Sagittarius

The Newsletter of the Astronomy Section of La Société Guernesiaise

July – September 2008

Forthcoming Events

Perseids BBQ

Observatory: 11th August: 7.30 pm

Public Open Evenings

29th July: 9.30 pm

5th August: 9.00 pm

12th August: 9.00 pm

19th August: 9.00 pm

26th August: 9.00 pm

Partial Solar Eclipse

1st August: 9.35 am - 10.53 am
Maximum eclipse 22% at 10.13 am

Partial Lunar Eclipse

16th August: 8.35 pm - 11.44 pm
Maximum eclipse 81% at 10.09 pm

In addition, the Section meets at the Observatory every Tuesday evening, and Friday if clear for observing.

Inside

Inserts

Star chart

Sunset, sunrise, moonset and moonrise times

Summer Skies through Binoculars

We do very little observing from mid May to mid July as the nights are so short and it is after ten o'clock before the sky is sufficiently dark. It is for this reason that we do not start our Public Open Evenings until the end of July but even then it is not dark before 9.30 pm. But of course the nights are warmer and holidays mean that people are able to stay up later.

Our summer sky is dominated by the Summer Triangle, three bright stars that form a triangle but are unrelated to one another. This large triangle consists of Vega, the brightest star in Lyra and overhead for most of the summer, Deneb, the bright star making the tail of Cygnus the Swan and Altair in Aquila, noticeable because of the two stars directly above and below it. In the west we have Arcturus, the red giant and together with the three stars of the triangle you will notice that the four are similar in visual brightness. When you then learn that Arcturus, Altair and Vega range from under 20 to 37 light years away from us but that Deneb is over 3,000 light years away, you realise just how massive this star is. Deneb is the most luminous star in our galaxy, shining with the luminosity of almost 400,000 suns. Our sun is very humble in comparison.

About halfway along a straight line from Vega to Altair, you come across a faint hazy patch. Binoculars reveal half a dozen stars in a straight line with a few stars below. Viewed in the finderscope of telescope (ie upside down) the stars appear as a perfect coat hanger shape hence the Coathanger Cluster or Brocchi's Cluster to give it its proper name. This is best viewed either in the telescope finderscope or in binoculars.

The sky offers much for the binocular viewer, particularly as our latitude enables us to see most of Sagittarius, the constellation containing many Messier objects. Your binoculars will show you several hazy patches, which are nebulae and star clusters. There is M8 (Lagoon nebula) and M20 (Triffid nebula) both reasonably easy to find with binoculars, being around the 6th magnitude objects. They are nebulous star clusters at distances of 6,500 and 2,200 light years respectively. M25 and M23 are also easy to spot star clusters. Scutum, the constellation just above Sagittarius is the home of M16, the Eagle nebula which you may remember fantastic pictures of from the Hubble space telescope published a few years ago and called the 'pillars of creation'. At 7,000 light years away and roughly 6.5 magnitude you are not going to see anything other than a faint patch but it is certainly worth finding the object that gave us such wonderful images.

Jupiter is in Sagittarius but quite low, if your horizon is reasonable decent binoculars will show this giant planet as a tiny disc with its major moons revealing themselves as pinpricks of light in your eyepieces. Pluto is also in Sagittarius, though lighter nights with the moon in the sky and any slight

haziness will make this tiny dwarf planet a very difficult object for our 16 inch Meade. Going eastwards Neptune is in Capricorn and Uranus is Aquarius, both visible in binoculars if you know where to look, but even in the telescopes only appearing as tiny discs.

Summer is the time to see Scorpio in the south and the bright red giant Antares, meaning rival of Mars. This ageing red giant is 600 light years from us and has the luminosity of 286,000 suns. Because this star is so low and bright, it is quite noticeable how the colour changes as it flickers from red to blue to green as the light passes through the thickest part of the atmosphere.

The globular cluster, M13 in Hercules, is just about visible on a clear night and easily shows up as a round hazy patch in binoculars. This is arguably the best globular cluster in the sky. Do also try to spot M92, another globular cluster, also in Hercules and above the 'body' of the constellation. It is a little fainter, not naked eye, but can be spotted in binoculars.

