Sagittarius

The Newsletter of the Astronomy Section of La Société Guernesiaise

January – March 2006

Forthcoming Events

AGM (Business Meeting)
24th January 8.00 pm at the Observatory

Postponed Christmas Meal
31st January 7.30 pm
Hougue Du Pommier

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

Astronomical Events in 2006

With the major partial solar eclipse of last October largely clouded out, we shall have to make do with a minor partial solar eclipse in March, and an even more minor partial lunar eclipse in September. Let's hope a good comet comes along to liven up the astronomical scene!

PLANETS

The dates of maximum elongations of **Mercury** are as follows. It can usually be seen about ten days before and after these dates.

24 February	Evening	Good
08 April	Morning	Very poor
20 June	Evening	
07 August	Morning	
17 October	Evening	Poor
25 November	Morning	

There will be a transit of Mercury on 8 November 2006, but this time it will not be visible from Guernsey. We will have to wait ten years for the next visible transit, on 9 May 2016, Liberation Day.

We have enjoyed **Venus** as the 'Evening Star' for the last few months, but it is not visible in the evening at all this year. It will, however, become visible in our morning skies at the end of January, and will remain visible until the end of September, being best in February and July.

Although **Mars** does not reach opposition this year, it remains visible in the evening from the beginning of the year until July, albeit receding and getting much fainter. During this period it will move from Aries, through Taurus, Gemini, and Cancer to Leo.

Jupiter is visible in Libra in the morning from the start of the year to March, and then in the evening until August, opposition being on 04 May. There will be many transit and occultation events involving Jupiter's moons, details of which can be found by following the link to "Chasing the Moons of Jupiter" at www.skyandtelescope.com/observing/objects/planets.

Saturn, at opposition on 27 January, will be an excellent evening object in Cancer from the beginning of the year until June. It will be just ½º from the Praesepe star cluster on 03 February.

Uranus is at opposition in Aquarius on 05 September, **Neptune** in Capricorn on 11 August, and **Pluto** in Serpens Cauda on 16 June.

OCCULTATIONS

There are no night-time occultations of planets this year. On 27 July the Moon occults second-magnitude Mars from 19.03 to 19.56 BST. A daytime occultation of Saturn by the Moon on 10 December starts just a few minutes after the Moon sets. The Moon does occult two third-magnitude stars at night: Tau Scorpii on 04 August, from 21.10 to 22.04 BST, when the Moon is only ten degrees above the horizon; and Alcyone in the Pleiades on 29

September by the rising Moon on 12 September from 21.08 to 21.47 BST. The Moon also passes through the Pleiades on 04 December, from 02.55 to 05.30 UT, occulting several of the cluster's stars.

CONJUNCTIONS

Date	Objects	Separation	Direction and time
08 January	Moon and Mars	1°	South, evening
24 May	Moon and Venus	2°	Low in east, before sunrise
27 August	Venus and Saturn	12'	Low in east, before sunrise
13 November	Moon and Saturn	1°	East, early morning

On 16 June Mars, low in the West, is in the Praesepe star cluster, with Saturn just a degree away.

METEORS

The Full Moon on 09 August will cause major interference with observations of the Perseid meteors. The Moon is favourable for observation of the Leonids, which peak on 17 November. The Geminids around 12 December will be little affected by the Moon, and should produce high rates.

COMETS AND ASTEROIDS

At the time of writing there are no very bright comets expected in 2006, but there may well be several faint comets and asteroids visible in telescopes, and, of course, one never knows when a bright comet may make an unexpected appearance.

ECLIPSES

On the night of 14 March there will be a penumbral eclipse of the Moon, from 21.25 to 02.10 UT. The dimming of the Moon is likely to be barely discernible.

A total solar eclipse occurs on 29 March, passing through Nigeria, Chad, Libya, the Mediterranean and Turkey. Organised eclipse tours have been arranged to Libya and Turkey, and several cruise ships will be in the Mediterranean. In Guernsey the eclipse will be partial, from 10.40 to 12.16 BST, a maximum of just 27% of the Sun being eclipsed at 11.27 BST.

A partial eclipse of the Moon on 7 September starts at 19.05 and ends at 20.38 BST, with maximum eclipse at 19.51 BST, just 19% of the Moon being eclipsed at this time.

