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Honorary Treasurer:	Peter Langford	720649
Light Pollution Officer:	Ken Staples	54759

The next newsletter will be published early in July. The deadline for publication materials is the 15th June.

La Société Guernesiaise, Candie Gardens, St. Peter Port, Guernsey. Tel 725093

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Sagittarius

The Newsletter of the Astronomy Section of La Société Guernesiaise

May/June 1996

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Astronomy on the Internet
by Steve Dorrity
Tuesday, 14th May
8.00 pm at the Observatory

Transits of Venus
by Peter Langford
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2nd July: Meteoroids, meteors and meteorites.

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Major articles in **bold**

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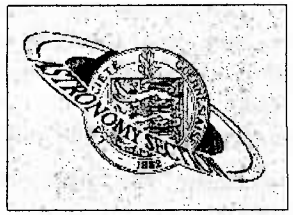

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Astronomy on the Internet

On Tuesday, the 14th May, at 8.00 pm at the Observatory, Steve Dorrity will tell us all about Astronomy on the Internet.

This is an opportune time for this subject, as we have just acquired an excellent computer, which will give us rapid access to many sources of astronomical information, programs and images.

For example, we have already got information and images of Comet Hyakutake. Steve will demonstrate the use of the computer to access the Internet to obtain much more of astronomical interest.

Transits of Venus

On very rare occasions the planet Venus passes in line of sight between the Earth and the Sun. Astronomers can then observe its transit across the Sun's disc. No present-day astronomer has seen a transit of Venus, because the last time it happened was 114 years ago.

This June, Venus comes quite close to the Sun, as viewed from Earth, but we will have to wait until June 2004 before the next transit occurs. Curiously, there will be another transit just 8 years after that.

Transits of Venus were considered to be of great importance by astronomers last century, and occasioned several expeditions to distant parts of the globe to observe them.

Peter Langford will give a talk about transits of Venus at 8.00 pm on Tuesday, the 4th June at the Observatory. He will explain why they occur so rarely, and then come two at a time, what those early astronomers were trying to find out, and whether they got the answers. ☆

The Comets Came!

There was a packed house at the Frossard Lecture Theatre at La Société's headquarters, Candie Gardens, for David Le Conte's talk about comets on Tuesday, the 19th March – over 70 people attending.

This was not surprising given the popularity and topicality of the subject. With two bright comets about to appear, many people were anxious to learn how to observe them and to understand these enigmatic objects.

David recounted the history of man's views of comets, including the place they held in folklore and superstition. Using many colour slides, he showed drawings, paintings and photographs of comets, including some of the more spectacular ones of the last few decades. He also described their composition as dirty snowballs, their orbits and appea ance.

Finally, David discussed Comet Hyakutake in some detail, explaining its path through the sky, and showing slides of recent photographs taken by Roger Chandler and himself with the Section's 8-inch Schmidt camera.

This introduction to the subject of comets, and Hyakutake in particular, was followed by several nights of observation of the Comet. The Observatory was open to the public on Friday, Saturday and Sunday, 22 - 24 March. The best weather was on the Saturday, when some 70 people came to view the Comet. Over the next couple of weeks many enquiries were answered, with people asking where and how to see it, and about another 30 people visited the Observatory, making a total of about 100. Some members took pictures with cameras, the Schmidt, and the CCD (see page 7). ☆

Practical Observing

On Tuesday, the 6th February Geoff Falla spoke about Practical Observing. He started by pointing out the wide range of fields of view (telescope <1°, binoculars >5°, naked eye – very wide), and magnitudes (Sun -26, Full Moon -12, Venus -4.4, Vega 0, naked eye 6, binoculars 8, 3-inch telescope 12, 12-inch telescope 14, 200-inch telescope 20, and Hubble Space Telescope 30).

A large variety of objects can be seen with the naked eye: planets, star clusters, double stars, galaxies, and, of course, constellations. Geoff described the use of star charts, planispheres and orreries. Binoculars are good for objects such as open clusters. Telescopes are, of course, essential, but Geoff pointed out that a 100° square of sky contained 10,000 one-degree fields, and 160,000 quarter-degree fields! Low-power eyepieces are useful for nebulae, medium-power for planets and globular clusters, and high-power for double stars.

The effective power of a telescope is 60 times its diameter in inches. Geoff spoke of inverted and reversed images, and then went on to describe the use of setting circles. Finally, Geoff talked about his bi-monthly observing programme, which is now published in Sagittarius. ☆

Infrared Astronomy talk

On Tuesday, the 9th April Dr David Falla presented a lecture on the subject of infrared astronomy.

In his lecture, which was accompanied by an interesting selection of slides, David explained that the observable universe contains a considerable amount of non-luminous, normally invisible dark nebulae, which in some cases become apparent as they obscure the stars and galaxies beyond. This is evident in such features as the *Horsehead Nebula* in the constellation of Orion. The dark clouds contain molecules and dust, and in many cases appear to be the birthplaces of stars.

The formation of stars, however, depends on the temperature of the cloud. A high temperature evaporates the molecules outwards, preventing the condensation process essential for stellar formation. A low temperature is therefore required to allow the gradual accumulation of matter under gravity, which results in stars, and then perhaps planets, being formed.

David went on the describe the different wavelengths of radiation, from the visible to the invisible, including infrared radiation. Embryo stars and surrounding dust material cannot be seen by direct observation of visible radiation, but can be detected from the emission of infrared radiation.

