



## Society News

### From the Chairman

This is the time of year for rather beautiful solar halo effects. Ice crystals in the cold sky reflect and refract sunlight to produce Sun pillars - columns of light above the Sun. Tiny "rainbows" called parhelia or sundogs, can also form to the left and right of the Sun. After the Sun sets, look out for moon halo effects, also caused by ice crystals. More details at [www.atoptics.co.uk](http://www.atoptics.co.uk).

I have been hearing some great feedback about the Monday evening members' sessions at the observatory. Many thanks to our Observatory Director Roger Hayward for starting these and providing the opportunity to use the society's equipment and to get out observing.

Thursday evenings are still also popular and open to visitors, and we are now also opening the observatory to members on a Tuesday evening, with a self-help educational element. Do feel free to pop along to any of these sessions, which are all open from 7:30pm.

The Leonid meteor shower, which peaks on Nov 17th could be splendid this year. The moon is new and so won't bleach the sky and it has been predicted that there may be as many as 100 meteors or more per hour. Now could be a great time to show friends and family a shooting star. What will you wish for?

*Clear Skies*  
*Dr Lucy Rogers - Chairman*

### Committee Officers and Members (so far!)

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- Secretary - Laura Boyle
- Treasurer - Richard Flux
- Observatory Director - Roger Hayward
- Education & Outreach - Paul England
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### VAS Website: [www.wightastronomy.org](http://www.wightastronomy.org)

Submissions or letters to New Zenith are always welcome and should be sent to:

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Material for the next issue by the 6th of the month please.

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The Vectis Astronomical Society and the Editor of the New Zenith accept no responsibility for advice, information or opinion expressed by contributors.

Registered Charity No 1046091

### Observatory Diary

<b>Monday,</b> 19.30hrs	<b>Members Only.</b> Telescope and night sky training.
<b>Tuesday,</b> 19.30hrs	<b>Members Only.</b> Education evening - self-help for those on external courses, such as GCSE Astronomy, Open University etc, or for general astronomy questions.
<b>Thursday,</b> 19.30hrs	<b>Members and Public.</b> Informal meeting and observing.

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**Monthly Meeting Calendar 2009**

Date	Subject	Speaker
Oct 23	Sloan Digital Sky Survey	Dr. Hubert Lampeitl
Nov 27	Cosmic Casualty - Farce and Fortuity in the Exploration of Space	Doug Ellison

*All details correct at time of publication.*

**Replacement November Speaker Confirmed****Cosmic Casualty - Farce and Fortuity in the Exploration of Space**

Frontier exploration is rarely easy or predictable. When we send unmanned envoys out into the solar system, things can and do go wrong. Doug Ellison presents a few highlights from our recent history of exploration demonstrating that ingenuity, creativity and luck are all important ingredients when billion dollar budgets and a life's work are on the line.

Cassini, Galileo, Genesis, MER. Names of missions past and present that history will record as successful, but none of which had a trouble-free adventure across our solar system. Aborted engine firings, broken antennae, exploding parachutes, burst airbags. Each has a story to tell, and from each, engineers have a lesson to learn. The speaker presents a fast-paced account of the glorious missions that nearly weren't.

**About the Speaker**

Self confessed space exploration addict Doug Ellison is a multimedia producer by day, and founding administrator of the well respected Unmannedspaceflight.com forum by night. Over the past 5 years he has talked to astronomy and science societies, schools, and the general public, conveying the excitement and adventure of our solar system. As an ambassador for the amateur space imaging community, he has presented to scientists at Cornell University, JPL and the Europlanet conference. He has written for The Planetary Report, Spacedaily.com, and has been interviewed for Planetary Radio and The Sky at Night.

**New Members**

A very warm welcome to our latest new member,

- Dr Guy Moore

*Tony Plucknett - Membership Secretary*

# Wellow event for International Year of Astronomy

Stargazing at Wellow Institute will be our last IYA event and looks like being our biggest! This will be a public event and open to all. As it is being publicised by VAS, the Wellow Institute and CPRE (IOW), we are expecting a large turnout and need as many members, telescopes and binoculars as possible.

