

Sagittarius

The Newsletter of the Astronomy Section of La Société Guernesiaise
January – March 2009

Forthcoming Events

Annual Business Meeting

3rd February: 8.00 pm at the
Observatory

Public Lectures:

David Le Conte: “The Emergence of Greenwich Mean Time”

Tuesday 3rd March
8.00 pm at the Frossard Centre,
Candie Gardens

Dr Michael Hoskin: “The Megalithic Tombs of Brittany in their European Context”

Friday 3rd April
8.00 pm at the Frossard Centre,
Candie Gardens

Dr David Falla: “Black Holes”

Tuesday 21st April
8.00 pm at the Observatory
(to be confirmed)

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

Inside

Section News 2

Pole to Pole 3

Astronomical Events in
2009 5

Abstracts from Astronomy
periodicals 10

Inserts

Star chart

Sunset, sunrise, moonset and
moonrise times

Section News

Unfortunately since the last edition of Sagittarius we have had to cancel many of the group visits which were listed due to the poor condition of the roof to the Main Building. I am pleased to say that external work to the roof has been carried out which should keep the building water tight. However we do need to remove and replace part of the ceiling and repair parts of the roof structure as needed. In addition there are leaks in the Meade Telescope building which will need attention too. Group visits are cancelled for the time being but we will continue with the annual WEA Star Gazing course in February and March and then carry out further repairs in the spring before the Public Opening Evenings in the summer.

Please note that Astronomy Section subscriptions are now due for 2009. These remain unchanged from 2008.

Families/Couples: £10
Individuals: £6
OAP / Juniors: £3

It would be helpful if email addresses could be supplied on membership renewal forms as email provides a convenient means of notifying members of events between editions of Sagittarius.

There are a number of meeting announcements. The first is the Section's Annual Business Meeting which is scheduled for 3rd February at 8.00 at the Observatory.

The Emergence of Greenwich Mean Time

Lecture by David Le Conte

Tuesday 3rd March
8.00 pm at the Frossard Centre,
Candie Gardens

In an illustrated lecture, David Le Conte will describe the popular (and sometimes unpopular) spread of Greenwich Mean Time throughout the country during the 19th century, and its eventual legal adoption in Guernsey exactly 100 years ago. It is a story full of anecdotes, involving temporal confusion, the railways, time-balls, and the electric telegraph, as well as international friction and the valiant efforts of generations of a single family.

The Megalithic Tombs of Brittany in their European Context

Lecture by Dr Michael Hoskin,
Cambridge University

Friday 3rd April
8.00 pm at the Frossard Centre,
Candie Gardens

The dolmens of Spain, Portugal and southwest France display a wide variety of construction techniques, but all embody clear orientations, and these orientations are nearly always towards the rising sun or the sun when it is climbing in the sky. As far north as the Loire valley, this generalisation holds true. But when one crosses into Brittany, matters change. Orientations

seem of less significance, and there is a bewildering variety of construction. Nevertheless, it is possible to make sense of what is going on there, if only just.

Dr Hoskin is the leading historian of astronomy at Cambridge University. He has conducted a survey of orientations of dolmens throughout western Europe, the Mediterranean islands and north Africa, and has personally measured some two thousand. In recognition of this work, a new building at the archaeological site of Antequera is named Centro Solar Michael Hoskin. He is founder and editor of the Journal for the History of Astronomy, Editor of the Cambridge Concise History of Astronomy, and a Fellow of Churchill and St Edmunds Colleges in Cambridge.

Black Holes

Lecture by Dr David Falla,
Department of Physics, Aberystwyth
University

Tuesday 21st April
8.00 pm at the Observatory

(Synopsis in next Sagittarius)

Colin Spicer

Pole To Pole

After my successful eclipse flight over the Antarctic in 2003 there seemed to be only one option for this year's – to go to the Arctic. With a score of eclipses to my credit since the famous Monte Umbe in '73, it seemed time to just enjoy the sight and take in what I normally photographed from pictures by others after the event. What I took would be a bonus, not the primary objective.

It's not often that type of decision pays off. Weather prospect predictions were so doubtful from sea level by ship in the Arctic at the maximum spot, I got in early and booked a

double window option on an Airbus 330 so that Wendy would have a good view too.

As I didn't know that aircraft type, the "KISS" Principle seemed a wise option, and that's how I went about it, keeping it simple. That combined with a stroke of luck earlier in the year. We'd planned a trip via South Africa and had to change airlines near to departure because of the cost. When I saw the departure date and time, my mind went into overdrive because the flight plan took us over the Equator at a total lunar eclipse maximum! And so it turned out.