The *Infrared Space Observatory* (ISO), a successor to the IRAS satellite, was launched in November 1995, and placed in an elliptical orbit, which takes it well outside the Earth's radiation belts. The Observatory telescope has to be kept very cold, to within a few degrees of Absolute Zero, to allow low levels of infrared radiation to be detected. The first test observations, now completed satisfactorily, have been directed at the *Whirlpool Galaxy* (M51), and have confirmed the presence of infrared sources within the spiral arms of the galaxy. It is anticipated that the Observatory will be producing much valuable further information relating to the formation of stars and planetary systems. ☆

GF

Computer acquired

In the last issue of Sagittarius we mentioned that we had decided on a minimum specification for the Section's computer, and that we were trying some out. We are pleased to report that we have now selected, and purchased, an excellent machine with the following specification.

PC 586, 16 Mbyte RAM, 166MHz (comparable to a 133MHz Pentium)

1.2 Gbyte IDE hard disc.

15-inch Hitachi monitor, SVGA, colour.

CD-Rom drive, quad speed.

Advance Logic graphics, set up for 800x600 in 64k colours (a higher resolution is available).

28,800 baud Supra Express fax/modem.

Soundblaster compatible card, with speakers built into the computer.

1.44 Mbyte floppy disc drive.

Parallel/serial ports, sound in/outputs.

The cost was £1,325, from Bill Smith computers. It has been tested with the Starlight Xpress CCD camera, and typically downloads an image in just 5 seconds!

Daniel Cave has done much work on it, reorganising the files, installing *Microsoft Windows 95*, PaintShopPro 3.12 (shareware evaluation version), SkyMap 3.0 (shareware evaluation version), Microsoft Internet Explorer 2.0, and Netscape Navigator 2.0. We also have Megastar and Mica, and an old Epson dot-matrix printer.

We plan to have internet access very soon. We are already able to connect to the RGO computer for the latest IAU circulars and the floppy almanac. We can also obtain data, programs and images from Starbase One and Starbase Four, as well as other bulletin board services. ☆ ***DC and DLC***

We're on the WWW

The Astronomy Section now has a few web pages set up on the internet. They contain information about what the Astronomy Section is and what it does, including information on the equipment based at the Observatory.

Pages include:-

News. Current Section information, such as the next scheduled meetings and astronomical events of interest.

Gallery. A series of images taken at the Observatory, mostly with the CCD camera.

Sagittarius OnLine. The on-line version of the Section's newsletter, with versions of articles that have appeared previously in Sagittarius.

The URL is:

http://www-dept.cs.ucl.ac.uk/students/d.cave/a_sect.htm

If you have access to the World Wide Web, please stop by and take a look. If you have any comments or suggestions please do not hesitate to e-mail them to:

d.cave@cs.ucl.ac.uk

☆ ***DC***

Much in the media

We have had a lot of media exposure over the last few weeks. David Le Conte gave a Radio Guernsey news interview on Comet Hyakutake, and provided details and diagrams to the Guernsey Even ng Press on the Comet and the eclipse. Daniel Cave's CCD image of the Comet made the front page of the Press. Geoff Falla was interviewed on Radio Guernsey about the eclipse, and Ken Staples was interviewed on Pat Lihou's show about light pollution and the Section's activities. ☆

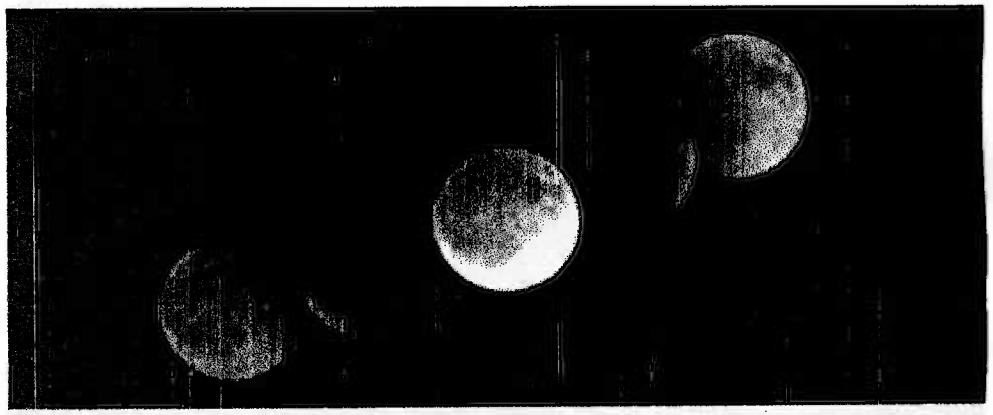
Total eclipse of the Moon

Conditions were perfect on the night of Wednesday/Thursday 3rd/4th April for the total lunar eclipse. Many islanders took the opportunity to watch it, although few saw it to the end. The Observatory became a very active place at about 11.00 pm, with some ten members getting equipment ready.

Daniel Cave used the 14-inch telescope to take a multiple exposure piggyback telephoto photograph (see his spectacular results below). Roger Chandler and David Le Conte used the 11-inch telescope for prime focus photography, also with good results. David also took tripod-mounted multiple exposure photographs. Geoff Falla took a picture with his C90 telescope, and Gareth Coleman took time-lapse video pictures – we were interested to see these at the meeting on the following Tuesday. Another half dozen or so members and others joined us during the progression of the eclipse.

The eclipse started at 11.21 pm. Gradually, over the next hour, we saw the Moon entering the umbra of the Earth's shadow. It was totally eclipsed from 00.26 am until 01.53 am, with mid-eclipse at 01.09 am. The eclipse ended at 2.59 am (by which time there were only three or four of us left!). Just after it finished a few clouds entered that area of the sky, but we had enjoyed a completely clear sky until then, with no wind, and not too cold – perfect.