My test of a clear sky is to see if I can spot M51, the Whirlpool galaxy in my binoculars. This is just under the handle of the Plough and in the fainter stars of Canes Venatici. There are two stars I find from the end of the Plough handle, which make a triangle with M51. Maybe it is not as easy in the summer with lighter nights but it can be spotted with binoculars if the conditions are right.

It is very enjoyable settling down in the garden on a summer's night and watching the stars slowly come out. Usually Arcturus and Vega are seen first. Every August at the Observatory we enjoy counting the Perseid meteors on a warm summer's night and you see much more as well. The Perseids are not the only active shower at this time of year. Whilst the Perseids can be traced back to a point in the north east, you may spot meteors shooting across the sky in totally different directions and belonging to some other shower. Other showers active at the time of the Perseids are:

- South Iota Aquarids
- North Delta Aquarids
- Kappa Cygnids
- North Iota Aquarids

In past years when counting Perseids meteors we have spotted as many satellites. The sky is a really busy place. The Heavens Above website gives details of the International Space Station and many other satellites such as bright Iridium flares (www.heavens-above.com). I had not seen many Iridium flares and was pleasantly surprised just how bright they can be when we were visited by La Houguette School Year 5. Needless to say the schoolchildren were delighted.

The summer night sky, brief as it may be, is full of interest, with much to offer the binocular or casual observer.

Debby Quertier

International Space Station

In 1993, NASA announced to the world that a space station was to be constructed. It would not be another American or Russian owned, but would be built and paid for by many countries and called the International Space Station.

Assembly in space started in 1998 when the Russian built Zarya, essentially a cargo hold, was launched into orbit, followed later by an American berthing unit named 'Unity'. These two sections were joined and meant that subsequent ships could dock on Unity and store cargo in Zarya. The third section was the Russian Zvezda which enabled the station to have breathable atmosphere and other necessary environmental requirements. In November 2002, the first crew arrived and with periodic replacements the station has been crewed ever since.

Over the years, steady progress has taken place with the construction of the space station. However it has not been without problems, some extremely serious, notably the space shuttle Columbia disaster, which has resulted in the completion date being delayed to 2010. There has been a huge change in the look of the station since the original Zarya unit was orbiting the Earth alone and it is only now starting to resemble the NASA's design pictures with many sections and huge solar panels covering the size of an American football pitch.

Two types of units have been installed, one type is for habitation such as living quarters and laboratories and the other is service units such as power, docking facilities and computer equipment. Most of the service units are now in place. Living quarters and research laboratories are the biggest items and there are four in all. Zverda - living quarters, Destiny - an American research laboratory, Columbus – the European Space Agency research laboratory and the Japanese Experiment Module (JEM) is being installed at present (June 2008). JEM will be the biggest of all and next year an external balcony is being planned to conduct experiments literally in outer space. This last unit will see the station more or less complete by 2010.

Until now very few experiments have taken place with time being devoted to ensuring correct functioning of existing equipment and installing new. It is expected that the cost of the programme will be around $158 billion, making it the most complex and expensive programme ever undertaken.

Normally there are three crew aboard, although this can increase to eight when the shuttle arrives. When completed there will normally be six crew on board. Supplies and crew are transported in a number of ways. The American space shuttle and the Russian Progress vehicle take care of the big loads. The Russian Soyuz spacecraft takes the relief crew every six months. The Soyuz spacecraft then

stays docked to the station to act as an emergency evacuation vehicle while the returning crew journey to Earth in the vehicle they arrived in six months earlier. In this way the lifeboat is renewed every six months. Recently, the European Space Agency's Automated Transfer Vehicle (ATV) docked for the first time. The ATV is designed to visit the station approximately every seventeen months with supplies. It is fully automated with a sophisticated guidance system. After about six months, when it has been filled with unwanted material, it leaves the station and is burnt up in re-entry. At the time of writing, June 2008, all four vehicles are docked to each of the four docking bays.

