Sagittarius

40th Anniversary Year

The Newsletter of the Astronomy Section of La Société Guernesiaise

July – September 2012

Forthcoming Events

Perseids BBQ

Observatory: 11th August: 7.30 pm

Public Open Evenings

(now Thursdays)

26th July: 9.00 pm

2nd August: 9.00 pm

9th August: 8.30 pm

16th August: 8.30 pm

23rd August: 8.30 pm

30th August: 8.30 pm

New format will be that Public Open Evenings will be on a Thursday evening and will comprise a talk or film show, with a clear night for observation being a bonus!

Section meets at the Observatory every Tuesday evening at 8.00 pm

Inside

Inserts

Star chart

Sunset, sunrise, moonset and moonrise times

From Earth to the Solar System – Exhibition and Lectures

The Museum exhibition *From Earth to the Solar System*, announced in the last issue of *Sagittarius*, ran from the end of March to the middle of May, and was evidently a great success, with encouraging visitor numbers. The Museum certainly did a superb job of mounting and displaying three dozen giant images, some blown up to supergiant proportions.

NASA had provided the Museum with a code by which it could download high-resolution versions of the images. The Museum then printed them out in excellent quality, and mounted them. At the entrance was a stunning picture of the Sun over six feet high, taken by the Soho spacecraft, with a huge prominence loop, and cleverly lit so that it really appeared to be glowing.

There followed detailed pictures of all the planets and some of their moons, including a large one of our Moon on the ceiling. A general depiction of the solar

General view of the exhibition.

system formed a table top, on which were several relevant books. Asteroids, comets and meteors were also depicted. Finally, there was a panel about the Astronomy Section, together with take-away leaflets describing the Observatory, and what could be seen in the night sky while the exhibition was open.

I was pleased to have been asked by the Museum Director to assist with the captions, as it is always encouraging when States departments involve us and recognise that we have expertise in matters concerning astronomy. The captions supplied by NASA were in general excellent, but needed some tweaking to put them into our version of English (rather than American), to take account of recent discoveries, and to reflect the language of the general public. A number of Section members as well as Heritage Pass holders and special guests attended the opening of the exhibition on the 3rd April, at which I was invited to speak.

The three public lectures which we organised to complement the exhibition were well attended. Some 30 people heard Dr David Falla talk on *Fifty Years of Astronomy*, emphasising that this had been a Golden Age for astronomers. As always, he gave an informative and well-researched discourse.

Invited speaker Professor Chris Riley of Lincoln University gave an appreciative audience of over 40 a stunning talk about the *Apollo Film Archive*, illustrated by many clips from the documentary films which he has directed. It is indeed remarkable that it has taken an Englishman to research the archive so thoroughly, and to interview personally so many participants in the space programme, including many astronauts.

The final talk, by myself, on *Guernsey Astronomers Past and Present*, was attended by some 30 people. It covered half a dozen Guernseymen who had had a significant interest in astronomy (and in a few cases had made a considerable contribution to the subject), and at least an equal number who had some interest. This might be the subject of a future article in *Sagittarius*.

At the exhibition opening and at the lectures we had telescopes available through which the public could view the heavens, especially Saturn, which was well placed for observation.

The exhibition and lecture series can, therefore, be recorded as a successful celebration of the Astronomy Section's 40th anniversary, and we are very grateful to sponsors *Aurigny* (who provided a flight from Gatwick for Professor Riley), and to *The Robus Group* (who met the costs of his accommodation in the Old Government House Hotel). The Hotel also provided a room upgrade for him.

Finally, our thanks are due to the Guernsey Museum and Art Gallery, which provided the venue for the lectures, support for Professor Riley's lecture, and, of

course, for mounting such an excellent exhibition, which provided a considerable impetus for astronomy in Guernsey.

The displays have had a new lease of life following the closure of the exhibition. The Section has been given several of the panels, which we will be able to use on future occasions, and indeed as a permanent display at the Observatory. We have loaned three of the panels, and provided a number of pictures, for an exhibition at the parish church of St Pierre du Bois, which is running from now until the end of the year. This is particularly appropriate as the Observatory is in the parish, and it will, hopefully, encourage more parishioners to our open evenings.

