Tailpiece

Grant application

We have still not received any news about our grant application to the Le Riche Centenary Fund. ☆

New web pages

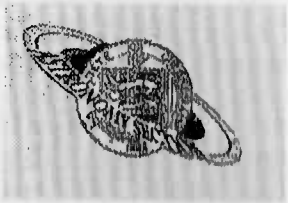
New web pages have been prepared, and more are in preparation for linking to the Astronomy Section's web site, and the UK national eclipse web site.

The report on the 1998 solar eclipse expedition, which appeared in the last issue of Sagittarius can be found, complete with eclipse pictures on:

http://ds.dial.pipex.com/eclipse99page/persac.htm

David Le Conte is preparing two new pages: one on information about the 1999 eclipse for the Bailiwick of Guernsey (including its significance in historical and future terms), and one on eclipse quotations, ie literary, historical and contemporary quotations about eclipses, mainly solar. This latter page is being constructed at the request of the compilers of the national eclipse web site, which is to be launched in August.

If anyone knows of suitable quotations for inclusion on the page please let David know. He already has about 100 quotations! The page is organised in chronological order, stating with Chinese, then mostly Greek quotations, followed by various Roman, biblical, and contemporary literary sources, Descriptive, rather than scientific, text is included. Copyright clearance is currently being sought. ☆



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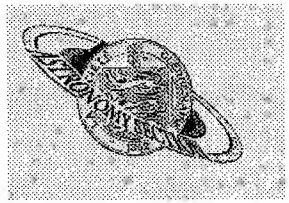
The next newsletter will be published early in October 1998. The deadline for publication copy is the 15th September.

La Société Guernesiaise, Candie Gardens, St Peter Port, Guernsey. Tel 01481 725093

Sagittarius

The Newsletter of the Astronomy Section of La Société Guernesiaise



July - September 1998

Forthcoming events

Observatory Day
Saturday, 11th July
From 9.00 am
at the Observatory

Barbecue and Perseid Meteor Shower Count
Tuesday, 11th August
7.30 pm
at the Observatory

Video Evening and Star Night
Tuesday, 29th September
7.30 pm
at La Houguette School

In this issue

The Hubble Classification of Galaxies

Inside

Centre inserts

Star chart

Sunset, twilight, and sunrise times and Moon phases

Observatory Day

Starting at 9.00 am on Saturday, 11th July, we will be carrying out our annual clean-up, painting, and fixing at the Observatory. Again, there are a lot of jobs to be done – something for everyone, so do come along either for the whole day, or for as much time as you can spare. ☆

Barbecue and Perseid Meteor Shower

Members' families and friends are welcome to this annual event. It starts **at 7.30 pm on Tuesday, 11th August at the Observatory**. As usual, the fire for the barbecue will be provided. Please bring your own food, which you can cook yourself. We have a few utensils at the Observatory, but you should also bring some. Side dishes are usually shared.

The **Perseid meteor shower count** will start after the barbecue, when it gets dark. All members and friends are invited to join in for an hour or so. Even if you cannot come to the barbecue, you are invited to join the meteor count.

The Moon will be close to last quarter, rising at ** so at the time of the count the sky should be free of moonlight.

The "rain date" is the following day, Wenesday, 12th August. If you are in doubt about the weather conditions on the 11th, please telephone Geoff Falla (724101) after 6.00 pm, or the Observatory (64252) after 7.00 pm. ☆

Video Evening and Star Night

This annual event is scheduled for **Tuesday, 29th September**, starting at **La Houguette School**. ☆

Solar observations and sundial project

Sunspots have now started to appear more regularly, as the solar cycle builds towards its next peak. The opportunity was taken on Sunday, the 17th May to use our solar mirror system, projecting the Sun's image onto the screen inside the main building. With a slight adjustment to the position of the tripod supporting the focusing mirror near the south boundary, several small groups of sunspots were displayed, with excellent definition.

We hope to use the solar mirrors on a fairly regular basis, so that the progress of the solar cycle can be followed.

The sundial project is progressing steadily, being undertaken largely by Lawrence Guilbert and Gareth Coleman. Lawrence has been using his artistic skills to draw a special sundial design, while Gareth is concentrating on the woodwork requirements. The sundial is to be mounted vertically on the south wall of the main building. The plan also includes separate panels to illustrate and explain the Equation of Time and other variations. ☆

GF

Summer Solstice Day

Fine weather blessed our Open Day on the Sumer Solstice, 21st June, and there was a good turnout, with over 100 people coming during the afternoon. The sundial was mounted temporarily on the wall of the main building, and a photograph of it, with Geoff Falla, appeared in the Press.

The 7½-inch image of the Sun, projected by our solar telescope, provided detailed views of two sunspot groups. ☆

Advances in astrophysics

Section member Dr David Falla's interesting lecture on the 14th April concentrated largely on topical subjects – *solar activity and magnetic fields.* These are particularly relevant at present as the level of the Sun's activity is beginning to increase again towards its peak.

David is a lecturer at Aberystwyth University, Wales. The University is a leading space weather research centre in the study of solar-terrestrial physics. The Physics Department has recently been given a grant to continue the research. This includes the use of satellites and ground-based radar to measure the solar wind, so that more can be discovered about its important effects on the Earth's atmosphere and communication systems.

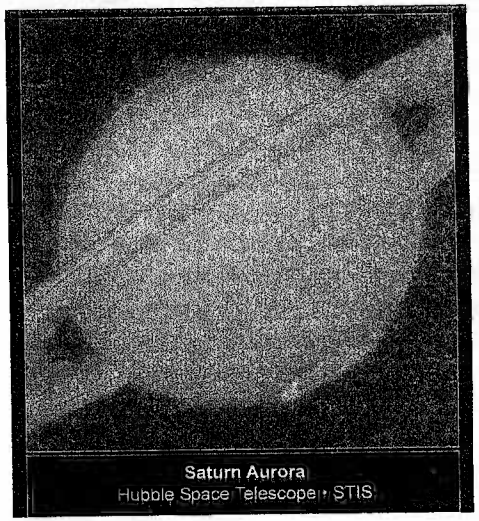
The Sun's 11-year cycle of activity is reflected in the number of *sunspots* observed. These are cooler areas on the surface of the Sun, but have intense magnetic fields, and indicate an increased level of activity. The *solar wind*, a regular ejection of electrically charged particles, is deflected by the Earth's magnetic field.