At totality, the Moon was a beautiful red colour, not too dark; in fact, it was quite a light eclipse. Unfortunately, we cannot yet reproduce colour in this newsletter, but do try to see the original photographs – they are splendid. ☆ ***DLC***



Multiple Exposure Showing Total Lunar Eclipse of April 3/4 1996

The image shows the passage of the Moon through the Earth's shadow during the 4 hours of the eclipse. The image was achieved by opening the shutter five times, using the same piece of film for all five exposures. Camera: Canon Eos 100 fitted with Canon 400mm f/5.6 telephoto lens. Film: Fujichrome Sensia 100 slide film. The camera was piggy-backed on the Celestron C-14 telescope for the duration of the 3 hrs 48 mins exposure. The exposures were:-

Time	Exposure	Phase
11:16pm BST	1/500 second	Pre-umbral eclipse
00:12am BST	1/125 second	Partial eclipse
01:09am BST	15 seconds	Mid-totality
02:07am BST	1/125 second	Partial eclipse
03:04am BST	1/500 second	Post-umbral eclipse

The ferret of comets – Charles Messier
by Debbie Quertier

The recent discovery of Comet Hyakutake has caused much excitement for both astronomers and the general public. Many people who have had no previous interest in astronomy have been looking at the sky to spot this celestial visitor. Although we were living in caves when it last passed our way, and none of us today will be around when it next returns, Hyakutake and his comet will not be forgotten.

The most famous comet of all won't be back for about about another 66 years, but Edmund Halley, although being the second Astronomer Royal and making several contributions to science, will be forever remembered for that comet, first and foremost.

Charles Messier, perhaps the most dedicated hunter of comets, and certainly very successful in finding them, is probably best known for his catalogue of nebulae and star clusters. Whilst meticulously searching the sky for comets, he came across a fuzzy patch in Taurus. He made a note of its position so it could not be confused with a comet at a later date, and so his list began. The fuzzy object he had spotted was the Crab Nebula in Taurus, M1.

Charles Messier had come to Paris in 1751, and was employed by Joseph Nicholas Delisle (the Astronomer of the Navy) as a draftsman and recorder of astronomical observations. It was here, at the Hôtel de Cluny, that he learnt to use the telescopes, soon becoming a careful and experienced observer. He enjoyed watching eclipses and transits, but his love was searching for comets.

The return of Halley's Comet had been predicted for late 1758/early 1759, and Delisle gave Messier the task of searching for it. Using charts made by Delisle, Messier began his search sometime in 1757. If he could be the first to spot this comet's return he really would make a name for himself. But sadly this was not to happen. Messier, after much searching, spotted the comet on the 21st January 1759, and continued to observe and record it until it was lost in twilight about mid-March.

Meanwhile, Delisle suppressed any announcement of the comet's discovery until the 1st April 1759, when Messier had re-spotted the comet on the other side of the Sun. Unfortunately, by this time news had reached Paris that on the 25th December 1758 the comet had been first spotted by a Saxon farmer named Palitzvch. So the announcement of Messier's sighting was greeted with scepticism.

Despite this unfortunate business, Messier continued to hunt for comets, earning himself the name "Ferret of Comets" from Louis XV. According to his friend Lalande, he discovered 21 comets, although it was more likely to be about 13 or 14, with several co-discoveries. There were also others where he was just pipped at the post.

The list of fuzzy objects was growing, and by 1759 he was considering publishing them. The first list contained just 45 objects, numbers 44 and 45 being the Beehive and the Pleiades. These objects had been known since way back, and probably added to round the list up. »»

It was actually published in 1774, in the Memoirs of Sciences. Not all the objects on the list were discovered by Messier. About 20 of the final list were discovered by his friend, a colleague Pierre Méchain, also a keen hunter of comets.

The final list stands at 109 objects (numbered 1 to 110, with 102 missing), these objects being: 4 planetary nebulae, 27 galactic clusters, 39 extra-galactic clusters, one supernova remnant, 7 gaseous nebulae, 29 globular clusters, and 2 asterisms.

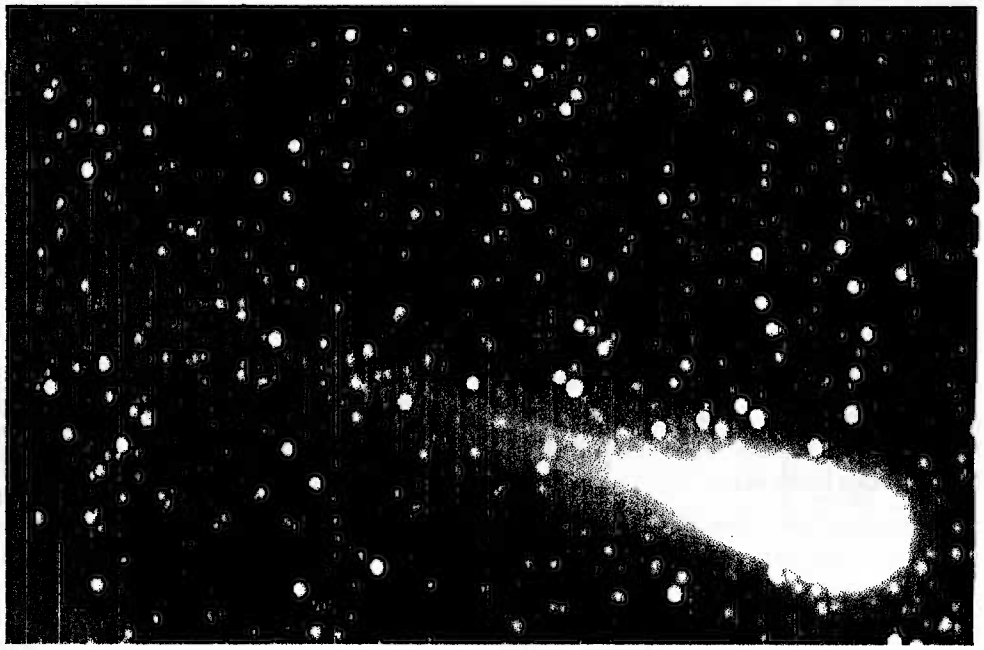
M102 was probably a duplication of M101. Messier carefully checked the positions of new objects, but there was at least one duplication, and for a while M91 was a "missing" object.

