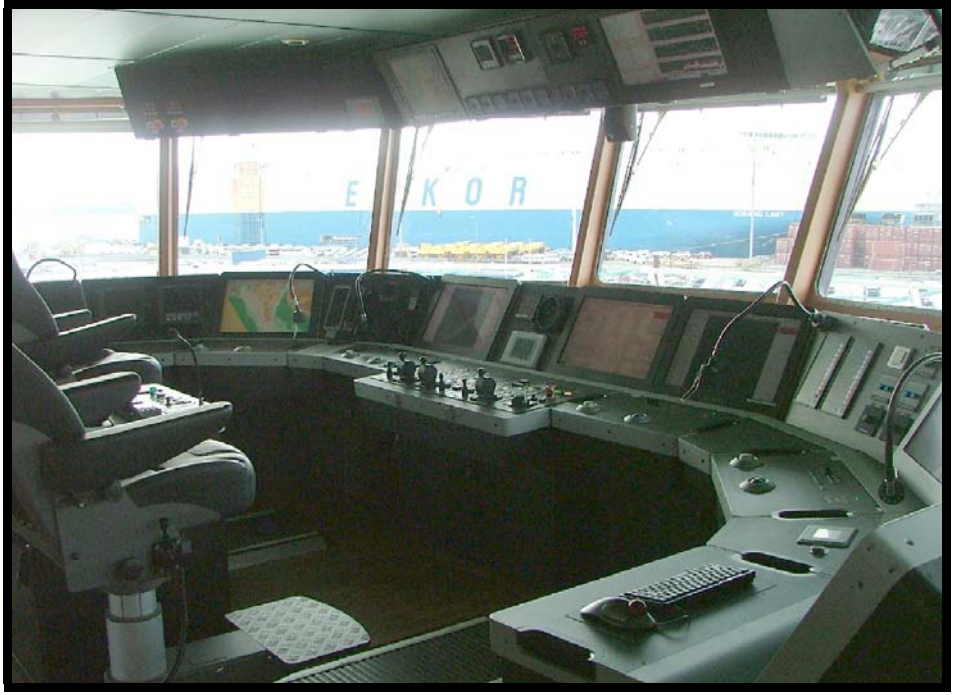
NEWSLETTER

December 2013 - February 2014 Issue 165



The bridge of the ~~Starship~~ ~~Enterpr....~~ Oops sorry getting carried away! RRS Discovery, seen on CAS's recent trip to Southampton to visit the new ship. Photo Ian Davies.

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Editorial — Ian Davies

As I write this the much expected Comet 2012 S1 ISON has outburst twice in recent days and is brightening nicely, it is visible to the naked eye in the morning sky. The comet looks on course to give a decent showing, though it is unlikely to reach the hyped-up brightnesses thought possible at the start of the year.

By the time you read this hopefully ISON will have survived perihelion passage (it is passing very close to the Sun and could possibly breakup during the passage.) and be emerging from behind the Sun and be visible in both the evening and morning skies. It will still be close to the Sun so will set in the evening soon after the Sun and in the morning rise not long before the it. This means that the skies will be quite bright.

> Please do not try to look for ISON if the Sun is above the horizon, **it's not worth risking your eyesight.**

By around 23rd/24th December ISON will be circumpolar from the UK. Observing it will be a bit of a balancing act, as it climbs into darker skies and moving away from the Sun it will in all likelihood be fading in brightness. But it's definitely worth a look, it may well still be spectacular!

Wishing you dark skies - Ian.

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 166 is 6th February).

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

Gerry Dolan David Powell

It is with regret that I inform you of the death of a long standing member, Mr Gerry Dolan at the age of 93.

Gerry (right) appearing with CAS secretary Dave Powell on BBC Wales as part of the B.A. Festival of Science week in1998.

Gerry was a regular visitor to the old Penylan Observatory and it was there that we first met in 1975.

He was a very enthusiastic observer and always keen to help get budding observers started. He had a wicked sense of humour, and was always ready to help the society. Elected chairman, he volunteered the use of his house for committee meetings and along with his late wife Marjorie helped keep the fledgling society going.

I will remember Gerry not only as a friend but also for his wise counsel, which I was grateful for on more than one occasion.

In later years his health declining he was unable to attend our meetings and he was made an honorary member in recognition of his loyalty and service to our society.

Sky at Nightmare ! Roger Butler

After an anxious few weeks, when the BBC refused to admit or deny that Sky at Night would no longer appear after December's programme, all appears well after the Beeb finally confessed that it would be returning to our screens each month, commencing in February 2014. StarGazingLive in January would act as curtain raiser to the new S@N. So did the BBC honour their word of finally listening to their viewers ? Did they cave in to the 53,000 people who petitioned the programming commissioners ?

Or was it all a cynical PR exercise to pretend the programme was under threat in order to bask in the glory of eventually saving its future ? Let's face it, axing the programme would hardly have

saved any money: we can thank Brian May for revealing that one episode of StargazingLive costs more than a whole year of S@N.

So are all our worries over ? Well, not quite. I am particularly fond of S@N having watched it since it began in 1957. But however much we each might owe to Sir Patrick Moore, the programme reflected his infectious enthusiasm and, above all, amateur approach. Now he is no longer with us, the programme will inevitably change. Will it be allowed to evolve naturally as it seems to be doing at the moment ? Or will it be subjected to a major revamp and be fronted by a 'personality'.

Chris Lintoff had a complementary role with SPM. The one a professional astronomer with a strong record of encouraging public involvement – he developed Zooniverse – and the other a diehard amateur with a practical and enabling approach. Lintoff was SPM's declared heir apparent and he has started to move away from the 'professional astronomer' image, rolling up his sleeves and getting stuck in with amateurs at the Brecon Star Party recently. Other names put forward by the public include SPM's close friend, Dr. Brian May. He has a very strong public image as a rock musician but he has ruled himself out, saying he is not the right person.