In times of greater solar activity, *solar flares* can occur. These are sudden releases of energy resulting from twisted magnetic fields suddenly uncoiling. The solar magnetic field extends in huge loops from pole to pole of the Sun. Violent magnetic forces occasionally blow the field apart, breaking the loops and allowing charged particles to stream out into space. These outbursts are known as *coronal mass ejections.*

At times of such increased activity, particles attracted to the Earth's magnetic poles collide with atoms of oxygen and nitrogen in the atmosphere, and produce the auroral glows – the *Northern Lights,* and their identical counterpart in the southern hemisphere – in the same way that gas glows in a fluorescent tube. Intense activity can have dramatic effects on communications, and is one of the reasons for the continuing research.

We were also shown a collection of photographs illustrating the Sun and solar activity. Recent photographs of Jupiter and Saturn, taken in ultra-violet light, show that these planets also have polar auroræ. The effect is more pronounced in the case of Saturn. ☆

GF



Saturn Aurora
Hubble Space Telescope - STIS

Mysteries of time and space

Various recorded mysteries, some of which are perhaps still to be explained, were the subject of Geoff Falla's talk on the 12th May.

The extinction of the dinosaurs, together with most of the life on Earth, ➠

around 65 millions years ago, is of some topical interest at present, with the search for Earth-orbiting asteroids. Evidence is now accepted that the extinction seems to have been the result of an asteroid impact. The evidence, and the possible reason for periodic extinctions was explained.

On the subject of the Moon, there was a documented observation of an impact in June 1178 AD, which has received some confirmation as a result of the lunar flights programme. Changes and unusual features observed on the Moon's surface, the Tunguska object and explosion on 30 June 1908, and perhaps the most remarkable display of meteors ever observed, in 1913, were described.

Planetary mysteries included evidence for the claimed discovery of the planet Vulcan in 1859, involving French astronomer Urbain Leverrier and others, and of 'canals' on Mars, notably by Percival Lowell in 1877.

In the Mali Republic of North Africa, the claimed knowledge of the Dogon tribe relating to the Sirius system, and in particular the invisible companion star Sirius 'B', seems still to be explained.

Other, more recent, mysteries included 'UFO' sightings by astronomers – not usually reported – the claimed discovery by Russian scientists of a 1955 fragmented object in Earth orbit, and recent photographs of unusual features in the Cydonia area of Mars – the subject of some speculation which seems to have been partly resolved by new images from Mars Orbital Surveyor.

This was a different kind of Mystery Tour, as a change from the usual mysteries of astronomy and the universe. ☆

GP

The Winchester Weekend

Once again, I attended the BAA Winchester Weekend. For those who are unacquainted with this event, it is targeted at practical astronomical activities, rather than the theory and research covered by many other meetings. It started many years ago, and is always held around Easter, at King Alfred's College in Winchester. This year it was held from Friday, 3rd to Sunday, 5th April.

The first session was advice on *Observing the Local Group*. This was supposed to have been followed by observing from the roof of the Students' Union, but cloud interfered with this plan. I recall that last year, when Comet Hale-Bopp was evident, the bright lights of the College grounds interfered with the observing.

Saturday started with Bob Marriott describing classic astronomical instruments. Bob is the BAA's Curator of Instruments, and he had a wealth of visual material, and fascinating stories about the instruments he described. Maurice Gavin, probably the country's best known CCD imager, discussed his favourite subject. Kevin West spoke on variable stars, and then Bob Mizon gave a Starlab (inflatable) planetarium demonstration.

The main evening lecture, by Mark O'Dell, was entitled *Why Study Open Clusters?*

The last day, Sunday, started with a talk about observing comets, followed by one on the history of radio astronomy. The last session was a series of 5-minute talks on a variety of subjects, including my own about the February eclipse.

I recommend the Weekend to anyone interested in improving their knowledge of observing techniques. ☆

DLC

The Hubble classification of galaxies by Mark Humphreys

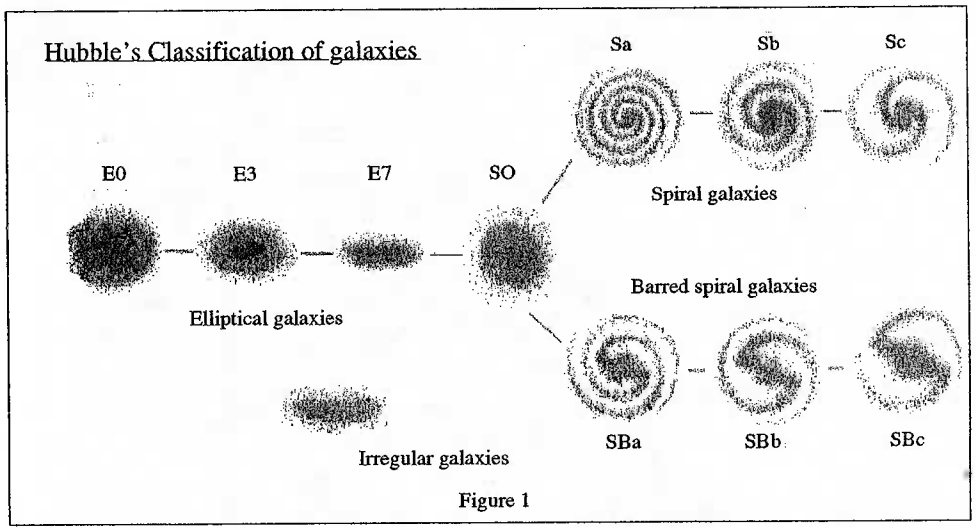


Figure 1

It was only in the 1920s that astronomers began to accept that certain "nebulous clouds" were collections of stars, gases and dust that lay outside of our own Milky Way Galaxy. Until that time all objects were considered to be part of our galaxy. It was the advent of larger telescopes, such as the 72-inch Leviathan at Birr Castle, which resolved the spiral nature of some galaxies for the first time, and highly detailed astrophotographs which enabled individual stars to be resolved. In particular it was the discovery of Cepheid variables, one of the yardsticks of astronomy, in the Andromeda galaxy, that gave a clue to the distances involved.