The Messier objects provide the amateur astronomer with a varied viewing programme. Most of the objects can be found using a modest telescope. The telescopes that Messier used were modest by today's standards, but he did have the advantage of no electric lights. We might not be looking for the return of a Comet Messier, but there are certainly plenty of objects with his name on for us to look at.

☆ ***Debbie Quertier***

Comet Hyakutake observed

Many members observed Comet Hyakutake from the Observatory, and some photographed it. Daniel Cave took the image below with the CCD camera, fitted with a 50mm lens, and piggybacked on the C14 telescope.



Observing Programme – May/June 1996

The Section of sky for May and June includes a number of constellations in that part of the sky which is between 13 and 17 hours in Right Ascension.

The constellation *Ursa Major* is partly within this Section and has one of the most notable double stars, the visual double *Mizar* and *Alcor*, with Mizar itself being a double star, forming a triple system. Mizar was actually the double star to be discovered, by Italian astronomer Giovanni Riccioli in 1650.

In the constellation *Canes Venatici* can be found one of the best known galaxies – *M51*, the *Whirlpool Galaxy*. This consists of a face-on spiral galaxy, which is connected to a smaller, irregular galaxy.

The Whirlpool Galaxy, M51 is now visible.
Daniel Cave used the 14-inch telescope and CCD camera.

Several globular clusters appear in the list. The most famous of these is *M13*, in the constellations *Hercules*. This cluster is considered to be the best object of its kind for observers in the Northern Hemisphere, and, at around magnitude 5.7, is just visible to the naked eye in good conditions.

Other notable star clusters include *M3* in *Canes Venatici*, *M4* in *Scorpio*, and *M5* in *Serpens*, all of these clusters being around magnitude 6.

Double stars also include *Epsilon Boötes*, also known as *Mirak* or *Izar*, and considered to be one of the best coloured double stars in the sky.

In the constellation *Draco*, *NGC5907* is an edge-on elliptical galaxy, while, in *Hercules*, *NGC 6210* is a small, bright blue planetary nebula. ☆

Geoff Falla

The table of objects for May and June is on page 9, the star chart on pages 10 and 11, and the observing log on page 12. These centre pages can be removed for convenience.

