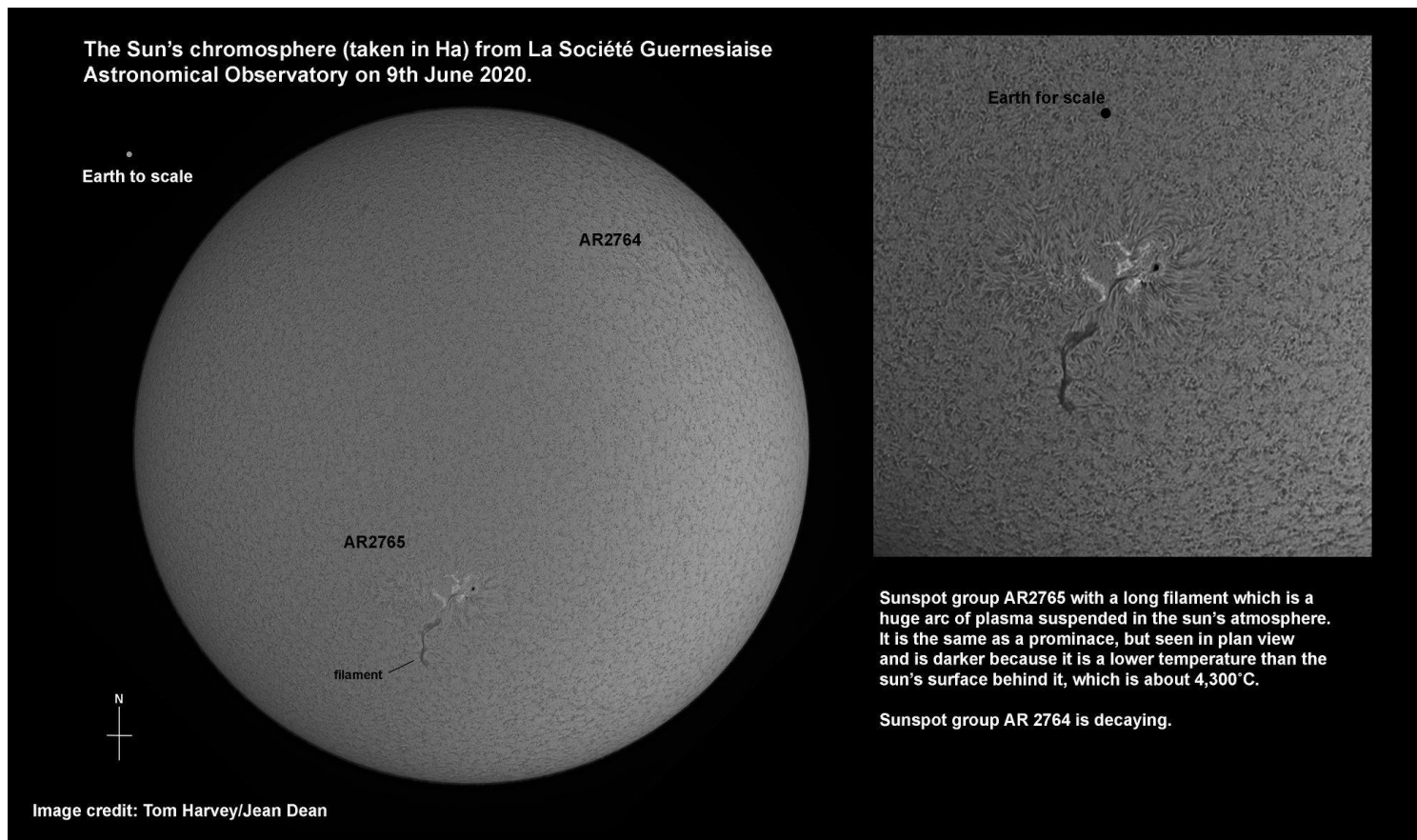
Solargram

This is a fantastic image showing the path of the Sun over the course of the year, taken using a homemade pinhole camera made from an empty beer can with a small pinhole in the sidewall and a sheet of photographic paper placed inside.