One of the first major classifications of galaxies was made in 1908 by Max Wolf, although this included planetary nebulæ as well. Edwin P Hubble first put these galaxies into a systematic classification in 1926. This classification divided galaxies into four main groups: elliptical, lenticular, spirals and irregular galaxies. The classification itself is rather simple; other more complex classifications exist, such as the de Vaucouleurs extension of Hubble's, but the Hubble classification more than suffices for the amateur astronomer. Figure 1 illustrates Hubble's classic tuning fork diagram, although it should be stressed that it only represents a classification sequence and not an evolutionary sequence.

Even this simple classification is subject to different interpretations. There are many instances where a galaxy is assigned a different type, depending on which source you read. For example *M49*, in Virgo, is listed as being *E4* in the Deep Space CCD Atlas, *E3* in Burnham's Celestial Handbook, *E2* in the Uranometria 2000.0 Field Guide, or *E1* in the Webb Society's Deep-Sky Observer's Handbook, Vol 5 – take your pick. Galaxies which do not ➠

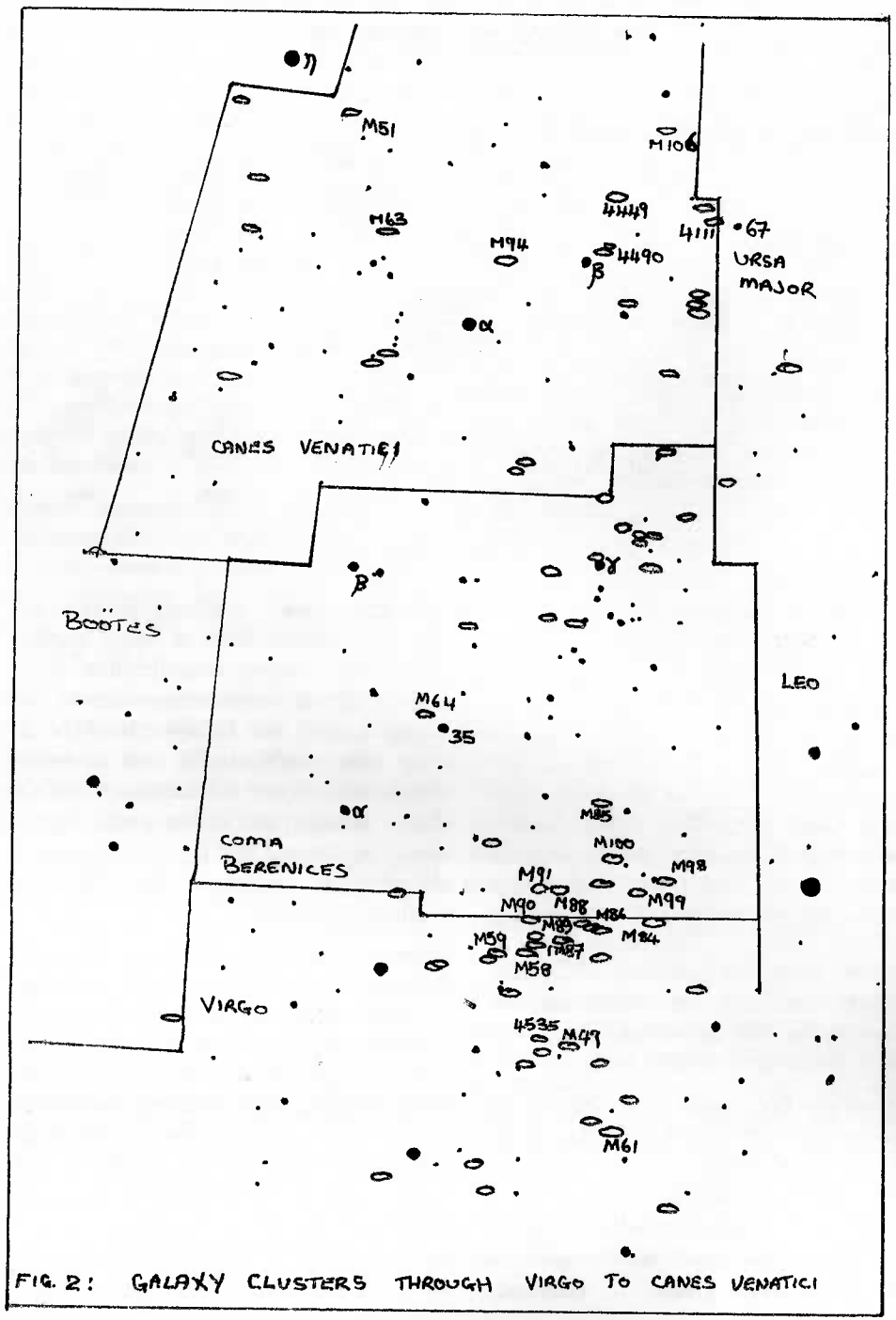


FIG. 2: GALAXY CLUSTERS THROUGH VIRGO TO CANES VENATICI

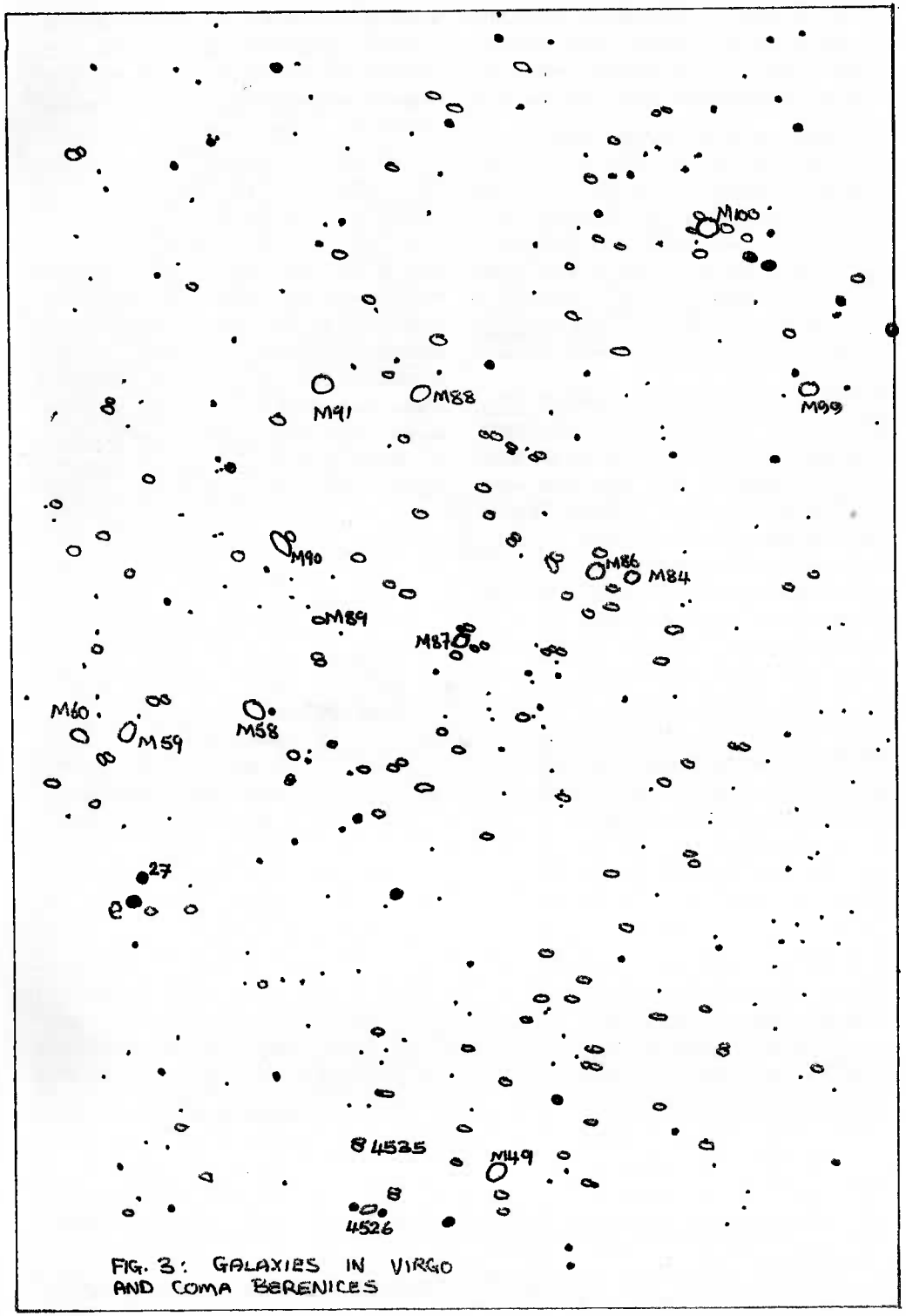


FIG. 3: GALAXIES IN VIRGO AND COMA BERENICES

readily fit into Hubble's classification are termed *peculiar galaxies*. These include galaxies that are very energetic, and those that are interacting with other galaxies.

This article aims to look at several of the different types in the night sky. The galaxies mentioned here are found in the region of the sky that stretches from Ursa Major in the north, through Canes Venatici and Coma Bernices, into Virgo to the south (Figure 2). This area has a massive concentration of galaxies, galaxy groups, clusters and super clusters.

