NEWSLETTER

June - August 2014 Issue 167

Owen Cornelius receiving the 2014 Bill Sutherland award from Chairman Roger Butler at the 2014 AGM. *Photo: Ian Davies*

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Editorial — Ian Davies

This Newsletter brings to a close the 39th season of Cardiff Astronomical Society and so begins the 40th season. Once again Dave has produced a great lecture programme for you, there is a sneak preview of the beginning of the programme on page 18.

As of July 2015 the Society will have been running for 40 years and the committee on your behalf are planning a number of events to celibate the Society's 40th Anniversary. These will be developed over the next six months or so. However your committee is aware that we may not have come up with all the good ideas for events and we would welcome any ideas from the general membership of celebratory events for the Anniversary. If you have an idea please let the committee know by through the usual channels or the suggestion box at meetings.

Wishing you dark skies - Ian.

Contact Details

Have you changed your email address or other contact details recently? Some that we hold appear to be out of date. You could be missing out. Please keep us up to date with any changes, send your revised details to either our Membership Secretary (Membership.Secretary@cardiff-astronomical-society.co.uk) or Secretary (Secretary@cardiff-astronomical-society.co.uk).

Publication Dates

The CAS newsletter is published at the first society meeting of September, December, March and June. The deadline for submissions is 4 weeks before the publication date (deadline for Issue 168 is 7th August).

Visit CAS on the web @

http://www.cardiff-astronomical-society.co.uk
General enquiries email info@cardiff-astronomical-society.co.uk
Remember as a CAS member you can use the Members' Area of the web site. You will need you password to access this area. If you don't know your password it is your surname followed by your membership number.

CAS is now on twitter, to follow us, follow **CardiffAS**

CAS on facebook at
http://www.facebook.com/CardiffAS

Your Membership is changing!

Mark Major

The membership of the society is now nearly 500 and increasing. While we can rightly be proud to be one of the largest, if not the largest, astronomical society in the UK, maintaining the membership list is becoming a challenge! This is why we have opted to migrate our old membership records to a Customer Relationship Management (CRM) system.

This move will allow us handle renewals more effectively and as a result we will be moving to a rolling 12 month subscription rather than the September to August system we currently have in place.

Our Membership cards will also be changing, we are dropping the date from the cards and the need to issue new ones every year. The new style cards will have an imbedded chip which will link into the CRM system and will allow us to quickly check and verify membership.

Please bear with me while the new system is rolled-out, I will be staggering renewals to avoid a rush come September! If you have any questions don't be afraid to grab me at one of the meetings.

Another Galactic Moment

Roger Butler, Chairman

Birthday, Christmas, New Year, Summer Solstice, MOT; all annual occasions that remind us that we have successfully completed another loop around our Sun, aboard our Earthship. The society AGM is yet another yearly event that gives us cause to pause for a moment to contemplate what we have achieved, where we are and where we are headed.

The meeting is unlike our usual Thursday programme and, because there is no astronomical content per se, it is usually poorly attended. This year it was good to note greater interest from our members.

The evening is dominated by the annual reports from various members of the committee with special responsibilities and roles.

There is an opportunity for members to ask questions and make comment. You can read all the reports in full on the website, under 'Members' Area' > Committee Meeting Agendas and Minutes > Annual General Meeting.

An important part of the meeting is the discussion of items from the floor. Mostly the committee are already aware of the topics and have been trying to resolve issues for some time. This time, mention was made of the poor sound and visual quality in the lecture theatre. It has to said that the committee is very grateful to the university to be allowed to used the lecture theatre free of charge. So we do not have any real control over the resources available there. Some of our speakers are unused to speaking to such a large audience and others are reluctant to use a radio microphone. In the Secretary's report, mention was made that each year it becomes increasing difficult to entice prominent speakers to Cardiff to give their presentation. The number willing to speak without a fee and merely for travel expenses is diminishing. In contrast to CAS, the vast majority of amateur astronomical societies in the UK do not have the support of the academic staff at the university and can rarely afford any outside speakers having, to rely of in-house presentations by members. Perhaps the perception of holding our meetings in a high profile university with many talks by professional research scientists has discouraged our members from volunteering to speak. This is a pity as we have several members who are able to address an audience about their interests, discoveries or individual research. I do hope that they can be persuaded to come forward and with discuss the possibilities with our Secretary.

The brightest star arising in the east at the moment is Owen Cornelius. He is a Junior Member and currently Junior Reporter, assisting our Junior Representative, Kayleigh Churchill. This year Owen has been very active at our events, helping out in all manner of ways. He is very good at engaging with the staff of the various venues we attend and often they ask if they can keep him. Well no ! – Owen is ours and is destined to be a leading light in our fledgling junior activities. Little wonder that, when nominations for this year's

Bill Sutherland Award were called for, Owen's name was the only one proposed and he was elected unanimously. (You can see Owen receiving his award on the front cover. Ed.)

I am sure there are many other talents among our junior members and, as the number of our years for some of us begins to add up alarmingly, it is good to see that the younger generation are preparing to keep amateur astronomy alive and, eventually, take on the running of the society in the future.

Sidmouth Observatory Trip Saturday May 24th 2014. Dave Powell.

Good news to begin, Lyn and I got there in good time to catch the coach.

Most passengers got on in Cardiff, and we made one other stop in Newport, before beginning the journey. The weather was bad, lots of rain and spray on the motorway.