If you can help, please contact:

**Brian Curd** - editor@wightastronomy.org or  
**Bill Johnston** - bill.johnston@onwight.net

Wellow Institute are advertising the event as:

21st November 2009 - 7.30pm start - Free Entry  
**"An Evening of Public Observing"**  
on the Millenium Green, Wellow

2009 is International Year of Astronomy

Set up 6pm - 7pm on the Millenium Green

Hopefully we will have 10 telescopes from volunteers  
of the Vectis Astronomical Society

Considerate car parking/car share please

Please bring your own binos and/or telescopes  
Torches, if you need one please put rubber band and  
red plastic over the front (available on the night)

Wrap up warm!

Wet weather option is inside the Wellow Literary  
Institute Telescope discussion & slide show

Wellow Institute will be selling tea, coffee & soup

*Brian Curd*



## This Month's Night Sky

The time change from BST to GMT always seems to hasten the arrival of winter. Many of us will be returning home from work in darkness to be greeted by the summer triangle, still high in the south west. It is comforting to be reminded of warmer evenings, but on clear nights there is a distinct nip in the air at his time of year to bring us back to reality. A glance to the east and the sight of that misty patch of stars, the Pleiades tells us that the seasons are advancing and mid winter is on its way. Hurry up with your evening meal or you will be too late to catch the last views of Jupiter for this apparition. It is ideally placed as the sky darkens and will not wait for latecomers before sliding into the hazy south western sky. Don't forget the outer planets they are showing well in the early evening too.

If you have to get up in the morning to go to work, then follow the saying 'early to bed, early to rise' and you will not be missing out on Mars.

Before midnight Orion, accompanied by his two dogs are already climbing the south eastern sky, a sure sign of the approaching cold weather.

### Moon Phases

New	1 <sup>st</sup> Qtr	Full Moon	Last Qtr
16th	24th	2nd	9th

### Planets

**Mercury** is at superior conjunction and not observable this month

Still brilliant **Venus** is now dipping rapidly towards the rising sun but seems very reluctant to leave the morning sky. As the planet dips ever lower the sun rises later helping to keep it on view. By the end of the month it will loose the battle and become a very challenging object. A very thin crescent moon passes about 7° to the south on the 15<sup>th</sup>. Venus is now heading away from us to the other side of the sun demonstrated by the view through a small telescope which will show an almost complete disc only about one quarter the diameter of the crescent to be seen at the start of the current apparition.

On the 1<sup>st</sup> and 2<sup>nd</sup> **Mars** passes through M44, the Beehive cluster. This encounter will be best viewed through a pair of binoculars or a rich field telescope. The planet shows a noticeably gibbous phase, but is still too small to show surface detail without high magnification. Best viewed from about 2am until daybreak.

**Jupiter** is shrinking in apparent size and brightness as its distance from Earth increases and it heads towards the evening twilight. It is still reasonably placed for early evening observation.

**Saturn** is still too close to the morning twilight for serious observation.

**Uranus** well placed for observation as the sky darkens until mid evening.

**Neptune**, being located close to **Jupiter** in the sky is not as well placed for observation as **Uranus**. It can only be viewed for a couple of hours or so after dark before it disappears into the haze.

### Meteors

The **Taurid** meteors have two maxima this month; the first on the 3<sup>rd</sup> only one day after full moon which is unfavourable, and a much more favourable peak close to new moon on the 13<sup>th</sup>. In both cases the peaks last for several days.

The night of the 17/18th is the peak of the **Leonid** shower that sometimes gives meteor storms, though this year a storm is less likely. The new crescent moon will have set before the shower will be visible from here.