The can was mounted on a southfacing pole, and normally would be left up for 6 months, in order to capture, the full range of the height of the Sun across the seasons, but in this case it was left up for a year. There is a lot of trial and error in producing these images, and it is hard to make one that is focused without overexposing the entire film. Well done to Anthony Nel for his patience in taking this spectacular image!



Solar Activity

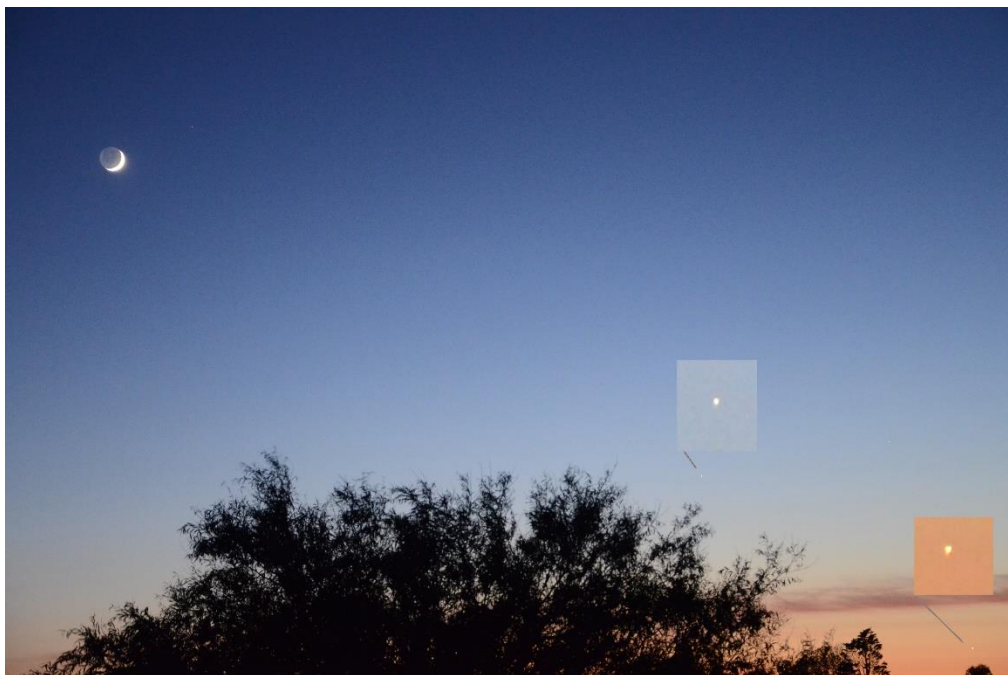


This image of the Sun's chromosphere was taken from the Observatory site on the 9th June 30, 2020. As we move away from the recent solar minimum, into solar cycle 25, the frequency of sunspots and prominences should increase. The sun completes a full cycle in around 11 years. This was taken with a Lunt, tilt and tune 60mm diameter solar scope which has a Ha filter. The camera was a ZWO ASI178 mono planetary camera.

There can be outbursts of activity, not only of sunspots but also of coronal holes and coronal mass ejections, which can result in displays of the aurora borealis (and australis) at high latitudes. Details of sunspot numbers are at www.ips.gov.au/Solar/1/6, and real-time views of the Sun are at <https://umbra.nascom.nasa.gov/newsite/images.html>. Auroral alerts, with lots of other information, are at www.spaceweather.com.

Other News

Jean Dean's amazing image of the Rosette Nebula which was awarded NASA's Astrophotography Picture of the Day (APOD) on the 12th April 2019, has appeared in a video celebrating 25 years of the APOD award. It can be viewed at the following [link](#) or on the APOD Facebook page.



The Moon, Mercury and Venus 25th May 2020, copyright Clive Stubbings

Here is a great photo from member Clive Stubbings, who managed to capture the Moon, Mercury and Venus in one shot. It was taken on the 25/05.