David Le Conte

Transits across the Sun and Other Stars.

Transits of Venus are one of the rarest of predictable astronomical phenomena. The recent 2012 transit, unfortunately not seen from Guernsey, and visible from only some parts of the British Isles because of the very cloudy conditions, will not be happening again until the next century.

There are only two planets which can pass between Earth and the Sun, the other being Mercury, but this has no comparable importance because it is a far smaller planet and further away from us, with its position around half way between Venus and the Sun. Mercury would appear as just a very small spot against the background of the Sun's surface.

The other, much more frequent occurrence of transits is, of course, in a transit of the Moon during a solar eclipse, covering the Sun partly or completely.

Another transit phenomena which has become important is that a great many planets are now known to exist in orbit around other stars, some identified as a result of a large planet's gravitational effect on the parent star, and more recently the transits of planets across other stars have also been confirmed.

The astronomer Johannes Kepler was the first person to predict a transit of Venus across the Sun. This was in 1627, when he predicted that there would be transits of Venus in 1631 and 1761. This proved correct, with the first of these being observed on December 7th, 1631.

It was the British astronomer Jeremiah Horrocks, however, who refined Kepler's calculations and realized that the transits would actually occur in pairs eight years apart, with each pair separated by more than a hundred years. He predicted correctly that after 1631 there would be another transit of Venus on December 4th, 1639, and he

became the first person to record a transit, observing this from his home near Preston, in Lancashire. He was uncertain of the time that the transit would occur, but with a break in the cloudy conditions just half an hour before sunset, he was able to observe the transit using a telescope to project the image safely from the eyepiece onto a piece of paper. Calculations from the transit also provided a rough estimate of the distance to the Sun, and although this was only about two thirds of the actual distance now known, it was better than any other estimate at that time.

Transits of Venus are rare because, as with eclipses of the Sun, the planet or moon have to be in exact alignment between the Sun and the Earth in its orbit. In the case of Venus there is a difference of about three degrees in the orbital angle of inclination, so the orbits only coincide on comparatively rare occasions.

The timings of a Venus transit are important because these can be used, particularly when measured from widely separated locations on the Earth's surface, to calculate the distances to Venus and to the Sun, by using the locations as a base line, and by angular measurement calculations.

The British explorer Captain James Cook, discovered Australia during a voyage in 1768, and visited the island now known as Tahiti, where he observed the Venus transit of June 3rd, 1769, and with the transit also being observed from Hudson Bay in Canada. At about the same time, King George III was also able to observe the transit in England, using a compact brass Gregorian type reflector telescope, and seeing the progress of the transit from the newly completed observatory at Kew, on the outskirts of London.

There is also a historical account of how one adventurous astronomer travelled out to India to make the important observations of a transit, but failed to do so because of unsuitable weather conditions. Not to be deterred, and perhaps unwilling to face the long journey by sea back to England, he decided to stay in India with the aim of recording the next transit of Venus, eight years later. We don't know if he was successful and if he was married and had left his wife in England, or what she would have thought, whether she gave consideration to a divorce for unreasonable behaviour, or on the grounds of desertion.

Before this year's Venus transit on June 6th, the previous one on June 8th, 2004, was well observed from Guernsey, with a transit time of around six hours and good weather conditions, using projection of the Sun's image onto a screen within the observatory's main building, and direct observation of the transit using safe filters.

An interesting point before the 2004 event is the date of the previous transit of Venus, more than a hundred years earlier, in 1882. This was the second in one of the pairs of transits, and was the year when La Societe Guernesiaise - the Guernsey Society of Natural

Science and Local Research, was formed. There has been some reference in the past to the fact that astronomy was one of the early interests of the Society at that time. There does not seem to have been any official reference to the transit in the earliest reports. The Venus transit of 1882 was on December 6th, and it would seem very likely that local researchers would have been aware of this. However, with weather conditions in December being often more unsuitable for observations than during other months of the year, it is more than possible that there were no observations of the transit on that occasion, and with the realization that it would be more than another century before the next opportunity.