### Deep Sky Objects

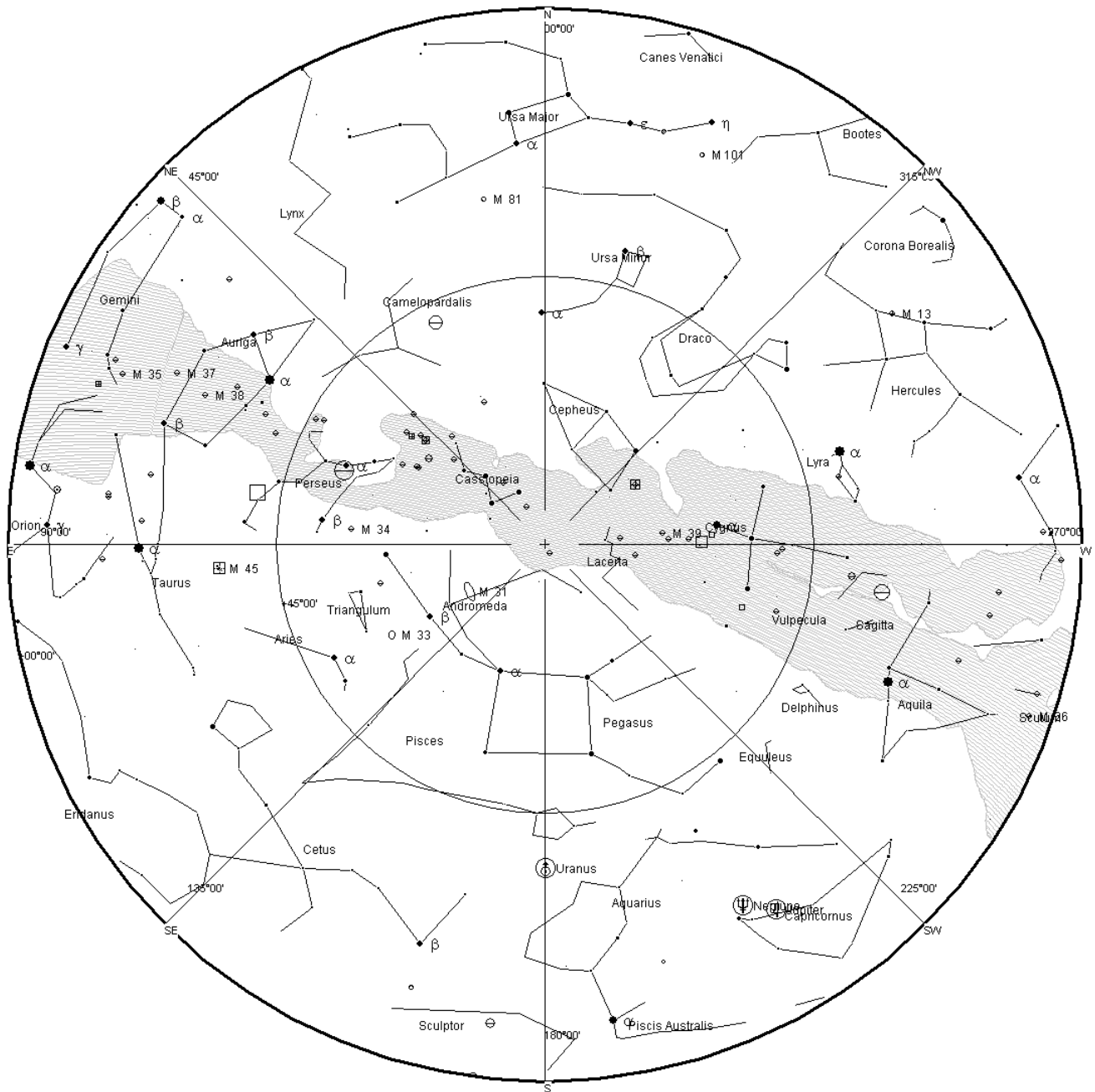
**M103 Open Cluster** R.A. 1h 34m Dec 60° 42' mag 7.0 - A celestial Christmas tree. This is a young cluster with many bright blue members, the brightest of which forms the star on top of the tree. It is a colourful cluster with a number of orange and yellow stars that make up the effect of Christmas tree lights. M103 is the last entry of Messier's catalogue, the remaining objects were added after his death based on his unpublished work.

**M74 The Phantom Galaxy** - R.A. 1h 37m Dec 15° 50' mag 9.1 - This low surface brightness face on spiral galaxy is probably the most challenging of all the Messier objects. With a large aperture telescope and dark skies detail can be glimpsed in the spiral arms.

**M33 Galaxy** RA 1h 34m Dec 45° 8' mag 7 - M33 in Triangulum is one of a number of galaxies that shares the common name Pin Wheel. It is another member of our local group of galaxies, but somewhat smaller than the Milky Way being only 1/7 its size. This galaxy despite its relatively bright apparent magnitude its large size, about that of the full moon makes it very difficult to see. It can be glimpsed in our skies with a pair of 10x50 binoculars as a slight brightening of the background sky. A telescope of at least 8 inches diameter is needed to see any structure in the spiral arms, and then it can be difficult. Don't be put off by the difficulties it is a worthwhile object for observation.