Experimental research to date has been mainly concerned with microgravity and performed in the American Destiny laboratory. Once completed the space station will be utilized for diverse research. The Columbus laboratory will host research in biomedical, fluid and quantum physics as well as meteorology and cosmology. The Japanese laboratory Kibo (meaning hope) will concentrate on astronomy and the Destiny research laboratory will research the long term effect of human space travel. All of the countries that have contributed to the construction of the space station will have access to the research facilities. This list includes the United States (the major contributor), Russia, Canada, Japan, Brazil and eleven European countries within the European Space Agency.

Astronauts from sixteen countries have now worked at the station and it has been visited by five space tourists.

The space station is at the highest point of the atmosphere and because of this it does experience some drag and will lose height of around one and a half miles a month. Once its orbit is as low as 170 miles above the Earth, it is taken back up to two hundred and eighty miles either from the propulsion of its own thrusters or those of a docked vehicle. Currently the station has a low orbit making it easier for heavily loaded space vehicles to reach it but on completion of the current construction it will return to a higher orbit.

This is one of mankind's most ambitious projects and is a significant step in the exploration of space and deeper understanding of science.

Frank Dowding

A Pair of Pairs

I have recently had reported to me two interesting sightings from Guernsey, both involving pairs of objects.

On Saturday, 31 May 2008, at about 10.20 pm, three people independently saw a pair of objects passing across the sky, from west to east, one bright,

the other with a reddish colour. The Space Shuttle *Discovery* had been launched from Cape Canaveral at 10.02 pm, and what they saw was clearly the Space Shuttle and the discarded fuel tank. A good picture, taken as they passed over Germany, appears on the *Astronomical Picture of the Day* website for 04 June 2008 - see http://antwrp.gsfc.nasa.gov/apod/ap080604.html

The Space Shuttle often passes over our area immediately after launch, and is worth looking out for. Of course, usually this happens in daylight, and it is unlikely that we would see anything, but launches in Florida's late afternoon should be visible in our evening twilight, so do keep both eyes open, and note when launches take place. For more details see http://www.nasa.gov/mission_pages/shuttle/main/index.html .

Although no member of the Astronomy Section reported seeing the Shuttle on this occasion, three of us did watch the extremely bright Space Station, with the Shuttle attached, pass overhead on the evening of 03 June. We used the *Satellite Tracker* software to drive the 16-inch Meade, and, although the tracking was not perfect, I did catch a brief glimpse of the spacecraft through the 50 mm eyepiece, clearly making out its shape. We need to use this technique more often, and hopefully get some pictures.

The other sighting occurred on 29 July 2007, at 3.55 pm (probably GMT, rather than BST), from Petit Bot. Reported sightings are often too vague to enable positive identification, but on this occasion the lady concerned took a photograph, and digitally enlarged the area of interest (see accompanying image). She reported them to me in May 2008, having just visited our Observatory. She said she observed the pair of objects for about a minute, and that they were moving west and slowly rotating. She said she had seen similar objects in the UK and Greece, and she thought they were satellites, which they are clearly not.

From the direction of sunlight, it seems that the objects were in the west. To me they look very much like hang-gliders, and such activities do take place on the south-west coast. The Airport authorities say that there was no unusual activity on that day, and that hang-gliders should not go so high. Their best guess was meteorological radiosonde balloons, but they do not normally go in pairs. Other possibilities are kites or birds.

If any member has any other suggestions, I would be interested in hearing them. I can email the original picture for closer inspection.

Editor: Unfortunately the photograph could not be reproduced with our current reproduction methods for Sagittarius. If you wish a copy of the image then ask David or myself for a copy. Alternatively we will place a copy on the Section website - www.astronomy.org.gg.

David Le Conte

Greenwich Observations Of A Past Century.

A Strange Celestial Visitor

The astronomer Edward W. Maunder (1851-1928) was the founder of the British Astronomical Association, now in its 118th year, and was Editor of the BAA Journal during its early years. He was invited by the Editors of 'The Observatory' magazine to contribute some reminiscences for the 500th issue of the magazine, and recalled one particular event which stood out most in his memory.

