



## Society News

### From the Chairman

August should be a great month for astronomy, with a penumbral lunar eclipse, a strange view of Saturn with its rings edge on and therefore not visible through amateur scopes and the Perseid meteor shower. And to top it all we have the Vectis Astronomical Society AGM - it starts at 7:00pm on Friday 28th August. Seriously, please make the effort and come along to vote for those who you want to represent your interests. The talk afterwards is by Richie Jarvis (who has been to all of the Isle of Wight Star Parties). He will be giving the monthly talk on an Introduction to Astro-Imaging. Having seen him give this talk at the IOW Star Party, it is a fantastic opportunity for you to ask questions, compare notes or just be amazed at the pretty pictures. You can see some of his images on his website [www.deepsky.org.uk](http://www.deepsky.org.uk).

As this is the last New Zenith before the AGM, I would like to say a big thank you to everyone for supporting the society over the last year. I am happy to stand for, and, if elected, carry on as Chairman for a further year. With the help of the committee, I aim to incorporate many of the suggestions put forward by members in the survey, such as regular observing sessions with specified targets.

However, I do not believe I should seek re-election the following year as I believe after a few years in the same

position on the committee it is possible to get a little stale and lose enthusiasm to drive the society forwards.

Graham Osborne, who has been our Treasurer for the last 6 years, also feels this way, and will not be standing for re-election as Treasurer this August. However, he has indicated that he is happy to stand as a member of the committee, so the society won't necessarily be losing his valued services. If anyone would like to stand for the position of Treasurer, or simply be on the committee, please do contact me on 731759 or email me at [chairman@wightastronomy.org](mailto:chairman@wightastronomy.org) or fill in the nomination form available in the New Zenith.

*Dr Lucy Rogers*  
*Chairman, Vectis Astronomical Society*

### Don't Forget!

Bring your astronomical equipment to the Isle of Wight Observatory for free advice on how to get the best from it. Whether it's a telescope that has been gathering dust in the loft, or advice on how to use your digital camera for astronomical photos, volunteers from Vectis Astronomical Society will be on hand to answer your questions.

**Thursday 30th July, 7:30pm - 9:30pm**  
**Drop-in event (no booking required)**

**VAS Website:** [www.wightastronomy.org](http://www.wightastronomy.org)

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

**The Editor New Zenith**  
35 Forest Road  
Winford  
Sandown PO36 0JY

Tel: 01983 864303 or email: [editor@wightastronomy.org](mailto:editor@wightastronomy.org)  
Material for the next issue by the 6th of the month please.

### VAS Registered Office

Castle Haven Cottage, Castle Haven Lane, Niton Undercliff,  
Isle of Wight, PO38 2ND

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

## Contents

<i>Society News</i> .....	1
<i>This Month's Night Sky</i> .....	3
<i>This Month's Sky Map</i> .....	5
<i>Starting as a Stargazer... Part III</i> .....	6
<i>Committee Nomination Form</i> .....	6
<i>A Radio Wave Propagation Story</i> .....	7
<i>The Back Page</i> .....	10

**Monthly Meeting Calendar 2009**

Date	Subject	Speaker
Aug 28	<b>AGM +</b> Astro Imaging	Richie Jarvis
Sep 25	Search for Novae and Supernovae	Guy Hurst
Oct 23	TBA	TBA
Nov 27	The Radial Velocity Experiment, the Gaia satellite & an historic coincidence	Dr. George Seabroke Open University

*All details correct at time of publication.*

**International Year of Astronomy**

VAS are planning events throughout 2009 and would appreciate the help of members during the year. If you can help with this project in any way, please contact either

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

Below are the events organised so far and will be updated as we add to it. All events are free of charge unless stated. Information is correct at time of publication.

Date/time	Subject	Venue
Thurs 30th July	Open Night with technical help on hand	Watery Lane Observatory, Newchurch
Mon 10th Aug 14.30 to 15.30	Starry Telling	Freshwater Library ( <b>Public</b> )
9th October	Observing the night sky	St Thomas Pri Sch ( <b>Private</b> )
Sat 21st November	Observing the night sky	Wellow Institute ( <b>Public</b> )

For the latest IYA event list, visit the VAS website  
[www.wightastronomy.org](http://www.wightastronomy.org)

**Monday Night Meetings**

If you would like to learn your way around the night sky, the observatory is open on Monday evenings from 7.30 for practical sessions with Roger Hayward.

