



The 21st September Fireball



October 2012



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Events list

Saturday 06 October: **Skywatch** at Kielder Castle.
Sunday 07 Oct: **Beginner's course**, 7pm: Final session –
Telescopes (£1 charge applies)
Wed 10 – Mon 15 Oct: Kielder Star Camp
Monday 15 Oct: New Moon
Saturday 20 October: **Public observing** session at
Killhope Lead Mining Museum
Sunday 21 Oct: **Speaker – David Hughes:**
“David Sinden, master optician”

Saturday 03 November: Nissan Fireworks Night
Tuesday 13 Nov: New Moon
Friday 16 – Sat 17 Nov: Leonid meteor shower maximum
Sunday 18 Nov: **Annual General Meeting**, 7pm at WWT

Sunday 16 December: **Astrophotography** –
Speaker: **Keith Johnson**

All Society events

- are free,
 - are held in the Washington WWT facilities, and
 - evening meetings start at 7:00pm
- unless otherwise noted.**

Please bring a torch and warm clothing to any night-time observing sessions.
All observing sessions are dependent upon favourable weather and **may be subject to cancellation.**



Above: Ten years ago - Gary Fildes putting the final brick into place in the observatory's exterior wall.

Editorial: Happy birthday, Cygnus

Believe it or not, it's our observatory's tenth birthday this month! The Cygnus Observatory was officially opened on 2nd October 2002 by former Astronomer Royal Prof Sir Arnold Wolfendale. It's seen a few changes since it first opened, most importantly the replacement of the original telescope with a shiny, new, computerised Meade Schmidt-Cassegrain telescope. Now seems an appropriate time to thank everyone involved in the original design and build of the observatory, and all those over the years that have helped to keep it running.

The new observing season is off to a flying start and October sees two important public events, at Kielder and at Killhope. Hopefully the weather will be favourable and help make these events as successful as they have been in the past. – Dave N., Editor.

SAS Yahoo Forum

The Society's Yahoo group provides a forum for members to exchange ideas, ask questions, and a place to post their pics:

<http://tech.groups.yahoo.com/group/SunderlandAstronomicalSociety/>

A Brand New Age: Queue Observing at Mt. Paranal

By Dr. Marc J. Kuchner

First a caravan of white observatory cars arrives, winding up the narrow road to the 2600-m- (~8500-foot-) high summit. Then the shutters around the domes open, and rays from the setting sun alight on colossal mirrors and metal struts. It's the beginning of another busy night at Mt. Paranal, Chile, where I am learning about new, more efficient ways of managing a modern observatory.

I stepped into the observatory's control room to soak up some of the new, unfamiliar culture. Here, under florescent lights and drop ceilings are banks of computer screens, one bank to control each of the four big telescopes on the mountaintop and a few others too. At each bank sits two people, a telescope operator and an astronomer.

The layout of this workspace was not unfamiliar to me. But the way these Mt. Paranal astronomers work certainly was. When I was cutting my teeth at Mt. Palomar observatory in California, I would only go to the telescope to take my own data. In stark contrast, everyone observing at Mt. Paranal tonight is taking data for someone else.

The Mt. Paranal astronomers each spend 105 nights a year here on the mountain performing various duties, including taking data for other astronomers. The latter, they call "executing the queue." Headquarters in Germany decides what parts of the sky will have priority on any given night (the queue). Then the Mt. Paranal astronomers march up the mountain and carry out this program, choosing calibrators, filling the log books, and adapting to changing conditions. They send the data back to headquarters, and from there it makes its way out to the wider astronomical community for study.

This new way of working allows the Mt. Paranal astronomers

to specialize in just one or two telescope instruments each. Surely this plan is more efficient than the old-fashioned way, where each of us had to learn every instrument we used from scratch—sifting through manuals at 3:00 AM when the filter wheel got stuck or the cryogen ran out, watching precious observing time tick away. Here at Mt. Paranal, much of the work is done in a big room full of people, not off by yourself, reducing some dangers of the process. Also, queue observing cuts down on plane travel, an important step for cutting carbon emissions.

It's a brand new age, I thought as I watched the giant domes spin in the silent, cold Chilean night. And maybe with queue observing, some of the romance is gone. Still, my colleagues and I couldn't help saying as we stared out across the moonlit mountains: I can't believe how lucky we are to be here.

Dr. Marc J. Kuchner is an astrophysicist at the Exoplanets and Stellar Astrophysics Laboratory at NASA's Goddard Space Flight Center.