This was on the night of November 17, 1882, at the Royal Observatory, Greenwich, when he observed a very unusual object, and described it as 'a strange celestial visitor'. There was an aurora visible at the time, but this was of no special interest. However, a large disc of greenish light then appeared from an easterly direction, moving smoothly across the sky. The circular appearance of this object when first seen was evidently due to a foreshortening effect, because as it passed above the Moon the object was described as looking 'like a torpedo', or 'cigar-shaped'.

With this particular shape, the astronomer also expressed the view that if this had happened some thirty years later, everyone would no doubt

have described the object as looking just like a Zeppelin airship. The object did not seem to be related to aurora phenomena because it appeared to be a definite body. It was in view for about two minutes, and moving too fast for a cloud - but was completely different to a meteor.

The astronomer gave the object's apparent dimensions as being approximately 27 degrees in length, and with a width of 3.5 degrees. He also described it as having a remarkable dark marking down the centre. Another observation of the object also described it as having a dark nucleus, and there were estimates of the altitude as being at between 40 and 200 miles, with the object also observed from across the English Channel in Holland and Belgium.

There were other observations reported in the science journal 'Nature'. The colour of the object was described as white, different to the aurora at the time, which was rosy coloured. There was also one description of bright stars being visible through the shape of the object, but not at the zenith when it looked opaque. The object's surface was also described as having a mottled appearance in another of the reports.

In 'Knowledge' magazine it was reported that the object had appeared from a south easterly direction, travelling across the sky and disappearing near the northwest horizon. The writer noted that the whitish torpedo-shaped light was of nearly uniform brightness. It had travelled at almost exactly right angles to the magnetic meridian, and there seemed to be 'very little doubt that the object was an electric phenomenon'.

In 'The Times' of London, November 20, 1882, the Editor reported that he had received a great many letters on the phenomenon, with two published. One correspondent described the object as 'well defined and shaped like a fish, extraordinary and alarming', with another writer describing the appearance as a most magnificent luminous mass, also describing the shape as somewhat like a torpedo, as reported in other descriptions of the event.

The Maunder Minimum.

Edward Maunder's name is also linked in particular with his identification of what has become known as the Maunder Minimum of sunspot activity.

Edward, and his second wife Annie, were solar astronomers at the Royal Observatory, Greenwich. Edward became assistant for spectroscopic and solar observations at the time that George Airy held the position of Astronomer Royal. Edward Maunder was assisted in his work by Annie, and it was in 1890 - the same year that he founded the British Astronomical Association - that he also identified a prolonged period of minimum sunspot activity which began during the 17th century. His study of sunspot numbers covered a 300 year period, and he noted in particular a scarcity of sunspots during the period 1645-1715. In much more recent times this has

become accepted and known as the Maunder Minimum, a period when the reduction in sunspot activity was accompanied by a marked cooling of the climate. This was not properly confirmed as a real effect until as recently as 1976, when tree rings were found to show a reduction of Carbon-14 during the same period. The production of Carbon-14 in the atmosphere is affected by solar activity, and the now accepted Maunder Minimum was apparently due to some unexplained reduction of the solar magnetic field for about 50 years during that period.

References.
The Observatory: **6**,192, **39**,214.
Nature (1882): **27**,82, **27**,87.
Philosophical Magazine: **5**, 15-318.
Knowledge Magazine (1882): **2**,419.
The Books of Charles Fort, Henry Holt & Co, New York, 1941.
W.R.Corliss, Handbook of Unusual Natural Phenomena, Sourcebook, 1977.
The Canopus Encyclopaedia of Astronomy, Canopus Publishing, 2004.

Geoff Falla

Footnote:
Alderney based astronomer and local Astronomy Section member Michael Maunder, author of the recently published book 'Lights in the Sky', (Springer-Verlag London Ltd, 2007.) and co-author with Patrick Moore of books on the subjects of solar eclipses and planetary transits, has mentioned that he has no family connection with the 19th-20th century Greenwich astronomer Edward Maunder.

