TRANSIT

The Newsletter of

Cleveland & Darlington Astronomical Society

05 March 2009

Comet Lulin – imaged by Keith Johnson

Front Page Image : Due to the very poor weather conditions recently and poor weather predicted in the coming days I decided to grab the opportunity in capturing Comet Lulin as a very small window of clear skies for an hour was forecast Wednesday evening at around 9pm, however - this meant taking the equipment to work and set up in a relatively dark area within the factory perimiter, fast moving low cloud made things very difficult and as increasing cloud cover was predicted for the rest of the night I decided that I had to grab what frames I could - sadly I was only able to obtain 2 frames before the cloud rolled in, thus it has got to be one of the most difficult image captures of any object I have ever encountered simply because of the poor weather conditions.

The comet certainly is a naked eye object and my opinion and from the light polluted area where I was situated the comet looked more like a star of about 4th magnitude, rather than use the Canon 300D DSLR I opted for my brand new Canon 1000D using a 200mm fixed lens and CLS clip filter (light pollution filter), with "live view" the camera focus is now incredibly easy to set up.

If the weather is kind at the weekend I'll be having another go but this time using the EQ6 Pro. and 80mm ED with auto guiding assistance.

Best Regards,
Keith. *26 February 2009*

Last meeting : 13 February 2009, "X-Ray Astronomy" by Dr Tim Roberts, of Durham University

Next meeting : 13 March : “Calendars of the World” by Dr Colin Steele of University of Manchester Institute of Science and Technology.

There were two new members, xxxxxxxxx, who were welcomed to the Society and given new member's information packs.

Please note the venue for the next meeting :-

7.15pm for a 7.30 pm start, Grindon Parish Hall (in Thorpe Thewles, our previous meeting place).

Please note. The Society dues for 2009 were due in January. The cost is only £9.00. If applicable please pay your outstanding dues to our Treasurer, Ian Miles, at the next meeting.

Letter to the Editor

From John Crowther

From Transit last month I was interested in Rob Peeling's article "Skylights" and the challenge to see Venus as Galileo did. But was it the objective or the eyepiece lens which was concave?

I have a field glass, German made, of probably WW1 vintage. It has an acceptable field of view and is just capable of picking out the Galilean satellites of Jupiter.

I once owned a British made pair large field-glasses, like the ones seen on the film "Zulu". They had two objectives and had belonged to my Grandfather, a Master Mariner in the Merchant Navy. These were probably the same as the locked-away ones not available to the two lookouts high up in their crow's nest on the "Titanic" on 14 April 1912.

Back to Galileo. With his x14 and x20 magnification his field of view would be extremely narrow. Would anyone like to work it out? Also the planets phase would be most easily seen, yet hard to find in the blue sky just before or after sunset.

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The Grubb-Parsons Lecture 2009

Sponsored by the Royal Astronomical Society

Hot Results on Cool Galaxies
The Hidden Universe Revealed

By Professor Rob Kennicutt

Institute of Astronomy
University of Cambridge

Wednesday 18 March 2009, 4.30pm

Appleby Lecture Theatre, Science Labs (South Road Entrance)

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Some fantastic Sun images – have a look on
http://www.boston.com/bigpicture/2008/10/the_sun.html

Skylights - March 2009

from Rob Peeling

The Moon

04 Mar	11 Mar	18 Mar	26 Mar
First Quarter	Full Moon	Last Quarter	New Moon

Planets

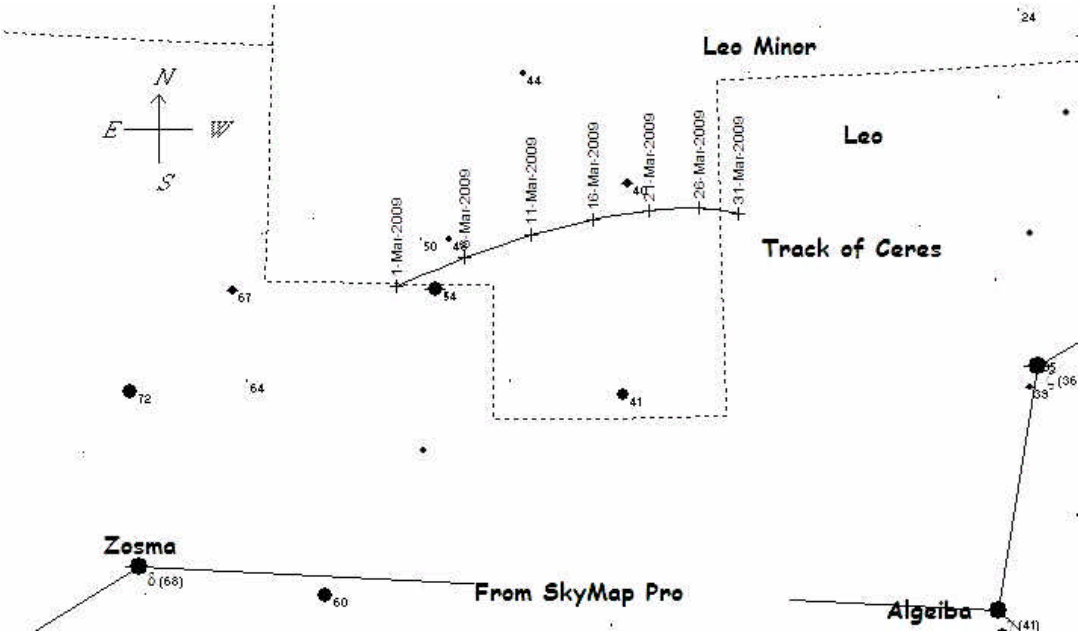
Venus continues to be very prominent in the evening sky. It is now moving towards the Sun and will pass it in the sky (inferior conjunction) on 27th March. It will be becoming a skinnier crescent as each day passes.

REMEMBER: Especially towards the end of the month as Venus comes closer to the Sun, please don't risk losing your eyesight by searching for the planet with either binoculars or a telescope before the Sun is completely below the horizon.

Saturn is at its best in March and can found under Leo's hindquarters. Titan is easy to see in pretty much any telescope and with many binoculars. Note how narrow a line the rings are now as they become more nearly edge on to us. How many moons other than Titan can you spot? Up to five different ones can easily be seen with perhaps two or three more possible to spot in the right conditions. My personal observing records *claim* a total of eight at various time (not all at once) with one observation each of Mimas, Enceladus and Hyperion – I am not sure I really believe this myself – there must be at least one misidentified! Rhea, Dione, Tethys and Iapetus are however readily observed.