Were we downhearted? Mostly no, but our driver Andrew who expected to be driving a 48 seater had been allocated a 57 seater and was somewhat anxious as to such a large vehicle making it up the "long and winding road"(sorry Paul) to the observatory. Rosa being as ever a professional, told him to "stop worrying and just drive". As we got nearer our destination the motorway signs became ominous," Devon County Show" cancelled. In fact the car parks were waterlogged. We now met "show" "traffic being turned away, and got stuck behind one very old and very slow tractor that led a queue stretching back for miles. We were now off the motorway and on a narrow road so watched and held our breath as

cars towing large caravans overtook the tractor while keeping a watchful eye on traffic coming the other way. Then it was our turn, while our driver did the manoeuvre I held my breath until Lyn slapped my back and my colour returned to normal.

We first dropped some passengers off near the sea front. Not everyone had come to see the observatory; some came to visit a donkey sanctuary, but we made

them promise not to bring one home with them. Then within five minutes we were turning into the big car park and being greeted by several domes of various sizes. Still it rained, but were we downhearted? No, wet, but not downhearted.

Now at this point I must point out I had an ulterior motive for being on the trip. You see the society made its first visit here on June 6th 1981. On that day we were blessed with glorious sunshine, which was very fortunate because the observatory was in a very sorry state indeed. There was little to see except for some rundown buildings with various windows missing and many of us thought the observatory would soon be gone, in fact the land was at this point up for sale and it was expected that houses would replace it. However local opposition kicked in and although much of the original land was sold to the National Trust, this allowed for development of what was left and a new refurbished observatory fit for the 21st century now stands testament to people power.

I was there to meet up with one of the original CAS committee members, Steve Godfrey. Steve was our first treasurer and was responsible for making sure CAS was on a firm financial footing. He must have done something right, because that was almost 40 years ago. Steve and I had not seen each other for many years and we had a lot of catching up to do. Having recently retired, Steve is now living about 10 miles from the observatory. We both greeted each other exclaiming neither of us had changed, but he ever the gentleman was I think just being nice, or perhaps in shock, still for my part at least, I could have chatted away for the whole weekend, I was so excited to see him again after all these years. I intend to invite Steve and Carol, his wife to Cardiff sometime next year for our 40th celebrations.

So while all this was going on between us, the group was split up into

smaller portions and taken off to see the various instruments and domes.

The planetarium was popular, described by our host Mac as being a tin can with holes drilled into it. He then thought this description needed an explanation so added “but some holes have lenses inserted as well”.Oh so that’s alright then.

The observatory team, including David Strange, no stranger to CAS stopped at nothing to make our visit pleasant and memorable. They even offered to make and supply us all with a cup of tea or coffee. They were great hosts.

Then at the allotted time 3pm Rosa ordered us back on the coach for a trip to the seaside, as this would give us all an appetite for our evening meal.

We said our farewells, and jumped back on board trying to dodge the rain teeming down. With the wind howling, the rain horizontal, Rosa nearly had to resort to violence to get us to leave the warmth of our coach. “Be back here by 5pm” she barked, “now go and enjoy yourselves” she ordered and remember” things could be worse”. I thought of these words as I clung to Lyn.” I know” she bellowed above the howling wind and lashing rain,” last time we came to Sidmouth we spent time on the beach, lets have a look” What can I say. The beach was missing, under a wall of seawater that was up to the promenade seawall. The waves threatened to cascade over and into the town centre. I managed to take some snaps before beating a hasty retreat, so we went for a cup of tea and a toasted teacake. “Come on let's go do some shopping” shouted Lyn above the roar of the sea and lashing rain. Incredibly we did, well how long can you make a toasted tea cake last?.

Mercifully it was time to make our way back to the pickup point. As we

huddled in the bus shelter I recognised various bedraggled members, and greeted them with a hearty “Hello, had a good time”? The replies were drowned out. The coach arrived, and Rosa searched those who went to the donkey sanctuary as she had heard a rumour someone had suggested sneaking one on board. But ever professional Rosa explained,” If it was not counted on board when we set off, its not coming back”.

Then we arrived in Exeter for our evening meal in a Toby Inn.

As one would expect from Rosa this part of the day went smoothly and we were all seated in one room and ate a hearty meal.

Back on the coach for 7pm we were soon on our way down the M5, the weather still awful but we made good time and pulled into Cardiff just after 9.30pm.

Some readers may not realise this but this trip was the last one arranged by Rosa. She has decided to stand down and give someone else a go. She will be a very hard act to follow.

Others, including myself have organised various trips and they have always been successful, but Rosa has in my opinion consistently organised the most professional and well-run trips and dinners I can remember.

Rosa I salute you.

The Power of the Sun's Engines

Dr. Ethan Siegel

Here on Earth, the sun provides us with the vast majority of our energy, striking the top of the atmosphere with up to 1,000 Watts of power per square meter, albeit highly dependent on the sunlight's angle-of-incidence. But remember that the sun is a whopping 150 million kilometers away, and sends an equal amount of radiation in all directions; the Earth-facing direction is nothing special. Even considering sunspots, solar flares, and long-and-short term variations in solar irradiance, the sun's energy output is always constant to about one-part-in-1,000. All told, our parent star consistently outputs an estimated 4 × 1026 Watts of power; one second of the sun's emissions could power all the world's energy needs for over 700,000 years.