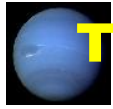
NASA's Astrophysics Division works on big questions about the origin and evolution of the universe, galaxies, and planetary systems.

Explore more at <http://www.science.nasa.gov/astrophysics/>.

Kids can explore these topics at <http://spaceplace.nasa.gov/space>.



Left: The European Southern Observatory at Mt. Paranal, Chile



THE DARKE SIDE

Society Update with Chairman
Graham Darke

September's Lecture

I hope everyone enjoyed my talk on extra-terrestrial life on Sunday 16th September. Despite "evidence" to the contrary, I don't believe that we are being or have been visited by aliens. The vastness of the universe quite probably means that life does exist elsewhere but in what form? Could we ever communicate with another civilisation? Here the size of the universe presents a problem. The sheer distance between star systems means that propulsion systems beyond our imagination would be required to allow intergalactic travellers to visit us. Communication would be similarly difficult with the round trip travel time for radio/laser communications of the order of decades. I was pleased that most people think life probably is common. However, higher intelligence is another matter altogether. Having watched the Sky at Night clip I showed during the presentation one has to wonder what level of intelligence some of humanity has reached!

October's lecture will be given by Vice Chairman, David Hughes, and will be on the subject of local master optical engineer **David Sinden**.

Nissan Family Fun Day, 26th August

Over 8,000 came through the gates to Nissan's family fun day over the summer bank holiday weekend. The society attended and shared the bill with Steps, Girls Aloud and Take That tribute bands – no we didn't sing any songs! There was great interest in our telescopes and I think our "who stares wins" t-shirts drew a few wry smiles from the boys from the army who were exhibiting next to us. Nissan are collaborating with the society on an event for the next series of Stargazing Live in January (more on this soon) and we're also taking telescopes along to Nissan's fireworks display on 3rd November (see below).

Kielder Starwatch – Saturday 6th October – Kielder Castle

Once again we are teaming up with the Forestry Commission to host a public star gazing evening at Kielder Castle. The evening starts at 7.00pm so volunteers are asked to be at the castle with their telescopes for 6.00pm for set up. Hope to see a few of you there.

Killhope Lead Mining Museum – Public event – Saturday 20th October at 7.00pm

Our third public evening in conjunction with the Killhope Mining Museum will take place on Saturday 20th October. Volunteers are requested to come along armed with telescopes. The format will be the same as previously with a talk followed by observing and a soup and sandwich supper is

thrown in for all who help. We are going to aim to arrive at the site for set up at 6.00pm. Hope to see you there.

Nissan Fireworks Night

Nissan have asked us to attend their fireworks evening on Saturday 3rd November from 5.30pm until 9.00pm. So were going to take some telescopes along for some lunar observing. Anyone wishing to help out will need to be there early for set up. The venue is Nissan Sports and Social Club accessed via the main entrance to the factory near to the aircraft museum. We are aiming to be there for 4.30pm.

Notice of Meeting: AGM

Notice is hereby given of the 19th Annual General Meeting of the Society which will be held on **Sunday 18th November 2012** at the **WWT, commencing 7.00pm**. The agenda is given below. If any member has business which is appropriate for discussion at an AGM, they should notify the secretary at least 21 days prior to the meeting.

The AGM has become a well attended date in the society calendar which is very encouraging. It is every member's chance to voice their views and also to volunteer for places on the Committee should they so wish.

This year I will be standing down from the role of Chairman after 9 years. David Hughes (current Vice-Chairman) has put himself forward as a candidate for the role. If anyone else wishes to put themselves forward for any committee role, they should notify the secretary accordingly: Paul.meade@me.com

AGM Agenda

- Financial Review
- Significant purchases
- Membership numbers
- Subscription rates for 2013/2014
- Review of activities of the past 12 months
- Appointment/reappointment of committee members
- Appointment/ reappointment of auditor
- Members' forum
- Any Other Business

Stay up to date

Keep up to date with all society developments on the website www.sunderlandastro.com and why not sign up for the news group. Also check out our Facebook and Twitter pages.

Clear Skies,



BBC News - 21st September:
'Meteors' sighted across UK

People from across the UK have reported seeing bright objects in the night sky, thought to be meteors or "space junk"

Coastguards in Northern Ireland took calls from people who saw the objects from Coleraine on the north coast, to Strangford Lough in the south east.

The lights were seen as far north as Caithness in Scotland as well as in Wales and Norfolk in East Anglia.