**Please note: This arrangement depends on attendance, so please be at the observatory between 7.30 and 8.00pm.**

**New Members**

A very warm welcome to our latest new members,

- Chris Haines
- Tom Haines

**Tony Plucknett**  
*Membership Secretary*

**Observatory Telescope Training**

Roger Hayward, our Observatory Director, has started training sessions at the Observatory at Watery Lane in Newchurch. If you would like training on the club's kit (and a key to the observatory), please contact Roger at director@wightastronomy.org, or come along on any Thursday evening from 7:30pm.

# VAS AGM & Elections

**This year's AGM will be held on  
Friday August 28**

**If you would like to be considered  
for an Officer or Committee post,  
please complete the nomination  
form on page 6 of this newsletter.**

**VAS belongs to you and needs  
people to help with the  
continued development and  
management of the Society**

**Several committee places are  
available this year, so this is your  
chance to get involved!**

**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.

## This Month's Night Sky

This is the best month for observing; the weather is still warm enough to be outside without having to dress up in full survival gear, the summer Milky Way is at its best and you can be almost guaranteed to see a shooting star or two on any clear night. There are a number of showers that peak in August and many of these continue at a low level of activity for days or weeks. Meteor showers are named after the constellation from which they appear to radiate, and where there is more than one shower the nearest star is added to the name. The Alpha Capricornids for example appear to radiate from the close to the brightest star in Capricorn; Alpha. When observing any meteor shower looking towards this radiant point is usually disappointing as the meteors appear very small. Try looking at about 90 degrees from the radiant to see the longest trails. For the Perseids I usually look towards Cygnus, it may be some time before a meteor flashes by and there is plenty to see in that part of the Milky Way so I don't get bored waiting.

### Moon Phases

New	1 <sup>st</sup> Qtr	Full Moon	Last Qtr
20th	27th	6th	13th

### Planets

There is a very disappointing lunar eclipse on the 6<sup>th</sup> where the moon just dips into the outer edge of the Earth's shadow. It will be difficult if not impossible for a visual observer to notice any change at all in lunar brightness.

**Mercury** is at maximum eastern elongation this month but this evening apparition, like the last morning apparition is not favourable for northern observers, with Mercury too close to the horizon at sunset to be observable.

**Venus** continues its role as the morning star as it passes through the constellation of Gemini. Its slow drop towards the horizon is not yet very noticeable because of the later sunrise times. Venus will be with us in the morning sky for some months yet.

**Mars** continues its slow brightening as the Earth catches up and the distance between us decreases. The disc is however still very small at only 5.5 arc seconds, so very little if any detail will be seen on the surface.

**Jupiter** is at opposition presenting a 48 arc second disc. Even a small telescope will show detail in the bands around the planet. Though it may not seem like it, through a telescope with a magnification of 60x Jupiter will appear to be larger than the full moon with the naked eye 48 arc minutes for Jupiter and 30 arc minutes for the Moon. Comparisons like this are the source of the rumours that on

certain dates some planets, particularly **Mars**, will be larger than the full moon. Be prepared for another surge later this year.

**Saturn** is now so close to superior conjunction as to be unobservable, which is a pity because the rings will soon be edge on and would be completely invisible in all but the largest instruments.

**Uranus** is close to opposition and **Neptune** is at opposition on the 18<sup>th</sup>. The finder chart for Neptune shows both Neptune and Jupiter in Capricorn from the 1<sup>st</sup> of Aug until the 1<sup>st</sup> of Dec. After this, the planet hardly moves against the star background. The field of view is 5x3 degrees and stars are plotted down to about magnitude 8.5. **Jupiter** moves quickly away during the first few weeks of Aug, returning to the scene again in late Dec.

### Meteors

August is one of the best months for meteor showers.

**Alpha Capricornids** have a fairly favourable peak on the 2<sup>nd</sup> with a rate of about 5/hr.

**Iota Aquarids** has an unfavourable peak on the 6<sup>th</sup> with an expected rate of 10/hr.

**Delta Aquarids** also unfavourable peaks on the 7<sup>th</sup> with an expected rate of 10/hr.

The reliable **Perseids** peak on the 12/13<sup>th</sup> with rates of about 80/hr. After midnight the last quarter Moon will make this shower less favourable.

**Alpha Aurigids** with a rate of around 10 peaks/hr on the 28<sup>th</sup>. The first quarter moon sets soon after the sky gets dark enough to observe meteors so will not interfere significantly.

