Sagittarius

The Newsletter of the Astronomy Section of La Société Guernesiaise

October – December 2006

Forthcoming Events

Public Open Evening

31st October: 7.30 pm

Public Lecture

Megalithic Tombs: An Astronomical Connection by David Le Conte

8th November: 8.00 pm
Frossard Centre, Candie Gardens

Astronomy Section Christmas Meal

12th December: 8.00 pm
Fleur Du Jardin

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

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Inserts

Star chart

Sunset, sunrise, moonset and moonrise times

Solar System Planets Reclassified.

Since the discovery of the most distant planet Pluto, in 1930, it has always been understood that there are nine planets in our solar system. Closest to the Sun are the four inner planets - Mercury, Venus, Earth and Mars. Then the asteroid belt, and a more spread out group of much larger, gas covered planets - Jupiter, Saturn, Uranus and Neptune. The very small planet Pluto is usually much further away, but has a peculiar orbit which sometimes brings it inside the orbit of Neptune.

For some years now, many astronomers have been debating whether Pluto should really continue to be accepted as one of the main planets, or perhaps reclassified in some way. This became more complicated with recent discoveries of other small planetary-type objects, also in distant orbits around the Sun. One of these, found about three years ago, turned out to be slightly larger than Pluto itself - making some redefinition of the planets more urgent.

The asteroid belt, which exists in the wide gap between the inner and outer planets, also contains a number of sizeable objects. These have always been classified as minor planets, and may be the remains of a larger planet which broke up long ago.

At a recent meeting of the International Astronomical Union, it was decided to recommend that Pluto should remain as a planet. In addition, Pluto's large moon Charon, discovered in 1978, should also be accepted as the first twin planet with Pluto. The recently found planetary object slightly larger than Pluto, and unofficially named 'Xena' after a warrior princess, would also have planetary status, subject to a full approval, together with Ceres - the largest object in the asteroid belt. It is also suggested that, to be accepted, planets should be basically round in shape. This again would be a major change from what is currently accepted.

When all of this is settled, it seems that astronomy text books will need to be rewritten.

At a full meeting of the International Astronomical Union in Prague on August 24th, many of the earlier recommendations were overturned. It was decided after much debate that the solar system should be accepted as containing eight planets, and three 'dwarf planets' including Pluto, Ceres, and the recently found Xena, named unofficially by its discoverer.

More dwarf planets are expected to be added before long, and it is good to know that all the debate about Pluto is now concluded. It should also be noted that a 'dwarf planet' is, of course, still a planet.

Geoff Falla

Pluto, the rocky body formerly known as a planet.

What we have learned about the universe has sped rapidly during the late twentieth century, and at light speed compared to the years before the fifteenth or sixteenth centuries. It was only during the middle of the last millennium that it became accepted that our earth was one of various bodies in orbit around our sun. The idea that the universe was not geocentric had taken a long time to be finally accepted and forward thinking individuals were able to openly share their ideas. The advent of the use of the telescope around 1610 showed Jupiter as a world of its own with four moons in orbit around its giant body. 1781 saw the discovery of Uranus by William Herschel, the asteroids began to be found from about 1801 onwards and then followed discovery of Neptune in 1846. The components of the asteroid belt had been named minor planets which seemed logical as there was a theory that these many bodies between Mars and Jupiter had once been a planet broken apart by the force of Jupiter's gravity. Knowledge had moved on a long way from five 'wanderers' that moved against a fixed background of stars. These 'wanderers' became known as planets after the Greek word for wanderer.

Soon after the discovery of Uranus and Neptune the quest was on to find further planets orbiting our sun. Effects on the orbit of Neptune did indicate that there could be a further planet beyond Neptune. Detailed searches of the sky by a young astronomer named Clyde Tombaugh, using calculations by Percival Lowell, came across a small body early in 1930 amongst the stars of Gemini. This was the discovery of Pluto, which became the ninth planet in our solar system. It was so small and distant that even today very little is known. It was only as recently as 1978 that it was found to have a small companion which was named Charon, after the boatman that ferried the dead across the river Styx. Pluto, of course, was the Roman name for the god of the underworld.

An 11 year old girl named, Ventia Phiar had suggested the name for the newly discovered planet from her interest in Greek and Roman myths and the powers that be agreed. On a lighter note, I understand Mickey Mouse's dog was named after the planet as its discovery was major news at the time.

The two distant bodies, Pluto and Charon are quite small both less in diameter than our moon, with Charon being about half the diameter of Pluto. Pluto is 3.6 billion miles from the sun and it takes 248 years to complete one orbit which is no wonder it wasn't found very easily. Pluto also has an eccentric orbit and between 1979 and 1999 was inside the orbit of Neptune making Neptune the outermost planet for a short time (astronomically speaking of course!)