An annular eclipse of the Sun on 22 September in the south Atlantic is not visible at all from Guernsey.

EQUINOXES AND SOLSTICES

The following are the dates and times (UT) of the equinoxes and solstices in 2006.

Vernal Equinox	20 March	18.25
Summer Solstice	21 June	12.25
Autumnal Equinox	23 September	04.03
Winter Solstice	22 December	00.22

SATELLITES

The International Space Station is regularly visible from Guernsey. Also of interest are flashes from the Iridium satellites. Many other, fainter, satellites appear every night. Details of the times and directions of visibility can be obtained from the Heavens-Above web site, accessible by a direct link from the web site of La Société Guernesiaise Astronomy Section, at www.astronomy.org.gg.

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 usual, it is well over-subscribed.

OPEN DAYS

The Observatory will be open again for a number of Tuesday evenings during the year, details to be announced.

REFERENCES

SkyMap Pro and ***Starry Night Pro*** software
Astrocalendar 2005/2006, The Federation of Astronomical Societies

David Le Conte

A Visit to Norwich.

A special full day conference meeting of lectures was organised in Norwich to mark the 60th anniversary of the Norwich Astronomical Society. It sounded very interesting;-with lectures to be given by several top rate astronomers, and as I had never been to Norwich before, I decided to go.

The line up included Heather Couper and Nigel Henbest, who both came to Guernsey back in 1991 to open our own Observatory site, and visited again in 1999 to attend the Royal Astronomical Society conference, and to view the solar eclipse in Alderney.

I had heard that Norwich was a very interesting and historic city, quite compact and with an impressive cathedral. As it was not practical to arrive there on the actual day of the meeting, I travelled up from London on the previous day, giving me some

time to begin finding my way around the city in the afternoon. Norwich is situated on a hill, with a river flowing around it. There are interesting shops, some in arcades, with the centre largely pedestrianised, as is becoming more usual these days. The cathedral, a short walk from the city centre, has the second tallest spire in England, after Salisbury, and I also discovered that Norwich has an amazing number of churches - more than fifty built during the early period of the city's history. Many of the older areas have been retained, with attractive Tudor style buildings.

The conference meeting itself was held at the John Innes Centre, a modern building close to the University of East Anglia, about four miles west of the city centre. There were two lectures in each of the morning and afternoon sessions, with displays of material and some items for sale in the foyer of the Centre before the well attended lectures and during the lunchtime interval.

The editor of the Norwich Astronomical Society's quarterly publication Cygnus for the last few years has been Mark Humphrys, who used to be based in Guernsey before he relocated to Norfolk for work reasons. He is now the IT Manager of the Norwich School of Art and Design. The Norwich Astronomical Society has its own well equipped observatory site a few miles outside the city, and has an active and growing membership. Mark has contributed many articles to Sagittarius over the years, so it was good to meet him again.

The day began with a lecture by Dr Robin Catchpole, of the Cambridge Institute of Astronomy. The lecture 'From the Solar System to the Edge of the Universe' was a wide ranging survey of everything from the planets to the evolution of stars and galaxies, and what is currently known about the wider universe. Dr Catchpole explained that the evolution of our own solar system was contained in the most recent one third time span in the age of the universe, and that all of the new planetary systems now being found around other stars are apparently no older than our own system.

Professor Paul Murdin, also of the Cambridge Institute, gave as his subject 'The Reality of Black Holes'. Although we may think that the concept of black holes is a comparatively recent development in astronomy, he explained that the idea is derived from as far back as the 18th century when it was first suggested that light would not be able to escape from any very dense and massive object. Many thousands of black holes are now known to exist, including small ones in the spiral arms of our own galaxy, as well as at the centre of the Milky Way and at the centre of other galaxies.

Mars Revelations.

The afternoon session began with an interesting lecture on the topical subject of Mars, coinciding with its close approach during October and early November. 'Mars - The Inside

Story of the Red Planet' was a comprehensive survey by Heather Couper and Nigel Henbest on the history of Mars observations, and what is presently known about the red planet, with some interesting revelations about the search for life there. After meeting some fifty scientists around the world, all specialising in the study of Mars, it has been concluded that there is indeed evidence of life on Mars, but that the evidence has been covered up by NASA ever since the Viking landing mission there in 1976.