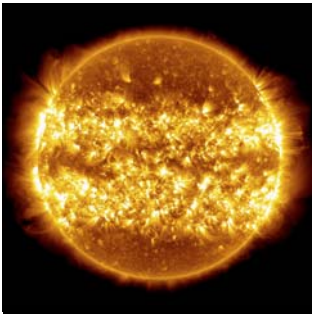


Image credit: composite of 25 images of the sun, showing solar outburst/activity over a 365 day period; NASA / Solar Dynamics Observatory / Atmospheric Imaging Assembly / S. Wiessinger; post-processing by E. Siegel.

That's a literally astronomical amount of energy, and it comes about thanks to the hugeness of the sun. With a radius of 700,000 kilometers, it would take 109 Earths, lined up from end-to-end, just to go across the diameter of the sun once. Unlike our Earth, however, the sun is made up of around 70% hydrogen by mass, and it's the individual protons —— or the nuclei of hydrogen atoms — that fuse together, eventually becoming helium-4 and releasing a tremendous amount of energy. All told, for every four protons that wind up becoming helium-4, a tiny bit of mass — just 0.7% of the original amount — gets converted into energy by E=mc2, and that's where the sun's power originates.

You'd be correct in thinking that fusing ~4 × 1038 protons-per-second gives off a tremendous amount of energy, but remember that nuclear fusion occurs in a huge region of the sun: about the innermost quarter (in radius) is where 99% of it is actively taking place. So there might be 4 × 1026 Watts of power put out, but that's spread out over 2.2 × 1025 cubic meters, meaning the sun's energy output per-unit-volume is just 18 W / m3. Compare this to the average human being, whose basal metabolic rate is equivalent to around 100 Watts, yet takes up just 0.06 cubic meters of space. In other words, you emit 100 times as much energy-per-unit-volume as the sun! It's only because the sun is so large and massive that its power is so great.

It's this slow process, releasing huge amounts of energy per reaction over an incredibly large volume, that has powered life on our world throughout its entire history. It may not appear so impressive if you look at just a tiny region, but — at least for our sun — that huge size really adds up!

Check out these “10 Need-to-Know Things About the Sun”: http://solarsystem.nasa.gov/planets/profile.cfm?Object=Sun.

Kids can learn more about an intriguing solar mystery at NASA’s Space Place: http://spaceplace.nasa.gov/sun-corona.

The Stories Behind the August Perseids

Mike Simonsen

Simostronomy (http://simostronomy.blogspot.com/)

It's August, so for better or worse, two stories will be making the rounds in the blogosphere. First, is the Mars Hoax email that will not die. I've written about this before, so we won't go there again. Second, is the Perseid meteor shower, which occurs every August.

The Perseids are my favorite meteor shower because the late summer weather is a lot easier to tolerate than some of the cold winter nights other annual showers happen to occur, like the Leonids in November and the Geminids in December.

Every August that the Moon promises not to interfere, we are reminded that this will be the best meteor shower of the year. But there is more to the Perseids than meets the eye and there are some interesting stories behind the Perseids that don't generally get told. I'd like to share some of them with you here.

Let's start with where do meteor showers come from?

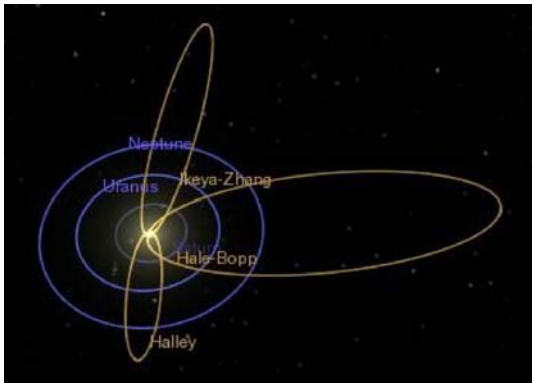
We know today that there are streams of particles, called meteoroids, in orbit around the Sun. When the Earth encounters one of these streams, these mostly dust sized particles are trapped by Earth's gravity and burn up as they descend through the atmosphere. The result of this flame-out is a meteor, or what people commonly refer to as "a shooting star."

But where do these streams of meteoroids come from?

In the 1800's Giovanni Schiaparelli was the first to suggest that meteor showers were associated with periodic comets. Schiaparelli noted the orbits of some periodic comets coincided with the orbits of streams of particles responsible for meteor showers. One of these, Biela's comet, discovered in 1826, was identified by Austrian astronomer Wilhelm Baron von Biela as a periodic comet that returned every 6.6 years.

Biela's comet put on quite a show on subsequent returns after its discovery. It was seen to break apart into two pieces in 1846, and in 1852 the two fragments returned as twin comets! The remains were

assumed to have disintegrated entirely since the comet was never seen again. In 1872 and 1885, however, when Earth crossed the path of the comet's known orbit, bright meteor showers known as Andromedids (or Bielids) were observed. This seemed to prove the idea that meteor showers are composed of fragments of disintegrated comets. Schiaparelli was also the first to show that the Perseid and Leonid meteor showers were associated with comets.



Today we know several annual meteor showers and their connection to periodic comets. The eta Aquarids and Orionids are associated with the famous comet 1P/Halley. The Southern Taurids are associated with comet 2P/Enke. I've already explained that the Andomedids come from comet 3P/Biela, the comet that broke into two pieces and then disintegrated entirely. The Leonids come from debris left behind from comet 55P/Temple-Tuttle and, getting back to our August astronomy story, the Perseids occur when Earth encounters the stream of dust left behind from comet 109P/Swift-Tuttle.

And here is another story within a story, the naming convention for comets. What is all this 1P/ and 2D stuff all about?