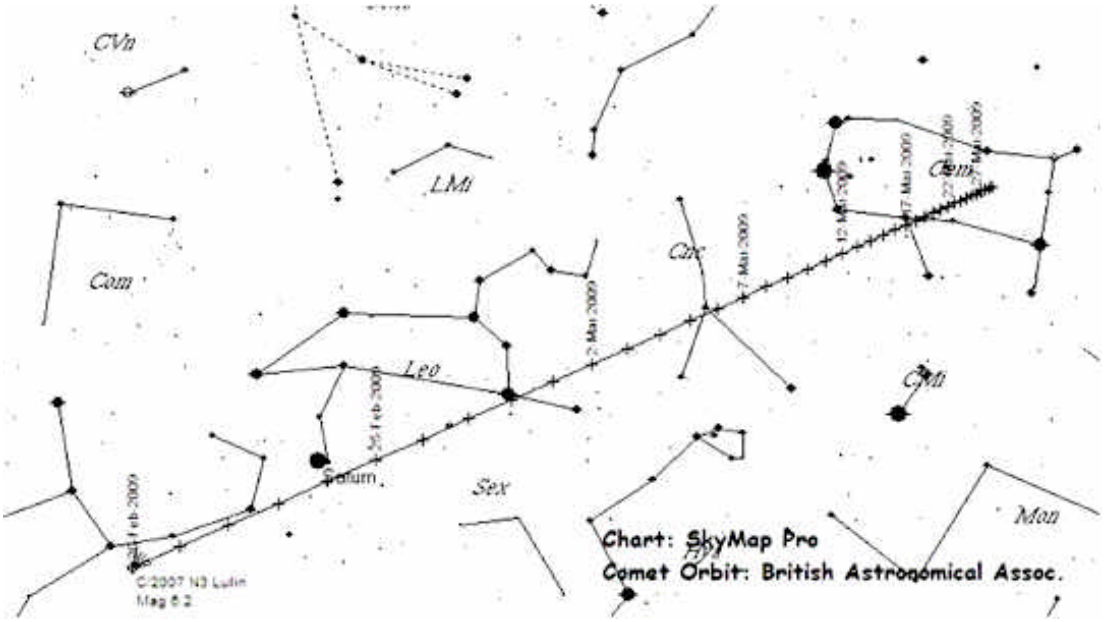
Dwarf Planets

In February I followed my own advice and successfully found Ceres for the first time. The dwarf planet is definitely visible with binoculars and it is slightly easier to identify with them rather than a telescope. Throughout March Ceres moves across the back of Leo. It is in the constellation Leo Minor rather than Leo.



Comets & Meteors

There are no major meteor showers during March. Comet 2007 N3 (Lulin) may well be easy to spot during March. Current estimates (around 20th Feb) have it near naked eye visibility. On Feb 24th it will be very close to Saturn and will sweep right under the constellation of Leo (grazing the star Regulus on 28th Feb) and then move outwards into Cancer.



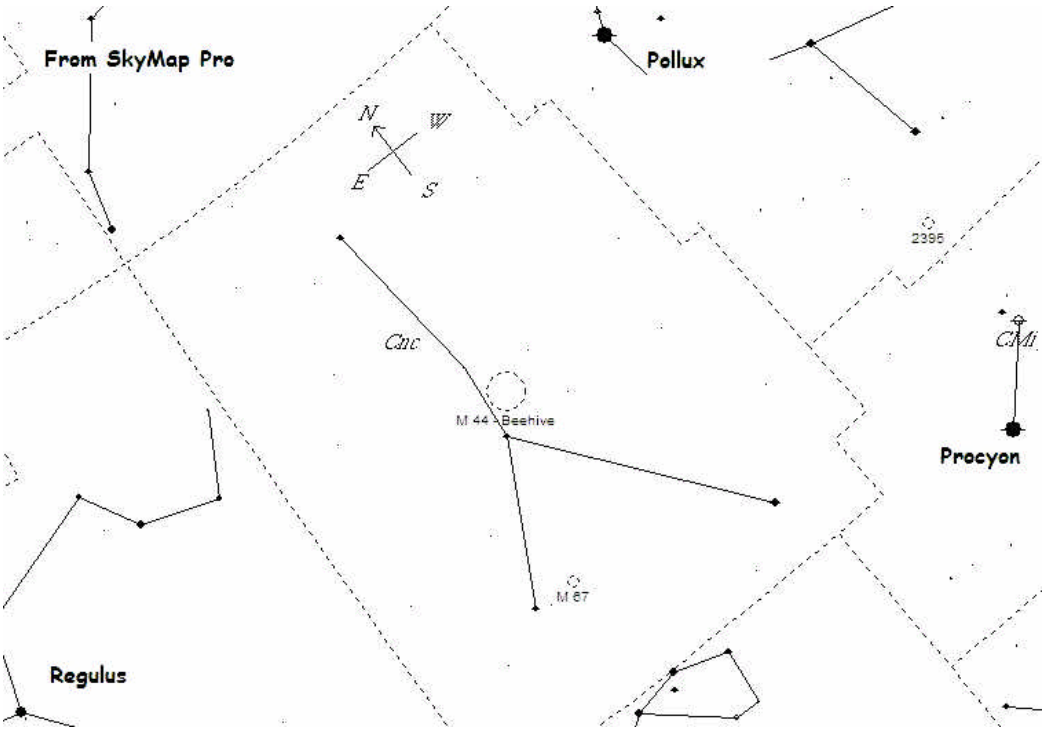
Deep Sky

If the weather cooperates then the southern sky in March is full of interesting objects.

Cancer

Look out for the large open cluster M44 named Praesepe or the Beehive cluster. It is easy to find as a glowing patch either in your finder or binoculars just below the midpoint of an imaginary line between the bright stars Pollux in Gemini and Regulus in Leo. In the telescope it becomes a huge bright cluster. Try and see if you can see it with the naked eye. I have been surprised at how visible it is through considerable light pollution. I have seen the Beehive with my naked eye both at home and at the planetarium. Out on the North Yorks moors you can't miss it. Once seen with the naked eye, the [translated] Chinese name for it; Ghosts, becomes obvious.

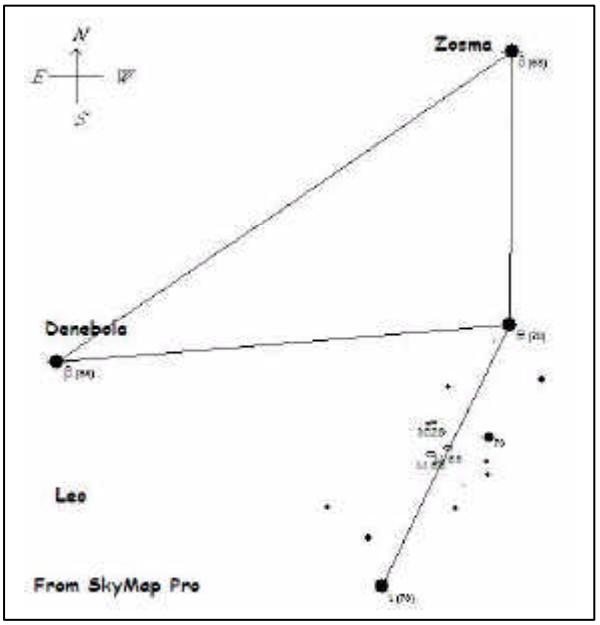
The other Messier open cluster in Cancer, M67 is also worth seeking out. This cluster is 2600 light years away, containing ~ 300 stars. It is between 4-5 billion years old making it a similar age to our Sun and it is one of the oldest open cluster you can easily view. Starting from M44, look for the delta Cancri which is the star slightly below and to the left of M44 in your finder. Now scan down (south) for the next star of similar brightness, alpha Cancri. Fit a low power lens and nudge the telescope about a field width or so to the right (west) and M67 should appear.