Satellites

The International Space Station (ISS) is regularly visible from Guernsey, looking like a very bright star crossing our skies from west to east. With the decommissioning of Iridium satellites flashes from them are now quite rare. Many other, fainter, satellites appear every night. Details of the times and directions of visibility (together with sky charts and much more) can be obtained from www.heavens-above.com, linked from our webpage www.astronomy.org.gg/iss.htm. It is also common now to see satellite trains from companies such as SpaceX or OneWeb. These can provide a spectacular sight, looking almost like a string of pearls moving across the night sky, but are a potential problem for astrophotography and professional astronomy. Details of these passes can be found at <https://findstarlink.com/>

Open days

The Observatory will be open to the public again for a number of evenings during the year, including weekly openings on Thursdays during the summer school holidays (23 July to 27 August). Details will appear on our website and will be sent to the local media. This year the summer open evenings will start a half-hour early during which there will be a presentation about historical Guernsey astronomers, as part of *Heritage75*.

We will also be holding solar open days, dates will be confirmed closer to the time. We will also be participating in the Late Summer Family Nature Guernsey Event on Sunday 30th August.

There will also be an event run in collaboration with Nature Guernsey at Halloween.

Thomas Harvey

More detailed information on viewing the planets, lunar phases, eclipses, for 2020, are available in the previous edition of *Sagittarius*, and have not been reproduced here.

Calendar of Astronomical Events 2020

Month	Date	Time	Event
June	20	22.45 BST	Summer Solstice
July	04	12.56 BST	Earth at aphelion (152,095,296 km)
July	05	Before sunrise	Penumbral lunar eclipse
July	14	All night	Jupiter at opposition
July	15	All night	Pluto at opposition (magnitude 14.2)
July	20	All night	Saturn at opposition
July	22	Before sunrise	Mercury at greatest western elongation
July	23	Evening	Observatory Open Evenings start
August	01	After sunset	Jupiter conjunction with Moon (2.5°)
August	09	Before sunrise	Mars conjunction with Moon (2.5°)
August	12/13		Perseid meteor shower (favourable)
August	13	Morning	Venus at greatest western elongation (46°)
August	27	Evening	Observatory Open Days end
August	28	All night	Ceres at opposition
September	06	Before sunrise	Mars conjunction with Moon (0.6°)
September	11	All night	Neptune at opposition (magnitude 7.8)
September	22	14.32 BST	Autumnal Equinox
October	01	After sunset	Mercury at greatest eastern elongation
October	03	Before sunrise	Mars conjunction with Moon (1.0°)
October	13	All night	Mars at opposition
October	25	02.00 BST	BST ends
October	31	All night	Uranus at opposition (magnitude 5.7)
November	10	Before sunrise	Mercury at greatest western elongation
December	13/14		Geminid meteor shower (favourable)
December	21	After sunset	Jupiter and Saturn conjunction (0.1°)
December	21	10.04 UT	Winter Solstice

In Memoriam: Heather Couper

We were sorry to hear that Heather Couper had died on 19 February 2020 at the age of 70. She was a charismatic populariser of astronomy who visited Guernsey twice. The first time was in 1991 when I invited her and her long-time collaborator Nigel Henbest to open the Guernsey Observatory, an event commemorated on the plaque on display at the Observatory. The attached picture shows her viewing an image of the Sun projected by member Geoff Falla. On the same occasion she and Nigel gave a memorable presentation at Beau Sejour about life in the universe. It took the form of a very animated debate, she arguing for and him arguing against. At the end two 'aliens' came on stage and dragged Nigel off!

Heather returned to Guernsey in 1999 for the Royal Astronomical Society's National Astronomy Meeting, and gave the public lecture about eclipses, again at Beau Sejour. She had the ability not only to present astronomy factually, but in an entertaining way. And she could be a lot of fun. I was running a



Heather Couper at the Observatory in 1991. Copyright David Le Conte

video for her during her eclipse lecture, and in giving me instructions as to exactly when I should run it she likened the part where she was screaming about the awesomeness of the eclipse to her 'orgasm', much to the surprise of a member of the audience who overheard her! Heather was fascinated by the night sky from a young age, and developed an early passion to tell people about it. She gave lectures at the Royal Observatory Greenwich, appeared on Patrick Moore's *Sky at Night* programme, presented many radio and television programmes about astronomy, and, mostly with Nigel, wrote dozens of books. I still have their book "The Stars", signed by them both.