The moon was at an extremely awkward elevation at the beginning, but that gave plenty of practice videoing whilst contorting to get a decent view. At mid eclipse the position was next to perfect, almost straight out of the window, just as for the solar event a few months later, and as that lunar totality lasted so much longer and was in pitch dark and extremely low light levels, it gave plenty of scope for exposure experiments. It also gave a timely reminder that planes do not always fly straight and level. Our few hours through Equatorial regions were horribly bumpy and most of my still pictures came out blurred, although you could follow the image in video.

The flight plan was one regularly used by the Company for North Pole sightseeing, and the original plan was to do that and see the eclipse on the way back. Because the sky conditions were so good, and Russian airspace forbade flying too far East, where totality was longer at that altitude and speed, the flight plan was reversed.

The plane took off from Dusseldorf in the early morning of the eclipse and as we travelled North over Trondheim, getting an excellent view of the Tirpitz memorial, thence to do some sightseeing over Svalbard, the pilot dropped from 37000 feet to 7000 specially for this. Rising rapidly to 36000 feet to the north of Svalbard, half way to Franz Joseph Land was our eclipse track. The predicted eclipse duration at that altitude and flying at our speed down the track got us an extra half minute of totality, to

just under 3 minutes at 09.43 UT. Our position at more than 82 degrees North was a record as nobody has ever seen a total solar eclipse from that high north before.

Everything went perfectly and we both got a fine view and my video pictures refreshed a nice memory later. The view of the lunar shadow and gorgeous orange to red hues on the sunlit side as that advanced underneath, then retreated was something really to be treasured. Venus popped out very early and Mercury shortly afterwards. What is difficult to explain is a total lack of view of Saturn, Mars and any stars under that crystal clear sky. The sky was pitch black in the stratosphere, devoid of particulates and so on. Everything had been thought of and all cabin and navigation lights were switched off, and this phenomenon has yet to be explained as some of the ground-expedition sightings reported all 4 planets with ease.

The pilot then travelled due north and we circled the North Pole twice, once in each direction, but we did upset a certain mindset with our insistence on drinking our traditional champagne toast immediately after the eclipse instead of "as instructed" after visiting the Pole!

In all the trip came up to full expectations but there were a few disappointed. Our windows iced up a little which did cause problems with auto-focus cameras, but windows towards the back iced considerably in spite of raised cabin temperatures way

above normal, and made photography extremely difficult. One American couple were so physically large (not overweight) that they literally couldn't see the eclipse at a 28 degrees elevation and spent the whole 12 hours seeing no eclipse.

I set a world record on this trip. I saw the Antarctic eclipse to perfection in 2003 and this made a complementary pair with the Arctic. My claim to fame is that I also saw another total eclipse in this year, but a lunar one from over the Equator in February on my way to South Africa. A fitting way to celebrate this year: two eclipses, visiting Halley's observing site on St Helena, my 70th birthday and 50 years' membership of the BAA.

What do I recall most vividly about the eclipse? It has to be the same as in Antarctica. That's seeing the moon's shadow sharply marked out on the ice below as a dark band from horizon to horizon, something impossible to see from the ground. One side black, banded with a narrow orange border and the other (appearing to be) in bright sunlight. It was bright sunlight

but extremely attenuated and a delightful contrast effect.

As the eclipse progressed the shadow rotated and moved off in a totally unexpected direction, and the supreme spectacle was over. The spectacular sight of the 'Diamond Ring' at that altitude, and my decision to just sit and stare made all the preparations and expectation so worthwhile. A great pity the next eclipses can only be seen from the ground or sea as the unique geometry at the Poles is difficult to achieve elsewhere.

My next vivid memory is going round the pole, twice, once in each direction, and seeing water channels and ice fields laid out as though a road map. The blue water against the pristine ice was staggeringly beautiful.

Here's to French Polynesia in 2009, my completed Saros cycle of 3 from the 1973 Monte Umbe.

Michael Maunder

Pole to Pole Copyright (c) 2008 Michael Maunder

Astronomical Events in 2009

This is not a year for exciting astronomical events. Possibly the most exciting is not a celestial appearance, but the disappearance of Saturn's rings. There is a long total eclipse, but you will have to travel a long way to see it. 2009 is, however, the International Year of Astronomy,

celebrating the 400th anniversary of Galileo's first telescopic observations.

PLANETS

The dates of maximum elongations of **Mercury** are as follows. It can usually be seen about ten days before and after these dates. The best dates to observe it in the evening will be the

last two weeks of April, and in the morning the first two weeks of October.