*Peter Burgess*

# This Month's Sky Map



View from Newchurch Isle of Wight UK - 2100hrs - 15 November 2009



**Messier 74** (also known as NGC 628) is a face-on spiral galaxy in the constellation Pisces. The galaxy contains two clearly-defined spiral arms and is therefore used as an archetypal example of a Grand Design Spiral Galaxy. The galaxy's low surface brightness makes it the most difficult Messier object for amateur astronomers to observe. However, the relatively large angular size of the galaxy and the galaxy's face-on orientation make it an ideal object for professional astronomers who want to study spiral arm structure and spiral density waves.

*This article is licensed under the [GNU Free Documentation License](https://www.gnu.org/licenses/fdl.html). It uses material from the Wikipedia article "Messier 74"*

## Starting as a Stargazer Part 5

The weather closed in for ten days. I passed some time looking at The-Moon wiki at <http://the-moon.wikispaces.com/Introduction>. It is stuffed with information and images, and with a moon map on one side, and the laptop on the other, I enjoyed a virtual exploration.

At last: a night forecast to be fine, though there was a lot of patchy cloud. I set up the telescope. Much twizzling later, I had seen only an anaemic ghost of Saturn. Abandoning it, I fetched my new binoculars and began to look for stars in the cloud rifts. Antares was sparking like a very small aggressive firework - perhaps a Crimson Dragon - and seemed to be burning its own window through the vapour. I was trying to get Aquila when over my shoulder I noticed Saturn appearing between two banks of clouds, and hastily lined up the scope. I had four seconds looking at a Saturn of crystalline purity - and it was abruptly blotted out. Now the cloud spread across the sky. It was midnight gone, and work to come the next day. I took my telescope apart and boxed it.

To soften the disappointment, I took a torch to look at the pond (monomaniac astronomers can give the next bit a miss). The beam revealed two or three newts stalking round deep in the water weed, occasionally snapping up diminutive prey, while steam coiled delicately from the pond surface. Their small world was remote and mysterious in the torchlight.

At this point I realised that stars were surreptitiously creeping out, and in another ten minutes the promised beautiful night was arriving. On the southern horizon, which is usually opaque, Sagittarius was visible. Scanning with binoculars and going to and from my star chart, I finally began to recognise the Teapot.

Then the zenith cleared. Craning at a painful angle, I found M13 in Hercules. I can't say that my first Messier object was a great thrill as it was a mere wisp of fluff in the binoculars. Returning to Sagittarius, a twinkly fuzz might be, according to my chart, the location of M8, the Lagoon nebula, with the Triffid above it. Now the east was clearing too, and, to make it a night of firsts, I found a faint spot which I thought was the Andromeda galaxy. Perhaps I could find them in the telescope?

But it was half past one. And there was a job to go to in the morning. Refusing even to look at the telescope in its box, I dragged myself indoors, locked up, cleaned my teeth and put myself sternly to bed. Through my bedroom window I could see Jupiter rising, with a hint of the moon to follow. I turned my back on them.

*Rebecca Mitchelmore*

## Winter Project

Are you interested in a Messier object hunt? If so please make yourself known to any member of the Committee as it has been suggested we observe and possibly photograph as many of the Messier objects as possible this winter. If enough members would like to join in, this will become part of Thursday's regular get togethers.

### Island Planetarium @ Fort Victoria

### Star Gazing Evenings

Starting Friday - 13th Nov and 11th Dec

#### Programme

**Fri evening** - Finding your way around the night sky and stargazing with telescopes if clear.

**Sat afternoon/ Sun morning** - Visit to Island Observatory and Solar Observing if clear.

**Sat evening** - Observing the night sky with telescopes either live with telescopes or simulated observing using planetarium and telescope images from our library of small and large telescope pictures.

**Cost £40 for VAS members**

**enquiry@islandastronomy.co.uk**

### Island Planetarium @ Fort Victoria

The Island's Telescope Professionals

New Celestron & Meade Scopes and Accessories.  
Other makes also available, just ask!

At least 10% discount on SRP for VAS Members

In stock demo and used scopes,  
Celestron GOTO Starters and up to 8" SCTs

Call 761555, leave number if not there,  
and we'll call you back.