She was elected a Fellow of the Royal Astronomical Society, served as President of the British Astronomical Association, and was appointed Professor at Gresham College in London. An asteroid is named after her. She certainly made a lasting impact, and her death is a sad loss to astronomy.

David Le Conte

Stars of the Summer Triangle

A very recognisable feature of the summer sky is the triangle shape made by the three bright stars Vega, Deneb and Altair. Each of the stars has its own interesting character.

In the summer months after the Sun has set Vega, right overhead, is usually the first star to appear. (The other one to look out for is Arcturus over to the west). The brightness of a star depends upon its intrinsic brightness, or luminosity, and its distance from us. If we say that stars within 10 parsecs (32.6 light years) are within our neighbourhood then Vega, 25 light years away, is well within that range.

If you want to understand the character of a star then a good place to start is its position on the Hertzsprung-Russell, or H-R, diagram. This plots the luminosity of a star against its surface temperature (or more accurately the temperature of its photosphere). By historical accident the temperature scale runs the opposite way to what you might expect so cooler stars are on the right and hotter stars are on the left. Stars tend to cluster in various regions in the H-R diagram and you can see from the picture that Vega, like the Sun, is a Main Sequence star. This is a stage that all stars go through where hydrogen in the core of the star is undergoing a fusion reaction and is being converted to helium. This releases energy, some of which we eventually observe as starlight.

The position of a star on the H-R Main Sequence is an indication of how massive the star is. It is estimated that Vega is 2.1 times the mass of the Sun. More massive stars are hotter and more luminous.

Vega's photosphere is much hotter than the Sun with a temperature of about 9,600 degrees K, compared to 5,800 degrees K for the Sun. The temperature determines the star's colour. As the temperature increases relatively more light is emitted at shorter wavelengths (the blue end of the spectrum) giving the star a more brilliant steely-blue appearance. Vega is classified as a blue-white star. The Sun is officially classified as a yellow dwarf.

Vega's luminosity (the total amount of energy given out by the star) is about 40 times that of the Sun. More massive stars produce energy at such a rate that their life on the Main Sequence is significantly shorter than for less massive stars. The Sun's expected lifetime on the Main Sequence is about 10 billion years and we are about half way through that. Vega's time on the Main Sequence is only about 1 billion years. It too is about half way through its Main Sequence lifetime.

As the night sky darkens the constellation Cygnus, the Swan, becomes clearer with Deneb at the swan's tail. Deneb is not quite as bright as Vega but otherwise it may not appear to be very different. However that is deceptive. Deneb is in fact extremely distant and extremely luminous. Deneb is the most distant of the bright stars and is so far away that its distance is difficult to measure. At one time it was thought to be 2,600 light years away but more recently that has been revised to about 1,500 light years. For us to see a star that far away it must be extremely luminous. Again that is difficult to estimate but Deneb's luminosity must be at least 50,000 and may be as much as 200,000 times the luminosity of the Sun. Deneb's mass was probably originally about 23 times that of the Sun but it is losing mass at a rapid rate and is now estimated to be 19 times the mass of the Sun. Deneb is a large star with a diameter of some 200 times that of the Sun, so if it was at the centre of the solar system the star would extend out to Earth's orbit. Deneb would have quickly gone through its

Main Sequence phase. It is currently classed as a blue-white supergiant and its position on the H-R diagram suggests that it is evolving towards becoming a red supergiant. In a few million years its life is likely to end in a supernova explosion.