So that leaves us with TV celebs – none of whom has a real commitment to astronomy. Richard Hammond has recently fronted 'RH builds a planet' and soon 'RH builds a cosmos'. Was this a dummy run to see how the public reacted to his fronting an astronomy programme ? But as one newspaper critic wrote, after the first programme, RH's qualifications and CV hardly equip him with building an Ikea footstool."Complete and utter asteroids" said another. So although he can read a script while looking in the camera, his long term credibility would soon be called into question. Who else: Mylene Kass, Holly Willoughby ?

And so my nightmare begins: the whole programme is completely revamped in order to attract a wider viewing public. The BBC has done this before: Horizon was once a really interesting programme but now the 'arty' directors have decided that science is just too hard and needs to chopped up into little soundbites with dazzling computer generated images and loud, epic orchestral music. So a

programme that appealed to perhaps a minority audience has been made accessible to all. Consequently, those who are interested in the subject will learn nothing and feel patronized and those who are not interested in the subject will not be tempted away from the latest version of GrandTheftAuto. The programme simply has no target audience. And the Beeb should not shy away from minority areas that no other broadcaster would tackle – who else could take on S@N ? – as they are funded by the Royal Charter specifically to provide a public service.

Meanwhile in my nightmare, the programme commissioner has decided that elements of mass entertainment shows are a surefire way to increase S@N viewing figures:

Rick Stein will demonstrate how to make an authentic Cornish Star Gazy Pie while Heston Blumenthal will reveal new and unusual combinations of flavours made with standard issue NASA astronaut food. There will be an elimination dance competition, choreographed in the weightlessness of the International Space Station. The Top Gear crew will be putting moon buggies through their paces on Dartmoor while Richard Hammond comments on contestants in spacesuits tackling the Total Wipeout course. And of course Russell Grant will feature with his monthly astrological forecast – an area so far neglected in 56 years of S@N.

The 'S@N crisis' of recent weeks has generated a strong internet community of 53,000 people who will each be monitoring the programme when it returns with 30 minute episodes on BBC4. They represent a force to be reckoned with. The BBC will be hoping hope the force will be with them.

For Sale

Sky Watcher 300P 12" Dobsonian reflector telescope for sale with SP10mm and SP25mm eyepieces, x2 Barlow lens and full aperture solar filter, all hardly used due to upgrade £400.

Contact: Dr Rae Jones

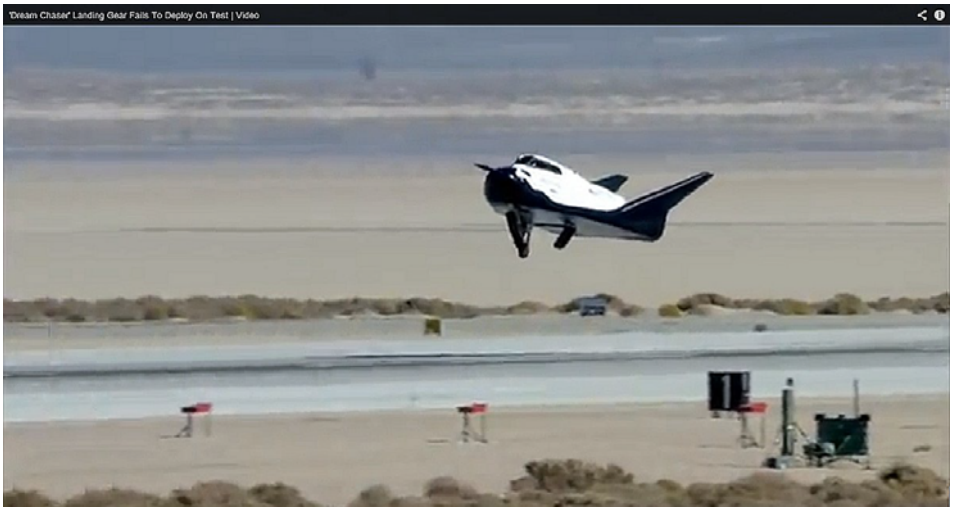
Tel 07841 750 945, email rae330@btinternet.com

Spaceflight Roundup John Richards

These are Interesting times in the launch arena. An Orion launch will soon be with us, Mars continues to fascinate many on Earth, and Sierra Nevada attempt a landing of their Dream chaser craft, with ‘mixed’ results.

Dream chaser, the mini shuttle, developed by the Sierra Nevada Corporation suffered an embarrassing failure in a recent drop test. Dropped from an Ericsson Air-crane helicopter from 12,500 ft, the flight seemed to be going well for a scheduled landing at Edwards Air force Base, just over a minute after deployment. Unfortunately, as the image below shows just before landing one of the 3 landing gear on the craft failed to deploy.

Sierra Nevada cut short the video of the landing and has made no confirmation of the damage to the craft other than to acknowledge the issue, and to state the test was successful. There are reports the craft flipped over, left the runway, and landed in the sand.



NASA had hoped to start using private contractors to ferry astronauts to the ISS from as early as 2017.

Olympic torch visits the ISS

The Winter Olympic torch left for a quick 4 day trip to the

International space station in early November. Taken aboard the station on a Soyuz craft, it was also taken on a 5 hour spacewalk before being returned to Earth by Russia's Fyodor Yurchikhin, American Karen Nyberg and Italian Luca Parmitano, after they'd spent 166 days on board the ISS. Perhaps logically, during the visit the flame was never lit.....

Happy Birthday Fred!!