04 January	Evening
13 February	Morning
26 April	Evening
13 June	Morning
24 August	Evening
06 October	Morning
18 December	Evening

Venus, continues as the ‘Evening Star’ in the south-west, reaching greatest eastern elongation in the middle of January. It reaches maximum brilliance a month later, when it will be so bright (almost magnitude -5) that it will be worth looking for in daylight, and seeing if it really does cast shadows at night. On 27 and 28 February especially it should make a fine sight, paired with a thin lunar crescent. It will be visible in the evening until March, reaching inferior conjunction at the end of that month. In May it reappears, again very bright, in the pre-dawn sky in the east, and stays there until it heads for superior conjunction in November.

We have not seen **Mars** for a year, and will have to wait until July before it reappears in the morning sky in the east. It gradually rises earlier and earlier, and gets brighter and brighter. By the end of the year it will have a magnitude of zero and rise at 8.00 pm, in Leo, as it heads towards opposition at the end of January 2010.

Jupiter appears in the morning sky in the southeast in March. It reaches

opposition in August, when it will shine with a magnitude -3, and then becomes visible in the evening. It remains visible until the end of the year, never reaching a high altitude, however. As usual, there will be transit, shadow and occultation events involving Jupiter’s moons, details of which can be found on the Sky and Telescope web site (see <http://www.skyandtelescope.com/observing/objects/planets/3307071.html?page=2&c=y>), or simulated on software such as StarryNight (<http://www.starrynightstore.com/>).

Saturn, reaches opposition in Leo in March, and is then visible in the evening until July. During these months we will see its rings almost edge on. It will be interesting to see to what extent they are visible in our telescopes. The most interesting time is on 04 September, when the Earth is directly in line with the plane of the rings, and they appear to disappear altogether (if you see what I mean). However, it will then be too close to the Sun for any observation. It reappears in the morning sky in October, with the rings still tightly closed, and remains visible for the rest of the year, rising earlier and earlier, but not as an evening object. The last time the rings closed up was in 1996, and the next time will be in 2025 (although they will be very tight in 2009). With the rings edge-on, it not only means that Saturn appears less bright to the naked eye, but its moons appear, unusually, all in a line, as they orbit in the planet’s equatorial plane, which itself will be lined up with the Earth.

Uranus is at opposition in Pisces on 17 September at magnitude 5.7. **Neptune** is at opposition in Capricornus on 17 August at magnitude 8.

DWARF PLANETS

There are now five dwarf planets: Pluto, Ceres, Eris, Makemake and Haumea. **Pluto** reaches opposition in Sagittarius on 23 June, at magnitude 14. **Ceres** reaches opposition on 24 February in Leo, a little brighter than magnitude 7. The other three are too faint to be seen in most amateur telescopes.

ASTEROIDS

The brightest asteroid, **Vesta**, at magnitude 7, is visible until March, but is best observed early in the year.

ECLIPSES

This is not a good year for eclipses, at least as seen from Guernsey.

If you are prepared to travel, however, and take a chance on the weather, you may get to see the longest total solar eclipse of the 21st century, which takes place on 21/22 July (depending on which side of the date line you are on). In Shanghai, for example, totality lasts 6 minutes on 22 July. The weather statistics, however, are not very encouraging. The shadow path passes through India, China, and the South Pacific. Full details are available at <http://eclipse.gsfc.nasa.gov/SEmono/TSE2009/TSE2009.html>.

The track of an annular solar eclipse on 26 January passes south of Africa and eastwards across Borneo.

Just under half of the Moon passes through the Earth's penumbra on 06/07 August, starting at midnight and ending at 03.15 BST. Not really worth staying up for!

On New Year's Eve there will be a very slight partial lunar eclipse, from 6.51 pm to 7.53 pm, with maximum eclipse of just 8% at 7.22 pm.

OCCULTATIONS AND CONJUNCTIONS

The only lunar occultations of note this year are two passages of the Moon through the Pleiades. At 5.45 pm on 08 January there will be a grazing occultation of the Pleiades star Alcyone, and 3.15 am BST on 18 July Alcyone will just be occulted by the Moon.

There will be several interesting planetary conjunctions:

17 February	Mars and Jupiter
24 February	Mercury and Jupiter
01 March	Mercury and Mars
19 June	Venus and Mars
08 October	Mercury and Saturn
13 October	Venus and Saturn

There will also be conjunctions of the planets with the Moon:

25 January	Mars
23 February	Mars and Jupiter
28 February	Venus
22 March	Jupiter
22 April	Venus and Mars
13 September	Mars

METEORS

The **Quadrantids** peak on 03 January, when the Moon is at First Quarter, and so will be quite favourable. The **Perseids** peak on 12 August, with the Moon almost at Last Quarter, so not very favourable. The **Leonids** peak on 17 November, favourably coinciding with New Moon. It is thought that we may be in for an enhanced shower of Leonids, with a few hundred per hour appearing for a short period at about 21.45 UT (see <http://www.skyandtelescope.com/community/skyblog/observingblog/35935909.html> and http://science.nasa.gov/headlines/y2008/04dec_1eonids2009.htm?list212414), so keep a good watch out for them that evening. Finally, the **Geminids**, peaking on the night of 13 December, will also be unaffected by the Moon.