Altair is much closer to home. At only 17 light years distance it is the closest star of the Summer Triangle and one of the closest of the bright stars (after Alpha Centauri in the southern hemisphere, Sirius and Procyon). You can see from its position on the H-R diagram that Altair is a Main Sequence star (so converting hydrogen to helium in its core) occupying a position between the Sun and Vega. Its mass is about 1.8 times that of the Sun and its luminosity is about 11 times the Sun's. It is classed as a white dwarf star. Altair, being more massive than the Sun, will have a shorter Main Sequence lifetime – about 2 billion years. Its current age is about 1 billion years. Altair's main claim to fame is its rotation rate. It rotates once every nine hours (compared to 25 days for the Sun) and the rotation is so fast that the star bulges out in the middle.

Peter Langford

New Section Website

For those that have not noticed we have a new website for the section which has replaced the previous one, which had been lovingly maintained by David Le Conte, *Figure 1&2*.

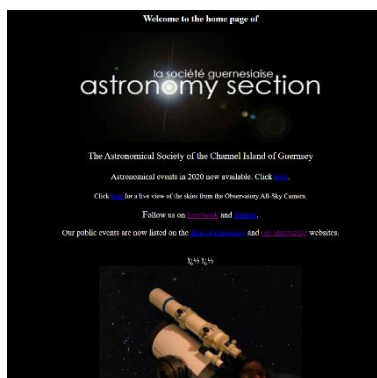


Figure 1 - Front Page

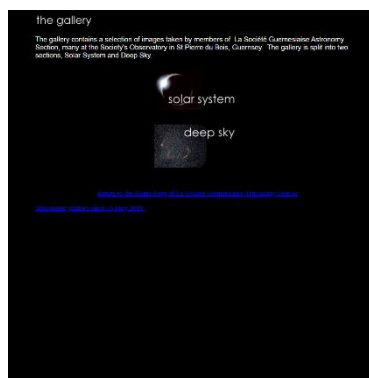


Figure 2 - Gallery Page

It consisted of single home index page with 9 or more subpages, detailing all aspects of what the section was about through to articles on various topics, *Figure 3*.

We held out doing any major updates as La Société were implementing a major update of their main website. As we share the same webserver as the main La Société website we envisaged we might be able to piggyback their development, but after a delayed launch it transpired that there would be no ability for sections add/edit any content or use the new websites framework. Post launch we did manage to get the La Société Astronomy Section page updated to include latest information and some new images, *Figure 4&5*.



Figure 3 - Old Structure



Figure 4 - La Société Landing Page



Figure 5 - La Société Astronomy Section

In my new role on the committee I looked at how and what we could use to replace the existing site with. There were two main features we were looking for, firstly it had to be a modern adaptive and responsive website which means it works on both desktop and mobile out of the box, *Figure 6*.

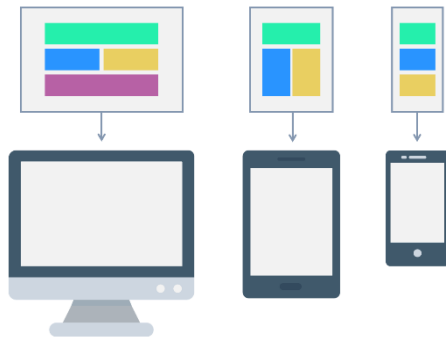


Figure 6 - Adaptive Design

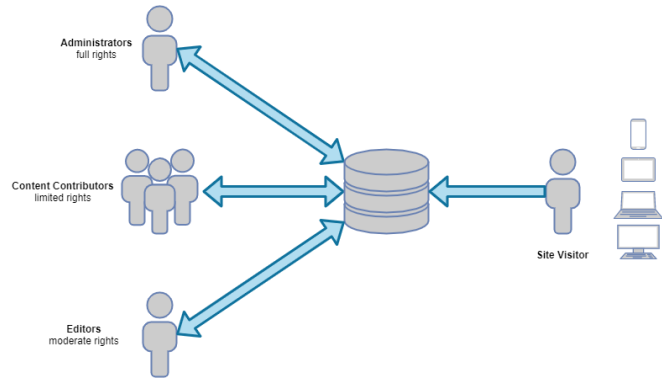


Figure 7 - How CMS works

Secondly has some form of content management system (CMS). CMS is a piece of software that helps you create and manage content for your website using a human-friendly interface, rather than needing to work directly with the code. Basically, a CMS makes managing a website much easier for people of all technical levels, *Figure 7*.