Fred Haise, left in his Apollo days and right in Nov. 2013

Happy 80th Birthday to Fred Haise. Born on November 14, 1933, The Apollo 13 astronaut was lucky to escape with his life in 1970, as a massive explosion wrecked any chance he had of setting foot on the Moon. Having spoken to him during Spacefest V, I can tell you the fact he didn't set foot on the Moon, still rankles with him, more than 40 years later. Many Happy returns Fred.

Orion first flight less than a year away

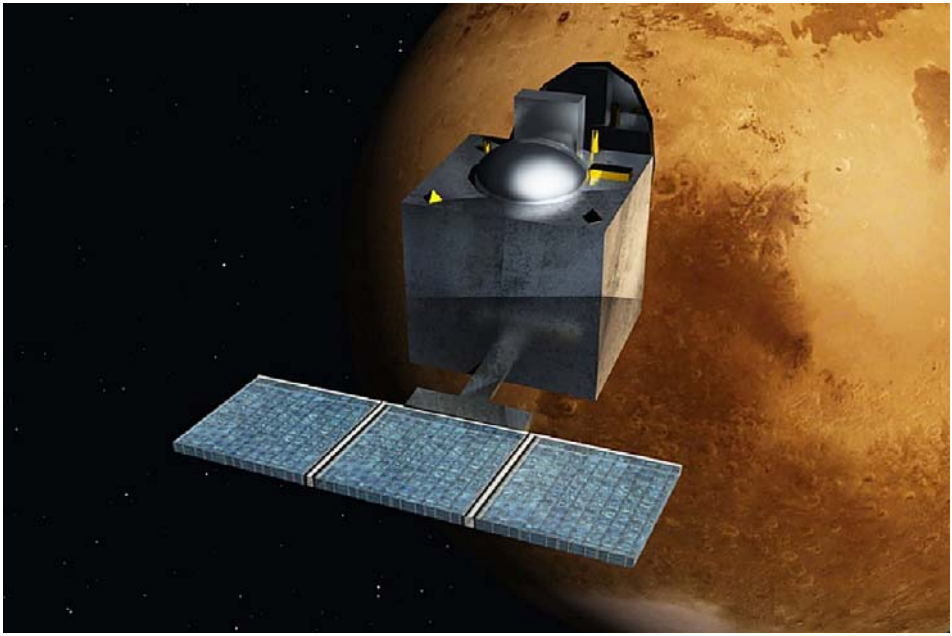
The first scheduled flight of the Orion capsule is now under a year away. It will be launched atop a Delta IV Heavy rocket from Space Launch Complex 37 at Cape Canaveral Air Force Station. The mission will be a two-orbit test of the Orion Crew Module featuring a high apogee second orbit and a high-energy re-entry at around 20,000 mph, to test the heat shield and flight control systems.

Mars

By the time you read this, both the Indians and Americans should have probes on their way to the Red Planet. Due to launch from SLC-41 from Cape Canaveral Air Force Station aboard an Atlas V rocket on the 18th November, the MAVEN probe will study the upper atmosphere of Mars to determine why and how Mars lost its atmosphere and what part this played in changing the Martian climate in its distant past.

The Indians could become only the 4th nation to successfully launch a probe to Mars. They launched their probe on November 5th from an Indian launch facility. After initial issues raising the orbit

of the craft, the probe will spend the next month gaining momentum from the Earth, before reaching Mars in late 2014. Compared to other craft sent to Mars, the cost of this probe, at £45 million, is very cheap.



The instruments aboard the craft include a photometer to measure hydrogen and deuterium in the atmosphere, a methane sensor (a possible indicator of life?), a spectrometer and a colour camera.

Earth Smiling

By now, you will have no doubt seen, NASA has released the photo taken, from the Cassini probe orbiting Saturn of, the Earth in space. Organised by Caroline Porco, it has been called “Earth smiling”, and is a repeat of the task undertaken in 1990,when Carl Sagan took a very similar picture with the Voyager probe as it hurtled out of the solar system.

The new pictures, available from the NASA website, are truly spectacular and beautifully show the majesty of Saturn, the minute nature of Earth, and the utter blackness of space. VERY inspiring, and SURE to gain a wider audience.

Flying Sorcery David Powell

I have been researching some information available in the bulletins of the Cambrian Astronomical Society, a forerunner of our society and came across this,

Flying Sorcery received a stimulus in Cardiff on Wednesday 25th November 1964. A report in the Western Mail the following morning reported that “Motorists left their cars in a Cardiff street last night to watch a mystery ‘glowing red’ object hurtle across the skyline. The object - like an ‘enlarged dustbin’ was visible for 3 to 4 mins, and was moving from west to east. Mr John Griffiths an engineer of Birchgrove estimated that it was under cloud level-about 500ft. He said ‘ I was driving along Heathwood Road when I saw it for about 4 mins, and at the time it was moving quite slowly. It was glowing red and we could all see it quite clearly’. Mr Griffiths telephoned Cardiff Airport to find the cloud level. Another man who phoned the Mail said it was like a small moon. ‘It was an unusually large object travelling at a tremendous pace’, he said. ‘I first thought it was a balloon or comet’. ’I looked through a pair of binoculars and saw it was perfectly round with no tail’.

Wonder what it was!!!!!!

Ahoy there, me hearties !

(Jolly) Roger Butler

Many of you will know that in 1910 Captain Scott set out on his ill-fated journey to the South Pole from the Royal Hotel in St Mary Street in Cardiff, embarking on the Terra Nova with his 'galant' crew from Cardiff Docks. His previous expedition to Antarctica had been in 1901-05, sailing on the Royal Research Ship Discovery.

One hundred and twelve years later, a group of intrepid CAS members assembled on the steps of the National Museum of Wales in Cardiff, ready for their expedition to Southampton, cruising along the M4 in a coach, to see Discovery's great grandson, er – Royal Research Ship Discovery.