Experts said the sightings could be satellite debris, burning up on entry to the atmosphere.

The lights have also been reported in the Midlands, parts of north-east England and in Glasgow and Edinburgh.

Brian Guthrie in Grangemouth near Edinburgh, who watched the objects pass through the sky, said it appeared to be something "pretty large breaking up in the atmosphere".

"I've seen shooting stars and meteor showers before, but this was much larger and much more colourful."

Coastguards in the Shetland Islands received what they believe is Scotland's most northerly sighting of the meteor at 23:00 BST.

They were called by a member of the public who had seen a bright white light in the sky over the Stacks of Duncansby in Caithness.

One person who contacted the BBC said it was "kind of a mass of light, gold light. Everything moving in unison".

"It wasn't diverging... I thought it was a plane at first. It was quite low on the horizon and moving much slower than I'd expect to see a shooting star, but it was amazing."

Another said the sight was "like Independence Day" - a reference to the film about an alien invasion of Earth.

Diane Martin from Rainworth in Nottinghamshire said she saw "a bright yellow and orange ball" and considered calling the police before her husband checked the internet and found other people had seen it.

She told the BBC: "We only saw the one. It was quite low as well. It wasn't that far away to be honest. We thought something was actually going to come down in the actual village.

"It was travelling from east to west. It was coming down but it was going across more than it was going down."

Durham Constabulary said they were "inundated" with calls from members of the public across the north-east who were "concerned" as to the sightings

of unidentified flying objects lighting up the night sky.

In Wales, sightings were reported between Cardiff and Swansea in the south, Aberystwyth in Ceredigion and Crickieth in Gwynedd.

Howard Parry spotted a "stream of light" while looking out to sea from his caravan in Llanrhystud in Ceredigion at around 23:00 BST.

"I thought first of all it was a plane going down then I thought what the devil is it?"

"The best way I can explain it is that it looked like a train with all different carriages on it... it lasted about 25 to 30 seconds.

"I've never seen anything like it - it was really, really bright," he said.

Chris Butler, of Tonypany in the Rhondda, said he saw "a triangle of orange lights" that "didn't look like a typical meteorite".

He added: "It looked similar to aeroplane lights but it looked really huge so it obviously wasn't a plane or anything."

Dr Tim O'Brien, associate director of the Jodrell Bank Observatory, told the BBC it was difficult to know the cause of the phenomenon.

"It's hard to say exactly, whether it was a chunk of rock coming in from outer space, burning up in the atmosphere, or a bit of space debris we call it, space junk, which is basically man-made stuff from a spacecraft that's burning up in the atmosphere.

"[The object was] probably 80 miles up or so, high up, moving very fast, actually, 18,000 miles an hour, probably, at least."

Colin Johnston, from Armagh Planetarium in Northern Ireland, said the lights were unlikely to be part of a meteor shower.

"There are actually several small, faint, meteor showers scheduled across September but they're so unspectacular, not many people actually bother looking for them.

"I think that actually this spectacle tonight might not be associated with that."

"I think it's something just by chance has happened to come in tonight, some piece of actual space junk floating around the universe for billions of years has just picked tonight to fall in across our skies, or a satellite that's been up for some years has decided to burn up," he said.

Solar maximum comes and goes

Waiting for solar fireworks to reach a grand finale next year? Um, sorry, looks like you already missed them. Structures in the sun's corona indicate that the peak in our star's latest cycle of activity has been and gone, at least in its northern hemisphere.

The southern hemisphere, meanwhile, is on a sluggish rise to solar maximum and may not hit its peak until 2014.

This bizarre asymmetry strengthens a theory that has been bubbling among sun watchers for the past few years: our star is headed for hibernation. Having the sun's outbursts turned off for a while

would provide a better baseline for studying how they influence Earth's climate.

Observations of magnetic footprints called sunspots revealed in the 1800s that the sun moves through a roughly 11-year cycle of activity. Around a solar maximum, the star ramps up production of sunspots, flares and ejections of plasma. During a solar minimum, things quieten down.

Following an unexpectedly deep minimum from 2008 to 2010, solar physicists predicted a weak maximum for 2013. These days, though, sunspots aren't the only tools for charting the solar cycle. Richard Altrock of the US Air Force Research Laboratory in New Mexico has been studying coronal structures called polar crown prominences, which stem from magnetic rumblings on the sun's surface.