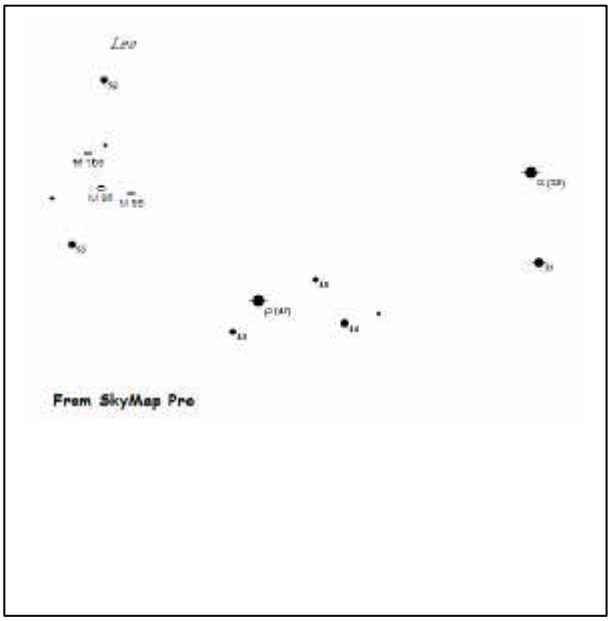


Leo

The pair of galaxies M65 & M66 should be fairly easy to spot with a low power lens in a moonless sky. Look for the right angle triangle of stars made up of Denebola, Zosma and theta Leonis that marks the hindquarters of the lion. Centre your finder on theta Leonis which marks the right angle of the asterism. Now scan with the finder below (south) of theta to find a line of three stars with 73 Leonis the brightest. Using the telescope move left (east) a field width or two to spot the two galaxies. Can you detect a third galaxy, NGC 3628 which lies just to the north of Messier's pair? All three are spiral galaxies like our own Milky Way.

The next targets are also spiral galaxies in Messier's list. I find these harder to track down than M65 & M66. This is because there are fewer signposts in the surrounding star field to help you find them. Find M95 and M96 by initially centring Regulus in your finder. Scan south-east (mostly left and a little down) to find bright rho Leonis with its distinctive surrounding fairly bright stars. Use rho and 44 Leonis as pointers to guide you to 53 Leonis. Now switch to the telescope with a low power lens and search northwards (upwards) to find the galaxies. M96 and the nearby elliptical galaxy M105 are generally more easily spotted than the somewhat fainter M95.





All maps are zoomable

Caldwell Objects

For the last three suggested targets for March, I am leaving the well-known Messier catalogue and picking Caldwell objects. The Caldwell list is 110 of Sir Patrick Moores *favourite* objects which was first published by Sky & Telescope in

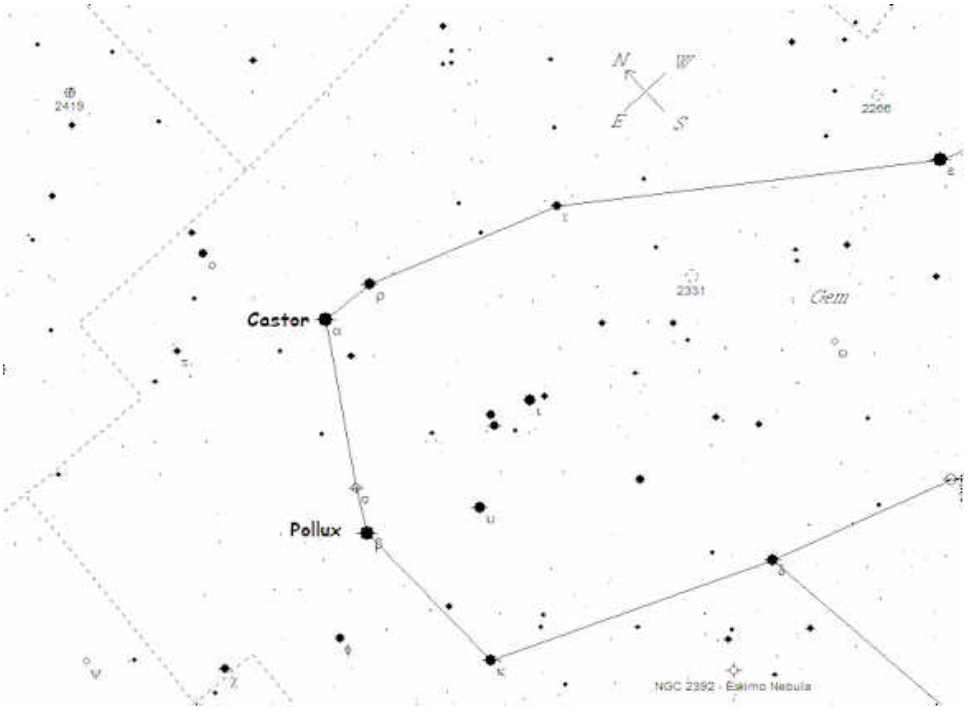
Dec 1995. Mostly it picks up all the best views that Messier didn't include but it also includes some harder to see objects because they are interesting. Caldwell is part of Sir Patrick's full surname, Caldwell-Moore.

Caldwell 39 = NGC 2392, the Eskimo planetary nebula in Gemini

This is a bright planetary nebula (almost as bright as M57, the Ring Nebula). You will almost certainly have seen professional images of this from e.g. the Hubble telescope. Search with a low power lens and then increase the power to as much as it will bear once found. Starting from the bright "twin" Pollux (Castor lies above), find the naked eye star delta Geminorum and center the finder on it. Scan downwards (southeast) to find the wide bright pair shown in the chart. Switch to the telescope eyepiece and continue one or two field widths to the southeast to find Caldwell 39. If you have an OIII or nebula filter you can use it to confirm your find. With the filter, the planetary nebula should seem roughly the same brightness as without the filter but the surrounding stars will be dimmer. This works because of the physics of the way the nebula emits light.