During the late twentieth century a host of solar system bodies were discovered beyond Pluto and distant regions of our solar system were known as the Kuiper Belt and the Oort Cloud. The Oort Cloud is the furthest out and it is believed that this is the region where comets originate. The nearer Kuiper Belt was thought to contain bodies similar to Pluto and the idea arose that maybe Pluto wasn't a true planet but perhaps one of the largest (so far) of these outer bodies. There had not been any clear technical definition of what constituted a planet. The discoveries in recent years of Sedna, Quaoar and especially 2003 UB313, which is larger than Pluto, fuelled the debate about exactly how a planet should be defined. 2003 UB 313 is over three times Pluto's distance from the sun and takes around 548 years to complete one orbit.

These newly discovered minor planets, with poor old Pluto now being demoted, orbit at vast distance from the sun and need powerful telescopes to locate them. Just how big is our solar system? How far away does a body have to be before the influence of the sun's gravity becomes negligible. We look at Mars, a relative neighbour of the sun compared to Sedna and Quaoar, but too far from the sun for its heat and light to support sustainable life. These new minor planets are so far away that the pull of gravity must be so small. How far out does a body have to be before the sun has no gravitational influence on it? What is the furthest point that a body can be to remain in orbit around our sun? Or any sun for that matter. Questions to be debated the next time cloudy skies prevent viewing.

With observing in mind, I recall a night a few years ago when 3 or 4 of us stayed at the observatory until the early hours and saw Pluto for the first time in our Meade telescope. It was not an easy object to find, the faintest of star like points but the identification was made easier with our computer software. Nevertheless, we were all so delighted to have seen the ninth and outermost planet in our solar system. I definitely felt I saw a planet that night and I won't forget how pleased I was to have done so. I haven't yet seen any of the asteroids but hope to do so but I'm sure they won't give the same pleasure. I do feel sorry that Pluto has lost its planetary status and whilst I accept that with the recent discoveries clarification was needed I would have preferred to see the nine planets left as they were with additional minor bodies added. Astronomy and science text books are constantly rewritten as the subjects develop and I suppose this is just another development. However I can't help but feel that a planet is still not defined properly, they are large or small, hot or cold, solid and rocky or great spheres of gas. Perhaps there will be some new discovery that will throw the latest definition up in the air.

Goodness only knows what the astrologers will do now with their forecasts and why didn't they predict this coming?

Debby Quertier

The Norman Lockyer Observatory

In August I had the opportunity of visiting the Norman Lockyer Observatory in Sidmouth, Devon. Norman Lockyer is famous for finding helium in the Sun in 1868. I saw the actual telescope that he used but not the original spectrometer.

I found observatory opening times on the internet. Between May and September, the observatory is open on Wednesday afternoons at 2.30 pm and Thursday evening at 7.30 pm. During winter it is open on Thursday and Saturday evenings at 7.30 pm. We arrived at 2.30 pm having arranged to stay with my cousin near Penzance that evening some 150 miles away. Still, I thought, plenty of time.

The Observatory is very impressive built on high ground away from the town. The domes were immediately evident. My wife, Val decided to stay in the car and catch up with some post cards and have a look around the area. The doors were just opening and there were about 30 other people venturing in. I wasn't sure what to expect, just a look around, asking some questions perhaps.

There were 4 or 5 guides and one organised us into two groups. My group was shown into an extremely comfortable theatre of around 100 seats. A Guide, using Power Point presentation on a large screen, gave a very relaxed, but detailed talk, for about twenty minutes on astronomy in general followed by questions and answers.

We then moved on to a short demonstration of real time satellite images which were being received for weather forecasting. Just by using the mouse our guide could show not only the temperature at any point on the globe, but also the temperature at 1000 feet higher. We moved on again, this time into about a 100 seater Planetarium. We again received a very professional talk followed by questions and answers. Evening visits are apparently very similar with the added bonus of viewing thrown in with clear skies. The observatory also have visiting speakers and run formal astronomy courses.

Next on our tour was the telescopes themselves. It was the first time that I have been inside an observatory dome. I now know that the domes can be moved by pulling on a loop of rope until you have the part of the sky you want visible. Once the telescope is aligned using setting circles the dome can be moved accordingly. All the telescopes that we saw were refractors.

I was thoroughly enjoying myself.

We were shown Norman Lockyer's telescope with which he had discovered helium. Helium was unknown at the time and this was such an important discovery that it was the beginning of modern astrophysics. We were near the end of our tour and I was looking forward to having a chat to one or two guides but was amazed

to find it was nearly 6.00 pm. It had all been so interesting that I had lost all sense of time - by now we should have been well past Exeter on the A30.

I highly recommend a visit as I had a fabulous time and intend to return. The admission charge is a bargain at just £4.