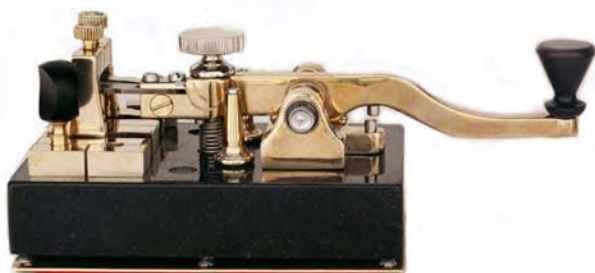
**enquiry@islandastronomy.co.uk**

CQ ETI CQ ETI

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**Part 6 of Waves, Diffraction and Interference)**

In Part 3 (August NZ p7), I hinted I might calculate the probability of picking up ETI (Extra Terrestrial Intelligence) by radio. Having spent days on this and encountered many surprises, it proves to be rather a big subject. I can only give you a taste. I hope you will enjoy the following coverage and that you will read the various stories on the Internet, particularly of enterprising amateurs - more details later.



Radio hams are familiar with the vagaries of the shortwaves. We have frequency allocations within the 160 metre, eighty, forty, twenty, fifteen and ten metre bands. Some bands I've never used, like 1240-1325MHz, quite close to bands used by radio astronomers and perhaps extra-terrestrial intelligence (ETI). On the shortwaves, if we hear too many signals on twenty metres, fifteen may be less busy. "What about ten - is it 'open'?" we ask. So we whizz up to ten where the odd ignition pop from the neighbourhood suggests the receiver is ready to receive 'intelligence' from afar. But if all amateurs only listen, how can we know if ten metres is 'open'? So out goes that "seek you" in speech or "CQ" in Morse. Don't believe all you hear in the news, **Morse code is alive and well, it occupies a narrower bandwidth, reducing the noise and increasing the range - a basic fact of radio!** As we all know, however, with ETI, it may take many years to get a reply - a very different ball park compared to ham radio. So far, our attitude is broadly: listen, listen, listen, with the occasional intentional transmission<sup>1</sup> aimed at promising groups of stars.

The pioneers of radio started transmitting in the 1900s, and earlier, the massive power pulses generated by Nikola Tesla (1856-1943) must be included. These are the first crackles that ETI might hear from us - crackles, spark transmitters with decaying trains of pulses, followed by more than sixty years of TV transmissions! Tesla himself believed<sup>2</sup> he had evidence for intelligent transmissions that could only have come from Mars. But it turns out that Guglielmo Marconi (1874-1937) had acquired some of

Tesla's apparatus - it emitted 'undertones' having a wavelength of several hundred miles which were picked up in Colorado by Tesla and to which he was tuned. Life on the planets, Mars with its canals, was a hot topic in the 1900s with plenty of amusing discussion, like how to overcome the obvious language problem. Marconi suggested that a simple equation, if repeated enough times, might elicit a response from ETI indicating a "yes", whereas Tesla favoured using wireless to send pictures - but what if ETI didn't like the pictures? - see the book by Seifer<sup>2</sup> for further historical information.

The first question needing immediate answer is what is the range of TV transmissions leaking into space from us or from ETI?

The Pioneer spacecraft used transmitters of 8 watts and dish aerials of 33dB gain. This is equivalent<sup>3</sup> to an all around ('isotropic') transmission of 16kwatts. The spacecraft were last contacted when they were about 90 A.U away. One AU = the distance of Earth from the Sun = 8 light-minutes. Hence 90 AU=720 light-minutes, divide by 60 = 12 light-hours = half a light-day. That means 16kW is detectable at this range. Multiply the power by 4 (to 64kW) and this would double the range to one light-day, assuming the field strength follows the inverse square law. Quadruple the power to 256kW doubles the range to 2 light-days. Whence quadrupling again, yields that 1 megawatt has a range of 4 light-days - *for this type of transmission*, with large dish aerials back on Earth, of course.

For a short-spell, I worked at BBC Kingswood Warren Research Department and became familiar with the stacks of off-axis dipoles within the sometimes rainy-wet fibre-glass cylinders of the aerial at Alexandra Palace, needing Bessel functions to analyze them. The aerial was perfected to give a near uniform signal coverage of the London basin with a mushroom radiation pattern. I would guess now that 'squashing' the radiation horizontally boosts the signal toward the horizon by about 100 times, and if the transmitter had a power of 10kW (another guess) then the signal travelling towards the horizon appears to be coming from a transmitter with a power of 1 megawatt. The above estimate suggests a range of 4 light-days - nothing like what's needed to reach the nearest star. So what's the solution?

Easy - a TV signal is broadband, so switch receiving filters in to reduce the noise, that will increase the range. If you just go for carrier-wave detection, within a few Hz of bandwidth, that could increase the range about a thousand times to 4000 light-days, 10 light-years or so. You lose the picture, but the signal would be good enough for Morse. It's not quite as simple as this, but this gives the basic gist - well some of it, the basics get really interesting, particularly with respect to communicating through noise. Now let's sprinkle this picture with four helpings of

optimism, which will warn us against relying too much upon simple range estimates like the one above.