Man's home "*Targeted by Meteorites*"

In the Daily Mail recently (10/4/08) a remarkable and very unusual news item told of a man in Bosnia whose home had been hit five times by meteorites in recent months. The rocks had been handed over to experts at Belgrade University for examination, and the results confirmed that all of the rocks had come from space. It was reported that local magnetic fields were now also being investigated in an attempt to discover why this particular home was so attractive to meteorites.

The home owner, in the northern Bosnia village of Gornja Lamovite, thought however that he already knew the answer to the bombardment - that he was obviously being targeted by extraterrestrials. He was quoted as saying "I don't know what I have done to annoy them, but there is no other explanation that makes sense". It was in November 2007 that the first of the meteorites struck, with four more since then, and with each of the meteorite falls happening during heavy rainfall.

Does anyone have a 'down to Earth' solution to this? One possible answer, I suppose, is that someone with a meteorite collection wanted to get rid of them for some reason, and decided to target this particular home. However, since meteorites are quite valuable, it would seem unlikely that anyone would want to throw them

away - and why only during heavy rainfall?

Surprising as it may seem, similar selective falls, with no apparent explanation and sometimes also during heavy rainfall, have in fact happened many times in the past.

Geoff Falla

Editor: Date seems to be too close to 1st April for my liking!

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

The New Monster Telescopes. Much larger telescopes are being planned, with combination mirror diameters of more than 100 feet. Many smaller mirrors working together, and with adaptive optics, will allow more distant stars and galaxies to be studied, also expected to include the first images of planets now known to be in orbit around other stars. (Sky and Telescope, April 2008)

Venus - A Parched Planet. Venus and Earth are nearly twin planets in size and mass, but although it is geologically active, Venus is known to have very different surface conditions. Details of what has been discovered as a result of the latest space probe visit, by the European spacecraft Venus Express. (Sky and Telescope, April 2008)

Virgo's Super Galaxies. The constellation of Virgo is the largest in the zodiac, and contains a supercluster of nearby galaxies, spilling into the neighbouring constellation of Coma Berenices. Information on what is contained within this area, and where to find some of the most notable galaxies. (Astronomy Now, April 2008)

The Search for Extraterrestrial Intelligence. A set of articles focusing on the search for life on other worlds. Including the new Allen Telescope Array - a large group of radio dishes now being built in conjunction with the SETI Institute; the Drake Equation - the probability of finding life elsewhere; alternative methods of interstellar communication, and why there has not yet been any definite proof of extraterrestrial intelligence. (Astronomy Now, April 2008)

Messages from Mercury. The Messenger spacecraft has now achieved a complete survey of Mercury's surface. It is hoped that this will answer questions about Mercury's composition, and how it has retained a partially liquid core with a significant magnetic field - even though the planet has a very slow rotation rate. (Sky and Telescope, May 2008)

Decoding the Oldest Light in the Universe. The cosmic microwave background is accepted as virtual proof of the 'big bang' theory. Cosmologists have partially decoded the microwave information, which has revealed much about the age,

composition, and early history of the universe back to its beginning almost 14 billion years ago. (Sky and Telescope, May 2008)

The Magic of the Moon. A set of articles focusing on our Moon, including the mechanics of the Earth-Moon system with its important tidal effects; some of the most important features on its surface, including which ones are taken to make up the 'Man in the Moon' appearance; meteorites which have been identified as having a lunar origin, and planned lunar space probes including an eventual return of manned flights. (Astronomy Now, May 2008.)