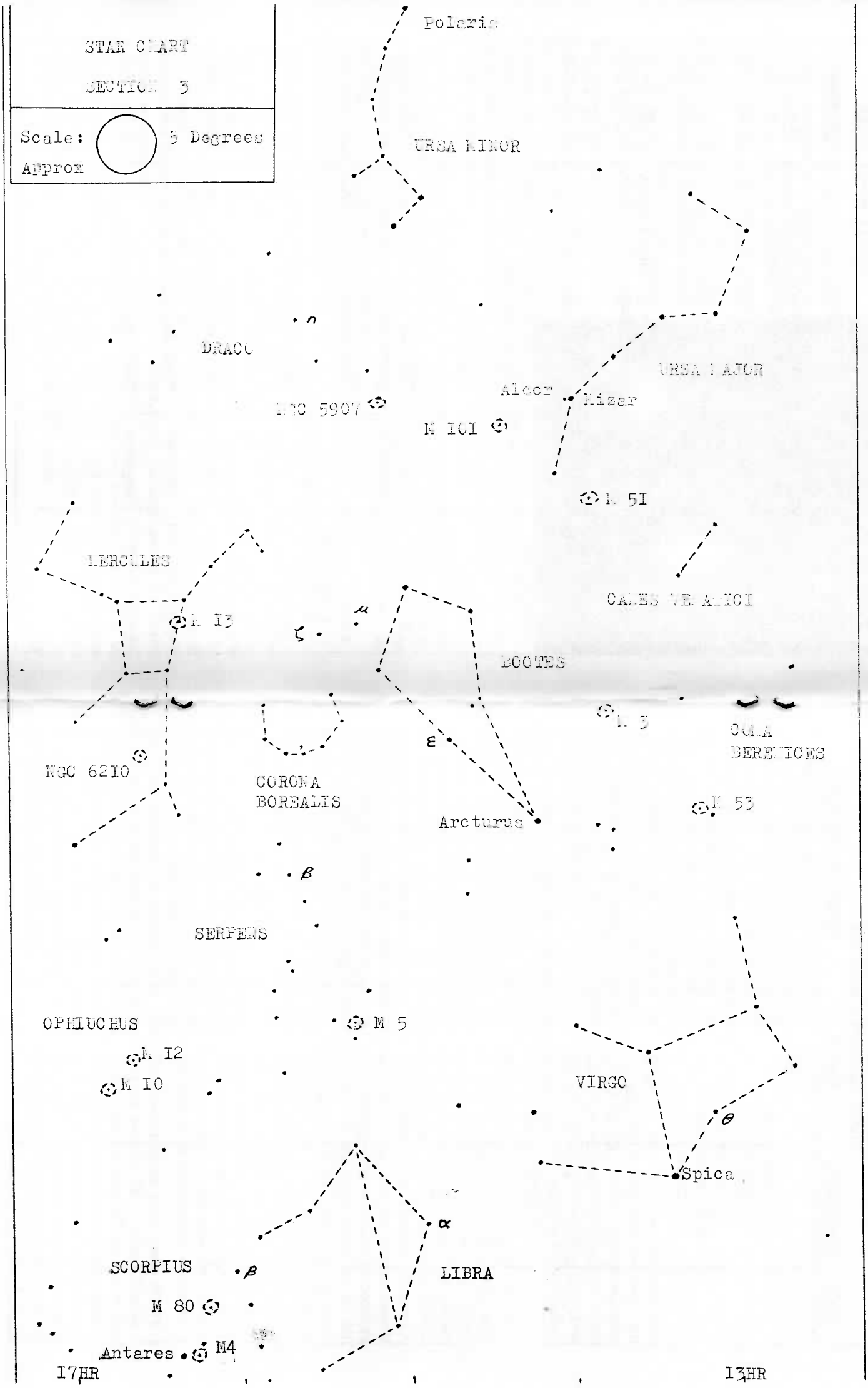
Star chart improvement

As mentioned during the Annual Business Meeting, it was felt that our regular bi-monthly Star Chart published in the *Guernsey Evening Press* could be improved further with the addition of topical information, The Star Chart for March/April, published on the 5th March, included a summary of details regarding Venus, Mercury, the total lunar eclipse on the night 3rd-4th April, and some preliminary information on Comet Hyakutake. ☆

GF

STAR CHART - SECTION 3

Constellation	Object	Type	Coordinates RA h m	Coordinates Dec degs
		○○ = Should be visible with binoculars		
URSA MAJOR	Zeta ζ	Visible double (*Mizar - Alcor*) ○○	13 23	+ 54.9
	"	Double star (*Mizar*)	13 23	+ 54.9
	M 101	Galaxy (*The Pinwheel Galaxy*)	14 03	+ 54.4
CANES VENATICI	M 51	Galaxy (*The Whirlpool Galaxy*)	13 28	+ 47.5
	M 3	Globular cluster ○○	13 40	+ 28.6
DRACO	Eta η	Double star	16 24	+ 61.5
	NGC 5907	Elliptical galaxy	15 15	+ 56.5
HERCULES	M 13	Globular cluster ○○	16 40	+ 36.5
	NGC 6210	Planetary nebula	16 45	+ 23.8
CORONA BOREALIS	Zeta ζ	Double star	15 39	+ 36.6
BOÖTES	Mu μ	Triple star	15 24	+ 37.4
	Epsilon ε	Double star	14 45	+ 27.1
COMA BERENICES	M 53	Globular cluster ○○	13 11	+ 18.4
SERPENS	M 5	Globular cluster ○○	15 16	+ 02.3
	Beta β	Double star	15 46	+ 15.4
OPHIUCUS	M 12	Globular cluster ○○	16 45	- 01.9
	M 10	Globular cluster ○○	16 55	- 04.0
VIRGO	Theta θ	Triple star	13 10	- 05.5
LIBRA	Alpha α	Double star	14 51	- 16.0
SCORPIO	M 4	Globular cluster ○○	16 21	- 26.4
	Beta β	Double star	16 05	- 19.8
	M 80	Globular cluster ○○	16 14	- 22.9


STAR CHART
SECTION 3
Scale:
Approx
5 Degrees
Polaris
URSA MINOR
DRACO
URSA MAJOR
Alcor
Mizar
NGC 5907
M 101
M 51
HERCULES
M 13
CANES VENATICI
BOOTES
M 3
COMA BERENICES
NGC 6210
CORONA BOREALIS
Arcturus
M 53
SERPENS
OPHIUCHUS
M 5
M 12
M 10
VIRGO
Spica
SCORPIUS
LIBRA
M 80
Antares
M4
17HR
13HR

STAR CHART - SECTION 3 OBSERVATION LOG

Date	Constellation	Object	Observation notes, etc

A Visit to . . . Space Center Houston
by Mark Humphreys

During the early 60's Houston was chosen as the centre for the manned missions into space. 25 miles south of the city, just off Highway 45, the *Manned Spacecraft Centre* (MSC) was constructed. From here all the astronauts were trained ready for their missions - from the early days of *Gemini* and *Apollo* right up the latest shuttle mission *STS-75* to launch the tethered satellite system. *Mission Control* also is based here. The MSC was later re-named the *Lyndon B. Johnson Space Center* (JSC) in 1973.

Part of NASA's philosophy has been an openness to the general public, to let the world know what is going on rather than being a secret organisation, and over the years it has amassed a large collection of artifacts relating to space but had nowhere to display them properly. So it was decided that somewhere special had to be provided to display them to the world at large. Managers from JSC got together to form a non-profit making organisation called *Manned Space Flight Education, Inc*, and they designed and built the *Houston Space Center* – with a little help from the Walt Disney Co.

Constructed less than a mile from the JSC, it is easily spotted from the road - you can't miss the massive *Saturn V rocket* lying on its side. I got there early to avoid the crowds, although it doesn't open till 10.00am. The ticket was $11.75 for adults. Through the doors and into the Plaza, you are confronted by a full size mock up of the front of the space shuttle – though at the other side of the massive building – it completely dominates the area.