Caldwell 25 = Globular cluster NGC 2419, the Intergalactic Wanderer in Lynx

Caldwell 25 is not a particularly easy object to find, being small and dim as well as in a sparse star field. It is worth the effort because it is one of the most distant globular clusters you can see. Its name came from the suggestion that it was so far from the Milky Way that it is drifting free in intergalactic space. However current theories are that it is actually attached to our galaxy. The most recent published distance is 275,000 light-years, making it half as far again as the Large Magellanic Cloud.

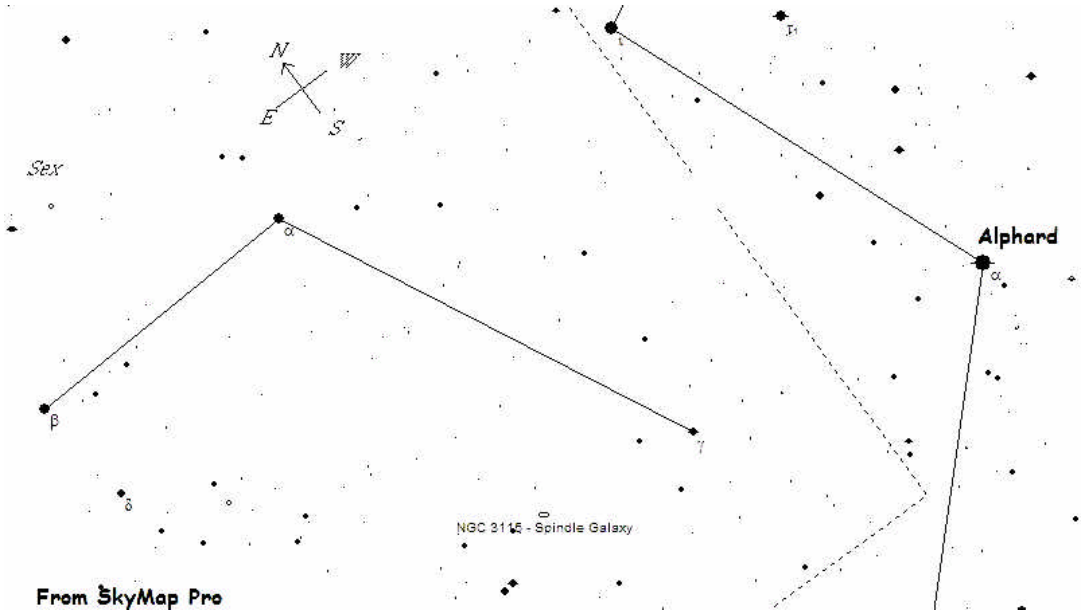


Starting from Castor, use you find to try and find your way north using the few brightish stars around to reach the 6th magnitude star shown close to the cluster in the chart. Then hunt northwards with a low power lens.

Caldwell 53 = NGC 3115, the Spindle Galaxy in Sextans

Caldwell 53 is as bright or brighter than many Messier galaxies. It is not well-known because it is in the obscure constellation of Sextans. It is a lenticular galaxy viewed edge on making it a long, thin splinter of light when you find it.

As with the Intergalactic Wanderer, it needs a little patience to find in a sparse star field. First you need to find alpha Hydrae, Alphard or the Lonely One. This is the only bright naked eye star in the huge region between Leo and Canis Major and underneath Cancer and Procyon (Canis Minor). Centre Alphard in your finder and then move due east to find 5th magnitude gamma Sextans forming a triangle with two 7th mag. stars. Gamma points the way along a line between the other two stars to a pair of 6th mag. stars. Look for another 7th mag star above this pair and then start seaching to the west (right).



Observing Report for Jan/Feb 2009

Here is a brief summary of how many of the objects mentioned in these notes I actually saw myself.

Successes

I saw the close approach of Venus and Uranus on 22nd Jan as did at least two other members of the society. I was just able to detect Uranus with 10x25 binoculars (as well as larger pairs of course).

I have sighted both Ceres, and another asteroid, Vesta on two or three nights.

On 13th Feb at the Planetarium we shared a magnificent view of the Rosette Nebula. The cave-like appearance of the nebula was wonderfully clear. I think this was the first time I saw the nebula itself although the bright star cluster within its cave is easy to see.

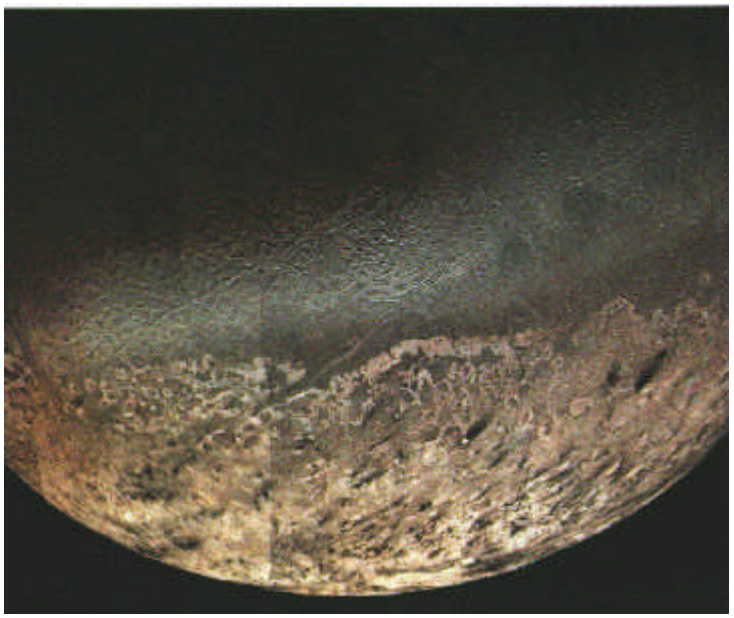
We have also had some very good views of Saturn and its edge-on rings during public observing on a Friday at the Planetarium.

Failures

Bad weather prevented me seeing the Moon occult the Pleiades on 7th Jan and also the close clustering of Saturn's moons on 31st Jan. I have also never got around to finding M79, the globular cluster in Lepus.

Transit quiz questions for the March 2009 issue

From Rod Cuff



Where in the Universe?
A pictorial challenge. Of what, where and when was this image taken

Q 1. Aldebaran (Alpha Tauri) is known by many other designations in various catalogues. What catalogues do the following labels relate to?

(a) 87 Tauri
(b) HR 1457
(c) HD 29139
(d) SAO 94027
(e) HIP 21421

Q 2. If Eagle + Pinwheel = Rosette, what is Dumbbell + Little Dumbbell?

Q 3. What constellation is each set of objects in?

(a) Phad, the Owl (planetary) Nebula, and Sidus Ludovicianum (a star between elements of a celebrated naked-eye double)

(b) Almaak, the last object in Messier's catalogue (an elliptical galaxy), and Alpheratz

(c) the double star Al Rischa, the spiral galaxy M74, and the First Point of Aries

(d) Cor Caroli, the Blue Snowball planetary nebula, and the Whirlpool Galaxy

Q 4. What are the following concepts, and who are they named after?