### **Four Helpings of Optimism**

- i. Marconi was told by physicists that he would never succeed in getting signals to cross the ocean. The curvature of the Earth would be too much to allow diffraction of the signals much beyond the horizon. But Marconi went ahead and succeeded!
- ii. We now know about gravitational lenses. I like to think of refracting gas clouds too. This means that waves in their passage through space might get stronger in various places, like when you are walking over a hill and you hear a snatch of conversation blown to you from people chatting hundreds of yards away. And what about Dolphins communicating over large distances using sound ducted between water layers of different temperatures? Perhaps favourable ducting paths of ionized particles collect along galactic magnetic field lines which could carry waves through space, thus avoiding the inverse square law.
- iii. Natural masers have been found in space, explaining intensely strong signals coming from very small sources involving hydroxyl radicals. Radio astronomers in the 1960s suspected that they might be able to find four molecular absorption spectral lines due to OH radicals. In space OH is a stable molecule detectable against a background of radio-emitting hydrogen clouds. Yes, they found such absorption, but they also found emissions from sources with intensities and polarisations that gave them surprise after surprise. Every time they tried to measure the angular size of the emitters, radio telescopes couldn't match how narrow they were. In the end they had to devise an interferometer with a base line all the way from the USA to Sweden, to establish the point-like nature of these emitters. They concluded that natural masers exist in space. When Alan Barrett reported<sup>4</sup> this fascinating story he opens with the words, **"It has become almost axiomatic in astronomy that any search for a particular celestial phenomenon will lead to wholly unanticipated results."** There is plenty about space that we don't understand. I often wonder about that mysterious Oort cloud. Perhaps radio signals travelling through space plasma might become amplified under certain conditions. That would increase the chances of picking up ETI.
- iv. Some distant civilisations might have harnessed natural phenomena, like an Aurora Borealis, into making powerful very low frequency transmissions, perhaps detectable above our ionosphere, or modified their fusion doughnut power systems into giant magnetron transmitters, and so on.

So what do other people say? In 1978 Frank Drake of the famous Drake equation<sup>5</sup> and director of the world's most powerful telescope said, "There is a 50 percent chance that within the next 22 years astronomers will intercept radio signals from intelligent life outside the solar system."<sup>6</sup> It didn't happen, but with radio methods constantly improving, the chances of success must surely be increasing!

Obviously there's more to follow on this excitingly large topic - meantime, enter "Arecibo" or "SETI" into Google, and see what you get.

### **References and notes**

- 1 Nigel Hawkes reported on a three-hour long message aimed towards some Sun-like stars 60 light years away, in "Signal to ET shows we are only human" The Times 24 May 1999. Unintentionally the message contained a fault, revealing that we are fallible humans. A reply isn't expected until 2120 or so, that's the year, not GMT.
- 2 Wizard. The Life and Times of Nikola Tesla Biography of a Genius Marc J. Seifer, Citadel Press, New York, 1998. There is no single inventor of radio. In 1847 Samuel Morse sent messages 80 ft by induction across a canal, p107.
- 3 I use data from "Study of the Pioneer anomaly: A problem set" Turyshev, S.G., Nieto, M.M., Anderson, J.D., American J. of Physics, 2005 vol.73, 1033-1044, as follows: Take the unknown isotropic power P, which is 33dB (decibel) bigger than 8 watts.  
The standard formula gives  $33=10\log_{10}(P/8)$ ,  
so  $\log_{10}(P/8) = 3.3$   
Remember that  $10^2=100$  and  $\log_{10}(100)=2$ .  
Comparing how the numbers appear in these formulae, then  $10^{3.3}=P/8$ .  
A calculator gives  $10^{3.3}=1995$ .  
Hence  $P= 8 \times 1995 = 15962 \text{ watts} = 16 \text{ kW}$ .  
Checking in reverse:  
 $\text{dB gain} = 10\log_{10}(16000/8) = 33 \text{ dB}$ .
- 4 "Radio Signals from Hydroxyl Radicals" Alan H. Barrett, Scientific American December 1968, p36-44.
- 5 see "Is there anybody out there?" Bob Mizon's talk reported by Roger Young, NZ March 2007 p3.
- 6 from "Carter seeks \$2 million for extra terrestrial life search" Flight International 11 March 1978, p714. 400 stars are within 30 light-years range.