Leading from the Plaza are several display areas:-

Mission Status Center
The Feel Of Space
Starship Gallery
Space Center Theater
NASA Tram Tours

There is also a large cafeteria and restaurant and of course the gift shop. All around the Plaza were large photographs taken from various shuttle missions – and they were stunning! Everything from shots of actual launches, satellites being released, to aerial shots of the Earth.

Mission Status Center (MSC) is a mock-up of part of Mission Control; several large screens served by numerous video feeds show events happening around the Johnson Space Center. While I was there *Mission STS-75* (that is *Space Transport System 75*) was in progress, and the screens showed live coverage of the astronauts on-board the shuttle. It also gave views of the MC (Mission Control) and the personnel working there – in particular *CAPCOM* (capsule communications) – the person who is the only one that talks to the astronauts in orbit. A briefing officer in the MSC gave a commentary of the current mission and answered questions from the audience about NASA or the Shuttle etc.

The *Feel of Space* gives you a chance to find out what it's like to pilot a Shuttle – to find out just how difficult it is to bring the Shuttle in on its one and only approach to landing (remember you don't have any engines to go round again). Or even more interesting - how to adjust your orbit to »»

be able to rendevous with a satellite that needs repairing – it is difficult. After a few minutes and several crashes it is easy to understand why the astronauts spend years training for one mission that will only last a few days. In this area is also a life size mock-up of part of the new *Freedom Space Station.*

The history of the American side of the manned space race is well documented in the exhibition called "*Star Ship Gallery*" A 25 minute film "*On Human Destiny*" shows its earliest beginnings with the *Mercury* and *Gemini* missions to *Apollo* moon shots and the link up with the *Soyuz* space craft in 1975. Once the film is over you are directed to a display showing some of the spacecraft used during those early missions. Three of the capsules on display are the actual craft that went into space and returned – the Mercury capsule "*Faith 7*", *Gemini V* and the *Apollo 17 Command Module*. The remainder on display are former trainers used by the astronauts. The largest on display is the training mock-up of the *Skylab* space station. It's big and spacious but to spend 84 days locked up in it (the longest duration that an astronaut spent in it) I think would be quite a strain – it's bad enough being on board a ship for months at a time – at least I can walk the deck and breath fresh air!

Also in this area is the *Lunar Samples Vault* which houses the largest public display of lunar rocks brought back to Earth during the Apollo missions. You get the opportunity to touch a 3.8 billion year old piece! Outside is a display of things astronomical, from a description of the Solar System to the Galaxy as a whole. There is also a large meteorite that was found in Antarctica weighing in at about 250lbs, the largest that has been found there to date.

For me the best part of the whole Center was the *Space Center Theater*, a massive *IMAX* cinema screen five stories high! The film that I saw was "*The Dream is Alive*" filmed on several Shuttle missions. I think the Astronomy Section has a copy of the film on video, but I doubt that it will have the impact that the original film has. (*We do, and it doesn't – Ed.*) Images of the Shuttle taking off were very realistic and the vibrations generated by the sound system made the ground and seats tremble as the engines ignited. The screen was so large that it was impossible to see it in its entirety without moving your head to and fro, so the images of the mountain ranges, storms and hurricanes, seas and islands really felt as if you were in the vastness of space looking down – it's probably the closest I'll ever get to being in space!! Outside of the theatre is a collection of space-suits worn by various astronauts, from the one used by Alan Shepard during his Mercury flight to the flight suit worn by Sally Ride, America's first female astronaut. Other suits include ones used to walk on the Moon; it's surprising anyone could move in such bulky suits.

The tram tour takes you from the Space Center Houston to the Johnson Space Center. On the way you pass the giant Saturn V rocket. I wonder what it was like being at the top with the engines firing? The tour takes you to three areas: the *Space Environment Simulation Laboratory* (SESL, pronounced SEE-SALL), a nine-storey building housing a massive vacuum chamber. The door alone is 40 foot high and weighs 40 tons. The interior can be pumped out to create a vacuum, and any satellite or space craft can be subjected to over 200 degrees centigrade on one »»

side and minus 200 degrees centigrade on the other side at the same time, by using heat lamps and liquid helium, in an attempt to find out if it can survive the rigours of outer space.

From SESL the tram takes you to the *Mock-up and Integration Laboratory*, which houses full size and fully functional mock-ups of the Shuttle and, recently added – the Freedom Space Station. These are used to train the astronauts in every aspect of their craft from piloting, to using the toilets, to manouvering the giant arm to deploy satellites. The last stop is the WET-F area, that is the *Weightless Environment Training Facility*, and as its acronym suggests it is a large swimming pool. It is about 70 feet long and 25 feet deep and contains a mock-up of the Shuttle's loading bay. The astronauts in their space-suits are neutrally bouyant (with the addition of weights and floats), so do not sink or float to the surface. They train in this simulated zero-g environment to operate various equipment to launch satellites and repair telescopes etc. A much larger pool is currently under construction, some 250 feet long and holding 6 million gallons of water. It will house a mock-up of the Space Station Freedom.

Another tour takes you to the Mission Control Center but as there was a Shuttle mission in progress it was off-limits to the public. There was also another display in the Plaza giving hands-on demonstrations of lasers, of how CD players work and how to make holograms, among other things. Get bored with that – then climb the stairs that takes you up to the flight deck of the Shuttle and the crew deck – again not much space, imagine spending a week in there with six other people. It helps if you all get on!