R.A.S. National Astronomy Meeting. The 2008 meeting, held in Belfast, revealed recent discoveries by Irish astronomers based at Queen's University, Belfast, at Armagh Observatory and in Dublin. Including the observation of meteors in the atmosphere of Mars, unusual solar flare observations, and the recent discoveries of the UK 's SUPER WASP project which has added significantly to the number of planets found to be in orbit around other stars. (Astronomy Now, May 2008; also Astronomy and Space, June 2008)

Our Milky Way's future collision with Andromeda. Some galaxies are observed to be in collision. Our own Milky Way is part of a local group, including the larger Andromeda Galaxy. How gravitational attraction, already in progress, will eventually result in a merging of the two galaxies. (Astronomy, June 2008)

Gamma Ray Bursts from the early Universe. It has been found that ultra powerful gamma ray bursts, from the explosion of massive stars, can be millions of times brighter than an entire galaxy. A recent one was found to originate back in time to the early history of the universe, which may reveal more of its secrets. (Astronomy, June 2008)

Pluto's moon Charon. The story behind how Pluto's large moon Charon was discovered in June 1978 by James Christy, working at the U.S. Naval Observatory in Flagstaff, Arizona. In October, 2005, astronomers announced the further discovery of two very small moons beyond Charon's orbit, but in the same orbital plane. (Sky and Telescope, June 2008)

NASA's new Gamma Ray Spacecraft. A new spacecraft is shortly due to begin a further study of gamma rays. The orbiting observatory will investigate active galactic nuclei, and is expected to reveal new information about neutron stars, black holes, and the origin of cosmic rays. (Sky and Telescope, June 2008)

Is the NASA Search for Life on the right track? At present, the search for some kind of life elsewhere in our solar system, such as on Mars, and other possibilities such as on Jupiter's moon Europa, and Saturn's Titan, is based on the need for water and on carbon-based life, as on Earth. There may, however, be different forms of life which should not be ruled out.

(Astronomy, July 2008)

Wolf-Rayet Stars. Some stars are massive, and in the final stages of life have the highest surface temperatures and strongest solar winds of any known type of star. In this final stage they are known as Wolf-Rayet stars before becoming a supernova, and with the particular form and sequence depending on the star's original mass. (Astronomy, July 2008)

Ireland's Ancient Astronomers. It has been thought that in Ireland, as in other countries, the knowledge of ancient astronomers was probably limited to tracking and marking the solar solstices and perhaps the equinoxes. Evidence is emerging, however, that much more was known, including knowledge in particular of the lunar cycles. (Astronomy and Space, July 2008)

Section News

Perseids BBQ

Our annual Perseids BBQ will be held on Monday 11th August at the Observatory at 7.30 pm. The Perseid peak is predicted for lunchtime on 12 August, but subsidiary peaks might occur later that day (see http://www.imo.net/calendar/2008?PHPSESSID=aa93953d5c4b20f9010efe6a8883c7c0). Full Moon is on 16 August, so it will be waxing gibbous at the period of interest. So not very favourable, although it is at a low altitude. On the night of 11/12 August it sets at 00.48 am. The BAA think that the night of 11/12 August is the best (see http://britastro.org/baa/content/view/300/119/).

So that is what we have decided!

Partial solar and lunar eclipses. There will be a partial solar eclipse on 01 August (from 09.35 am to 10.53 am. Maximum eclipse is 22% at 10.13 am BST). There is a partial lunar eclipse on 16 August (8.35 pm, to 11.44 pm. Maximum eclipse is 81% at 10.09 pm BST).

Members may be interested in the following course which is to be run by Dr Robert Harnish for the WEA this autumn. It will be formally announced in the WEA brochure, which will be available at Post Offices, libraries, some shops, and the Observatory from early August. Enrolment starts on 1 September. The course will be held on Tuesday evenings, for 8 weeks, starting 7 October (but excluding half-term, 21 October).

Myth Conceptions: Fact and Fiction in the History of Science and Religion.

The course will explore contemporary misunderstandings of the nature of the historical relationship between Western Science and Christian Theology. Figures as diverse as Plato and Aristotle, Augustine and Aquinas, Bacon and Descartes, Columbus and DaVinci will be used to prepare the background for a reconsideration of the works of Galileo, Newton and Einstein. The format of the course will encourage student participation. The lectures will aim primarily to inform discussion and debate concerning the roles of science and religion in contemporary culture.

Dr Harnish holds a Doctorate in Theoretical Particle Physics and a Masters degree in Theology. He was Dean of Divinity at New College, Oxford, where he taught both Physics and Theology. He is currently working as Chaplain of Elizabeth College.

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