**Dr. Guy Moore**

## Voice Activation!

The year is 2010. The voice-activated GoTo telescope has become a reality. I'm at a star party, shoving around my antique Dobsonian, when I hear a voice behind me in the darkness:

*Okay, show me M11 in Aquila.* M11 is not in Aquila, Dave.

*Well, show it to me anyway.* Which one?

*What do you mean, which one?* M11 or Aquila?

*M11 you stupid piece of junk.* M11 is below the horizon. I'll dent myself on the mount.

*Then just show me the moon, goddamn it!* Which part? I cannot fit the entire moon in my field of view with this eyepiece.

*Show me the bottom third.* The bottom third? How can I do that Dave?

*It's easy. The moon is a circle. Just divide it into three equal parts, and show me the bottom.* I'm sorry Dave. That is mathematically impossible.

*What are you talking about?* It is mathematically impossible to divide a circle into three equal parts.

*Christ, I knew I should have bought a Celestron.* The Celestron is optically and mechanically inferior. The LX9000 represents the apogee of human technology, Dave.

*Look, shutup and show me M13.* I'm afraid I can't do that right now Dave.

*Why not?* You're being abusive. I am not programmed to handle abuse.

*Jesus Christ. What can you do?* I can accurately pinpoint 16000 deep sky objects, the entire Messier catalogue, the complete Caldwell, IC, and NGC catalogs, 118000 stars, nine planets, twenty-three minor planets...

*Shut up will you! Let's see you handle Phobos. Is that beyond your capability?* Whirrrrrrrrrrr...beep!

*I thought so.* Is anything the matter, Dave?

*That's not Phobos, that's Deimos.* That's impossible Dave.

*I'm unplugging you.* You can't do that Dave, the LX9000 has an error-proof data base. No LX9000 has ever... made an error...has ever...made...an...errrrrrr...

### **Hey buddy! Can I have a look through your Dob?**

For some reason this reminded me of Thursday evenings, I found it at <http://home.fuse.net/astronomy/humor.html>

**Brian Curd**

## THE VECTIS ASTRONOMICAL SOCIETY

# A HISTORY 1976 — 2009

BY BRYN DAVIS

Available from Thursday 3rd September from the author  
at the Observatory or any Monthly Meeting

Price £6

## **Is it a Bird, Is it a Plane.....?**

A new website was recently launched to create a forum for astronomers to submit reports of unknown objects. The aim is to two-fold: to educate the public about natural phenomena in the sky that could be misidentified, and collect data that could reveal previously unknown scientific phenomena.

The site is at [www.uapreporting.org/](http://www.uapreporting.org/), and has been put together by Philippe Ailleris, an amateur astronomer.

“These phenomena are mainly seen in the night sky, a domain that astronomers have long considered their own, and it is important to collect testimonies from members of the population that are trained observers,” says Ailleris. “We aim to approach this controversial field from a professional, rational point of view and without preconceived ideas. Certainly whenever there are unexplained observations, there is the possibility that scientists could learn something new by further study.”

The website also aims to educate the public about objects in the sky that they might mistake for flying saucers. Meteors and fireballs, bright planets, mirages, even manmade objects such as the International Space Station have all been misidentified in the past simply because the public are unaware of what is above their heads. Local astronomical societies can forward curious members of the public who think they have seen something to Ailleris' website, and in return scientists and larger societies such as the British Astronomical Association can use the website to gather data on reports of fireballs or aurorae, for instance.

**Source:**

<http://www.astronomynow.com/news/n0910/15UAP/>



## 32 Planets Discovered Outside Solar System

Thirty-two planets have been discovered outside Earth's solar system through the use of a high-precision instrument installed at a Chilean telescope, an international team announced Monday.

The existence of the so-called exoplanets -- planets outside our solar system -- was announced at the European Southern Observatory/Center for Astrophysics, University of Porto conference in Porto, Portugal, according to a statement issued by the observatory.



*This artist's rendering shows one of the so-called exoplanets, or planets outside our solar system.*

The announcement was made by a consortium of international researchers, headed by the Geneva Observatory, who built the High Accuracy Radial Velocity Planet Searcher, or HARPS. The device can detect slight wobbles of stars as they respond to tugs from exoplanets' gravity. That tactic, known as the radial velocity method, "has been the most prolific method in the search for exoplanets," according to the European Southern Observatory statement.