Frank Dowding

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

The First Billion Years of the Cosmos. Astronomers are still learning about the early history of the universe. Evidence indicates that after the big bang there was a period of darkness, before the formation of galaxies with their countless stars brought light back again after about a billion years. (Astronomy, June 2006)

Pluto's New Worlds. Pluto has now been found to have another two small moons in addition to its large moon Charon, discovered in 1978. The story behind this discovery by two astronomers, who are also involved in NASA's New Horizons mission to Pluto which was launched in January. (Astronomy, June 2006)

Flamsteed's Star Atlas. The achievements of England's first Astronomer Royal, John Flamsteed, in particular his development of the first modern type Star Atlas - the Atlas Coelestis. (Sky and Telescope, July 2006)

A Quasar in Every Galaxy? Recent observations suggest that black holes are a common feature of galactic centres, and that quasar-like outbursts of energy are produced as hot matter accretes on to the core. (Sky and Telescope, July 2006)

Smart 1 Mission Almost Complete. The European Space Agency's Smart 1 mission was launched two years ago to test the operation of a solar powered ion engine, and to study the Moon from orbit in high resolution detail. The mission is due to end in August. (Sky at Night, July 2006.)

The Planet Venus. A detailed summary on what is currently known about Venus, so similar to the Earth in size, and relatively close to us in comparison with other planets, but so different in many ways. (Sky at Night, July 2006)

Saturn- The Cassini Mission Findings. There have been some surprising discoveries since the arrival of the Cassini spacecraft at Saturn in June 2004. Details of what has been found, including new information about Saturn's moons, and in particular the moons Titan and Enceladus. (Astronomy, July 2006)

Cosmic Collisions. NASA's Swift satellite was launched into orbit in 2004, and has since observed more than a hundred mysterious gamma ray bursts. It is thought that these may be caused by neutron star collisions. (Astronomy, July, 2006.)

The Mystery 'Spiders' of Mars. There are several kinds of mystery features found recently in the south polar regions of Mars. These include branched, dark spider-like features, averaging about a thousand feet in diameter, and formed by some presently unknown process. (Astronomy, July 2006)

Our Mystifying Milky Way. Ten Mysteries of the Milky Way. Our galaxy was primarily formed from a disc of stars, but some of its mysteries are not yet fully resolved. Including how the galaxy was born, the formation of the spiral arms, what is at the centre, and how it may all end. (Astronomy Now, August 2006.)

Thomas Harriot - the Englishman who beat Galileo. Galileo is credited with discovering the four main moons of Jupiter in 1610, but there is evidence that English astronomer Thomas Harriot was perhaps the first to do this. He used a telescope to observe and map the Moon in July, 1609. He also recorded sunspots, and as an accomplished mathematician he observed and measured the paths of a number of comets. (Astronomy Now, August 2006)

What Happened to Life on Mars? It is now ten years since it was announced that a meteorite from Mars was thought to contain evidence of life (and thirty years since the Viking landers also found some controversial evidence). A summary of the findings so far, and current thinking on the possibilities of life there. (Sky at Night, August 2006)

Patrick Moore's Top Ten Summer Sights. Favourite objects to observe in the summer sky, including a few not so well known as the more popular ones. The favourite ten include nebulae, star clusters, and double stars. (Sky at Night, August 2006)

The View from Mars. The two NASA Mars Rover vehicles, Spirit and Opportunity, are still operational - for much longer than was anticipated. They have been able to make observations of stars and meteors, also following the movements of the moons Phobos and Deimos in their orbits. (Sky and Telescope, August 2006)

Rocks from Space. A major set of articles on the subject of meteorites. Including the origin of meteorites - some containing particles older than any of the planets; the asteroid belt where collisions produce many potential meteorites; craters produced by impacts on Earth, and a detailed study of Arizona's Meteor Crater, produced by a giant impact 50,000 years ago. Many other articles about meteorites in this special issue. (Astronomy, August 2006)

Asteroid Itokawa. A detailed look at Itokawa, an asteroid* which crosses the orbits of both Earth and Mars, and was visited by a Japanese spacecraft in November 2005. It is hoped that the spacecraft will return safely to Earth in 2010, with the first ever sample from the surface of an asteroid. (Sky and Telescope, September 2006)

[* At a meeting of the International

Astronomical Union on August 24th, it seems to have been decided that asteroids will no longer be officially classed as minor planets, but instead will be called 'small solar-system bodies', perhaps to avoid confusion with the newly designated dwarf planets including Pluto.]

Section News

Please note David Le Conte's lecture announcement on the front cover. He will report on his recent research into the orientations of Guernsey's megalithic tombs, assesses whether they have any astronomical significance, and relates them to the orientations of Guernsey's mediaeval churches.

We have one remaining open evening for 2006 at the end of October. This is usually a 'hands on' session for younger people using our smaller telescopes since it coincides with half term. There is a rumour that Halloween might be a theme this year!

A wireless network has been set up at the observatory which works between the two buildings. In future we hope to be able to view images from the Meade telescope in the comfort of the Main building.

Clearly this month more articles are desperately needed!

Colin Spicer

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