There are plenty of great open source CMS platforms out there, including [Joomla](#) (*Figure 8*) and [WordPress](#) (*Figure 9*). All of these platforms rely on a database for data persistence, are powerful, and offer a good degree of flexibility.



Figure 8 - Joomla

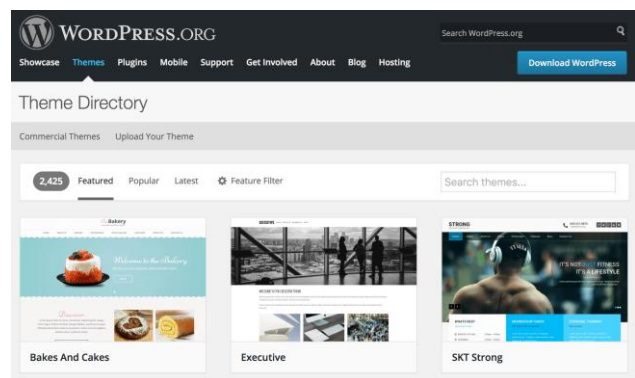


Figure 9 - WordPress

One real downside to these platforms is they require a real commitment to learn how to use and develop on them. You really have to pick one out of the pack, and dedicate yourself to that platform if you wish to become competent as either a user, developer, or administrator.

In the search for such a platform, it became clear that a flat-file based CMS was likely to be the answer. A flat file is built around the concept of folders and markdown files for content. These folders and files are automatically compiled into HTML and cached for performance. The platform decided upon was called GRAV which is Open Source and allows pages to be accessible via URLs that directly relate to the folder structure that underpins the whole CMS, *Figure 10&11*.

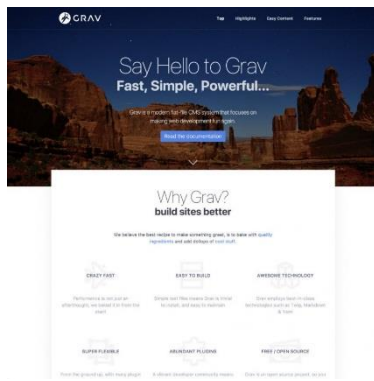


Figure 10 - Grav Frontend

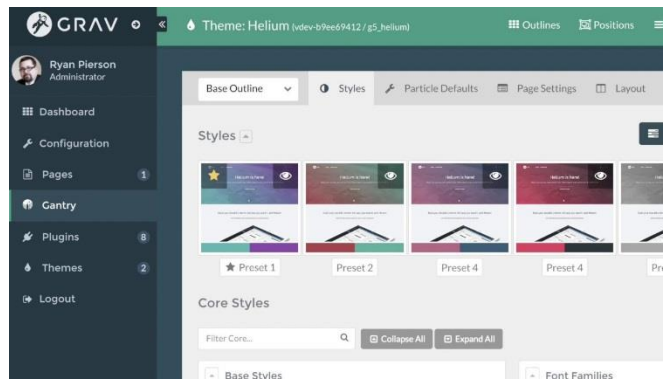


Figure 11 - Grav Backend

Over many weeks converting the original HTML website content into the new Markdown formatted files and sorting them into a folder structure the skeleton of a website was created, which was launched early in in December 2019, Figure 12&13.