Taking a look at elliptical galaxies first, these are spheroidal or elongated conglomerations of stars, with no apparent internal structure, and they are very symmetrical in shape. Edwin Hubble classified these galaxies by their apparent flattening, that is the ratio of their axes, *a*, the major axis and *b*, the minor axis. The formula used is *(a-b)/a*. A circle has a value of 1, while a nearly flat system approaches zero. In classifying ellipticals the value obtained is multiplied by ten and rounded to the nearest whole number. Thus a galaxy described as *E0* is virtually circular, while an *E7* galaxy is very elongated in shape.

M89 (*NGC 4552*) in Virgo (Figure 3) is a classic example of an *E0* elliptical galaxy. It is round and featureless, but brightens very rapidly to the middle. Its overall magnitude is around 9.8. Another large galaxy is *M87* (*NGC 4486*), an *E0/E1* elliptical at magnitude 9.6. Burnham's puts its mass at around 790 billion solar masses, making it somewhat greater than the Milky Way Galaxy, and one of the largest and most massive of all galaxies. It is also an extremely bright source at radio wavelengths – the fifth brightest in the sky – and is known as *Virgo A*. The radio emissions are thought to be due to a jet of material thrown out from the nucleus. As already mentioned, *M49*, *NGC 4472*, has been placed into several different types depending on the source, but here I'll consider it to be an *E3* elliptical. It is the brightest galaxy of the Virgo cluster at about magnitude 8.4. Its oval shape is readily seen. This is also a massive galaxy – about 5 times the mass of our own Galaxy. Still in Virgo, *NGC 4526* is ➠