Overall, I think the whole Center was worth the visit. It's a good 5 or 6 hours well spent and I would recommend it to anyone. It's especially great for kids - no matter what their age! ☆

Mark Humphreys

A nearby planetarium

How many members know that we have a huge planetarium just 40 miles away? In fact, it is one of the largest in Europe!

The *Planetarium du Tregor* is at Pleumer-Bodou, on the north coast of Brittany, near Perros-Guirec. I have enclosed a brochure with this newsletter. I visited it in March, and spent a very pleasant time there, including an hour-long chat with the very friendly Director, Claude Ganter.

It has a 20-metre dome, and seats no less than 350 people. 72,000 visit it each year. It was opened in 1988, with a Zeiss Spacemaster projector (there are plans to replace it with a fibre-optics system), and it uses 26 slide projectors. There are 6 shows daily in the summer, and one in the winter. A few are in English, but the French one I saw was excellent and understandable.

It also has an well-stocked and tempting shop, and a small exhibition with a little video theatre. The planetarium is in an enormous complex called *Cosmopolis*, the main feature of which is the telecommunications centre and museum, and the gigantic radome. The whole place is well worth a visit.

An astronomy club is based at the planetarium, and I obtained names of some members with a view to establishing a contact between Guernsey and Brittany socieities. How is your French? ☆

David Le Conte

European AstroFest '96

After skipping one year, European AstroFest returned to London's Royal Borough of Kensington and Chelsea Town Hall last February. The two-day event held on the 2nd & 3rd was, as always, professionally organised and well attended. First rate speakers from around the world were attracted to discuss topics from CCD cameras to the astronomical work of Robert Hooke.

In addition to the series of talks there was an extensive exhibition of astronomical merchandise from many of the country's well known suppliers. Rosemary Naylor attended a well stocked bookstand, with other exhibitors including Starlight Xpress (CCD cameras), David Hinds Ltd (Celestron Telescopes), and the British Astronomical Association.

An increasing trend is for universities to have stands in the exhibition and this year the University of Hertfordshire, University College London and the University of Central Lancashire were all present. Other academic or educational institutions included the Particle Physics and Astronomy Research Council, The Royal Observatory Edinburgh, The Scientific Instrument Society, The Society for Popular Astronomy, and the London and Armagh Planetaria.

Amongst the speakers at this year's event were: Dr Monica Grady, Dr Steven Miller, Professor Heinz Wolff and Martin Mobberley. Dr Grady from the Department of Mineralogy at the Natural History Museum talked on "*Meteorites: Messengers from the Past*". In this talk she discussed the nature of meteorites, how they are formed and how they are found when they land on the Earth. She showed slides of a visit to Antarctica where meteorites were collected; in Antarctica if a rock is found amongst the snow then it is most likely to be a meteorite.

Dr Richard Hook, from the Space Telescope European Co-ordinating Facility, described the *Hubble Deep Field* – the deepest optical exposure ever made. Whilst we were all settling down to our Christmas lunch, the Hubble Space Telescope was keeping its cameras trained on a rather uninteresting area of sky. It did this for 10 days in total and the final image, which is still being processed, will show objects as faint as 30th magnitude. A partially processed image was released in January and made its way on the front page of several newspapers. This image when first seen seems to be peppered with thousands of stars, but if you look very closely you see that they are not stars at all, but galaxies. In fact only about a dozen stars are recorded in the whole image.

Another talk, of interest to those with internet access, was on the *Bradford Robotic Telescope* (point your web browser at http://www.telescope.org). This is a totally automatic telescope that can be instructed by users to make observations of an object and then inform the user (via email) that it has been made and is ready for them to download. I took a quick look at the site, and whilst there were many observations only a handful showed any notable results – teething troubles no doubt . . .

The highlight of the two-day event for many people were the two talks given by expert astrophotographer David Malin. David's photographs have appeared on numerous television programmes and »»

been reproduced thousands of times in books and magazines around the world.

In his first talk, entitled *Peculiar Galaxies I Have Known*, he discussed some of the more unusual interacting and 'shell' galaxies that have been discovered. As you may expect, his talk was well illustrated with images he had taken at the Anglo-Australian Observatory. Using unique photographic techniques, many of which he developed, he revealed many extremely faint structures associated with otherwise normal looking galaxies.

David Malin's second talk was devoted to the presentation of new images made with the Anglo-Australian Telescope and other telescopes around the world. Many of the images presented were having their first public airing, and they should certainly find their way into the astronomical literature shortly. There was a series of excellent photographs of very faint planetary nebulae, and for many of these objects it was the first time that they had been photographed in colour.

Despite virtually all of his impressive images being taken on emulsion, David indicated that he did not dislike CCD cameras, and to illustrate this point he produced an impressive image of comet Shoemaker-Levy 9. He did note, however, that when it came to wide fields, the CCD camera does not cover a large enough area to produce spectacular results, at least not at the moment.

The standard of talks at this year's AstroFest was high, with a wide variety of subject matter, meaning once again that it was well worth attending. Let's hope that AstroFest '97 will keep this standard up. ☆

Daniel Cave

Educational activities

We were recently invited by the Island Federation of Women's Institutes to take part in a display arranged at St Martin's Primary School as part of National Science Week.

The display, with an interesting range of stands, was set up at the School on the morning of Saturday, the 9th March, in preparation for the afternoon event. The Astronomy Section was represented by Roger Chandler and myself.

We had selected various materials and posters for display, including: The Channel Islands from Space, images from the Hubble Space Telescope, star maps, the Scale of the Universe, large charts of the Moon and Mars, and the Earth by Night, showing the Aurora Borealis – and light pollution.