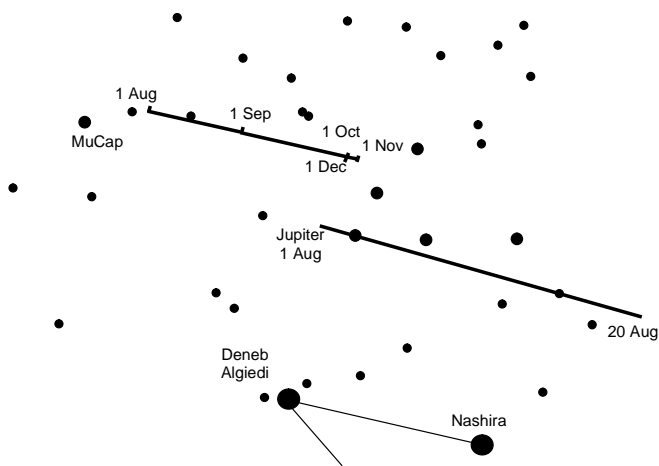
### Deep Sky Objects

**M24 Sagittarius Star Cloud** R.A. 18h 16m Dec -18° 43' - This object is big! Eight times the area of the full moon. It is an object full of objects, open clusters, dark nebulae and even a planetary nebula. Use any optical aid you have, binoculars for wide field views and a telescope for closer examination. This is one of, if not the best star fields in the galaxy; don't miss it.

**M11 The Wild Duck Cluster** R.A. 18h 51m Dec -6° 16' mag 7.0 - Easily seen in binoculars as a fuzzy patch in the Scutum Star clouds, this cluster gets its name from the V shape formed by two long chains of stars on its northern edge. They are supposed to represent the V formation of a flock of wild ducks flying across the Milky Way.


(Cont'd Over)

**Stock 1 Open Cluster** R.A. 19h 36m Dec 25° 13' mag 5.3 - A little over a fingers width east of Alpha Vulpeculae lays a large misty patch of the Milky Way. This is Stock 1, a rich open cluster where the brighter stars are rather spread out floating over a misty haze of the dimmer cluster members and background Milky Way. Although this cluster is a nice sight in binoculars it does not give its best; a small telescope using magnification up to about 60 gives a much better view. The brighter stars tend to form angular patterns rather than the more 'normal' curved chains.



Neptune 1<sup>st</sup> Aug to 1<sup>st</sup> December. 5x3deg field of view. Stars to mag 8.5

*Peter Burgess*



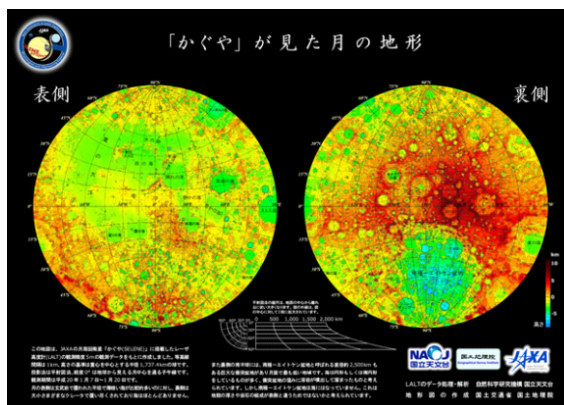
## For Sale

Heavy duty Astro-Engineering  
ETX Alt-Az Tripod

It has a 100% steel construction and weighs over 13KG (2 stone) Because of its weight it is very stable and will fit any ETX 90,105 or 125

Cost over £250, sell for £100.  
Contact Tim on 07934379096

### Conclusive Signature for Lunar Uranium



Data from Kaguya's GRS. Credit: JAXA

Using data obtained from the gamma ray spectrometer on the Kaguya spacecraft scientists have found signatures of uranium, an element not seen in previous moon-mapping efforts. In addition to uranium, the Kaguya GRS data also is showing clear signatures for thorium, potassium, oxygen, magnesium, silicon, calcium, titanium and iron.

“We've already gotten uranium results, which have never been reported before,” said Robert C. Reedy, senior scientists at the Planetary Science Institute. “We’re getting more new elements and refining and confirming results found on the old maps.”

Earlier gamma-ray spectrometer maps from the Apollo and Lunar Prospector missions show a few of the moon’s chemical elements. But the maps constructed by Reedy and the Kaguya GRS team, using data gathered by state-of-the-art high-energy-resolution germanium detectors, are extending the earlier results and improving our understanding of the moon's surface composition.

Reedy and his colleagues are using measurements from the Kaguya lunar orbiter’s GRS to construct high-quality maps of as many chemical elements as possible. Kaguya was launched in September 2007 and crashed into the moon at the end of its mission on June 10 of this year.