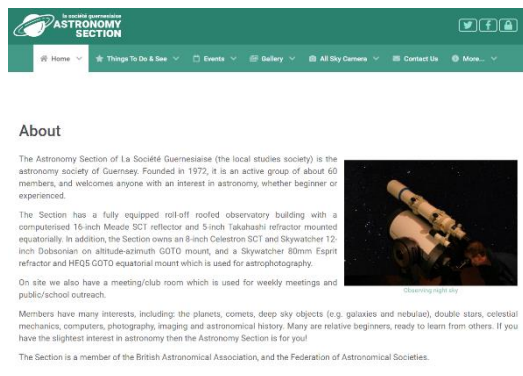


Figure 12 - New Landing Page

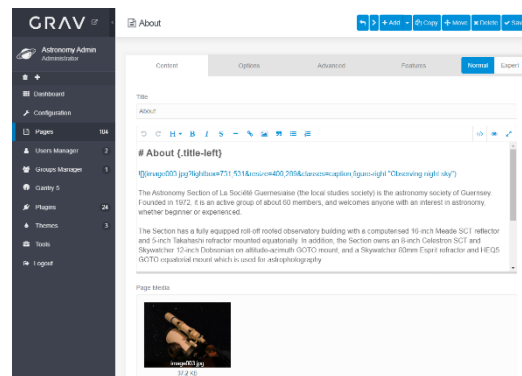


Figure 13 - Landing in Editor

Development is continuing both increasing the content and convert the remaining articles across. If you are interested in getting involved get in contact. A big thank you to David Le Conte for all the content checking and the continued supply of new content. Come visit the new site at <http://www.astronomy.org.gg>

Owain Catton

Events of the Giga-annum

A lot of astronomical events are once in a lifetime experiences for most people, such as the view of Halley's Comet which was famously last visible in 1986 and won't reach perihelion again until 2061. A single human lifespan is incredibly short when compared to astronomical timelines, but here are some of the rarest sights you could see if you could live forever.

In 2177, Pluto will have completed one orbit around the Sun since its discovery in 1930. March 16 2880 is the predicted impact date for the near-earth asteroid 1950 DA, the object with the highest known probability of a collision with Earth. By the year 3000, the Earth's axis will have precessed enough that Gamma Cephei will become the North Star. In 4385 the comet Hale-Bop, which many members may remember, will return to the inner solar system for the first time since 1997. If humans are still around in 6757 I expect some spectacular photos of the simultaneous solar eclipse and transit of Mercury, which will be the first in recorded history. In around 25000 years from now the Arecibo message, which contained basic information about Earth and humanity, will reach its destination in the globular cluster M13.

We're going to jump even further forward in time now, to explore some of the rarest events and changes that will happen to our solar system in the distant future. In ~6 million years, the comet C/1999 F1 will return to the inner solar system, having completed a single orbit with an aphelion of 1.05 light years. It is one of the longest period comets we know about, though there are certainly many millions more out there floating in the dark.

In around 30-50 million years one of the moons of Mars, Phobos, will have lost enough angular momentum that it will either crash into Mars or be destroyed and form a temporary ring system around Mars. The rings of Saturn are also expected to disappear in around 100 million years, due to the rings losing energy and falling into Saturn.

Expect some serious climate change in around 600 million years – the Sun will have gotten bright enough to kill off photosynthetic-based plant life on Earth, and 200 million years after that all complex life on Earth will have died. If any humans are still around by then, they will be on the hunt for a new home. Luckily for them as the Sun gets hotter, the habitable region, which is the region within which liquid water can exist on a planets surface, will move outwards, meaning that Mars and perhaps Titan might become more suitable for human life.

When the Sun reaches its 12 billionth birthday, it will have around 2700 times its current luminosity and be very close to the end of its life. It will have swallowed both Mercury and Venus, and will be close to swallowing the Earth. By that point the Earth will consist of a lava ocean with floating continents of metals and a surface temperature over 2000°C! Earth will essentially be orbiting in the outer atmosphere of the Sun, and it is possible that the friction caused by this will cause the Moon's orbit to decay until it is destroyed by tidal forces, creating a temporary ring system which will mark the final days of Earth.

Thomas Harvey

Guernsey Astronomical Observatory

Open Days in July and August 2020

23rd and 30th July from 9pm
6th, 13th, 20th and 27th August from 8.30pm



All Visitors welcome

La Rue du Lorier, St Pierre du Bois

Please park at La Houquette School; from the school head up the road and follow the signs.
Please take care on the road it is very dark, a torch and high visibility clothing is advised.



**Donations are welcomed and assist with the
running and maintenance costs.**

We suggest adults £2, children £1.

The Observatory is run by volunteer members of the
Astronomy Section of La Société Guernesiaise.