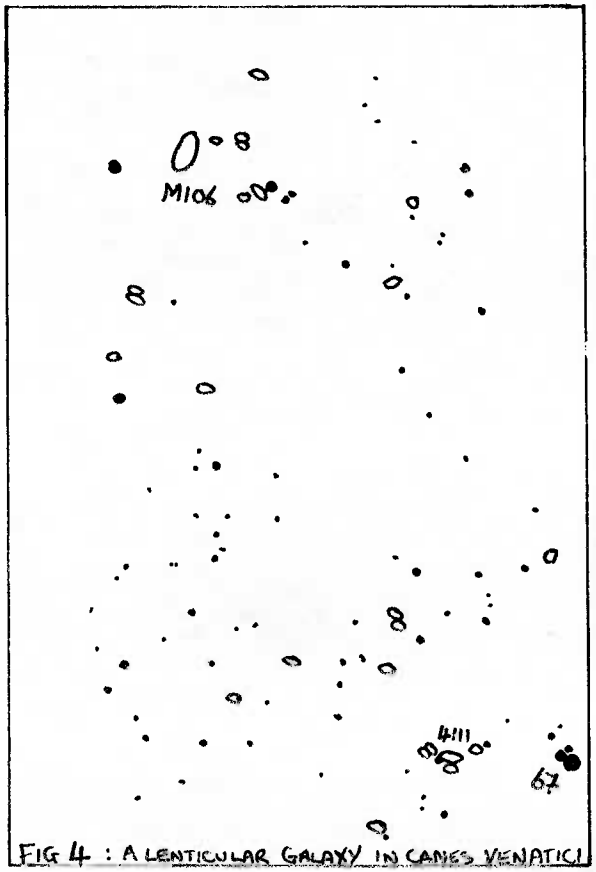


FIG 4 : A LENTICULAR GALAXY IN CANES VENATICI

a good example of very elongated *E7* ellipticals. It can be found about 4 arc-minutes to the east of *M49*, between two 7th magnitude stars. Small telescopes will show its elongated shape.

Lenticular galaxies are termed *S0*, that is galaxies that have a disk and a central bulge but with no obvious spiral arms. Within Hubble's scheme they fall between the elliptical form and the spiral forms. One example is the 11th magnitude *NGC4111* in Canes Venatici (Figure 4). It is the brightest member of a small group of galaxies, lying about 4° east of 67 Ursae Majoris. It is small with a bright middle. Larger telescopes may reveal the dark lane cutting through the nucleus.

Spiral galaxies come in two major forms, those with a central bar (*SB*) from which the arms extend, and those without (*S*), the arms simply issuing from the nucleus, resembling catherine wheels. Both of these groups can be further subdivided into *a*, *b* and *c* categories. *SBa* and *Sa* have tightly wound arms and a relatively large central bulge, while *SBc* and *Sc* have loosely formed arms and a small central bulge. Categories *SBb* and *Sb* fall in between these two extremes.

Canes Venatici is an ideal place to track down some examples of spiral galaxies. *M51* galaxies. *M51* (*NGC 5194*), better known as the *Whirlpool Galaxy*, lies around 3.5° southwest from Eta Ursa Majoris, (Figure 5). This is the galaxy that Lord Rosse, using the 72-inch telescope, first detected the now familiar spiral patterns. Apparently he had already observed *M51* using a 3-foot telescope and failed to detect this spiral pattern. These days a 10-inch telescope is sufficient to see the spiral nature. *M51* is an *Sc* type galaxy at about 8th magnitude. Its companion is the 10th magnitude *NGC 5195* which is classed as a peculiar galaxy. ➠

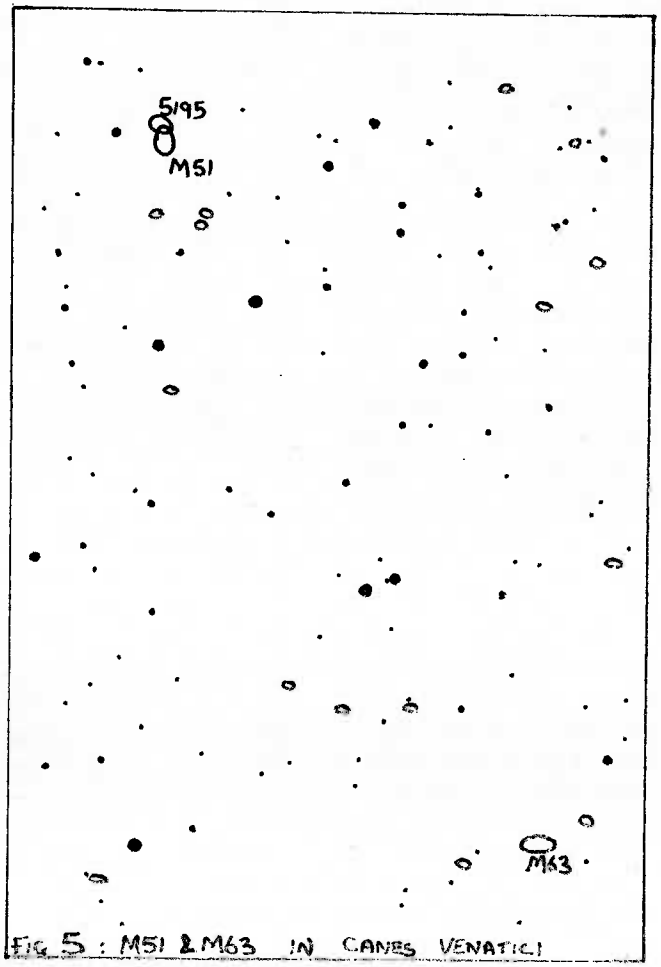


FIG 5 : M51 & M63 IN CANES VENATICI

Lying about 5.5° to the southwest of *M51* is the *Sb* spiral galaxy *M63* (*NGC 5055*) – Figure 5. It is 10th magnitude, with a small 8th magnitude star close by to the northwest. Only larger 'scopes will reveal any detail in the spiral features, in particular the slight differences in brightness between the inner part of the spiral and the outer. Our own Milky Way is thought to be an *Sb* type spiral. Moving into Coma Berenices about 1° northeast from 35 Comæ Berencis lies the 8th magnitude "Black Eye" galaxy, *M64* (*NGC 4826*). This is an *Sa* galaxy (though again some classify it as *Sb*) famous for its dust cloud which obscures the cental region. Only larger telescopes will show any sign of the absorption (Figure 6).