<http://www.universetoday.com/>

*Thanks to Matthew Grattage for this item*

UNIVERSITY OF  
**Southampton**  
School of Physics  
and Astronomy

Inaugural Lecture  
**“Tides in the Universe”**

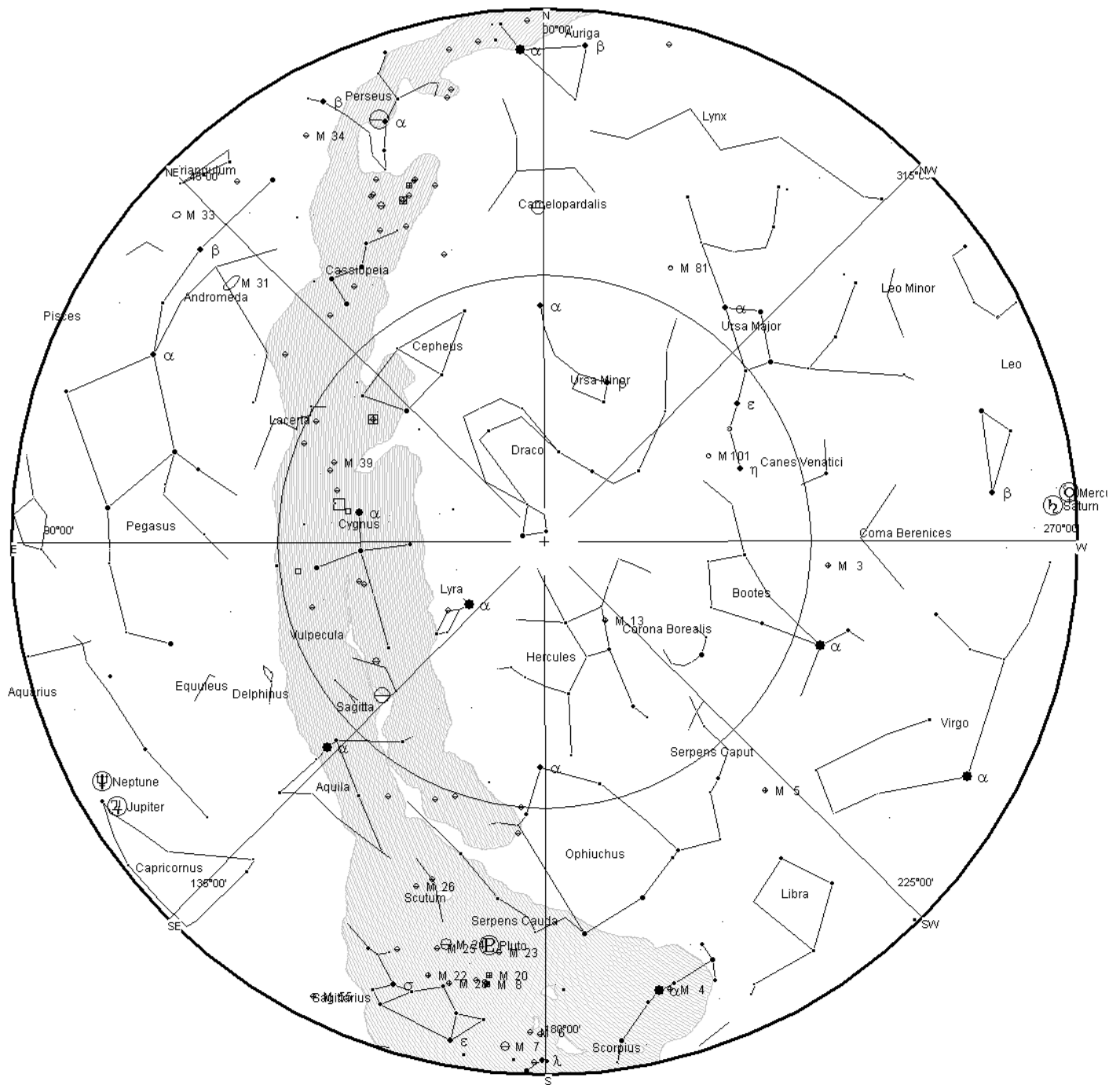
By  
**Professor Malcolm Coe**  
School of Physics & Astronomy

In the Chair  
**Dame Jocelyn Bell Burnell FRS CBE**

5.00pm Wednesday,  
28th October, 2009  
Lecture Theatre A, Building 46  
Tea and Coffee served at 4.30pm  
All are welcome, no tickets required



# This Month's Sky Map



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



The Wild Duck Cluster (also known as Messier 11, or NGC 6705) is an open cluster in the constellation Scutum. It was discovered by Gottfried Kirch in 1681. Charles Messier included it in his catalogue in 1764.