(a) the Jeans mass
(b) Bok globules
(c) Seyfert galaxies
(d) the Schwarzschild radius

Q 5. For a typical amateur telescope, what would be the usual main reason for employing each of the following accessories?

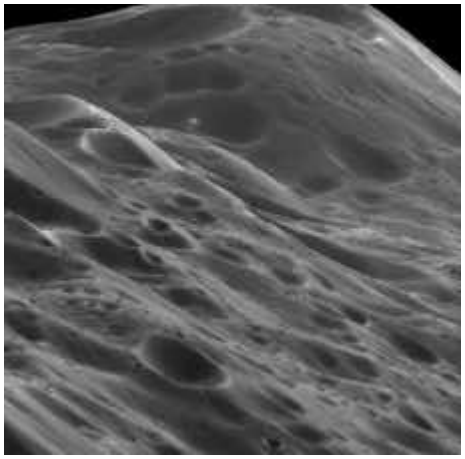
(a) a polar (equatorial) mount
(b) a Barlow lens or PowerMate
(c) a very low-magnification eyepiece
(d) a webcam
(e) a Baader filter

Q 6. In the context of amateur observing, what is each of the following terms a shorthand for?

(a) an apo
(b) a Dob
(c) a chip
(d) FOV
(e) power

Answers for the February 2009 Transit quiz

Where in the Universe? A pictorial challenge. Of what, where and when was this image taken**?**



Answer : Saturn's moon Iapetus. The Cassini spacraft zoomed in on the cratered moon to provide this stunning close-up. And did you know you can golf the moons of Saturn?

The image was taken on 10 September 2007 with the Cassini's narrow-angle camera at a distance of approximately 3870 km from Iapetus. Image scale is 23 m per pixel. Credits: NASA/ JPL/ Space Science Institute.

Q 1. Where in the Solar System are the following craters?
(a) Manson
(b) Manton
(c) Marca
(d) Marci
(e) Mark Twain
(f) Musa
(g) Mush

A1. (a) Earth. It's in Iowa (www.123exp-geography.com/t/18624319124).
(b) Venus (www.lpi.usra.edu/resources/vc/vcinfo/?refnum=338)
(c) Mars. There's a full list of Martian craters (and who/what they're named after) at www.nationmaster.com/encyclopedia/List-of-craters-on-Mars . Marca is a place in Peru, it seems.
(d) The far side of the Moon [www.absoluteastronomy.com/topics/Marci_(crater)].
(e) Mercury (see the artefact retrieved from there at www.waymarking.com/waymarks/WM43G2) ...
(f) Enceladus, a moon of Saturn [www.absoluteastronomy.com/topics/Musa_(crater)]
(g) Ganymede, a moon of Jupiter (knowledgerush.com/kr/encyclopedia/List_of_craters_on_Ganymede)

Q 2. Put these in order from the centre of the Sun:
chromosphere, convective zone, core, corona, heliopause, magnetopause, photosphere, radiative zone, transition zone.

A2. core, radiative zone, convective zone, photosphere, chromosphere, transition zone, corona, magnetopause, heliopause.

www.novacelestia.com/space_art_solar_system/sun.html discusses most of those. You can find an unconventional piece of astronomical argument that deals with the heliopause at www.darkstar1.co.uk/heliopause.html . The magnetopause is really more to do with the Earth than the Sun – see www-istp.gsfc.nasa.gov/Education/wmpause.html .

Q 3. What do these have in common:
dark matter, the Higgs boson, dark energy, Population III stars, and the Oort cloud?

A3. Each is believed to exist or have existed, but none of them has yet been observed!

Dark matter:
http://imagine.gsfc.nasa.gov/docs/science/know_l1/dark_matter.html
Higgs boson: www.phy.uct.ac.za/courses/phy400w/particle/higgs.htm
Dark energy:
http://imagine.gsfc.nasa.gov/docs/science/mysteries_l1/dark_energy.html
Population III: www.solstation.com/x-objects/first.htm
Oort cloud: www.ifa.hawaii.edu/~jewitt/oort.html

Q 4. What are:
(a) a blue moon?
(b) a moon dog?
(c) a mock moon?
(d) a moon dial?

A4: (a) The second full moon in the same calendar month. A lunation (the mean time from one full moon to the next) is about 29.5 days, so 12 of them take up about 354 days, or 11 days less than a full year. Therefore every 2 or 3 years there are 13 lunations in a year instead of 12. So 'once in a blue moon' isn't as rare as people usually mean!
(b) A relatively bright circular spot on a moon halo, which is a circle of light that sometimes appears around the full or nearly full moon, about 22 degrees in radius, and is caused by refraction of the Moon's light through ice crystals high in the atmosphere.
(c) Another name for a moon dog ...
(d) It really *is* an object just like a sundial, but using the Moon's light to indicate the time. It has a gnomon (the slanting arm that casts a shadow on the dial) and a marked dial; but reading off the time requires a correction chart to account for the fact that moonlight doesn't 'work' on a 24-hour cycle. The average time between moonrises on consecutive days is 48 minutes, but, owing to the Moon's elliptical orbit, this can vary between about 20 and 110 minutes. By the time you've worked it all out, the sun is probably up anyway.

www.queens.cam.ac.uk/queens/Images/sundial.html shows the combination sundial/moon dial at Queen's College, Cambridge.

Q 5. Which stars have names that mean the following?
(a) the rival of Mars?
(b) the hand of Gemini?
(c) the follower?
(d) before the dog?
(e) female warrior?

A5. (a) Antares; (b) Betelgeuse; (c) Aldebaran; (d) Procyon; (e) Bellatrix. There are lots more at www.naic.edu/~gibson/starnames/starnames.html .

Q 6. In November 2008, three star systems hit the astronomical (and some general) headlines for similar reasons. Why, and what systems were they?

A6. Fomalhaut (www.spacetelescope.org/news/html/heic0821.html), HR 8799 (http://apod.nasa.gov/apod/ap081117.html) and Beta Pictoris (www.eso.org/public/outreach/press-rel/pr-2008/pr-42-08.html). Different sets of researchers produced visual images of planets in these systems, the first time this had been achieved. The links give you more information on each discovery.

The CaDAS Interview

Alex Menarry interviews Ken Stewart

Responding to popular demand, this is the return of the CaDAS interview. Ken Stewart lives in Newton Aycliffe and joined CaDAS in 1995. He finds it difficult to attend meetings very often but keeps in touch with the Society via Transit each month. As so often with our members, the interviewer found a man whose

interest in astronomy was only one of many interests. It seems that a study of astronomy opens up the opportunity for life long learning.