For some practical test of knowledge we had cut-outs of the planets to be placed in the correct order from the Sun, which quite a few of the children and their parents had a go at placing correctly. A quiz sheet, with questions relating to each of the displays, encouraged children to study all the material carefully to find the right answers. We happened to have several well illustrated books on display, and one of these, open on the topical subject of comets, soon had the children studying the small print to find the answer to one of the questions: "What does the core of a comet consist of?".

The display, which also included Guernsey Geology, Electricity, Police, Telecoms, and the Airport Met Office demonstrating a variety of weather instruments, was very well attended. ☆

Geoff Falla

What do you believe?
(Thoughts for Ash Wednesday)

I was munching on a cold sausage roll on a bitterly cold evening in the Church Hall at Ulford, a small village just outside Woodbridge. A coach load of us from Whitton Church had gone there to join in the Ash Wednesday services.

As I was munching away, one of the twins came up to me and said: "Which order would you place them in?" He'd previously quizzed one of the Church Wardens, and I was next in line. "What was the question?", I replied. "God, Man, Evolution", he said, "We were asked this in our GCSE RS lesson last week", – "it depends what you believe", he added.

I finished off my sausage roll – well, it was only small – you know, the cocktail party size – and at the same time I gave this question some thought. After some considerable thought, I replied: "It depends, as you say, if you believe; so to me, it's God, Evolution, Man. Of course, it could be: Evolution, Man, God, or, if you disregard God completely, then simply: Evolution, Man. It's all rather personal, isn't it?

I thought it would stop there, but it didn't. My fault really, because I moved the conversation on to explain that I had no difficulty in my belief in God, and, studying science, to me the two complement one another. "How?", asked the twin.

Well, the scientist and the theologian ask different questions, of course, and we decided to test that out by taking the Big Bang as an example. The scientist will ask: "How did it happen?", and search for physical evidence to support his hypothesis, and so prove the theory correct. As we know, this is ongoing, and a great deal of data has already been collected.

On the other hand, the theologian asks not how, but why? Why did it occur? The answer may be found, not by the collection of data, but in simple faith – no evidence to back you up, it's faith, pure and simple. Either you believe or you do not. To the theologian, the answer is to be found in God. God caused the Big Bang to occur, and in so doing brought the Universe into being, and all that followed is as a result of his decision.

I was by now in full flow, but was brought back to Earth by the Rector telling us we had to back on the coach by 9.00 pm. So the talk was brought to a sudden halt.

As we left the hall, the twins and I looked up. The sky was very crisp and dark. Orion stood out boldly against an inky black sky, Sirius was beaming at us, the Plough dipped graciously, and Taurus charged across the sky in a never-ending race to try to outrun the Hunter.

'Wonderful sight", I suggested. "Yes", said the twin, "not that I know one from the other." And then, after a slight pause: "But I'm pretty certain who created this lot." And then he was gone, up the lane to be first on the bus ahead of his brother.

I was left to ponder his question and his original comment: "depends on what you believe." So I put it to you – what do you believe? ☆

David Williams

Come to Meeting Point at the Town Church, – lunchtime, Friday the 28th June, and hear about the Big Bang. Further details on page 19.

Eclipse99

The logo above heralds a new enterprise started by David Le Conte and his son, Christopher, a Chartered Accountant. They have formed a small company, called *Eclipse99 Limited*, with the objective of providing solar eclipse viewers and solar filters in the British Isles for the October 1996 partial eclipse and the 1999 total eclipse.

Members may recall that in 1994 the Astronomy Section, in conjunction with Specsavers, provided 2000 eclipse viewers for local school-children. It was apparent at that time that it was impossible to obtain such devices on this side of the Atlantic – they had to be mail-ordered from America, at considerable expense for shipping and transfer of funds.

David and Christopher have entered into an agreement with Roger Tuthill Inc, of New Jersey, to provide the *Solar-Skreen* viewers and filters, which have undergone comparative tests demonstrating their outstanding safety when compared with some other products. The viewers are worn like 3D glasses.

The Astronomy Section will benefit from the profits of the Guernsey sales of eclipse viewers. The Section has already ordered 50 of them for re-sale. The cost is just £1.50 each, so order yours now from Geoff Falla (724101).

For those interested in viewing the eclipses with binoculars or telescope, or using cameras or camcorders, special filters are available.

Contact David direct on 64847 for further information. ☆

Did you know?

The *First Point of Aries*, which was referred to in the last issue of Sagittarius is actually in the constellation Pisces. 2000 years ago, when Hipparchus first used this term, it did lie in Aries, but precession (the spinning of the Earth's axis) has moved it out of that constellation. ☆

DLC

The Comet

Coming closer to the Sun
On a path long since begun,
Just a ball of ice and dust
Forms a long bright trail, we trust.
Nearing Earth at such a pace
From the depths of Outer Space,
It appears a wondrous sight
In the darkness of the night.

Geoff Falla

Talks, talks

David Le Conte gave a talk on general astronomy to the St Matthew's Church Wives Group at Le Guet on the 9th April (and therefore had to miss David Falla's talk on infrared astronomy).

By request, he included a mention of the 1999 solar eclipse, and took the opportunity to show his latest pictures of a lunar eclipse – the one just five days before the talk. He also emphasised the excitement of Comet Hyakutake's appearance.

David has also been asked to talk about the **Big Bang** at the **Town Church at 1.00 pm on Friday, the 28th June.** This is one of the *Meeting Point* lunchtime events. Sandwiches are available before the talk. ☆