The Wild Duck Cluster is one of the richest and most compact of the known open clusters, containing about 2900 stars. Its age has been estimated to about 220 million years. Its name derives from the brighter stars forming a triangle which could represent a flying flock of ducks.

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# A Radio Wave Propagation Story

## Part 3 of Waves, Diffraction and Interference

Many amateur astronomers are also radio amateurs - so here's a 'hands-on' story that explores the properties of waves from the perspective of ham radio - with minimal jargon. Hopefully this will provide more insights into planet Earth's properties as well. Eventually I might have a go at calculating the probability of receiving signals from ETI, as an extension to the Drake equation - it needs all this theory plus plenty of data. But first, here's the story...

**Autumn 1964.** I'm a self-taught teenager, with a new licence. I'm in my shack, contacting European stations in Morse code on the 40 metre band. My aerial is a wire, half a wavelength long, up between poplar trees, giving high-angle radiation. This doesn't favour "DX" (long distance) contacts, but..."Hello, what's this?" - someone in Campbell Island (near the Antipodes) and some Australians in Melbourne. For several weeks nearing sunrise, sometimes nearing sunset too, these DX stations are in demand. I'm lucky to get through.

"But", thinks me, "how come I can contact Europe and Australia but nothing in between? Where are Japan, India, Asia and China in the short-path direction, or America in the long-path direction? - places where the signals should touch down on their way to 'down under'".

According to normal practice, the waves propagate mostly through the darkness, see the right-hand half of Fig.3.1, reflecting from the F layer of the ionosphere and from the ground or ocean, in a series of neat hops. In between the hops are silent or skip zones. Could I check the theory by measuring the skip distance indicated in Fig.3.1?

**The ionosphere** is a different animal in the day (see left-hand half of Fig.3.1) compared to at night. (You aren't supposed to notice this yet, but there are question marks over how the day and night time 'animals' connect together - more later! Keep those question marks at the back of your mind...) The extra absorbing layers, E and D, blanket the daytime range on 40 metres. At night, when they vanish, signals can travel a long way (until the F layer becomes too weakly ionized). If you wish to talk to

Australia and New Zealand on 40m, then times near sunrise or sunset are favoured and then the waves can travel half-way around the world in the dark without getting blanketed. That is how the theory goes. (Note, the 'ground wave' has a range of only a few miles or so on the 40 metre band.)

**Gathering the hops:** Using a map, I measure how far it is to every station I've contacted during darkness, entering one dot per contact on the chart of Fig.3.2. Distance is measured horizontally, signal strength vertically.

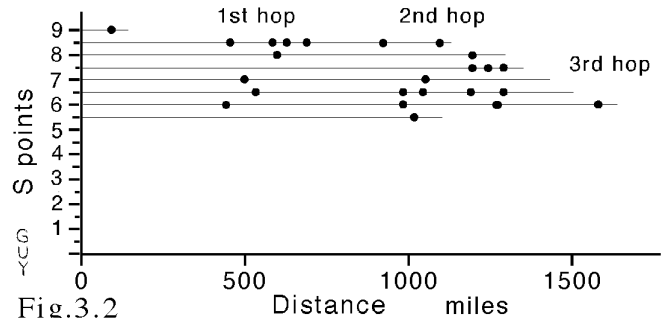


Fig.3.2

I conclude that the dots have gathered into two groups spaced by 500 miles, so this must be the skip distance. My signals aren't going much further than two hops. But to get to 'down-under', needs another twenty! So why haven't I got world-wide coverage? During the whole season, I contact only two USA stations, losing them in the noise, so that propagation path isn't up to much, even with low-loss reflections in the Atlantic. The mystery deepens. Day after day, at sunrise and sometimes at sunset, Australia and New Zealand are steady and reliable, mixed in with European signals. What could be the explanation?

**Antipodal focussing?** When waves are squashed sideways, like the tidal bore on the river Severn, the amplitude increases as the channel narrows. When diverging into a widening channel, the amplitude decreases. So, for example, signals setting out from the North pole are weakest when spread around the Equator, but strengthen as they squash laterally on approaching the South Pole. This is called 'antipodal focussing'. You can see this effect happen using a soup bowl. Let a drop fall into the middle of the soup. Watch the waves travel to the edge getting weaker. See them reflected at the circular rim and then, focussing back to the middle, give large central wobbles again.