You have just donated your eight and a half inch telescope on its equatorial mounting to the Society.
Yes, I handed it over to Planetarium Bob last week. It was made by a guy called John Braithwaite, who has a workshop in Dalserf, in Lanarkshire. He used to work for Franks in Glasgow before striking out on his own. He made me a six-inch first of all, then this eight and a half. I made him twelve alt/az telescope mounts in my workshop, here.

Does this mean you have given up observing?
No. Not at all. I intend buying an ETX 125PE 'goto'. The light pollution is quite bad around here, so I hope to get better viewing at my daughter's in West Aukland.

Are you a local lad?
I'm originally from West Hartlepool – affectionately known as British West Hartlepool - but the family moved to Seaton Carew (no, don't say it, not Seaton Canoe!) when I was very young. That has brought back memories of growing up through the war, the bombing, picking up hot shrapnel after air raids, all that sort of excitement. They must have been terrifying times for our parents. I have one brother – I'll tell you about some of his adventures later. I am married and have two daughters, six grand-children and three great-grand-children.

Tell me about your education.
Living on the coast, I suppose it was inevitable that an interest in engineering would lead to me becoming a merchant navy Marine Engineer. Local school and secondary college led to an apprenticeship with Richardson Westgarth and some experience with big engines and steam turbines before going to sea. After two years sea service, I had to attend the South Shields Marine and Technical College for my marine engineer's licence.

Where did you go?
There were regular trips , to India via the Suez Canal and across to the East Coast of the USA. Lots of interesting experiences, including the deep, black skies when away from the coast. It was impossible not to be amazed by the night sky and be drawn into an interest in astronomy. Binoculars at first – a telescope is not a practical proposition on a ship! I married and had two daughters, so after six years I decided the family came first and left the sea to take a shore job. One of the best places I visited was India.

You were still living locally?
The new town of Newton Aycliffe had a number of companies with suitable jobs for an ex-marine engineer, so we moved there. It was really interesting tackling a number of completely different areas of work, like ICI Instruments, GEC as a

reproduction engineer and development engineer on reprographic machines in R&D. I was even a training officer in IT at Peterlee for a while, where I set up a robotics department. Being at sea as an engineer makes you very flexible!

And what about the story of your brother?
Here's the marine tradition, again. He decided to build an ocean-going yacht at Hartlepool. Completely from scratch he built a 65-foot, ferro-cement-hulled schooner, the "Wild Knight". He gained his yacht-master's Certificate and sailed the Atlantic, round the Caribbean, Tenerife – all over. He then retired to live near Carcasonne, the mediaeval town in the south of France. We go for holidays there. It is near Toulouse, where there is a magnificent Planetarium. Well worth flying to Toulouse to visit it.

Let's go back to your astronomy. It all started at sea?
The perfect observing conditions, without any light pollution, inspired me to buy some binoculars, get some star charts and books and learn about the night sky. I bought my big telescope about 15 years ago. I then joined the Society and met lots of very encouraging people. David Blenkinsop, Jack Youdale, John McCue, Ron Peacock.

I even started and taught evening classes in Newton Aycliffe for a number of years. The Society met in the old Railway Buildings then – now the Wynyard Country Park Visitor Centre – and regularly used the Jack Youdale Observatory. When the Planetarium was being built, I worked on the design and the building, designing the first central plinth for the projector.

It was a very exciting and absorbing time for the Society. My interest in astronomy made me realise what a small speck we live on and sparked my interest in the Earth as a planet, the natural history, geology and all that. How we are abusing this planet! If it was an animal it would be groaning in pain!

Have you any heroes?
Oh, yes. Alan Chapman (I would go anywhere to hear him speak), Carl Sagan and his Cosmos series, Sir Patrick Moore, of course, Stephen Hawking. In engineering, Isombard Kingdom Brunel. They are the truly inspiring guys.

And your favourite reading – apart from astronomy?
As you might guess, my favourites are naval yarns. An author called Patrick O'Brien writes about two naval characters of Nelson's time, Steven Maturin and Jack Aubrey. They are historically very accurate novels and exciting yarns. There are 20 books in the series and I have read them all four times.

Any other hobbies?
For the last 12 years or so I have been painting in water colours and oils. Here's one of mine. (*Ken pointed to a superb painting of "HMS Warrior" hanging on the*

wall, as well as some country scenes and portraits). I studied quite hard at evening classes.

Final Question – whom should I interview next?
I've always wondered what would happen if you interviewed two people at once and contrasted the answers. I suggest John and George Gargett.

Good news! Ken has decided to update his observing with a lightweight Go-to telescope. He has very kindly donated his Braithwaite 8" reflector with equatorial mount to CaDAS for use in public viewing sessions. Our many thanks go to Ken.

Galaxy Zoo 2 Launches

Written by Nancy Atkinson

Do you Zoo? Well, now you can Zoo 2. Galaxy Zoo, that is. Galaxy Zoo 2 is a new version of the highly successful project that enabled members of the public to take part in astronomy research online. But the research is now getting more interesting, and shall we say, more provocative?

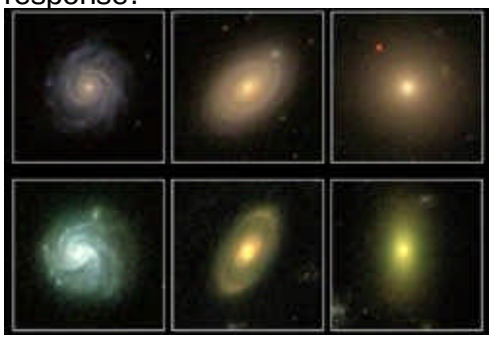
The original site only asked members of the public to say whether a galaxy was spiral or elliptical, and which way it was rotating, Galaxy Zoo 2 asks them to delve deeper into 250,000 of the brightest and best galaxies to search for the strange and unusual. "We we were so surprised about how many people participated in Galaxy Zoo and how good they were at this," said Dr. Chris Lintott of Oxford University, one of the founders of Galaxy Zoo. "But now the idea is to ask for more detailed classifications.

So it's a Faustian pact we're making with our users. We want them to spend more time with each galaxy, so it's not just this fly by night, quick one-night stand of galaxy classification. We want them to get to know each galaxy a little bit better, have dinner first and all of that. But as a compromise, we have only a quarter of a million of the most interesting galaxies, the brightest, and the nearest. So you'll spend more time looking at galaxies, but they're prettier."

At latest count, Galaxy Zoo has 182,383 users, (which Lintott notes is more people than live in Guam or Sunderland) who have performed 74,503,984 classifications of galaxies.