The exact rules for comet nomenclature are pretty involved, but essentially the letter P stands for a periodic comet with a period of less than 200 years. C stands for a comet that is not periodic, and D stands for a comet that has broken up or been lost, a dark comet. The names associated with comets are most often the discoverer or co-discoverers of the comet, although some of them, like Halley's Comet are named after the astronomers who first calculated their orbits rather than their original discoverers. The number corresponds to the order and number of discovery of that type of comet. 109P/Swift-Tuttle, the comet responsible for the Perseid meteor shower each year, is therefore the 109th periodic comet

known, and it is named after its co-discoverers, Swift and Tuttle; which leads us to two more stories behind the story of the Perseid meteors.

Who were Swift and Tuttle?

Lewis Swift was born in Clarkson, New York on February 29, 1820. Swift was a farmer and hardware store owner by trade. Between 1866 and 1892 he discovered thirteen comets, making him one of the most prolific comet discoverers of all time. Lewis Swift's life story is one of pain, perseverance, disappointment, delight, fame and fortune.

According to Swift, he first really became interested in astronomy after observing the Great Comet of 1843. This comet was so bright it could be seen in broad daylight and its tail extended 40 degrees across the sky!

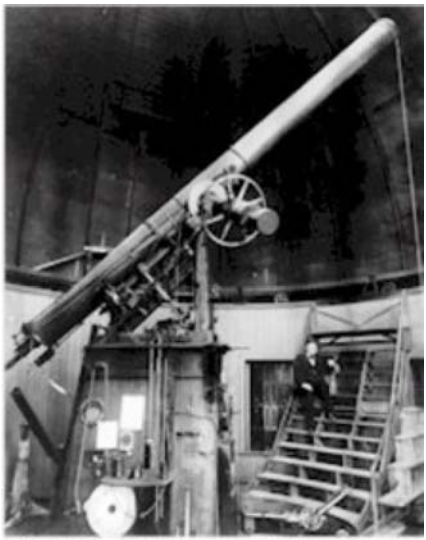
Swift made his first telescope, a 3-inch refractor with a lens purchased for $5.00 from the Spencer Optical Company. In 1858 the 3-inch was accidentally broken, so Swift purchased a 4 1/2-inch 'comet seeker' from the American optical craftsman Henry Fitz. This was the telescope he made all but one of his comet discoveries with. His early observatories weren't much more than small platforms built on the roof of his barn, accessed through a hole cut in the roof.

His first comet discovery, and the one he is most famous for, was actually quite by accident. Upon hearing of the discovery of a comet in the northern sky, near Polaris, the North Star, Swift decided to observe the comet one July evening in 1862. After less than five minutes he came across a beautiful comet that he took for granted was the comet he had been looking for. After following the comet for several nights it become clear that this was actually a different comet. In fact, it was the same comet that Harvard astronomer Horace Tuttle had independently discovered a few days after Swift.

It was in 1866 that Giavonni Shiaparelli announced that comet 1862III (Swift-Tuttle) traveled in an orbit virtually identical to the Perseid meteor stream. Swift and Tuttle argued bitterly for years over who deserved credit for this important comet's discovery.

In 1872, Swift moved to Rochester, New York and opened a hardware store. He became well known for discovering comets with his 4 1/2-inch telescope from the roof a local cider mill. As his popularity increased, he began to give lectures on astronomy and often held what we now call star parties, showing people comets and other celestial wonders in Lake View Park.

In 1879, Swift found a generous patron in Rochester patent medicine businessman Hulbert Harrington Warner, who financed the building of an observatory for Swift. Warner assured "Professor Swift" as he had become known, that if Swift could raise the money to purchase a large telescope, Warner would build an observatory for it. The original estimate for construction of the observatory was $20,000.



rpf00505.jpg RFL Local History Division

Swift was able to fulfill his part of the bargain by collecting donations for a 16-inch Alvan Clark & Son telescope from the people of Rochester, NY. When the observatory opened it was the fourth largest telescope in the United States. The plans for the observatory also called for an astronomical library, an elevator and a residence for Professor Swift and his family. Ultimately, the Observatory cost Warner $100,000.

The observatory itself was the first observatory in the world to encourage visits by the general public. All a visitor had to do was buy a ticket for 25 cents at Warner's business on St. Paul Street. It became so well known that it was included in travel guidebooks.

Soon after the observatory opened in 1882, Swift closed his hardware store and became, for all intents and purposes, a professional astronomer. Swift's attentions soon turned from comets to nebulae. While Charles Messier had considered them to be mostly annoyances to the discovery of comets, Swift believed they were worthy of study in their own right. By the end of his career he had discovered over 1200 objects, ranking him third behind the Herschels and number one among American observers.

He was awarded an honorary Ph.D. from Rochester University, and received more medals than any other astronomer of his time, including three from the Imperial Academy of Science in Australia, four from the Astronomical Society of the Pacific, and the Laplace Medal from the French Astronomical Society. In 1897 he was the first person awarded the Jackson-Gwilt Medal of the Royal Astronomical Society.

In 1893, motivated largely by the construction of an Episcopal church next door to the observatory that blocked his view to the sky, Swift relocated the 16-inch telescope to Lowe Observatory on Echo Mountain in California, where he spent the remainder of his career. Swift discovered his last comet in 1899 at the age of 79. Although some of his comet discoveries can surely be said to be lucky, most were the result of persistent, systematic, tireless observations. Swift was known to remark often, "One cannot discover comets lying in bed."