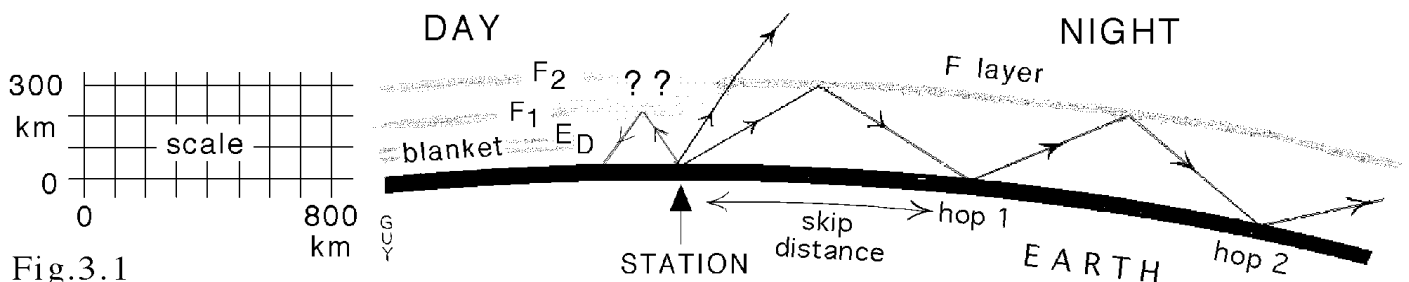


Fig.3.1

This is more than just pure theory. If we lived on a flat Earth, New Zealand would subtend an angle here of 4 degrees, but on the Great Circle map, Fig.3.3, New Zealand subtends more than 40 degrees. The map extends beyond the Antipodes so Antarctica, Australia and New Zealand appear twice. The short-path to 'down-under' is northeasterly, the long-path southwesterly. The radial distance scale is parabolic. The shaded region shows darkness at the time of a sunrise in England.

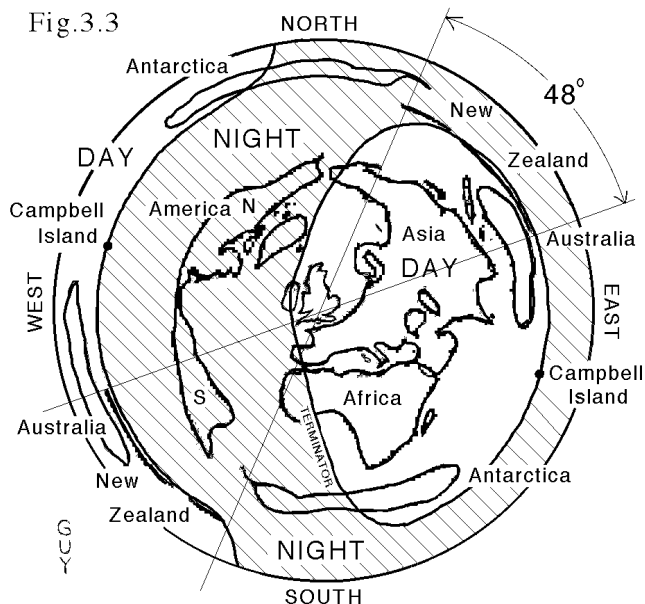


Fig. 3.3

This approximately tenfold angular magnification gives more than 10dB gain for New Zealand, compared to a flat Earth, and 5dB for Australia - one of the hidden perks of living on a spherical Earth. You don't need to focus your radio waves at New Zealand, the Earth does this automatically.

Another advantage of a spherical Earth is you can skip over your neighbours and talk to people further away. Marconi discovered this when his Morse letter S travelled from Poldhu to Newfoundland in 1901, astonishing those who claimed this was impossible. But I didn't think Antipodal focussing fully explained the effect that I was experiencing - the signals would have to vanish into the noise, continue to propagate by hops, then re-emerge from the noise near the Antipodes - possible, but the problem is the Maximum Usable Frequency, or MUF, gets less the further the waves travel into the night.

**Twilight propagation?** Sometimes signals propagate around the Earth following a circumferential strip of uniform ionospheric conditions between day and night. This 'twilight propagation' is characterized by one-seventh of a second echoes<sup>1</sup>, the time for signals to circuit the Earth. I've heard them on the BBC World Service and counted more than ten. It's very characteristic and spectacular - probably needs a lot of power, and is favoured by low angle radiation antennae - not applicable

to my station with 50 watts of power and a high angle radiation aerial. Besides echoes would make Morse unreadable. (Isn't it amazing, a 50 watt bulb can illuminate a small room, but on 40 metres, 50 watts can illuminate semi-circular swathes of the planet, of radius 500 and 1000 miles, plus a mysterious patch on the opposite side of the Earth. The puzzle is - so what happens in between?)