In locations with clear weather, viewing of the pair of transits in 1874 and 1882 allowed the distances to Venus and to the Sun to be calculated with much greater accuracy, and in that way the scale of the solar system with the distances to all of the other planets began to be resolved. From there to using the whole of the Earth's orbit as a base line for observation and measurements then allowed the distances to the nearest stars to be estimated.

With space probe missions now travelling to the farthest parts of the solar system, even out to Pluto which is soon due to be reached, it is even more important for distances to be known accurately. Radar data is also used, and during the earlier years of space missions with the historic first manned landing on the Moon in 1969, the landing time was achieved to within an accuracy of less than a minute. The astronomical unit, the distance between the Earth and the Sun, is now reported to have been refined to within a distance of about thirty metres.

Transits of a planet across a star are also being used in the search for planets in other star systems. Although planets are not yet expected to be visible because of the huge distances involved, the presence of planets can now be detected from a star's small but regular decrease in brightness as a planet transits across its surface. Many of the hundreds of "extrasolar" planets already confirmed have been discovered in this way, and seem now to be much more plentiful than has ever been predicted.

Geoff Falla

Looking for Venus – the Transit of 2012

If I had to sum up in one word, the thoughts that were going through my mind as we stood on Bordeaux headland waiting for the Sun to rise with Venus crossing it, I really do not know what that word would be.

We each must have known before we left home (and we are talking about 4.30 am in the morning), that there would be very little chance of seeing the Sun, let alone Venus too. The thick

clouds that morning were never going to allow such a thing.
At 4.30 am I duly arrived with the Celestron telescope and mount in the back of the car, where George De Carteret and I had placed it the previous day. Within a very short time David Le Conte arrived. As we exchanged pleasantries and looked at the clouds William Wright arrived on his bicycle. William had been on the last WEA Course. George De Carteret joined us, looked at the clouds and then he and I carried the telescope and tripod separately to a suitable vantage point. Paul Seymour followed, noted the clouds then helped George, William and myself to bolt the telescope to the stand and point it to the horizon where the Sun was due to appear (which, of course, also happened to be the area of thickest cloud). Peter Langford arrived and too noted the thick clouds. Wendy Porter arrived and said "what a shame" followed by Colin Gaudion and his Border Collie.

Everything was now ready; telescopes and cameras on tripods, waiting for the Sun to rise. As William said "The cameras are rolling, all we need is a star, the nearest one will do".

We talked about the clouds on Venus. Wendy had her iPad and we talked about that. I must say that it was not unpleasant. It was not cold and the view of Herm and Sark was quite splendid. The company was good and as David said "Is anyone bringing the bacon rolls?" there was a brief moment where the clouds in front of the Sun's apparent position appeared to be thinning but immediately thickened up again.

Six o'clock came and it was time to leave. The Celestron was carried back to the car, cameras were packed away and we agreed to meet in 105 years time to try again!

So what was I thinking as we waited for the Sun? It's not going to happen! At least we saw it 8 years ago. What are we doing here? No!

The company had been very good. I had actually enjoyed it. To have so many people there at 5.00 am in the morning knowing there was such little chance of success, I thought was quite remarkable. Yes, I believe that is the word that sums it up 'remarkable'.

Frank Dowding

In 2004 we had an American visitor, Silvie Browne, join us at the Observatory to view the transit. This time she had better luck at home. Some extracts from the recent email correspondence between Silvie and David.

Dear David,

Hello from Sylvie who came to visit for the 2004 Transit of Venus! I've been thinking of the Guernsey astronomers a great deal in the last few days.

With one child in university and another having just finished, this year I stayed in Troy and resigned myself to seeing whatever was possible. We had clouds all day up until just after first contact, but the sun came out for almost two hours and my family and I were able to see Venus for about a third of the transit. Troy is on a hill with a great view to the west and it was a good time to bond with new friends in the neighbourhood. After sunset, we watched the rest of it online. Despite the limited visibility I thought it was an event worthy of champagne.

I read in your newsletter that the Section decided to move the telescopes to another part of the island in hopes of better viewing but, alas, it was just too cloudy. I hope that everybody still enjoyed the effort - I have fond memories of my visit with your group and wish you all well.