Coma Berencies also holds some fine barred spirals (Figure 3). Take the 10th magnitude *NGC 4548*, an *SBb* galaxy, small but quite bright – its central bar is readily seen. In Messier's Catalogue of Nebulous Objects, *M91* is not identified and is thought to have been a comet. Some authorities suggest that *NGC 4548* is in fact the missing *M91* and that Messier incorrectly gave its position – but who really knows? *M88* (*NGC 4501*) lies about 1° to the west of *M91*, another *SBb* galaxy. Quite bright at around 9.5 magnitude, it has a small bright nucleus, while the outer part has dark lanes with a knotty appearance to the arms.

Moving into Virgo again, about 3° to the southeast from *M88* lies *M90* (*NGC 4569*), an *Sb* type spiral of 10th magnitude (Figure 3). It serves as a marker to locate the next barred spiral *M58* (*NGC 4579*). An *SBa* galaxy, although some authorities mark this galaxy as a transitional galaxy, inbetween an ordinary spiral and a barred spiral. For the last example of a barred spiral galaxy - an *SBc*, it is necessary to locate *M49* again in Virgo. The 10th magnitude galaxy, NGC *4535* lies about 1° to the east. It is very sharp with a bright nucleus and shows two main arms.

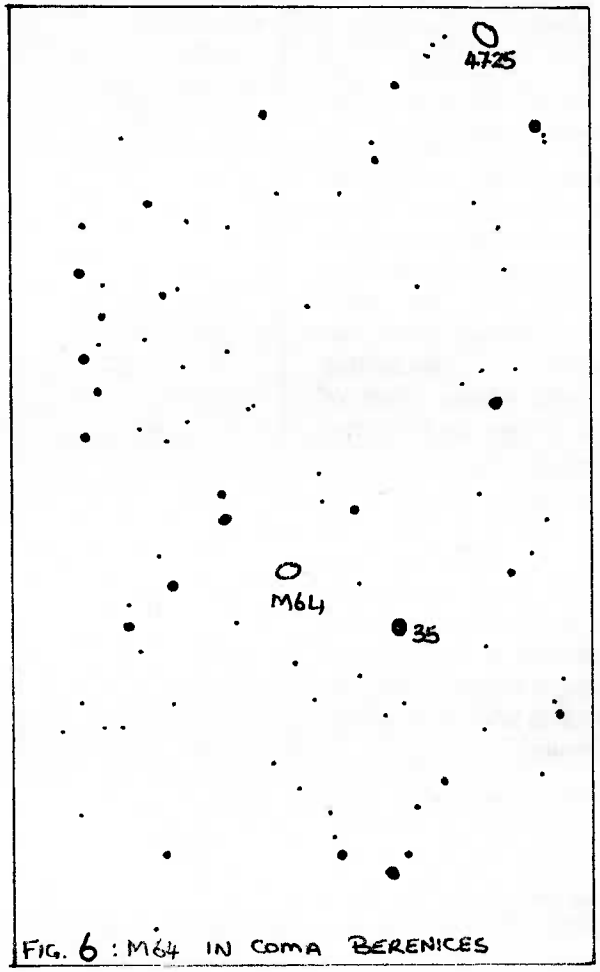


FIG. 6 : M64 IN COMA BERENICES

Irregular galaxies are those that have no regular form or structure. The best examples are the *Magellanic Clouds* although unfortunately these are not visible from this far north. Two irregular galaxies that are visible lie in Canes Venatici – close to 4.2 magnitude Beta Canum Venaticorum (Figure 7). The first, *NGC 4485*, lies about 1° to the west. It lies in the same field of view as the 10th magnitude *Sc* spiral *NGC 4490*, although the irregular galaxy is much fainter at 12th magnitude. In small telescopes it is quite rounded but faint, but larger ones will show some degree of elongation. *NGC 4490* is quite bright in small 'scopes and larger ones show a very bright core.

The next irregular galaxy is *NGC 4449*, lying about 2.5° to the north. Its overall magnitude is around 9. It appears rectangular in shape. Larger telescopes will show faint knots in the structure.