For those of us who were around at that time, it should be remembered that one of the experiments evaluating existence of life in soil samples produced a very positive result, later confirmed by cross checking. However, a different test gave a negative result, although the instrument used in this test was deemed to be far too insensitive for the purpose. After the Viking mission, NASA reported that there was no evidence for life, and has tried to maintain this position. In the light of more recent findings it has admitted that the results in the Viking tests for life were inconclusive.

The most recent results from the European Mars Express orbiter include the discovery of methane in parts of the atmosphere on Mars. This would come either from living processes, or alternatively from present or recent volcanic activity. Otherwise the methane would by now have escaped from the atmosphere.

The final lecture of the day was by Dr David Whitehouse, Science correspondent of the BBC with a lecture 'Astronomy in the Media'. This was a very interesting and often humorous lecture on how the subject of astronomy and space achievements are dealt with in the media, and the comparison in treatment between the broadsheet newspapers and the tabloids. Also included was some little known news, such as the fact that the Hubble Space Telescope mirror was reported to have been given to NASA by the U.S. Air Force, because it was surplus to current requirements - its usual purpose being a rather different kind of long range observing!

Altogether this was a most interesting and enjoyable occasion. A full day, well attended lecture programme by professionals was quite a treat, as I do not usually get to attend such events. I can certainly also recommend Norwich as an interesting place to visit, and with direct flights from Guernsey due to be restarted in 2006, travelling to that area should be much easier.

Geoff Falla

Progress On Light Pollution Control

In 2004, I made a number of representations on behalf of La Société Guernesiaise, as President, to the Planning Inquiry on the review of the Rural Area Plan. One of these representations concerned light pollution, and I am pleased to report encouraging results.

I expressed concern at the incremental increase in background illumination of the night sky, adversely affecting people's enjoyment of the stars. In this Island, especially away from the main sources of illumination in the town and at the airport, we have enjoyed generally dark skies, and this is frequently remarked upon by visitors, especially those from regions such as south-east England, which are severely affected by light pollution. In many of our country areas there are few street lights, and this absence of general illumination contributes to the welcome darkness of our nights.

However, there is a trend towards more and more lighting from a variety of sources, both domestic and commercial. These include: security lighting, car parks, garden illuminations, greenhouse lighting, floodlighting, sports fields, leisure facilities, the airport, and general development. I said that we are particularly concerned about major developments, which are frequently accompanied by peripheral lighting, often of a design which is not environmentally friendly, and domestic security lighting, which is becoming more and more popular, for example cheap 500-watt halogen lights. Very often these lights, which are far brighter than either necessary or for efficacy, are positioned and orientated badly, sending light onto neighbouring properties and into the sky. Some lights are kept on far too late into the night.

We see newspaper and magazine articles encouraging homeowners to illuminate their gardens, including trees, with up-lighters, and the requisite equipment is readily and relatively cheaply available at garden centres and hardware shops. Some public bodies like to floodlight edifices such as churches.

This proliferation of lighting, especially in the area covered by the Rural Area Plan, is gradually but perceptibly degrading the night-time appearance of the Island. This not only affects our astronomical observations, but also devalues an asset recognised by many residents and visitors.

I pointed out that light pollution can also have an adverse effect on wildlife. Birds, bats and some moths are particularly affected. Lights can have physiological effects on plants and animals by altering the perceived day length and interfering with their circadian (24-hour) rhythms. This can bring on flowering in plants at

inappropriate times of year, break or extend insect diapause (suspended development), and have unfortunate effects on bird breeding.

I said that La Société was concerned to note that lighting was not addressed by the Rural Area Plan Review. There was no section on light pollution, and it did not appear in the list of factors required in Environmental Impact Assessments. The Environment Department should strictly control the lighting aspects of any development, and should insist that any outdoor lighting requires planning permission. Alternatively, and perhaps preferably, the Department should specify what lighting design is acceptable and/or does not require permission. As a minimum it should issue guidance on lighting.