Dear Sylvie -

How wonderful to hear from you again after all these years. I remember you well, and your brave journey all the way from New York in 2004 just to spend a couple of hours with us watching the Transit of Venus!

Although a couple of our members planned to view this year's transit from faraway places (one in Switzerland and one in the Galapagos) most of us decided to stay put in Guernsey, and take our chances, albeit that only the last 50 minutes were scheduled to be visible from here, immediately after sunrise. Because the Observatory does not have a good view of the north-east horizon we moved a couple of telescopes to the north-east of the island. The weather the last few days has been rather poor, and when I left home at 4.00 am my wife said to me: "I'm afraid your chances are slim." I replied: "They are slim, but not zero, but tomorrow they will be zero, so it's now or never." Eight of us and a dog gathered, but the clouds just got worse. In a radio interview I said that our disappointment was lessened by the fact that we had seen it in 2004. Indeed, we are lucky that these events happened in our lifetime!

I am so glad to hear that you got to see some of the transit from Troy, and that it was a good neighbourly experience. We didn't break open the champagne on this occasion, but will save it for the next major event.

Geoff Falla's regular roundup of articles from popular Astronomy and Space Journals

Finding the Sun's Lost Nursery. Finding the environment where the Sun formed could help in finding out if there are other stars and planets in our galaxy which are similar to our own. Evidence suggests that the Sun's birth was in a different part of the Milky Way, and some key information obtained by astronomers indicates one particular star cluster as the possible source. (Sky and Telescope, March 2012)

Mystery Dimming of Auriga star is

Solved. A mystery lasting 200 years in the constellation of Auriga has been solved. Astronomers have discovered from highly detailed observations that a dimming of the star Epsilon Aurigae is caused by the transit of a large elongated disk of material which has a massive star at its centre. (Sky and Telescope, March 2012)

Probing Einstein's Relativity. The Gravity Probe B experiment, one of the longest projects in NASA's history, was launched in 2004 to test the theory of gravity. The results were announced in 2011, confirming two effects predicted by Einstein's general theory of relativity. (Astronomy, March 2012)

How we know that Black Holes Exist. In spite of the invisibility of black holes, it is now known that they noticeably affect their environments, including by the emission of high speed jets, and that black holes are of two types - stellar mass ones of at least several times the Sun's mass, and supermassive ones of enormous size at the centres of galaxies. (Astronomy, April 2012)

The Universe in the Background. A set of articles focusing on the background radiation of the Universe, including how this radiation is created and seen at different wavelengths; the microwave background radiation identified as an echo of the 'Big Bang'; infrared radiation from interstellar material in star-forming galaxies; X-rays from black holes, and gamma rays which may reveal the hidden dark matter in the large scale structure of the universe. (Astronomy Now, April 2012)

A Titanic Lunar Connection? Some very unusual circumstances are being linked with the sinking of RMS Titanic in April 1912. Apart from other factors which contributed to the disaster, it is now thought that the Moon's position at that time - at its closest for more than a hundred years, would have caused extreme tides and the greater quantity of icebergs moving down into the North Atlantic current. (Sky and Telescope, April 2012)

The Marvels of Mercury. Images and discoveries as a result of two flybys of Mercury by the Messenger space mission. Some images obtained from low orbit have shown highly detailed features of the planet, including craters and rays. Other instrumentation has also revealed that Mercury has a surprisingly large iron core, and a substantial magnetic field. (Sky and Telescope, April 2012)

What Happens when we detect Alien Life? The existence of life on Earth has been broadcast since 1920, and alien signals may one day be received. What procedures will follow the receipt of such a signal, and would any message be understandable? (Astronomy, May 2012)

Spaceguard - Avoiding an Armageddon Impact. It has been accepted for some years that an asteroid impact produced devastating effects, including the extinction of the

dinosaurs. In recent years there have been more efforts to identify Near Earth Objects which would be a major threat to life, and there is now a project to install the largest telescope in Wales to identify such objects. (Astronomy Now, May 2012)

A Guide to the Universe. A five part guide to the Universe, with the first of these dealing with the solar system, including all of its planets, and other summary information on asteroids, comets and their origins. (Sky at Night, May 2012)