The weather was changeable but distinctly gloomy as we put into Newport to pick up extra hands. And conditions worsened as we proceeded eastward. However spirits were high and lively chatter could be heard from all quarters as we drew up at the services. Today was going to be a bit different.

A good soaking in heavy rain did not dilute our resolve and we continued, due south, on the motorway towards our destination.

Approaching Southampton, the skies suddenly cleared and the sun emerged just as we were about to disembark. Theresa Cooper and husband Edward were there to welcome us. I am not sure how they had arranged for the change in the weather at just the right moment but should this technique be perfected, it could be of great benefit at observing sessions and Dave's Star Parties.

So why were members of the astronomical society on a mission to visit Southampton Docks ? I do recall that when the idea was first suggested, a voice was heard to cry: "Why would I want to see a boat ?" Undeterred by this, a good many of us though it was a splendid excuse for a society outing and a unique opportunity to see a brand new scientific research project at first hand. And the invitation only arose because Edward Cooper is the National Environmental Research Centre Project Officer for the 'Discovery Replacement' at the National Oceanographic Centre in Southampton. The new Discovery is very much Ed's 'baby' and he

has supervised its construction from initial ideas, design and laying the keel to launch and sea trials. This has entailed considerable time away from home in South Wales and months of commuting between Southampton and Vigo in Spain.

We proceeded into the NOC building and up to the first floor. After a brief introduction, the group was divided into three colour-coded teams and each group then rotated through three activities: a guided tour of the Discovery, a talk about the history of oceanographic research and specifically the four 'Discoverys', a lunch in the dockside refectory, overlooking the ship.

I was in the first group to tour the ship and very soon we were

downstairs and alongside the Discovery, which was berthed just outside. And what a magnificent sight ! Gleaming in the sunlight, immaculately turned out and bristling with all the latest technology. We could hardly wait to clamber up the gangway and investigate on board. Ed gave a very thorough tour and we saw all sorts of spaces – cabins, the mess, the wardroom, the medical centre, the bridge and, or course, the on-board labs where the actual science will be done. We were not hurried and were afforded plenty of time to take it all in and to ask Ed lots of questions. I was mindful that he was going to have to do this two more times, after a very tiring week which included the official naming by HRH The Princess Royal only two days previously.

I think everyone's favourite space was the bridge, with its tremendous view over the rest of the ship and its surroundings. The technology was everywhere – control panels, monitoring lights, dozens of visual displays but (quite remarkably) no engine levers or a 'wheel'. Amazingly, the whole bridge is designed for one person operation and, even then, that person is not exactly hands-on but


Commander Townsend

sits back from the controls and displays, monitoring the situation and only intervening and correcting when necessary. And everyone wanted to be photographed in that chair. Captain Kirk would have been green with envy as this bridge made the Enterprise look distinctly passé.

From there we proceeded to the labs where research scientists will soon be plugging in specialist equipment and beginning their experiments. On the deck we saw various submersibles that will be used to collect all kinds of data. I was pleased to see that they were all painted bright yellow in deference to the Beatles. Some of these probes will trail behind the ship, others drop to the sea floor and others be programmed to venture far away from the ship on their own mission, returning possibly months later.

It was awe inspiring to see the very latest technology applied to cutting edge scientific research. The ability to remain exactly over the same spot on the ocean floor whatever the sea conditions is mindboggling. And of course, Discovery will be going to some pretty inhospitable places on the globe in the foulest of sea conditions. Fortunately there are people around like Edward and Theresa, who don't really understand seasickness. Whereas others feel quite queasy whilst rowing slowly around the Scott Memorial on Roath Park Lake.

Back on dry land, it was our turn to listen to an illustrated talk given by Ed's colleague, Jackie, on the history of oceanographic

research. She had also had an exhausting week but had volunteered to come in on her day off to welcome the CAS group. And she also gave the same presentation three times. My lasting impression was of how primitive research techniques were up until only a few years ago compared with the level of sophistication we had seen on board the new Discovery.

After a leisurely lunch in the refectory, catching up with other CAS members, we returned to the lecture theatre for more archive films before Ed gave us a chronological rundown of the development and construction of the vessel, with slides of the areas we were not allowed to go in – engine rooms, etc – together with a description of various design features and functions.

There was just time to get everyone outside, on the quayside, alongside the ship for the mandatory group photograph and so that Ian could demonstrate he can still manage a 'timed shutter' sprint just like Mo Farah. Then it was time to bid farewell to our hosts with enormous thanks for all their efforts in making this such a splendid excursion.

On the way home, we were treated to a spectacular sunset as we sped along the motorway. Surely an auspicious sign. Before long we were nearing Swindon and the Sally Pussey Inn, where we frequently stop for a carvery meal. Soon we were back to Newport and Cardiff and home.

Was this trip relevant to astronomers ? There are so many obvious parallels between space exploration and oceanography. You will recall Discovery was the name of the most successful of all the space shuttles. And sending probes to roam across the surface of Mars is not so different from sending submersibles out into the ocean to gather data. Deep space probes sent to Mars in the late '90's were called Amundsen and Scott. The two furthest manmade objects in space are called Voyager 1 and Voyager 2. And other space missions were called Mariner and Magellan. So exploring space and the ocean are very similar pursuits in many ways. Did the water in the ocean really get transported here by comets ?

Very many thanks, once again, to Theresa and Edward for arranging such a special day. I am sure we will all follow Discovery's future voyages with special interest. And thanks, of course, to Rosa for sorting out all the logisitics of getting us to the ship and back safely.


The CAS Crew

Scott's original wooden Discovery got stuck in the Antarctic ice for over a year (is that where the expression 'shiver me timbers' comes from ?) before being released by explosives and two relief ships, one of which was Terra Nova. It is now on display in Dundee. Another trip ? Piece of cake !