There are many sources of such guidance, such as the UK Government, lighting manufacturers, the Institution of Lighting Engineers, the British Astronomical Association's Campaign for Dark Skies, and the Council for the Protection of Rural England. Pollution-limiting lighting is readily available from a number of manufacturers. This typically is designed to shine or be reflected downwards, where the light is required, rather than upwards into the night sky. The wattage used is also often excessive. Bright security lights, for example, create dark shadows, making it easy for miscreants to hide. Very often low-watt bulbs are much more effective, and all that is necessary. The profligate use of high-power bulbs also, of course, wastes energy.

La Société sometimes receives complaints from the public about neighbours' bright lights, which affect their enjoyment of their property. The new Environmental Pollution Law will, we understand, make light a nuisance only if it affects people's health, and this will be difficult to prove. It will also not do anything to prevent the gradual deterioration of our night environment.

I said that we would be happy to work with the Environment Department on the preparation of guidelines for lighting design and control.

The Planning Inspector's report records that the Environment Department pointed out that by no means all illumination is subject to planning control. For example that within glasshouses is not controllable. However, it was acknowledged that many installations and fittings would be, and it seemed wholly appropriate that the supporting text of this policy should require design solutions that avoid light pollution and minimise unnecessary spillage.

The Inspector recommended that the following sentence be added at the end of the paragraph relating to design in the draft Plan: "*The relationship of development to its surrounding will include the need to avoid light pollution wherever possible and minimise unnecessary light spillage.*"

The design paragraph (2.6) currently reads:

"*Development that has been designed to relate well to its surroundings can make a positive contribution to the character of an area, whereas visually obtrusive or poorly designed development can spoil the quality of the environment. For this reason, it is important that careful thought is given from the outset to the design, scale, massing and materials of construction of new development.*"

This relates to policy RGEN6: "*In considering proposals for development, the Committee will take into account the quality of design and the materials to be used and the relationship of the development to its surroundings.*"

The Environment Department has accepted the Inspector's recommendation, and the States, at its November 2005 meeting, approved the change to the Plan. Therefore, the Department will be required to consider the effects on light pollution in future applications. It remains to be seen, of course, how the Department interprets and administers this requirement. We propose, however, to reiterate our offer to work with the Department in preparing lighting guidelines.

David Le Conte

Book Review: Two Sides of the Moon by David Scott and Alexei Leonov

This book is an interesting juxtaposition of the events of the Moon Race seen through the eyes of participants on either side of the Iron Curtain. Each author's narrative is intertwined as the story proceeds chronologically. Both astronaut Scott and cosmonaut Leonov nearly lost their lives during this technological race.

Scott was an airforce pilot who had been stationed in the front line of the Cold War in Germany. He achieved the pinnacle of his profession being posted to the Test Pilot school at Edwards Air Force Base under legendary pilot Colonel Chuck Yeager (who was the first pilot to break the sound barrier). Scott was top of his class and later went on to command the school himself. Scott applied and joined NASA as part of the recruitment for the Gemini missions. He flew in Gemini 8 with Neil Armstrong (who wrote a foreward to the book) and was only seconds away from death as the capsule spun violently out of control.

Leonov too was a fighter pilot but on the other side of the Iron Curtain. Like Gargarin, Leonov was a favorite of the Chief Designer, Korolev and Leonov was the first cosmonaut to walk in space. However this was to nearly cost

him his life as his pressurized space suit greatly inflated making it difficult for him to re-enter the spacecraft.

Whilst this book does encompass both sides of the space race and many facts are revealed which were not public knowledge at the time one aspect which was not covered was the downturn in the USSR's programme following Korolev's premature death. This was the subject of the recent BBC documentary series concerned with the rivalry between von Braun and Korolev. Subsequently a book 'Space Race' by Deborah Cadbury has been published.

Scott went on to command Apollo 15 to the Moon, the mission which took the lunar rover, colour TV cameras and a practicing geologist. Scott proved Galileo's thesis, that a feather and pound of lead if dropped from the same height would both hit the ground at the same time (in the absence of air resistance). Scott performed this on the Moon (without atmosphere) in front of a TV camera with an eagle's feather and a geological hammer.

Leonov went in space again on the joint Soyuz – Skylab mission. Scott by this time had moved to project management in NASA and first met Leonov during liaison for the Soyuz – Skylab mission. There are interesting cultural differences highlighted in the book particularly note attitudes to meals and alcohol by both nations. These cultural differences led to misunderstandings.