Lintott told Universe Today that Galaxy Zoo is a classic pub idea that worked. "I was working with Kevin Schawinski of Yale University on galaxies," he said, and

to get accurate data, they needed to classify a large number of galaxies. "We'd heard about Stardust at Home, which is an amazing project. I was impressed they were able to do this, to get people search for dust grains. And we've got all these pretty pictures of galaxies to look at, so surely people would like to look at galaxies. We put the site together, and we've been overwhelmed with the response."



Galaxies from Galaxy Zoo.

The human eye and brain are better at doing pattern recognition tasks than a computer. Lintott noted that astronomers have spent 70 years classifying galaxies according the laws that Hubble put down, but only by classifying a really large population are astronomers going to have any sense of what the population of different types of galaxies are. "Is there really any difference between and Sa and an Sb galaxy?" asked Lintott. "They're defined by different tightnesses of spiral arms and different bulge shapes, but we want to know do they live in the same place or do they have the same star formation histories or what is going on with the black holes? So we need to classify many galaxies into these categories.

So that's the idea for Zoo 2. Rather than getting people to remember the categories we have a series of questions that you go through so we get individual information about the galaxies."

As with the original site people are free to look at and describe as many galaxies as they like – even five minutes' work will provide a valuable contribution. Galaxy Zoo 2 is intended to be even more fun as galaxies are pitted against each other in "Galaxy Wars" (which one is more spirally?) and users can compete against their friends to describe more objects as well as record their best finds.

Zoo 2 has been in a test phase for a couple of months, and everything seems to be working well, as hundreds of thousands of classifications have already been done in the new version. "There was a worry that maybe we had exhausted people's tolerance for galaxies, but apparently not," said Lintott

ASTRONOMICAL OBSERVATIONS IN JANUARY

from Mike Gregory

O. S. 001/09 – Tuesday January 13th – It was pouring down at dusk but, incredibly, completely clear at 19.00 UT so I phoned DB to advise him then set my refractor up on what my parents would once have called a lawn.

My plan was simple. View as many doubles in Orion as I could before the Moon, just two days past full, came up to blight the already hopelessly light polluted area. Having aligned the Gotostar on Pollux (beta Gem), I was able to find M42 very accurately so ready to go at 19.40!

I looked at 18 multiples in Orion, two in Canis Majoris and one in Camelopardalis – all were clearly seen separated except for 52 Orionis, which appeared as a figure-of-eight, and the two CMa stars, mu which was too fuzzy and h3945, which was still below my neighbour's garage roof.

ORION

05006+0337 STF 627 21.5 6.59 6.95 B9Vn B9Vn
05020+0137 STF 630 14.3 6.50 7.71 B8V
05133+0252 STF 654 7.0 4.62 8.50 K2II – rho Orionis – yellowish & bluish
05145-0812 STF 668 9.2 0.3 10.4 B8Iae: - beta Orionis – Rigel
05228+0333 STF 696 31.6 4.95 6.76 B1V
05233-0825 STF 701 6.1 6.13 8.09 B8III
05245-0224 eta Orionis 1.7 3.56 4.87 B1V+B2e
05320-0018 delta Ori Aa-C 52.8 2.41 6.83 B4 – Mintaka
05350-0600 STF 747 AB 36.2 4.70 5.51 B0.5V B1V
05351+0956 STF 738 AB 4.3 3.51 5.45 O8 B0.5V – lambda – Meissa
05353-0523 STF 748 Aa,B 8.8 6.55 7.49 O7 B1V - theta[1]
Aa,C 12.7 6.55 5.06 - theta[1]
Aa,D 21.2 4.98 6.71 O7 B0.5V - theta[1]
05354-0525 STFA 16 AB 52.2 5.03 6.19 O9.5V - theta[2]
05354-0555 STF 752 AB 11.3 2.9 7.0 O9III – iota Orionis
05387-0236 STF 762 AB-C 11.5 3.73 8.79 – sigma Orionis
AB-D 12.7 3.76 6.56 – sigma Orionis
05407-0157 STF 774 Aa-B 2.5 1.88 3.70 O9.5Ibe - zeta Orionis - Alnitak
Aa-C 57.7 1.88 9.55 – zeta Orionis
05480+0627 STF 795 1.0 5.99 6.03 A5V – 52 Orionis – elongated
05549+0702 STF 817 18.6 8.68 8.93 A5+K – in same wide field as Betelgeuse
06090+0230 STF 855 AB 28.7 5.68 6.68 A3Vn A0V

CAMELOPARDALIS

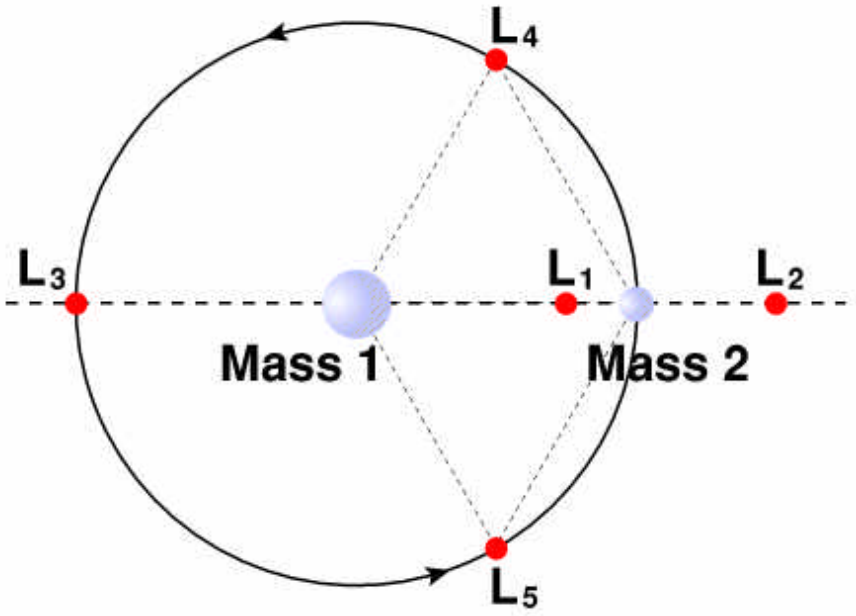
04320+5355 STF 550 AB - 10.3 5.78 6.82 B0III

The go-to mode on my refractor found all the above multiples with stunning accuracy but unquestionably this is cheating! Surely there would be more satisfaction to be gained by star-hopping to such targets with a big dumb Dobsonian? Conversely, who would wish to drive a Morris Minor if they had a Ferrari in their garage, albeit just a little one!

Friday January 16th 2009 – After a miserable day I went to WWP in hopeless conditions just for something to do, and found the gate locked and not a living soul in sight (discounting me if I qualify). But for a brief period the sky was full of stars and, using just my 10x50 binoculars, I had some acceptable views of the Hyades, the Pleiades, M31 (quite good in fact) and h & chi Perseus before it clouded over. It then rained determinedly on the drive back to Acklam.