Behind the Scenes

Rosa Adams

The last three months have seen CAS as busy as usual with a full diary of outreach events. September started with the telescope workshop at The National Museum of Wales and was a resounding success. CAS welcomed a number of new members.

It was a similar story at Dyffryn Gardens for the solar observing at their Open Doors Wales Saturday with the sun actually putting in an appearance.

October and we were at Brecon Beacons National Park Visitor Centre for an evening event, a full house and some observing.

The CAS trip to visit RRS Discovery, the UK's new royal research ship was enjoyed by all. Thanks must go to Theresa Cooper for

suggesting the visit and her husband Edward Cooper, the ship's project manager, for arranging the talks and tour around the ship. A good dinner and an absolutely stunning sunset on the way home, perfect. (See Roger Butler's full account starting on page 10.)

We now have the camera at the observatory that will enable us to take part in the UKMON meteor watch. Some of the committee visited the Norman Lockyer observatory in Sidmouth for a UKMON meeting. They had a very enjoyable day there and suggested it as a CAS trip. I plan to action this shortly and hope we may be able to visit around the middle of May.

Robert, Martin and Claude seen here fitting the UKMON meteor watch camera housing our observatory at Dyffryn Gardens.

With an increasing number of members from Newport and surrounding areas it was decided to seek some new venues for outreach events to the east of Cardiff. Theresa has been in touch with managers at Tredegar House the beautiful 17th century mansion on Newport's western outskirts. Recently taken over by the National Trust we met with the staff, were treated to a tour of the house and received some very positive feedback. CAS will be attending an event there in November for the junior rangers –as a first step hopefully to an annual event.

Free to enter, the grounds of Tredegar house are an ideal place for solar observing and no objections were raised to us using them for this purpose.

We are in the process of trying to raise funds for a replacement observatory telescope. The present scope is over 20 years old and is becoming very difficult to manage particularly when attempting to align it.

With a queue of people waiting to see the wonders of the heavens

during star parties we all too often have to say, sorry the scope is playing up. A new telescope with modern technology should make that a thing of the past and a more enjoyable experience for its operators.

On the last occasion of a Dave's Star Party, Robert Love decided to stay on alone, all night if necessary with the expressed aim of mastering this telescope at whatever cost. Even Robert's resolve faltered at first light.

So we must have a new telescope to enable full use of the observatory, to better serve our members and the public at outreach events and to attract new members.

Volunteers….. A full programme of outreach events is essential if the society is to attract new members, bigger membership mean larger audiences and that in turn attracts the very best speakers for lectures.

For such a large society we have relatively few volunteers but they turn out time after time and we would like more of them. From manning a table or a telescope at an event, to giving a small talk [typically 15 - 20 minutes]. So if you would like to become more involved and help out at any of our events, visit our website's outreach page (no. 15 on the Members' Area menu) or speak to a committee member.

Our packs of notelets and envelopes continue to sell well and huge thanks must go the contributors of the superb images for allowing their work to be used. If you have any images you would like to have considered then do send them to me.

Finally – don't forget to pop in to our website from time to time; for information, volunteering, membership renewals and much more. Also here, you can donate to the telescope fund.

Stop Press

Membership Secretary---Catrin Griffiths has resigned from the post and Vannita Popli whom you may remember as our previous membership secretary will take over from November onwards. All membership enquiries to Vannita from now on please.

Up-coming CAS Public Events

Date	Time	Event	Venue
11th Jan.	10:00am to 4:00pm	Stargazing Live	National Museum of Wales Cardiff
15th Jan.	6:00pm to 9:00pm	Stargazing Live	University of South Wales, Glyntaff Campus
8th Feb.	7:00pm to 9:00pm	Dark Skies in Glyncorrwg	Glyncorrwg
19th Feb.	8:00pm to 10:00pm	Friends of Dyffryn Stargazing Evening	Dyffryn Gardens
29th Mar.	7:00pm to 9:00pm	Stargazing from a Dark Site	Brecon Beacons National Park Visitor Centre
26th Jul.	10:00am to 4:00pm	SAFE solar viewing	Brecon Beacons National Park Visitor Centre

CAS Lectures December To March

Date	Title	Lecturer
12th Dec.	Constructing the Mechanical Universe.	Prof Mike Edmunds, Cardiff University.
9th Jan.	The Search for signs of Intelligent Life in the Universe.	Roger Butler, Cardiff Astronomical Society.
23rd Jan.	Observing Galaxies with Backyard Telescopes.	Martin Griffiths, Glamorgan University.
6th Feb.	Discovery of the Higgs Boson.	Dr Simon Hands, University of Swansea.
20th Feb.	A Jupiter Odyssey.	Andy Lound, Birmingham.
6th Mar.	The Changing Face of Astronomy over the last 30 years.	Guy Hurst, Basingstoke.
20th Mar.	How I Wonder what you are: The Birth, Life, and Death of Stars.	Dr Paul Ruffle, Jodrell Bank, Manchester.