My only criticism of the book is that it doesn't deal with the decline in the USSR's space programme after the death of Korolev and in some regard the latter half of the book is a little one sided as Scott reaches the Moon, Leonov doesn't. Nevertheless, a good read in an original format. There are plenty of revelations on both sides that I wasn't aware of and which I have been careful not to give away here!

Colin Spicer

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

Discovery of new Minor Planet The discovery was confirmed at the end of July of another major object in the far reaches of the solar system. At present three times further away than Pluto, and considerably larger, it has been designated as a minor planet until the International Astronomical Union decides on the definition of planets. (Astronomy Now, September 2005)

Giant Impacts on Saturn's moons Several of Saturn's moons show evidence of giant impacts, and these are to be studied in more detail in the course of close fly-bys during the present Cassini spacecraft mission. (Astronomy Now, September 2005)

The Five Ages of the Telescope A set of articles focusing on the history of the telescope - from its Dutch invention in 1608, the improvement in

design, and rivalry between mirror and lens systems, to the supremacy of reflectors and future prospects for giant telescopes. (Astronomy Now, September 2005)

Space Shuttle Flights Resumed What may be one of the last in the present generation of space shuttle flights was completed successfully in August. A review of the mission, which was not without its problems, and was the first to dock with the International Space Station since 2002. (Astronomy and Space, October 2005)

Deep Impact Mission - Preliminary Results The results of the spacecraft impact with comet Tempel 1 last July 4th are still being analysed, but preliminary results show evidence of much organic material with silicates from perhaps rock or soil.(Sky and Telescope, October 2005)

Making Multiverses Recent evidence and discoveries suggest that the idea of multiverses or universes parallel to our own is a distinct probability. (Astronomy - Special Cosmology Issue, October 2005)

The Accident that saved the Big Bang Supporting evidence for the Big Bang theory as the beginning of the universe was lacking until results were obtained from the COBE satellite launched in 1989. How the incidental discovery of microwave background radiation provided convincing support for the theory. (Astronomy, October 2005)

The Telescope Making Machine The history of Broadhurst, Clarkson and Fuller Ltd, which was founded in London in 1745, and developed a machine for making brass tubes more efficiently. Although no longer making telescopes, the company is now the world's largest distributor of Meade telescopes. (Astronomy Now, November 2005)

Active Volcanoes on Mars? Recent images from the Mars Express orbiter have revealed a large number of volcanic cones in the Mars north polar area, and at different stages of development. It is thought that this may be the source of recently detected methane in the atmosphere of Mars. A recent image of the giant crater of Olympus Mons also suggests the possibility of active volcanism. (Astronomy Now, p 14 and 80, November 2005)

Megastars of the Universe The importance of rare high-mass stars, up to a hundred times the mass of our own Sun. They are the brightest and hottest of all stars, and produce supernova explosions. A set of articles. (Astronomy Now, November 2005)

Finding Gravitational Waves A network of detectors worldwide is being used in an attempt to identify gravitational waves, linked with the acceleration of matter and major events in the universe. The existence of gravitational waves was predicted by Einstein's general theory of relativity. (Sky at Night, November 2005)

The Biggest Hole in the Moon The Aitkin Basin, more than 8 miles deep, is a huge area around the Moon's South Pole. Parts of it would be in permanent shadow, and with perhaps significant amounts of ice from comet impacts it could be a good site for a future moon base. (Astronomy, November 2005)

Europe's Eye on Mars The Mars Express orbiter's stereo camera is providing many new images. Valuable information is also being obtained about the planet and its atmosphere, which will help NASA's planning in the next reconnaissance mission, due to arrive in March 2006. (Sky and Telescope, December 2005)

Barnard's Milky Way It is a hundred years since astronomer E.E. Barnard took almost 500 wide-angle photographs of the Milky Way, revealing new information about the structure of the galaxy, and resulting in the publication in 1927 of his 'Atlas of Selected Regions of the Milky Way'. The photos can now also be viewed on the Internet. (Sky and Telescope, December 2005)

Fast Track to Venus Details of the latest European Space Agency mission, Venus Express. The spacecraft may help to answer the mystery as to why Venus, although so similar to Earth in size, has evolved so very differently. (Astronomy and Space, December 2005)

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