**Whispering gallery mode?** In the dome of St.Paul's Cathedral is the famous 'Whispering Gallery' where sound waves reflect internally around a curved wall. If radio waves could be launched into the ionosphere like this, Fig.3.4, then they might travel ten thousand miles. But if the reflecting layers are at a constant height, then it isn't possible to launch radio waves into this mode from ground level. But who says the ionosphere has a constant height? All the clues are now in place. Perhaps you'll jump to the obvious solution.



**Tilting:** Using the simple logic of a teenager, I came up with my 'Tilt and Whisper' solution. Recall in Fig.3.1 how the ionosphere is a different animal at night compared to during the day, particularly, the F-layers change height. What happens to the layers as they convert from night-time to daytime conditions? - hence the question marks in Fig.3.1. The layers change height and if tilting occurs, the geometrical possibilities open up - see my suggested DX propagation path in Fig.3.5 (not to scale). Signals reflected from a tilting ionosphere could propagate in a whispering gallery mode, miraging across the weaker parts of the ionosphere. This would take the signals to a corresponding tilt on the opposite side of the Earth, reflecting the signals down to Earth from the sky. At the same time, normal hop communication could also occur. This would explain how European, Australian and New Zealand stations can keep company nearing sunrise and sunset, without worldwide coverage.

Nice theory? - it won first prize in a Cambridge University Engineering Society (CUES) competition in 1965, but I never heard anything more about such ideas - not surprising given the huge switchover to satellite communications, plus I shifted into other areas of study.

**Sequel:** 40 years later, I made a fresh start into ham radio - (another story a bit outside the field of astronomy). Then I came across radio amateurs who believe in a different theory to explain how stations from 'down under' can keep company with Europeans, called 'Grey lines' propagation.

**'Grey Lines' Propagation.** From some Google searching, I learn that this mode of propagation is



particularly useful for signals below 10MHz. As the Sun rises, the daytime D and E layers are slow to form. This gives a window up to a higher F-layer, already strengthened by the rising Sun, strong enough to maintain reflections for long distances, on 40 metres, allowing DX communication between stations near to the terminator (the line between day and night).

This mode is similar to round the world propagation, but the signals wander before getting all the way round - like trying to roll a slightly conical barrel hoop in a straight line.

However, I remained puzzled. My logbook revealed that my aerial had nulls to the north and south - I never had any contacts with Scotland, and rarely with Spain. The terminator through Britain in Fig.3.3 at sunrise (Autumn) runs approximately north-south. Grey Lines propagation would demand my signals set out to the north or south, but my aerial was next to useless in these directions. And Campbell Island is roughly perpendicular to this direction.

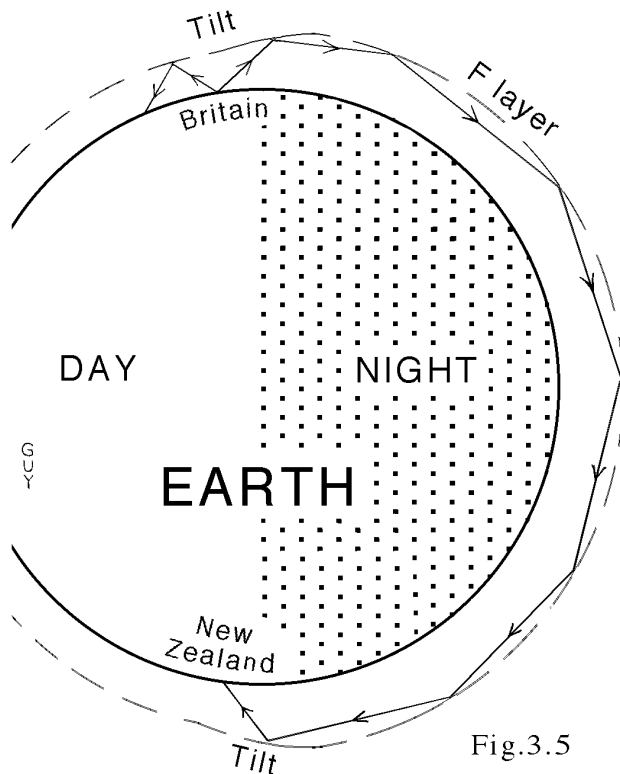


Fig.3.5

After several weeks of metaphorical pencil chewing, I came across something on the Internet called "Chordal propagation". Hey-ho! - this *is* the whispering gallery mode under a different name, recognized by the Australian Government IPS Radio Services, activated by ionospheric tilting and instabilities at sunrise and sunset. Multiple reflections in the ionosphere are low loss and give 'good signal strength over very long distances'<sup>2</sup>. A chord is a line joining two points on the circumference of a circle, hence 'chordal' describes the multiple reflections of Figs.3.4 and 3.5.