COMETS

No bright comets are predicted this year. The brightest is Comet Lulin (2007 N3), which is visible for the first few weeks of the year, reaching magnitude 6. For more details of visible comets see the British Astronomical Association Comet Section web page, at <http://www.ast.cam.ac.uk/~jds/preds09.pdf>. It is, of course, possible that a new comet may make an unexpected bright appearance.

EQUINOXES AND SOLSTICES

The following are the dates and times of the equinoxes and solstices in 2009:

Vernal Equinox	20 March	11.42 UT
Summer Solstice	21 June	06.45 BST
Autumnal Equinox	22 September	22.18 BST
Winter Solstice	21 December	17.46 UT

SATELLITES

The International Space Station is regularly visible from Guernsey. Also of interest are flashes from the Iridium satellites, and periodic launches of the Space Shuttle. Many other, fainter, satellites appear every night. Details of the times and directions of visibility can be obtained from the Heavens-Above web site.

WEA COURSE

The Astronomy Section is running its annual six-week “Star Gazing” course at the Observatory in February and March. Enrolment is through the Workers Education Association. As always, it is already fully subscribed.

OPEN DAYS

The Observatory will be open again for a number of Tuesday evenings during the year. Details will appear in the Astronomy Section newsletters, and on the website.

INTERNATIONAL YEAR OF ASTRONOMY

2009 is the International Year of Astronomy (IYA), and will include a large number of events and activities, world-wide. Of particular interest may be the period 02-05 April, when the 100 Hours of Astronomy cornerstone project (100HA) is a

worldwide event with a wide range of public outreach activities including live webcasts, observing events and more taking place during a 100-hour period. The idea is to have as many people as possible look through a telescope as Galileo did for the first time 400 years ago. The Moon and Saturn will be good subjects for observing during this period. For more information about the UK

programme for IYA see <http://www.astronomy2009.co.uk/>.

David Le Conte

References

SkyMap Pro and *Starry Night Pro* software
 RAS diary
 BAA Comet Section
Astronomy magazine

CALENDAR OF ASTRONOMICAL EVENTS

Month	Date	Time	Event
Jan – Mar		Evening	Vesta visible
Jan – Mar		Morning	Comet Lulin visible
January	03		Quadrantid meteor shower
January	04	Evening	Mercury at greatest elongation
January	08	17.45	Grazing occultation of Alcyone by Moon
January	14	Evening	Venus at greatest elongation
January	25	Morning	Conjunction of Moon and Mars
January	26		Annular solar eclipse, south-east Asia
February	12	20.00 UT	WEA course starts
February	13	Morning	Mercury at greatest elongation
February	17	Morning	Conjunction of Mars and Jupiter
February	19	Evening	Venus at greatest brilliance
February	23	Morning	Conjunction of Moon with Mars and Jupiter
February	24	Morning	Conjunction of Mercury and Jupiter
February	24		Ceres at opposition
February	27/28	Evening	Venus close to crescent Moon
March		Morning	Jupiter reappears
March	01	Morning	Conjunction of Mercury and Mars
March	04	Not visible	Saturn’s rings edge-on
March	08		Saturn at opposition
March	19	20.00 UT	WEA course ends
March	20	11.42 UT	Vernal Equinox
March	29	01.00 UT	BST starts
April	02-05		IYA 100 Hours of Astronomy
April	22		Conjunction of Moon with Venus and Mars
April	26	Evening	Mercury at greatest elongation
May		Morning	Venus reappears
June	13	Morning	Mercury at greatest elongation
June	19	Morning	Conjunction of Venus and Mars
June	21	06.45 BST	Summer Solstice
June	23		Pluto at opposition