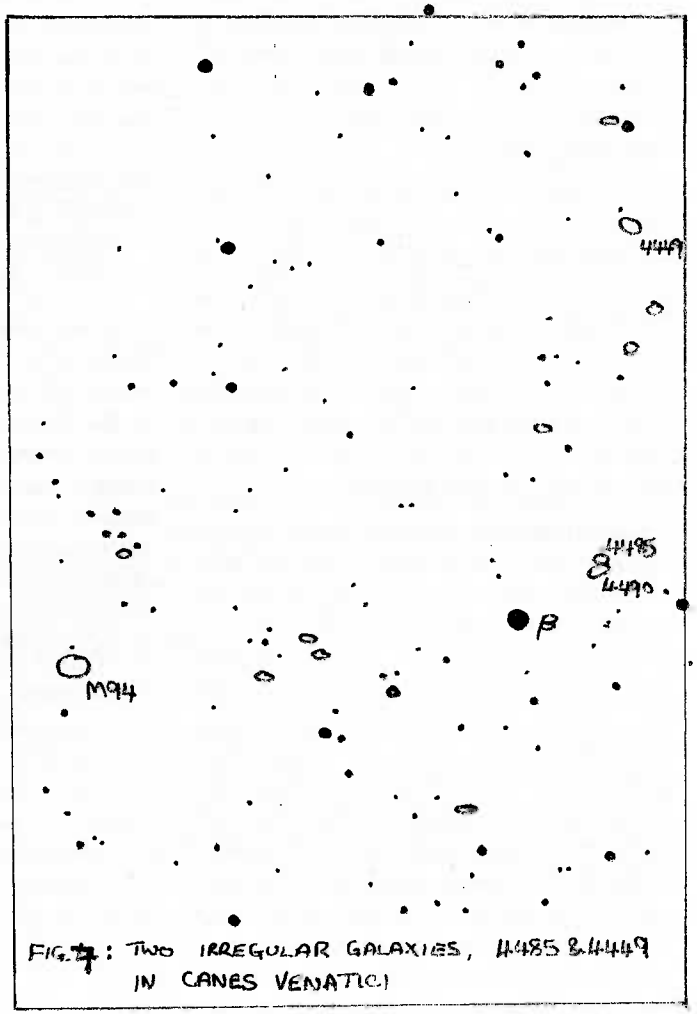


FIG. 7 : TWO IRREGULAR GALAXIES, 4485 & 4449 IN CANES VENATICI

Throughout this region lies a multitude of galaxies, many more than I could mention in this article, and no doubt I have left out your favourite galaxy. There are so many to chose from, but I hope that it has given you a taste for what is out there. It certainly is a magnificent region of the sky in which to be galaxy hunting. ☆

Mark Humphreys

A visit to Jodrell Bank

Over the years I have been to Jodrell bank several times (my family lives in Cheshire, and it is a fairly short drive to get there). It lies in the Cheshire countryside, near to Holmes Chapel. As you make your journey there, the *Lovell Telescope* suddenly appears above the trees and ➠

you realise how huge it is. For a few years I worked on the ninth floor of an office in Stockport which looked out over the flattish Cheshire countryside, and the telescope, several miles away, stood out well on the horizon.

Jodrell bank is set in lovely grounds, with a picnic area, small children's play area, Environment Discovery Centre (which we did not manage to see on this visit), and Arboretum. In these grounds there is a model of the Solar System (I think to scale). I've walked round these grounds before and not found Pluto, but, as it was pouring with rain during this visit, I decided against another look.

On a wet day there is plenty inside to keep all members of the family occupied. There are several 'hands-on' experiments, as well as funny mirrors, holograms, and how your weight changes on the Moon (for the better!). A life-size Isaac Newton is near the entrance, explaining how light is split through a prism; he is really ghoulish. Further on, Albert Einstein explains his famous equation $E=Mc^2$. There are all sorts of displays showing the different sizes of the planets, where we are in the universe, and how the Earth's position in space affects the weather on different continents. Other displays keep you up to date about what's going on in the world of astronomy.

The show we saw in the planetarium was definitely the best I have seen there. it took you around the night sky, with planets and major constellations pointed out. They showed the changing sky as the year progressed. Certain objects, such as *M31* were picked out, and you saw pictures of what you could expect to see in both 4-inch and 8-inch telescopes.

For someone just getting started in astronomy it gave a realistic picture of what you could see. I have often thought that some descriptions overstate what you see, and reality can be a bit of a let-down. My two daughters enjoyed the show, although the five-year-old got a bit fidgety. Children under five are not allowed into the planetarium, although they are allowed into the Centre for free.

Of course, the main attraction at Jodrell Bank is the 76-metre Lovell Telescope. Work on it started in 1957 (it was designed by Sir Charles Husband), and in 1960 a donation from Lord Nuffield secured its future. The Observatory, from then on, became known as the Nuffield Radio Astronomy Laboratories of the University of Manchester. The telescope was named the Lovell Telescope in 1987, in honour of the founder of Jodrell Bank.

The telescope, manned 24 hours a day, forms part of the *MERLIN* network; it joins up with other telescopes to form a larger one over 200 kilometres diameter. (*"MERLIN"* stands for *Multi-Element Radio Linked Interferometer Network*). When an even larger one is needed, Jodrell Bank can join up with others in Europe to form a telescope the size of a continent. Jodrell Bank astronomers are working on many projects, and have done a lot of work on pulsars.

The cost of admittance to the Centre is £3.80 adults, and £2.00 children, a family ticket costing £11.00. The shop is well stocked with all sorts of reasonably priced gifts, as well as a good selection of astronomy and science books. I would certainly recommend Jodrell Bank as a good day out, if you happen to be in the north of England. ☆

Debby Quertier

Eclipse activities

The activity in preparation for next year's total solar eclipse is increasing exponentially, and a lot has happened since the issue of the last newsletter.

In early April, David Le Conte attended the 1998 National Astronomy Meeting (NAM98) in St Andrew's, Scotland, assisting the States Tourist Board with a stand to promote NAM99 here in Guernsey. He also gave a short speech of welcome to over 200 delegates at a pre-dinner reception hosted by the Tourist Board. One session of the Conference was devoted to the eclipse, and it was also featured in concurrent sessions on solar physics.

David gave a brief presentation on his 1998 eclipse experiences at the BAA Winchester Weekend, at Easter. In mid-April he attended the Education Working Group meetings held in Plymouth, and was invited to give two presentations, on eclipse safety and what is being planned for the eclipse in the Bailiwick of Guernsey, to the plenary session of the UK Eclipse Group, in a packed City Council Chamber.

Following the Plymouth meetings he toured the path of total eclipse in Devon and Cornwall, and had meetings with many people, including the newly appointed Eclipse Coordinators for Plymouth City Council, Cornwall County Council, and those responsible in Devon County Council.

On 18 May Peter Hingley, RAS Librarian, visited the Island for discussions on the eclipse exhibition being planned for Candie Museum. Further planning is continuing, and it looks as if it going to be a super exhibition.

On 9 June David spoke about the eclipse to Year 10 Grammar School students.