Wednesday January 28th 2009 – Clear at dusk and still clear at 19.00 so I wrapped up warm and drove to near Newby, arriving there about 20.00. Using only my 10x50 binoculars, I had reasonable views of the Orion nebula and belt (countless dim stars above Mintaka), M35, M31, the Double Cluster, the Mizar-Alcor area, the Pleiades and the Hyades. I then watched a very slow satellite trailing across the sky from northwest to southeast. Or was it an aeroplane? After some thought, as it appeared to have stopped, I assumed it might be a helicopter. Or Aldebaran. What a Wally!

The Lagrangian Points



The Lagrangian points of a two -body system, such as the Earth and the Sun.

Lagrangian points in planetary systems are islands of gravitational stability. They are volumes of space where the gravity of two massive bodies cancel out. The first two Lagrangian points in the Earth-Sun system are fairly obvious. The L_1 point is located directly between the Earth and Sun, about 1.5 million km from the surface of the Earth, the point at which the gravitational pull of the Sun and Earth cancel each other out.

The L_2 point is located at approximately the same distance, but on the opposite side of the Earth. In this case, the Earth is constantly eclipsing the Sun. The L_3 point is on the opposite side of the Sun from the Earth, at approximately 1AU. Now this is where it starts to get a little strange. The L_4 and L_5 points are located 60° in front and 60° behind the Earth's orbit.

The 4th and 5th Lagrangian points are also the most gravitationally stable regions, primordial debris lurks, trapped in the Lagrangian prisons. Although the L_1 point is often considered to be the most stable of the Lagrangian points (as it's directly locked between the gravity of the Sun and Earth), even space observatories (such as SOHO and ACE) have to carry out complex orbits to remain in place. Otherwise the delicate balance will be lost and they will drop away from L_1.

L_4 and L_5 are in fact the most stable locations, balanced by a complex cage of competing gravitational components from the Earth and the Sun. It is thought that these two regions have trapped lumps of rock and dust all the way through the evolution of the Solar System, making them a very interesting place to send a space mission.

It is a known fact that other planets in the Solar System possess these islands of gravitational calm, and asteroids have been observed sitting in stable locations in front and behind of Jupiter's orbit for example (called "Trojans" and "Greeks"). Does Earth have a swarm of asteroids sitting in its L_4 and L_5 points? Scientists believe this is a certainty. However, *no asteroids have ever been observed*.

Although millions of kilometres across, L_4 and L_5 can only be observed at dawn and dusk.

CERN Aims for LHC Restart in September, First Collisions in October

Written by Ian O'Neill

It may seem that the delay is getting longer and longer for the restart of the LHC after the catastrophic quench in September 2008, but progress is being made. Repair costs are expected to hit the $16 million mark as engineers quickly rebuild

the damaged electromagnets and track down any further electrical faults that could jeopardize the future operation of the complex particle accelerator.

According to the European Organization for Nuclear Research (CERN), the Large Hadron Collider will resume operations in September. But the best news is: *we could be seeing the first particle collisions only a month later*…

If, like me, you were restlessly awaiting the grand LHC "switch-on" on September 10th, 2008, only to be disappointed by the transformer breakdown the following day, but then buoyed up by the fact LHC science was still on track, only for your hopes to be completely *quenched* by the quench that explosively ripped the high-tech magnets from their mounts on September 20th, you'll probably be weary about getting your hopes up too high. However, allow yourself a little levity, the LHC repairs are going well, potential faults are being identified and fixed, and replacement parts are falling into place.

But there is more good news.

Via Twitter, one of my contacts (@dpodolsky) hinted that he'd heard, via word of mouth, that LHC scientists' optimism was growing for an October 2009 start to particle collisions. However, as of February 2nd, there was no official word from CERN. Today, the CERN Director General issued a statement.
"*The schedule we have now is without a doubt the best for the LHC and for the physicists waiting for data*," Rolf Heuer said. "*It is cautious, ensuring that all the necessary work is done on the LHC before we start-up, yet it allows physics research to begin this year*."

So, the $5 billion LHC is expected to be restarted in September and the first experiments will hopefully commence by the end of October 2009. It may be a year later than when the first particle collisions were planned, but at least a better idea is forming about when the hunt for the Higgs particle will recommence…

William Herschel: The First Deep-Sky Astronomer

from the One Minute Astronomer

William Herschel (1738-1822) was the first astronomer to systematically look beyond the solar system into the depths of intergalactic space. His early sky survey formed the foundation of today's NGC (New General Catalog) of deep sky objects.

The Basics

• Born into a musical family in Hanover, Germany, Herschel mastered the oboe and made his living as a professional musician. He played in the Hanoverian

Guard during the Seven Year War, but abandoned his military career and fled to England.


Library of Congress

• Herschel was blessed with a winning personality. He made many friends in England and secured a lifetime appointment as an organist in Bath. Yet he was bored, and turned for challenge to astronomy, starting with the popular works of James Ferguson.
• Herschel was captivated by the mysterious "nebulae", the distant "cloudy stars". But he was frustrated by the aberration-ridden refractors of the day and learned to build large aperture Newtonian reflectors to see deeper into space.
• He built more than 400 telescopes. In his most ambitious attempt, he tried to make a 36" metal mirror using a cast of hardened horse dung. The cast leaked molten metal onto the floor of his workshop, causing flagstones to explode and ricochet off the ceiling. This episode aside, Herschel made some of the finest large-aperture telescopes in the world at that time.

A Deeper Look

• He became a supremely patient and skilled observer. His detailed knowledge of the stars enabled him to discover an unexpected celestial wanderer: the planet Uranus. This discovery, made with a 6" reflector, gained him fame and freedom: he was granted fellowship in the Royal Society and a rich stipend from King George III.
• He was the first to discover that many nebulae were made of stars (these were the globular and tight open clusters). But he also concluded some nebulae (planetary nebulae, for example) were made of a "shining fluid" of unknown constitution, which remained unknown until the 19th century.
• Herschel assumed we lived in a vast cluster of stars and set out to map it by counting stars in different directions. He correctly concluded we lived in a flat disk of stars… a galaxy.

Good To Know

Herschel made many conjectures of astonishing accuracy. He believed the Orion Nebula was "the chaotic material of future suns". And he believed the Andromeda "nebula" was an island of millions of stars. He had no way of proving these conjectures, yet he was correct.

Personal View

Despite his wealth, fame, and accomplishments, Herschel never lost his love "for this magnificent collection of stars" in which we live. In the summer of 1819, at the age of 80, he wrote his sister to come dine with him and help him see a great long-tailed comet. May we all find a calling we enjoy as much.

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Articles : Please send contributions for the newsletter to The Editor, Bob Mullen, 18 Chandlers Ridge, Nunthorpe, Middlesbrough, TS7 0JL, 01642 324939 (b2mullen@hotmail.com) Copy deadline date is the 25th of each month).