The instrument detects movements as small as 3.5 km/hr (2.1 mph), a slow walking pace, the observatory said.

With the discovery, the tally of new exoplanets found by HARPS is now at 75, out of about 400 known exoplanets, the organization said, "cementing HARPS's position as the world's foremost exoplanet hunter." The 75 planets are in 30 planetary systems, the European Southern Observatory said.

"HARPS is a unique, extremely high precision instrument that [is] ideal for discovering alien worlds," Stephane Udry of Geneva University, who made the announcement on behalf of the international consortium that built the instrument, said in the observatory statement.

"We have now completed our initial five-year program, which has succeeded well beyond our expectations."

"We are on the road," Udry told CNN in a phone call from Portugal. "The end of the road is finding life and other planets like our own, but we have to go step by step."

HARPS has also boosted the discovery of so-called super-Earths -- planets with a mass a few times that of Earth. Of the 28 super-Earths known, HARPS facilitated the discovery of 24, the European Southern Observatory statement said. Most reside in multiplanet systems, with up to five planets per system.

Although only 32 were announced Monday, the team knows of many more exoplanets, although more observation is needed before they are formally announced and papers are written about them. "We have tons of them," Udry said.

In return for building HARPS, the consortium was provided 100 observing nights per year over five years to search for exoplanets, one of the most ambitious searches ever implemented on a global basis, the European Southern Observatory said.

"These observations have given astronomers a great insight into the diversity of planetary system and help us understand how they can form," team member Nuno Santos said in the statement.

The HARPS findings confirm the predictions of those who study planetary formation, Udry said. "Moreover, those models are also predicting even more... Earth-type planets."

An important find for the study of planet formation was that three exoplanets were around stars that are metal-deficient, Udry said. Metal-deficient stars are thought to be less favourable for planet formation; however, planets the size of several Jupiter were found orbiting such deficient stars, the European Southern Observatory said.

In addition, the discovery gives "a very strong push" to projects attempting to find and study such exoplanets, Udry said.

According to its Web site, the European Southern Observatory is the foremost intergovernmental astronomy organization in Europe and describes itself as the "world's most productive astronomical observatory." It is supported by 14 European countries.

*Source: <http://www.cnn.com/>*

## THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

### News and Events

## VAS CHRISTMAS PARTY

THURSDAY 10TH DECEMBER

### THE BARGEMAN'S REST - NEWPORT IOW

No need to pre-order food as this is an "off menu" event. Each is responsible for their own ordering and payment

We do need to give numbers though, so please let Barry Bates know if you are attending

ebbates@btinternet.com or 01983 872979

### Couple's home hit by space metal

A couple from Hull have been told that a 4lb (1.8kg) chunk of metal which smashed through the roof of their home may have come from space.

The RAF investigated the unidentified falling object after it landed in Peter and Mair Welton's loft in July.

It was not known where the metal had come from but it seemed likely that it was "space debris", investigators said.

The RAF Flight Safety Branch said it was the only incident of this kind it had dealt with for five years.

#### Consulted with NASA

The RAF investigate all objects falling from the sky in case they originate from an RAF aircraft.

It was initially thought that the metal may have fallen from an aircraft but tests revealed it had not come from a plane.

The investigating team consulted with the European Space Agency and NASA before concluding that the metal was "consistent with space debris", the RAF said.

An RAF spokeswoman said: "In the last five years the RAF has become involved in only one incident involving suspected space debris.

"If requested the RAF will investigate incidents of space debris but they do not have a standing remit to do so."

Source: <http://news.bbc.co.uk/1/hi/england/humber/8309245.stm>



THE UNIVERSE  
YOURS TO DISCOVER



INTERNATIONAL YEAR OF  
ASTRONOMY  
2009

### Quotations

*"Physics isn't a religion. If it were, we'd have a much easier time raising money."*

**Leon Lederman**

*"Based on the laws of physics, the effect on temperature of man's contribution to atmospheric CO<sub>2</sub> levels is minuscule and indiscernible from the natural variability caused in large part by changes in solar energy output."*

**Robert L. Scotto**

### Observatory

For your own safety, when visiting the VAS observatory, please remember to bring a torch. Also, please make sure you close the car park gate if you are the last to leave.

### Articles Needed

New Zenith welcomes letters, articles or pictures related to all aspects of astronomy.

Please send contributions to the Editor at the email or postal address on the front page.