Completing the International Space Station. Since the first component was placed into orbit in 1998, with the Space Shuttle taking the first crew there two years later, construction has been a continuous process using NASA and Russian launchings for crew changes and supplies. The ISS is now about to be completed, with private industry due to be taking part in the programme. (Sky at Night, May 2012)

The Herschel Space Telescope. The largest space telescope is in orbit at one of the Lagrange points, about a million miles out, where the gravity influences of the Sun and Earth are balanced. The Herschel telescope's infrared observations are revealing new information about galaxies and their formation. (Sky at Night, May 2012)

Rogue Planets adrift in Space. Apart from the many hundreds of planets now known to exist in orbit around other stars, astronomers are now sure that many planets are thrown out from their orbits during the early stages of multiple planet development, before a more stable situation is reached. (Astronomy, June 2012)

The World's Greatest Telescopes. A comprehensive summary of 50 of the world's largest telescopes and their observatories, including optical and radio telescopes, with the modern techniques providing even better telescope performance. A review also of the developments in space telescopes, and a history of telescopes. (Astronomy, Special Issue, Summer 2012)

Venus Transits History. A history of Venus transits and observations from the earliest times, with the first predictions by Johannes Kepler, and the first observational records of a transit, by British astronomer Jeremiah Horrocks; also why observations of the transits have been so important. (Astronomy Ireland, June 2012)

The Transit of Venus. A set of articles about Venus and its transits, including how the Royal Society took part in the first major scientific experiment to observe the transit of 1761 for calculating the scale of the solar system. Also, how observations of Venus over the course of time have steadily increased knowledge about the planet. (Astronomy Now, June 2012)

Is the Sun heading for Hibernation? The Sun is expected to reach peak activity in the solar cycle towards the end of 2012. Although there has been

some major activity, the present cycle has been a relatively quiet one, and there are concerns that the overall level of solar activity may be decreasing. (Astronomy Now, June 2012)

Obituary
Peter Hingley (1951 - 2012)

I was shocked to receive the announcement of the untimely death of Peter Hingley, Librarian of the Royal Astronomical Society, at the age of just 61, on 23 June. I was aware that he had been ill, and was due to retire shortly, but had not realised how serious his illness was.

Peter was a good friend of the Astronomy Section and very much a personal friend. I had had numerous contacts with him over the best part of two decades, both during my many visits to the RAS Library and by email. He was a tremendous help to me in my research on Guernsey Astronomer (and RAS President) Warren De La Rue (1815-89), was always ready to give assistance with the library resources and archives, encouragement in my research, let me know of anything new that came to his attention, put me in touch with other researchers with similar interests, and chat about his latest research project as well as mine. Nothing was too much trouble for him.

I have spent many hours, indeed days, in his company at the RAS, and whether by appointment or an unannounced visit, he was always willing to give me his time and attention. He made me feel that he was pleased to see me, even if he was up to his ears in RAS activity (which he invariably was). My wife says that she too was made to feel welcome, even though she is not an astronomer.

He had a bubbly, energetic character, bouncing with enthusiasm for his subject and his research. He would be excited to show me his latest archival find, and had an extraordinary knowledge about astronomical history. He would talk at length about subjects such as trains and ships, as well as about astronomy. Latterly he was a Council Member of the Society for the History of Astronomy, and as a founder member myself I had some dealings with him also through that Society. He supported me by attending a lecture I gave to the Guernsey Society in London in 2006.

Peter visited Guernsey for the RAS National Astronomy Meeting in 1999, and joined us in Alderney for the total solar eclipse. He had already made

one or two preparatory visits, and loaned material for the eclipse exhibition at the Guernsey Museum. He remained in contact with several members of the Section, and was of assistance in finding good academic homes for some of the library of the late planetary geophysicist Keith Runcorn, which came into our possession.

Internet tributes to Peter have been pouring in from all over the world, referring to him as '*an institution*', '*one of astronomy's great characters*', '*a gentleman and a scholar*', the fact that he will be sadly missed, and that it will be hard to replace his in-depth knowledge. It is indeed a tragedy that the astronomical community will no longer benefit from his expertise and boundless exuberance.

David Le Conte

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