The second half of the story behind the discovery of Comet Swift-Tuttle is Horace Parnell Tuttle. Born March 17, 1837 in Newfield, Maine, Horace's life story is a bit more of a mystery.

Charles Wesley Tuttle, Horace's older brother, was an amateur astronomer who constructed his own telescope, and upon visiting the Harvard Observatory so impressed observatory director, William Bond, he was hired as an assistant observer. This was Horace's connection and eventual inroad to working at Harvard Observatory later on.

Charles was eventually replaced at Harvard by his younger brother Horace as an observatory assistant. Horace became attached to the observatory's four-inch Merz comet seeker, which he used on

the balconies of the observatory of the 15-inch refractor, spending night after night in search of new comets. While not as prolific as Swift, Horace Tuttle proved to be a successful comet hunter.

He discovered or co-discovered numerous comets, including 55P/Tempel-Tuttle, parent body of the Leonid meteor shower, 109P/Swift-Tuttle, parent body of the Perseid meteor shower, and the "Great Comet of 1860." Other comets that bear his name are 8P/Tuttle, parent comet of the Ursid meteor shower, 41P/Tuttle-Giacobini-Kresak and C/1861 Y1 Tuttle. In 1859 he was awarded the Lalande Prize of the French Academy of Sciences for discovering of two comets in one year (1858).

With the outbreak of the Civil War, Horace Tuttle enlisted in the 44th Massachusetts Volunteer Infantry and served at New Bern, North Carolina. He continued to make astronomical observations during the war, reporting on the appearance of Comet Tempel 1864 II.

The war had taken Tuttle out of comet seeking for three and a half years, so his discovery of comet 1866 I at the U.S. Naval Observatory on January 5th, 1866 must have felt pretty good after such a long hiatus. This was Comet Tempel-Tuttle, first discovered by the French astronomer, Tempel, more than two weeks earlier. Tuttle received a lot of press for this discovery since it was only the second comet ever discovered at the Naval Observatory.

In 1887 Tuttle obtained a 6.5-inch broken-back reflecting comet seeker, made for him by John Brashear. It was installed on the roof of the Naval Observatory, where he made his last comet discovery, a recovery of Comet 1888V Barnard.

Tuttle lived in the Washington, D.C. area from about 1884 until his death in 1923. In his final years he was feeble and blind. His gravesite is unmarked and its location is unknown.

Comet Swift-Tuttle itself is a pretty intersting story. It is the largest object known to make repeated passes near the Earth. It is also one of the oldest known periodic comets with sightings by the Chinese as far back as 68 B.C. The best estimate of when it will return is July, 2126.

The first attempt at computing a definitive orbit was made in 1889, when F. Hayn determined the orbital period to be 119.64 years. In 1971, Brian Marsden and Zdenek Sekanina took 212 positions obtained during the period of July 22 to October 22, 1862, applied perturbations by all nine planets, and came to a similar conclusion, 119.98 years.

A couple of years later, Marsden considered the possibility of linking Swift-Tuttle to an earlier comet. He found two in the 18th century that looked promising--1737 (Kegler) and 1750 (Wargentin). The 1750 comet appeared at just about the right time, but the 1750 comet seemed to be moving too fast to fit the orbital calculations. The 1737 comet actually exhibited a motion consistent with what would have been expected for Swift-Tuttle but the comet's period would have to have been some 10 years longer than was indicated by the observations in 1862.

Marsden made two predictions for a forthcoming return. First, using the definitive orbit calculated by Sekanina and himself, he suggested a perihelion date of September 16, 1981. Second, he suggested that if the link to the comet of 1737 was valid, Swift-Tuttle would most likely return to perihelion on November 25, 1992.

Initial searches for the comet began in 1980, which was within the error range given by calculations, and more rigorous searches were conducted in 1981 and 1982, but the comet was not recovered.

On September 26, 1992, Tsuruhiko Kiuchi, from Japan, discovered a comet and reported it to the National Astronomical Observatory in Tokyo. Several observers were able to confirm the comet within the next 24 hours and the direction and rate of motion were consistent

with what would be expected for Swift-Tuttle. The long lost parent of the Perseid meteor shower had indeed returned.

After refining the calculations of its orbit and looking at predictions of its next return, there was some concern that Swift-Tuttle might actually collide with Earth in 2126!

The comet has a diameter of 10 kilometers, and if it did hit the Earth going 60km/sec, it would be catastrophic. The collision would be 1 billion times more powerful than the atomic bomb dropped on Hiroshima. An impact similar to this is believed to have caused the extinction of the dinosaurs. Swift-Tuttle crashing into the planet could create a cloud of dust that would block out the sun, killing all plant life, and causing an ice age.

What are the chances it will hit? It's difficult to estimate. The comet will only collide with the Earth if the two bodies occupy the same space within a narrow three and a half minute window of their orbits. A difference of one hour would cause the comet to miss the Earth by about 100,000 kilometers. Considering the last calculations were off by 10 years, you can imagine how difficult it is to be sure one way or the other.

We haven't heard the last of comet 109P/Swift-Tuttle. In less than 120 years our ancestors will be learning about Professor Swift's comet as it makes another pass through the inner Solar System, leaving a trail of meteoroids behind to delight another generation with August meteor showers for another 130 years.

This content distributed by the AAVSO Writer's Bureau.