Dave's Star Parties

Date	Day	Time	Venue
8th Janurary	Wednesday	19:30 to 21:30	Dyffryn Gardens/Observatory
4th February	Wednesday	19:30 to 21:30	Dyffryn Gardens/Observatory
4th March	Wednesday	19:30 to 21:30	Dyffryn Gardens/Observatory
2nd April	Wednesday	19:30 to 21:30	Dyffryn Gardens/Observatory
5th May	Wednesday	19:30 to 21:30	Dyffryn Gardens/Observatory

Almanac Compiled by Ian Davies

Sun Rise/Set & Twilight

Date	Astronomical Twilight Begins	Sun Rise	Sun Set	Astronomical Twilight Ends
01st December	05:54	07:55	16:07	18:08
08th December	06:01	08:04	16:04	18:07
15th December	06:07	08:11	16:03	18:07
22nd December	06:11	08:16	16:05	18:10
29th December	03:14	08:18	16:10	18:14
01st January	06:14	08:18	16:13	18:17
08th January	06:14	08:16	16:21	18:24
15th January	06:11	08:11	16:31	18:32
22nd January	06:06	08:05	16:43	18:41
29th January	05:59	07:56	16:55	18:51
01st February	05:56	07:51	17:00	18:56
08th February	05:46	07:40	17:13	19:07
15th February	05:35	07:27	17:26	19:18
22nd February	05:22	07:13	17:38	19:30

Meteor Showers

Date	Meteor Shower	RA	DEC	ZHR
9th December	Puppids-Velids	09h00m	-48°	15
14th December	Geminids	07h28m	+32°	75
23rd December	Ursids	14h28m	+78°	5
26th December	Puppids-Velids	09h20m	-65°	15
4th January	Quadrantids	15h28m	+50°	80

Observers Club Meetings

Date	Day	Time	Venue
31st January	Fri	20:00 - 22:00 GMT	Black Cock Inn
28th February	Fri	20:00 - 22:00 GMT	Black Cock Inn

Observing Sessions

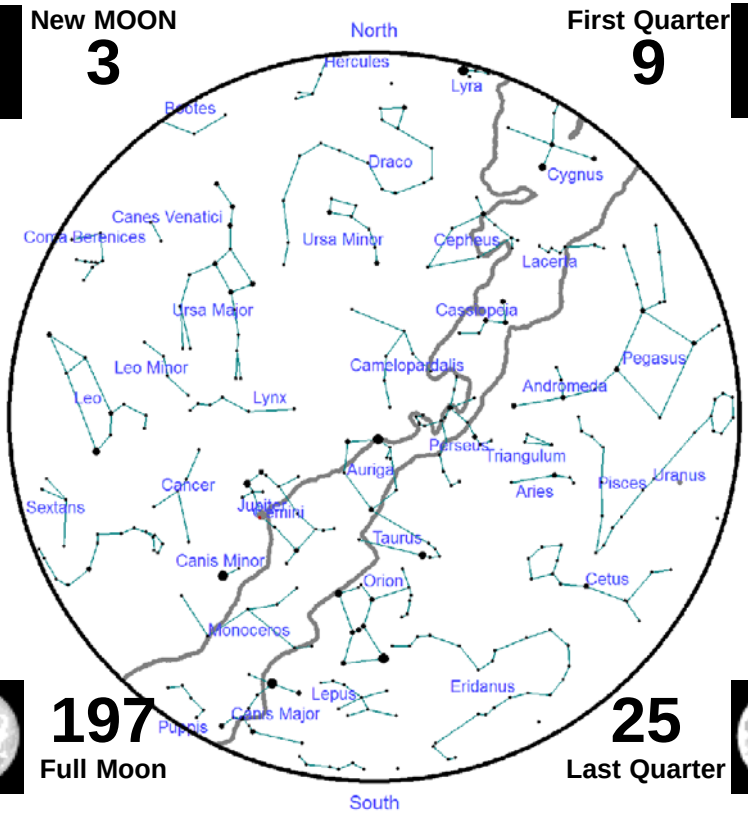
Date	Day	Time	Venue
20th or 21st December	Fri or Sat	20:00 - 24:00 GMT	Dyffryn Gardens
17th or 18th January	Fri or Sat	20:00 - 24:00 GMT	Dyffryn Gardens
24th or 25th January	Fri or Sat	20:00 - 24:00 GMT	Mountain View Ranch
7th or 8th February	Fri or Sat	20:00 - 24:00 GMT	Dyffryn Gardens
14th or 15th February	Fri or Sat	20:00 - 24:00 GMT	Mountain View Ranch
7th or 8th March	Fri or Sat	20:00 - 24:00 GMT	Dyffryn Gardens
14th or 15th March	Fri or Sat	20:00 - 24:00 GMT	Mountain View Ranch

NOTE Where two dates are given we will attempt to hold the session on the first date, weather permitting, otherwise we will try again on the subsequent date. All dates are subject to weather conditions. For confirmation of any session please check on the CAS Web site or the CAS Observing line 07817 723 883 for more information.

Mountain view Ranch was formerly Castle Heights Golf Club.

Almanac December

New MOON
3

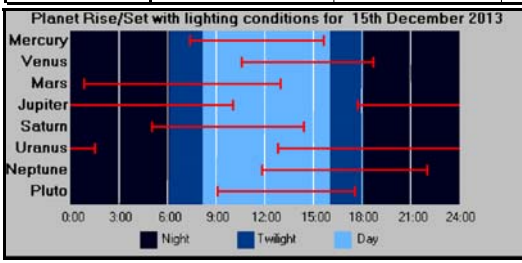


First Quarter
9

197
Full Moon

25
Last Quarter

	Constellation	R.A	Dec	Rises	Sets	Mag.
Mercury	Ophiuchus	16h55m48s	-21°00'00"	07:22	15:38	-0.8
Venus	Sagittarius	20h01m38s	-21°43'27"	10:32	18:39	-4.7
Mars	Virgo	12h16m25s	+00°23'18"	00:47	12:56	+1.1
Jupiter	Gemini	07h19m07s	+22°16'28"	17:44	10:02	-2.6
Saturn	Libra	15h07m15s	-15°19'00"	04:59	14:25	+0.5
Uranus	Pisces	00h32m40s	+02°46'00"	12:49	01:26	+5.8
Neptune	Aquarius	22h31m08s	-10°02'06"	11:53	22:16	+8.0
Pluto (Dwarf)	Sagittarius	18h44m39s	-20°15'25"	09:08	17:35	+15.1