On 10 June the Public Relations and Marketing Manager in Alderney organised a series of briefings to the media, States of Alderney members and officers, businesses, and hoteliers. Mike Maunder and David participated in the briefings. Mike spoke about what happens during an eclipse, how to observe it, and other issues. He used some of his excellent photographs of eclipses. David covered the eclipse path and the significance of the eclipse for Alderney.

Planning in Alderney is now well advanced. (Anyone hoping to stay on the Island during eclipse week must be quick, as there are very few beds left.) David appeared on BBC Radio Guernsey and Channel Television, in connection with the eclipse.

The *Alderney Journal* in June carried an article about the briefings held on 10 June.

On 27 June we welcomed Dr Jacqueline Mitton, RAS Press Officer, (also Editor of the BAA Handbook, and author of astronomy books, including the *Penguin Directory of Astronomy*), and her husband, Dr Simon Mitton (although author of a number of astronomy books and Editor of the *Cambridge Encylopedia of Astronomy*. Jacqueline was visiting Guernsey and Alderney to plan for media coverage of NAM99 and the eclipse.

Much more activity is being planned. David has been invited to talk about the eclipse to the Chamber of Commerce Lunch Club on 21 July, and will take the opportunity to emphasise the challenges to business, and the business opportunities which the eclipse affords. ➠

David will be attending a further meeting at the RAS in London on the 4th August. This is a wash-up meeting for NAM98, and is part of the planning for NAM99.

Tim Lillington, Senior Meteorological Observer at the Airport, and David have co-authored an article on the weather prospects for the eclipse. This will be published in the August issue of *Astronomy and Geophysics*, the journal of the RAS.

Web pages about the eclipse are being prepared (see back page of this issue), and an article giving answers to the many questions the general public of Guernsey and Alderney are asking about the eclipse will appear in the next issue of the newsletter of La Société.

Finally, David has been invited to give the 1999 Raymond Falla Memorial Lecture on 19 May 1999. You can guess the subject!

With all this activity already, in 1998, what is it going to be like in 1999? ☆

DLC

Astronomy and Space – References for further reading

Planets, Moons and Nebulæ in 3D

A total of 27 remarkable 3D images, including features on Mars, the Moon, the Eagle Nebula, and Jupiter's moon Io. (*Astronomy*, March 1998)

Patrick Moore

A profile and tribute to Britain's best known astronomer, as he celebrates his 75th birthday. (*Astronomy and Space*, March 1998)

The 1999 solar eclipse

The track of the eclipse and preview of the event. (*Sky and Telescope*, April 1998)

Jupiter's moon Europa

The best images yet from the Galileo spacecraft. High resolution photographs taken in December 1997 reveal mountains and a remarkable structure of ice flows, indicating the possible existence of oceans beneath the ice. (*Astronomy and Space*, April 1998)

Ice on the Moon

Confirmation of the discovery of water ice at the lunar poles. The story of this momentous discovery by the Lunar Prospector spacecraft. (*Astronomy and Space*, April 1998)

La Palma, Canary Islands

Report on a visit to one of the best observing sites in the northern hemisphere. The Observatory is run by the Royal Greenwich Observatory, and is the home of the Isaac Newton group of telescopes. (*Popular Astronomy*, April 1998)

Review of the Caribbean solar eclipse, 1998

The eclipse of 26th February in the Caribbean area and north coast of South America. (*Sky and Telescope*, May 1998)

Water vapour found by Infrared Space Observatory

The Infrared Space Observatory (*ISO*) has found huge amounts of water vapour being produced in an interstellar gas cloud located near the Orion nebula. It has also discovered water vapour in the atmosphere of Saturn's moon Titan. (*Astronomy and Space*, May 1998) ➠

Mars Global Surveyor

Although the spacecraft has not yet stabilised into a circular mapping orbit, further excellent photographs are being taken. a photograph of the controversial 'face' feature in the Cydonia area seems to have confirmed the illusory nature of the earlier Viking images. (*Astronomy and Space*, May 1998)

The Tunguska Event

There has never been a really satisfactory explanation for the world's largest recorded explosion, following the observation of an object over the Tungus area of Siberia on 30 June 1908. A new theory suggests that the event may have a geophysical cause linked with seismic activity. (*Modern Astronomy*, May 1998)

Martian meteorite analysis - continued

Two years of research into the possible evidence for fossil bacteria in meteorite *ALH84001*. The outcome may have to await study of further samples and exploration of the planet. (*Modern Astronomer*, May 1998)

Comets – Eugene Shoemaker

The hunt for comets and Earth orbit crossing asteroids. The work of the late Eugene Shoemaker, which was shared and now continued by his wife, Carolyn. (*Astronomy*, May 1998)

The Next Generation Space Telescope

A new orbiting observatory planned to replace the Hubble Space Telescope. Details of the design and expected capabilities of the telescope, now in the planning stage. (*Astronomy*, May 1998)

The Solar System – Lost planets?

Have we lost any planets? Chaos theory and possible instabilities in the Solar System. (*Astronomy*, May 1998)

The Astroscan telescope

A review of this very portable rich-field telescope, produced by Edmund Scientific Company. (*Astronomy*, May 1998)

Asteroid impact hazards

The vulnerability of Earth to possible cosmic collisions, one of which is now thought to have caused the extinction of the dinosaurs. (*Sky and Telescope*, June 1998)

First photograph of planet outside our Solar System

The Hubble Space Telescope's first photograph of a planet outside our solar System. Located in the constellation Taurus, the planet is near a binary star about 450 light-years away. (*The Times*, 29 May 1998) ☆

Geoff Falla

Nobody's perfect

"*The sun is at the centre of the universe*", according to The Usborne Book of World Religion. This glaring error appears in a picture caption, and appears to be stated as a corollary to the text, which refers to Galileo and the long-held belief that the Earth was at the centre of the universe.

David Le Conte wrote to the publishers, pointing out that while the Sun is at the centre of the solar system, it is certainly not at the centre of the universe. The Company replied, saying that they were grateful for the correction, and that they would ensure that it was changed in future reprints. ☆