Free Astromomy Magazine

A free English language version of the magazine l'Astrofilo, has been made available by its publishers. The contents are essentially devoted to the latest and most important discoveries made by professional astronomers. Get it at:- **www.astropublishing.com**

Up-coming CAS Public Events

Date	Time	Event	Venue
26th Jul.	10:00am to 4:00pm	SAFE solar viewing	Brecon Beacons National Park Visitor Centre
4th Oct.	10:00am to 4:00pm	Telescope Workshop	National Museum of Wales Cardiff
18th Oct.	7:00pm to 9:00pm	Stargazing from a Dark Site	Brecon Beacons National Park Visitor Centre
12th Nov.	7:00pm to 9:00pm	Star Gazers Evening	Dyffryn Gardens
29th Nov.	7:00pm to 9:00pm	Stargazing from a Dark Site	Cwmcarn Forest Drive and Visitor Centre

CAS Lectures June To July

Date	Title	Lecturer
12th Jun.	The Astronomical Society of Wales 1894-1914.	Dr Bryn Jones, London.
26th Jun.	The Moon: what is, what was, what might have been.	Steve Balbus, Savilian Professor of Astronomy, Oxford University.
10th Jul.	Three Short Talks.	Members of CAS.

2014/5 Season Lectures Preview

Date	Title	Lecturer
4th Sept.	Images of the Universe Vol 2	Paul Money, Horncastle, Lincolnshire.
18th Sept.	The Jacobean Space Programme	Allan Chapman, Oxford University.
2nd Oct.	The Debate- “Wales was the best place to be an astronomer in 500AD”	Jon Davies and Mike Edmunds, Cardiff University.
16th Oct.	Variable Stars - How and Why they Vary	Gary Poyner, Birmingham.
30th Oct.	The Chelyabinsk Meteorite	Elizabeth Pearson, Bristol.
13th Nov.	Studying the Atmospheres of Extra-Solar Planets	Prof Matt Griffin, Cardiff University.
27th Nov.	Observing Galaxy Clusters	Owen Brazell, Oxford.

Observing Sessions

Due to the light nights at this time of year. There are no observing sessions scheduled for June, July or August.

Almanac Compiled by Ian Davies

Sun Rise/Set & Twilight

Date	Astronomical Twilight Begins	Sun Rise	Sun Set	Astronomical Twilight Ends
01st June	--:--	04:01	20:19	--:--
08th June	--:--	03:57	20:26	--:--
15th June	--:--	03:55	20:31	--:--
22nd June	--:--	03:55	20:33	--:--
29th June	--:--	03:58	20:33	--:--
01st July	--:--	03:59	20:33	--:--
08th July	--:--	04:05	20:30	--:--
15th July	--:--	04:12	20:24	--:--
22nd July	00:42	04:21	20:16	23:55
29th July	01:30	04:31	20:06	23:08
01st August	01:43	04:35	20:02	22:54
08th August	02:10	04:46	19:50	22:26
15th August	02:33	04:57	19:36	22:01
22nd August	02:53	05:08	19:22	21:37
29th August	03:11	05:19	19:07	21:15

Meteor Showers

Date	Meteor Shower	RA	DEC	ZHR
10th June	Ophiuchids	17h56m	-23°	5
21st June	Ophiuchids	17h20m	-20°	5
8th July	Capricornids	20h44m	-15°	5
16th July	Capricornids	20h44m	-15°	5
21st July	alpha-Cygnids	21h00m	+48°	5
26th July	Capricornids	21h00m	-15°	5
29th July	delta-Aquarids	22h36m	-17°	20
31st July	Piscis Australids	22h40m	-30°	5
3rd August	alpha-Capricornids	20h36m	-10°	5
7th August	iota-Aquarids	22h10m	-15°	8
13th August	Perseids	03h04m	+58°	75
21st August	alpha-Cygnids	21h00m	+48°	5

Observers Club Meetings

Date	Day	Time	Venue
27th June	Fri	20:00 - 22:00 GMT	Black Cock Inn
25th July	Fri	20:00 - 22:00 BST	Black Cock Inn
29th August	Fri	20:00 - 22:00 BST	Black Cock Inn

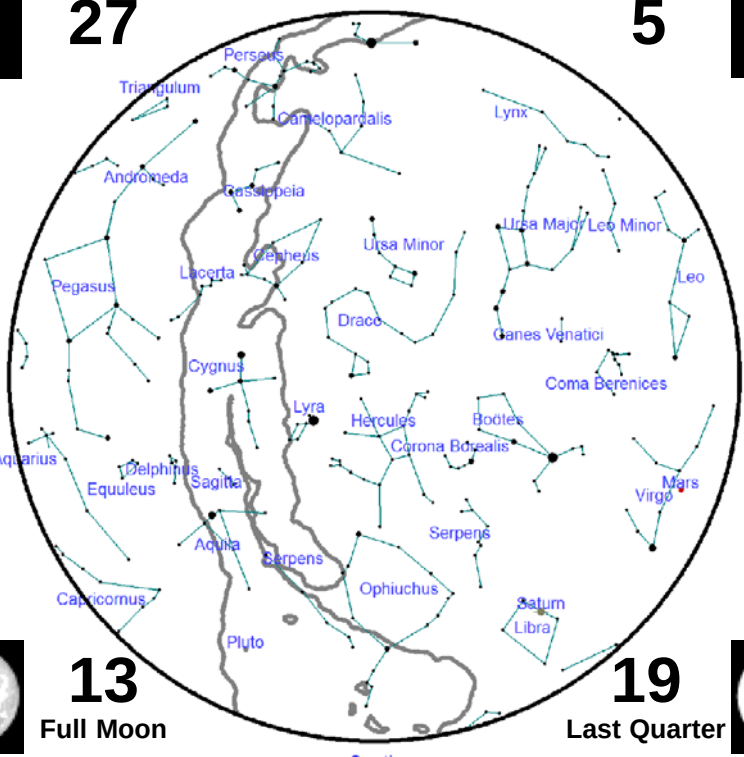
Dave's Star Parties

Date	Day	Time	Venue
19th August	Tuesday	21:00 to 23:00	Dyffryn Gardens/Observatory