Planet Events

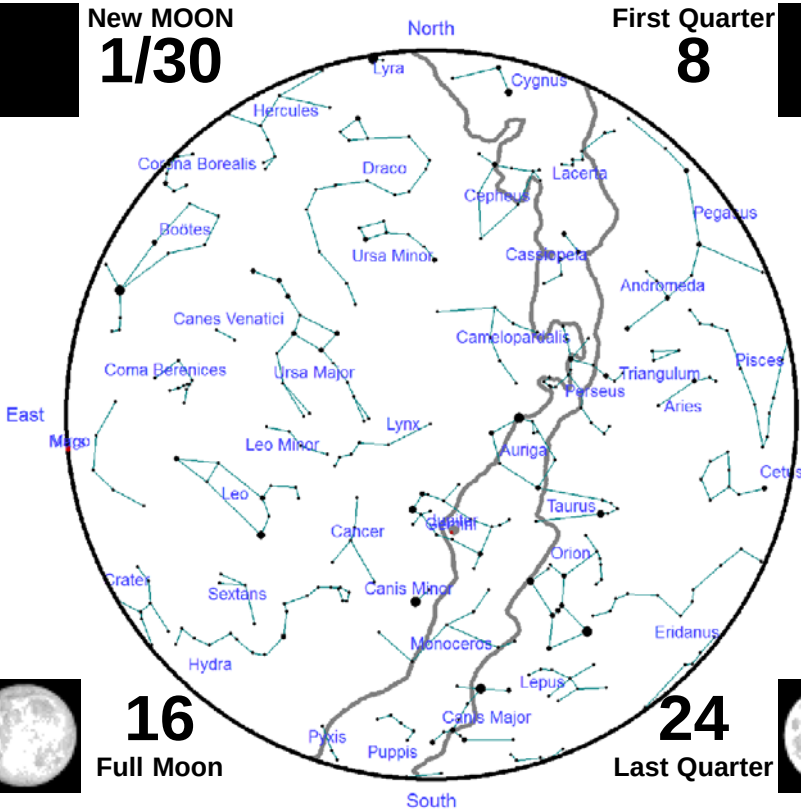
21st Mercury at Aphelion (0.47 A.U.)
29th Mercury at Su[erior Conjunction.

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

Almanac January

New MOON
1/30

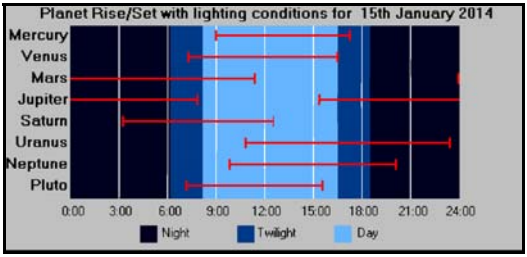
First Quarter
8



16
Full Moon

24
Last Quarter

	Constellation	R.A	Dec	Rises	Sets	Mag.
Mercury	Capricornus	20h32m17s	-20°55'49"	08:55	17:13	-1.0
Venus	Sagittarius	19h19m17s	-16°16'38"	07:14	16:29	-4.1
Mars	Virgo	13h07m57s	-04°41'39"	23:58	11:20	+0.6
Jupiter	Gemini	07h01m56s	+22°49'48"	15:21	07:47	-2.7
Saturn	Libra	15h18m40s	-16°00'11"	03:13	12:30	+0.4
Uranus	Pisces	00h33m53s	+02°55'06"	10:48	23:22	+5.9
Neptune	Aquarius	22h37m42s	-09°27'08"	09:55	20:24	+8.0
Pluto (Dwarf)	Sagittarius	18h49m15s	-20°13'14"	07:10	15:38	+15.1



Planet Events

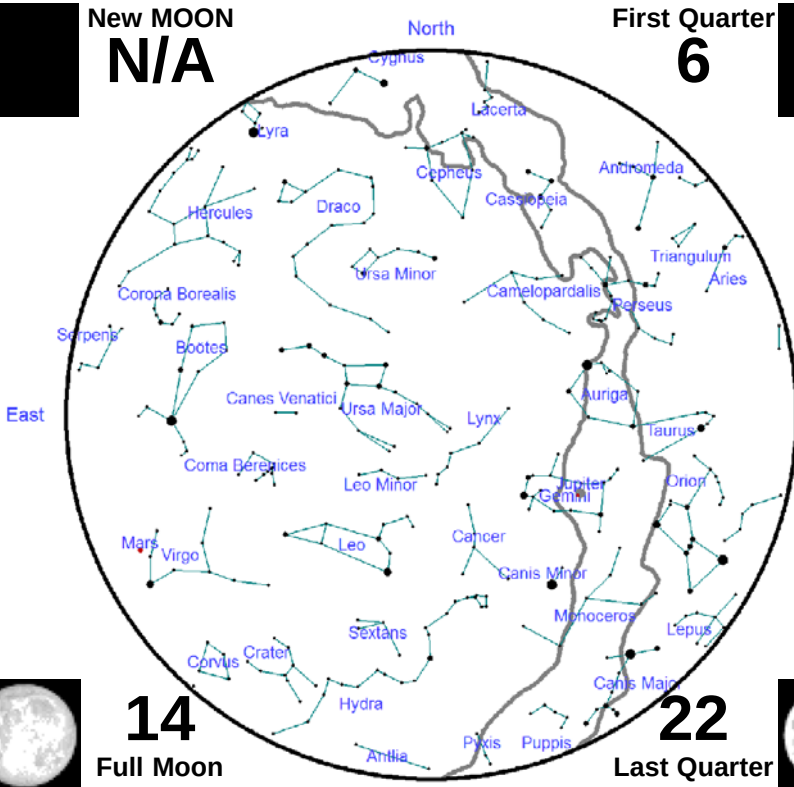
3rd Earth at perhelion (0.98 A.U.)
5th Jupiter at Opposition.
11th Venus at Inferior Conjunction.
24th venus at Perhelion (0.72 A. U.)