July		Morning	Mars reappears
July	18	03.15 BST	Slight occultation of Alcyone by Moon
July	21/22		Total solar eclipse in India and China
August	06/07	00.00- 03.15 BST	Penumbral eclipse of the Moon
August	12		Perseid meteor shower
August	17		Neptune at opposition
August	24	Evening	Mercury at greatest elongation
September	04		Saturn's rings edge-on
September	13	Morning	Conjunction of Moon with Mars
September	17		Uranus at opposition
September	22	22.18 BST	Autumnal Equinox
October		Morning	Saturn reappears
October	06	Morning	Mercury at greatest elongation
October	08	Morning	Conjunction of Mercury and Saturn
October	13	Morning	Conjunction of Venus and Saturn
October	25	01.00 UT	BST ends
November	17		Leonid meteor shower
December	13		Geminid meteor shower
December	18	Evening	Mercury maximum elongation
December	21	17.46 UT	Winter Solstice
December	31	18.51 – 19.53 UT	Partial eclipse of the Moon

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

Einstein - Relativity being put to the Test. The detection of gravity waves will be a final test for the theory of relativity, with two new U.S. observatories built to begin the search. (Astronomy, September 2008)

European Missions to study Cosmology. The Herschel Space Observatory the largest space telescope so far, and the Planck spacecraft are to be placed into final

orbits around the Sun-Earth gravity neutral point. They will study galaxy evolution and the structure of the cosmic microwave background, with better resolution than present images. (Astronomy, September 2008)

The Coming Solar Superstorm. Solar flares over a century ago were more powerful than in recent years. Similar major outbursts are expected to recur, and would have more serious consequences for power networks and the present dependence on satellite communications. (Astronomy, September 2008)

Four Hundred Years of the Telescope. A detailed look at the history of telescopes, from their invention in 1608 through to modern and giant telescopes of different types including space telescopes. The introduction of multiple mirrors will make even larger telescopes possible. (Astronomy Now, October 2008)

The Hubble Space Telescope. It is now 18 years since the launch of this very successful project for NASA. A set of articles focusing on the many achievements of the Hubble Space Telescope after a disappointing start, and now with the recent installation of two new scientific instruments which will enable the HST to remain in productive operation, even beyond the launch of the planned new James Webb Space Telescope. (Astronomy Now, October 2008)

Cassini's Saturn Surprises. Since 2004 the NASA spacecraft Cassini has been able to make a detailed study of Saturn and some of its moons. Discoveries have included methane lakes on the largest moon Titan, icy volcanic plumes on Enceladus, and highly detailed images of Saturn's rings and atmosphere. (Astronomy, October 2008)

Exoplanets - The Search for super-sized Earths. The number of planets found to be orbiting other stars now exceeds 300. The most easily found are gas giants - from the gravitational effects on the parent star, but now better techniques are beginning to find

the first more Earth-sized planets. At the right distance from a star, such planets could also be very suitable for life. (Astronomy, November 2008)

The Northern Sky's Top 10 Galaxies. The ten galaxies recommended as being some of the best to see for observers in the northern hemisphere, with photographs and advice for observing these galaxies. (Astronomy, November 2008)

Visual Astronomy. A set of articles focusing on the techniques of observing, with some of the most interesting objects to see and record as drawings, and a guide to observing the Moon- one of the most visually rewarding objects to study in detail. (Astronomy Now, November 2008)

The Deep Seas of Jupiter's moon Europa. Europa is covered by ice, but with evidence of an ocean beneath the surface. Preparations are being made for a future mission, and as part of this a borehole has been drilled deep into Earth's Antarctic ice sheet - where a large lake is known to exist more than two miles below the surface. (Astronomy Now, November 2008)

Supernova Explosion Observed. At the beginning of 2008 NASA's SWIFT satellite detected an X-Ray outburst from galaxy NGC 2770, and astronomers were able to see the beginning of a supernova explosion for the first time. This was the second

supernova in the same galaxy during the past year. (Sky and Telescope, November 2008)

Planet Factories Everywhere. Discs of material around stars provide evidence of planet formation, and it now seems that planet building happens around most stars. (Sky and Telescope, November 2008)



Astronomy Section Officers

Secretary	Debby Quertier	725760
Hon Treasurer	Peter Langford	263066
Editor	Colin Spicer	721997
Facilities	Geoff Falla	724101
Public Relations	David Le Conte	264847
Library	Geoff Falla	724101
Research	Frank Dowding	255215
Light Pollution	Vacant	

Observatory

Rue du Lorier, St Peters,
Guernsey
Tel: 264252

Web page

www.astronomy.org.gg

Material for, and enquiries about Sagittarius should be sent to the Editor

Colin Spicer
60 Mount Durand, St Peter Port
Guernsey GY1 1DX
Tel: 01481 721997
colin.spicer@cwgsy.net

Articles in Sagittarius are copyright the authors. Views expressed are those of the authors and are not necessarily endorsed by the Astronomy Section or La Société Guernesiaise.

**Copy deadline for next issue is
3rd April 2009**

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