Almanac June

New MOON
27

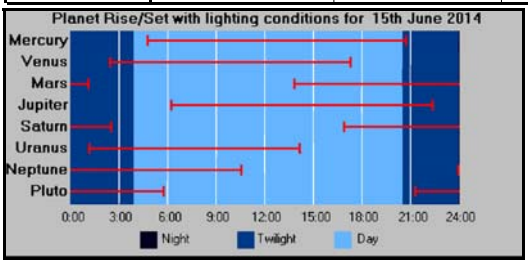
First Quarter
5



13
Full Moon

19
Last Quarter

	Constellation	R.A	Dec	Rises	Sets	Mag.
Mercury	Orion	06h05m20s	+20°49'29"	04:45	20:39	+4.2
Venus	Aries	03h11m53s	+15°54'49"	02:22	17:16	-3.9
Mars	Virgo	12h47m21s	-05°10'43"	13:46	01:03	-0.2
Jupiter	Gemini	07h40m24s	+21°47'00"	06:13	22:21	-1.8
Saturn	Libra	15h03m25s	-14°45'57"	16:53	02:28	+0.2
Uranus	Pisces	00h59m50s	+05°40'03"	01:06	14:09	+5.9
Neptune	Aquarius	22h38m24s	-09°22'59"	23:57	10:31	+8.0
Pluto (Dwarf)	Sagittarius	18h53m29s	-20°13'23"	21:19	05:47	+15.0



Planet Events

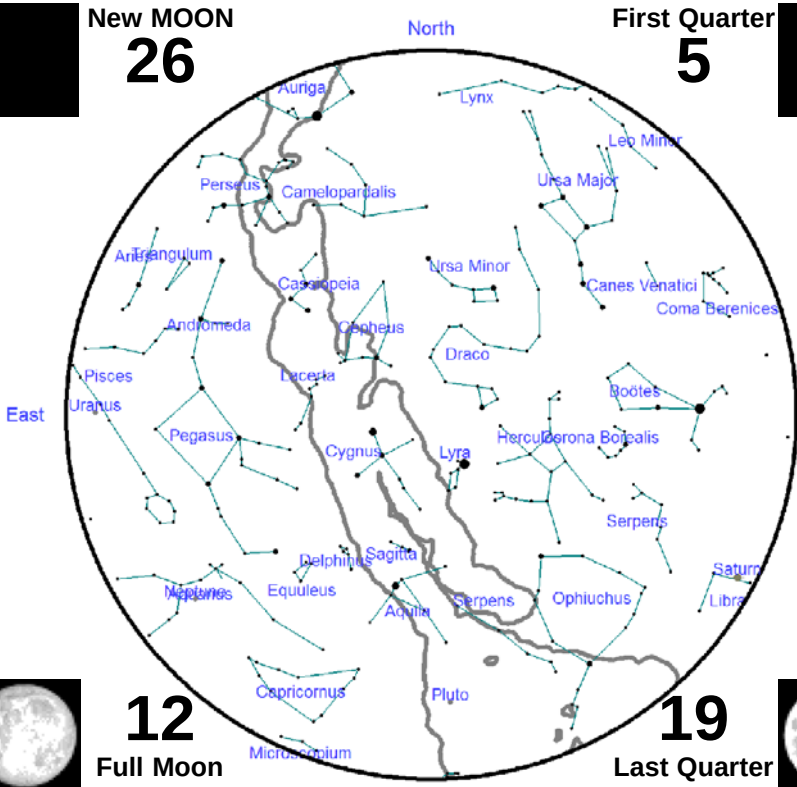
19th Mercury at Inferior Conjunction.

The data presented here is for the 15th June, positional data is at 00:00 GMT/UT

Almanac July

New MOON
26

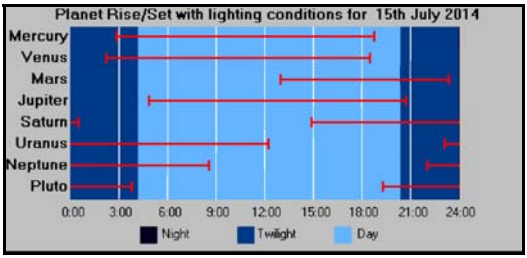
First Quarter
5



12
Full Moon

19
Last Quarter

	Constellation	R.A	Dec	Rises	Sets	Mag.
Mercury	Orion	06h07m58s	+21°07'31"	02:47	18:46	+0.1
Venus	Taurus	05h41m18s	+22°30'57"	02:11	18:29	-3.9
Mars	Virgo	13h29m32s	-10°11'25"	12:56	23:18	+0.2
Jupiter	Cancer	08h07m44s	+20°35'16"	04:50	20:42	-1.8
Saturn	Libra	14h59m27s	-14°36'27"	14:50	00:27	+0.3
Uranus	Pisces	01h01m49s	+05°51'24"	23:05	12:14	+5.8
Neptune	Aquarius	22h38m33s	-09°22'09"	22:00	08:33	+8.0
Pluto (Dwarf)	Sagittarius	18h50m22s	-20°20'12"	19:18	03:45	+15.0