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

Almanac February

New MOON
N/A

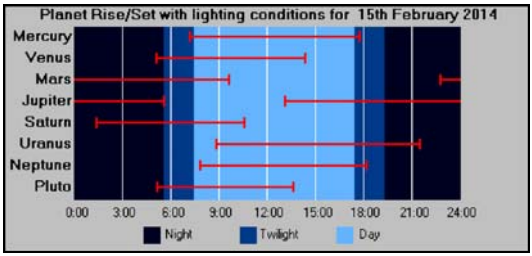
First Quarter
6



14
Full Moon

22
Last Quarter

	Constellation	R.A	Dec	Rises	Sets	Mag.
Mercury	Aquarius	21h55m44s	-08°43'27"	07:07	17:44	+4.5
Venus	Sagittarius	19h11m20s	-16°25'29"	05:05	14:18	-4.6
Mars	Virgo	13h41m28s	-07°37'59"	22:45	09:37	-0.1
Jupiter	Gemini	06h48m12s	+23°11'24"	13:03	05:34	-2.5
Saturn	Libra	15h25m11s	-16°18'42"	01:19	10:33	+0.3
Uranus	Pisces	00h37m51s	+03°21'35"	08:48	21:27	+5.9
Neptune	Aquarius	22h37m50s	-09°26'18"	07:53	18:22	+8.0
Pluto (Dwarf)	Sagittarius	18h53m23s	-20°09'50"	05:11	13:40	+15.1



Planet Events

3rd Mercury at Perihelion (0.31 A.U.).
15th Mercury at Inferior Conjunction.
23rd Neptune at Conjunction.

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

Is it a bird? Is it a plane? No, it's a Comet!

(Sorry Superman Fans!)

Sorry to disappoint any Superman fans, but with Comet Ison making an appearance this November it might be worth brushing up on your knowledge of comets.

Comets are leftovers from the dawn of our Solar System around 4.6 billion years ago. Consisting mostly of ice, coated with dark organic material, each comet has a tiny frozen part known as a nucleus which is no larger than a few kilometres across. The nucleus contains icy chunks, frozen gases with bits of embedded dust, which has resulted in it being referred to as “cosmic snowballs” or “dirty snowballs”.

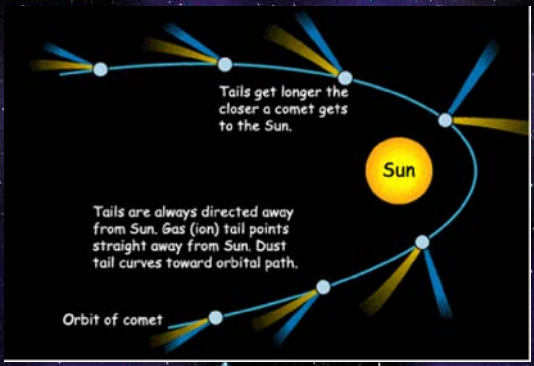
Comets may provide us with vital clues about the formation of our Solar System. Although they are unable to support life themselves they may have brought water and organic compounds, the building blocks of life, to the early Solar System through collisions with Earth and other celestial bodies.

Analysis of samples from NASA’s Stardust mission, suggests that comets may be more complex than originally thought. Minerals formed near the Sun or other stars were found in the samples, suggesting that materials from the inner regions of the Solar System travelled to the outer regions where comets formed.

Comets come from two places, the Kuiper belt and the Oort cloud. Short-period comets (comets that orbit the Sun in less than 200 years) reside in the icy region known as the Kuiper belt beyond the orbit of Neptune from about 30 to 55 AU. Long-period comets (comets with long, unpredictable orbits) originate in the far-off reaches of the Oort cloud, which is 5 thousand to 100 thousand AU's from the Sun.

Most comets travel a safe distance from the Sun, but occasionally comets are pushed by gravity into orbits which bring them closer to the Sun. The pressure of sunlight and high speed solar particles (Solar Wind) causes the comets ices to change to gas, developing an atmosphere around the nucleus called a coma. The gas and dust that melt off sometimes form a long, bright tail.

Did you know comets have two tails? One is made up of dust and the other of gas (ion) from the coma. Many people think that a comets tail is always following behind it, but actually the tail can either be behind the comet or in front of it. Which way the tail is pointing depends on where the sun is.



So if a comet is travelling towards the Sun then the tail will follow behind, but if the comet is travelling away from the Sun the tail will be in front of the comet. Some comets called Sun grazers, crash straight into the Sun or get so close that they break up and evaporate. Some comets that break up can be the origin of the annual meteor showers.

In the distant past, people were both awed and alarmed by comets, perceiving them as long-haired stars that appeared in the sky unannounced and unpredictably. They were formerly considered to be supernatural omens. Chinese astronomers kept extensive records for centuries, including illustrations of characteristic types of comet tails, times of cometary appearance and disappearances, and celestial positions. These historic comet records have proven to be a valuable resource for later astronomers.

Days on comets vary. One day on Comet Halley varies between 2.2 to 7.4 Earth days (the time is takes for the comet Halley to rotate or spin once) it makes a complete orbit around the Sun (a year in this comets time) in 76 Earth Years. Comet Halley even makes an appearance in the Bayeux Tapestry from the year 1066, which chronicles the overthrow of King Harold by William the Conqueror at the Battle of Hastings.

Since then more than 20 missions have explored comets from a variety of viewpoints. Scientists have long wanted to study comets in some detail and NASA's Deep Impact and Stardust missions have allowed them to do so.