These gaseous filaments form at mid-latitudes at the beginning of a solar cycle. As it progresses they drift polewards, and when they reach 76 degrees latitude, a solar maximum has arrived. Soon afterwards the prominences disappear, only to form again during the next cycle.

Based on the movements of this cycle's prominences, Altrock says that an especially weak solar maximum took place in the sun's northern hemisphere around July last year.

Bernhard Fleck, project scientist for NASA's and the European Space Agency's Solar and Heliospheric Observatory, calls the paper solid work, but adds that even if we missed the northern maximum, the southern hemisphere is still expected to put on a show.

According to Altrock, the southern prominences are still on the move, but slowly. If they continue at the current rate, he says, the south will not reach its maximum until February 2014.

Such a large asymmetry between hemispheres could be a sign of big changes ahead, says Steven Tobias, a mathematician at the University of Leeds, UK, who models what drives the sun's magnetic field. According to his models, such a situation precedes an extended quiet phase called a grand minimum. "Changes in symmetry are more indicative of going into a grand minimum than the strength of the cycle," he says. Grand minima can last for decades. The previous one took place between 1645 and 1715, and has been linked to the little ice age in Europe. A new one might also cause localised cold periods, but many climate scientists see a silver lining to such a turn of events: a grand minimum offers ideal conditions for testing the effects of solar variability on Earth's climate.

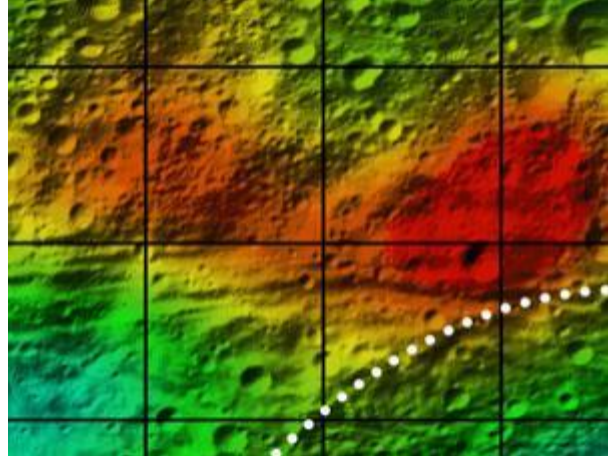
But Michael Proctor, a solar physicist at the University of Cambridge, is not convinced that this will happen. "This present cycle is similar to the weak one that ended in 1913, and that was followed by a strong cycle," he says.

Only time will tell.

Asteroid Vesta's hydrogen suggests water-delivery role

It's no aqua-world, but the giant asteroid Vesta is surprisingly rich in one watery ingredient – hydrogen. The discovery, combined with its oddly pitted terrain, suggests that water arrived on young planets – including early Earth – during an intense round of meteor impacts.

The 530-kilometre-wide Vesta is unusual among asteroids because it's thought to be the seed of a terrestrial planet that didn't finish forming.



"Vesta is an example of such a world – as Earth once was – frozen in an embryonic state," says Mark Sykes, an astronomer at the Planetary Science Institute (PSI) in Tucson, Arizona, who wasn't involved in the new studies.

The object therefore offers clues to the earliest stages of planet formation in our solar system.

Using data from NASA's Dawn spacecraft, PSI's Thomas Prettyman and colleagues compared the chemical composition of Vesta's surface with that of howardite-eucrite-diogenite, or HED, meteorites.

Dawn's spectral maps show more hydrogen in regolith, near the asteroid's equator, and less in relatively young impact basins, including the large crater Rheasilvia, from which many HED meteorites probably originated.

"Vesta, like our moon, was thought to be bone dry, and yet we find this material that has been distributed all over Vesta's surface," says Prettyman. The HED meteorites, meanwhile, contain traces of carbon-rich chondrites, some of which hold significant amounts of water-bearing minerals.

The team thinks hydrogen was delivered to Vesta through a swarm of carbonaceous chondrite meteors. These rocks hit at slow enough speeds that their hydrous content was preserved on Vesta's surface. Later, high-speed impacts ejected some of the hydrogen-rich surface material, leaving behind the erratic pattern.

The idea is supported by 30- to 500-metre-wide pits seen in Dawn's images of some smaller craters, according to a second study led by Brett Denevi of the Johns Hopkins University Applied Physics Laboratory in Laurel, Maryland.

Denevi's team thinks the pits formed when some of the impacts caused volatile compounds – also found in carbonaceous chondrites – to degas due to the high temperatures.