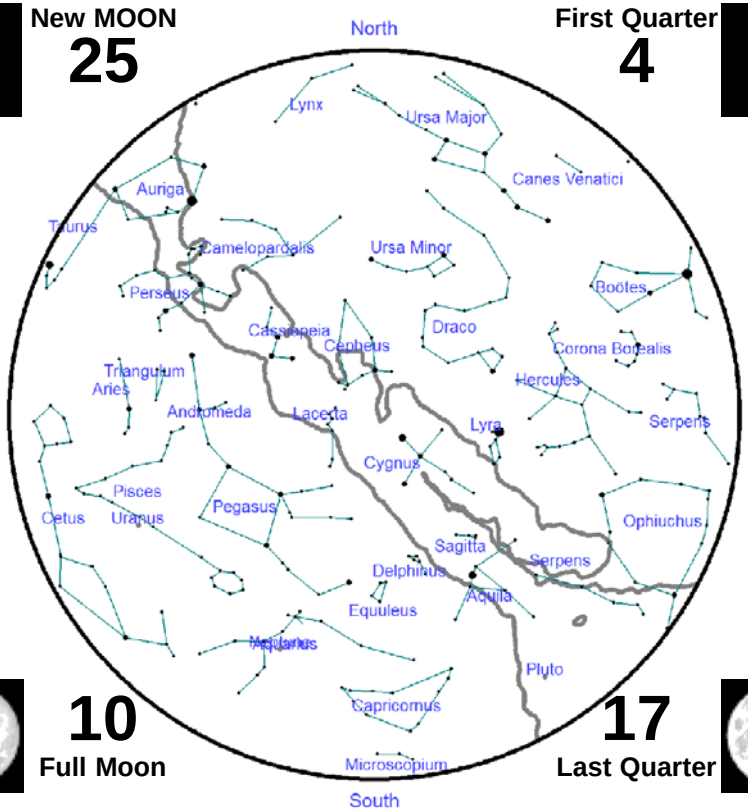
Planet Events

24th Jupiter at Conjunction.
29th Mercury at Perihelion (0.31 A.U.).

The data presented here is for the 15th July, positional data is at 00:00 GMT/UT

Almanac August

New MOON
25

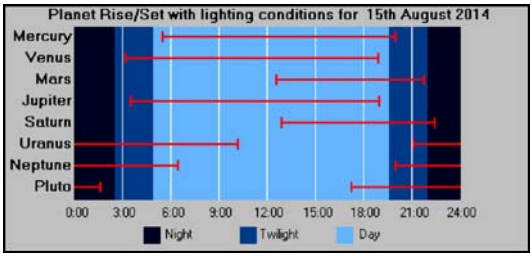


First Quarter
4

10
Full Moon

17
Last Quarter

	Constellation	R.A	Dec	Rises	Sets	Mag.
Mercury	Leo	10h05m37s	+13°30'37"	05:29	19:55	-1.3
Venus	Cancer	08h22m52s	+19°54'45"	03:08	18:51	-3.9
Mars	Libra	14h33m13s	-16°17'45"	12:32	21:46	+0.5
Jupiter	Cancer	08h36m09s	+19°03'05"	03:27	18:58	-1.8
Saturn	Libra	15h01m13s	-14°52'21"	12:51	22:22	+0.4
Uranus	Pisces	01h01m04s	+05°45'52"	21:03	10:10	+5.8
Neptune	Aquarius	22h38m42s	-09°21'20"	19:58	06:32	+8.0
Pluto (Dwarf)	Sagittarius	18h47m33s	-20°27'48"	17:14	01:39	+15.0



Planet Events

8th Mercury at Superior Conjunction.
29th Neptune at Opposition.

The data presented here is for the 15th August, positional data is at 00:00 GMT/UT

Big Bang News

CAS Juniors | ASTRONOMY IS LOOKING UP | Issue No.167

National Science and Engineering Week 2014

It was a lovely sunny day on March 15th. First everyone signed in so that they got a certificate and a Jupiter pack at the end of the event, then we had a look at the sun what a spectacular sight that was loads of sunspots. Then everybody went into the Cory centre for a fabulous talk on Jupiter that was put on by Emma Wride from the University of South Wales.

Then we went into the marquee where the National Museum of Wales had set up their stand. In the marquee we had a quiz that was read out by Dave Powell the secretary. Everyone had loads of fun and some people even got prizes!

Then we did something called the Mars impact simulator this simulated different sized meteorites hitting Mars. Everyone had loads of fun and we even pretended that the meteorites were landing on Dyffryn Gardens and Cardiff; that was really enjoyable.

Next we made rockets and launched them; they went really high and that was really cool! Then we did the most epic thing ever we watched two 3D movies and did a small 3D quiz! That was really epic and awesome best thing ever! Then we had a presentation where we gave out certificates, Jupiter packs and prizes from the first quiz and for the day.

However don't feel too disappointed as we will be running more of these epic days. Also remember to check the website www.cardiff-astronomical-society.co.uk so that you don't miss out on any more of the epic and mindboggling things on this year's program.

Remember that we run Dave's star parties where we can show you how to use a telescope and much more. There are also society trips and talks on a Thursday and the society library and we hold regular events that you are welcome to attend you will find information for all of this on the website .

Merchandise such as mugs, posters, 3D rulers and bookmarks and even books sold in talks and events and join in with as much as you can don't miss out and most importantly enjoy!

Written by the Junior News Reporter (Owen Cornelius).