**So now there really is a choice of explanation** - 'Grey lines' or 'Tilt and Whisper Chordal' propagation. The next time such conditions arise a D/F (direction finding) loop (or a very large beam aerial - rare on this band) may help to decide which mode is operating. Meantime, if your signals travelling into the night, cannot cross a weak patch of ionization, then follow the hint from 'Grey Lines' - alter the aerial so as to send the signals more towards sunrise, ionization may be stronger this way. What fun learning to master the invisible forces of Nature. With radio you're dealing with the solar wind, sunspots, seasons and solar cycles but like the weather, it's a not a simple subject!

**Who got to 'Tilt and Whisper' first?** - I wouldn't know! But I express thanks to the *CUES* for permission to reproduce diagrams similar to the ones I did for their *Journal*, 1966 vol.36, p13-19, particularly Figs.3.2, 3.4, 3.5, and Fig.3.3 which was sketched from a homemade map, where the great circle directions had been obtained from a six-inch globe using a piece of cotton.

Lastly, another delight that can accompany round the world echoes, is the 'dawn chorus'. Perhaps this activity of birds, with their sensitivity to magnetic fields, possibly sunspots too, heralds good DX! By now you'll know what 'DX' is!

*Dr. Guy Moore G3RVU*

- 1 If the waves zig-zag, then increase the echo time by 25% - hence echo time provides information on propagation mode. Perhaps the waves reflect around the cylindrical ionized surface formed by the shadow of the Earth in the illuminated ionosphere (just an idea, so don't rely on it!)
- 2 see <http://www.ips.gov.au/Category/Educational/Other%20Topics/Radio%20Communication/Intro%20to%20HF%20Radio.pdf> (rather a mouthful in Morse Code!)

### Puzzle Corner

How can you *easily* get the bearing of Campbell Island (52S, 169E) using *only* a map of the British Isles plus Ireland?

**SURVEY DRAW**  
**THE WINNER OF THE COMPLETED**  
**SURVEY FORM DRAW WAS**  
**RYAN DIMMOCK**  
**CONGRATULATIONS RYAN, YOUR PRIZE**  
**WILL BE WITH YOU VERY SOON!**



## News and Events

### ***Device Makes Radio Waves Travel Faster Than Light***

A scientist has created a gadget that can make radio waves travel faster than light. Einstein predicted that particles and information can't travel faster than the speed of light, but phenomena like radio waves are a different story, said John Singleton, who works at the Los Alamos National Laboratory. The polarization synchrotron combines the waves with a rapidly spinning magnetic field, and the result could explain why pulsars - which are super-dense spinning stars that are a subclass of neutron stars - emit such powerful signals, a phenomenon that has baffled many scientists.

Singleton said the polarization synchrotron basically abuses radio waves so severely that they finally give in and travel faster than light. This may be what happens in pulsars, as well.

"Pulsars are rapidly rotating neutron stars that emit radio waves in pulses, but what we don't know is why these pulses are so bright or why they travel such long distances," Singleton said. "What we think is these are transmitting the same way our machine does."

The device consists of a 2 meter-long gently curving arc of alumina (a dielectric material), with a series of electrodes fitted at regular intervals along its length. Applying a sinusoidal voltage across each electrode and displacing the phase of the voltage very slightly from one electrode to the next generates a sinusoidally-varying polarization pattern that moves along the device. By carefully adjusting the frequency of the voltage and the phase displacement the researchers say they can make the wave travel at greater than the speed of light. However no physical quantity of charge travels faster than light speed.

And beyond explaining what has been a bit of a mystery to the astronomical community, Singleton's discovery could have wide-ranging technological impacts in areas such as medicine and communications, he said.

"Because nobody's really thought about things that travel faster than light before, this is a wide-open technological field," Singleton said.

One possible use for faster than light radio waves - which are packed into a very powerful wave the size of a pencil point - could be the creation of a new generation of cell phones that communicate directly to satellites, rather than transmitting through relay towers as they now do.

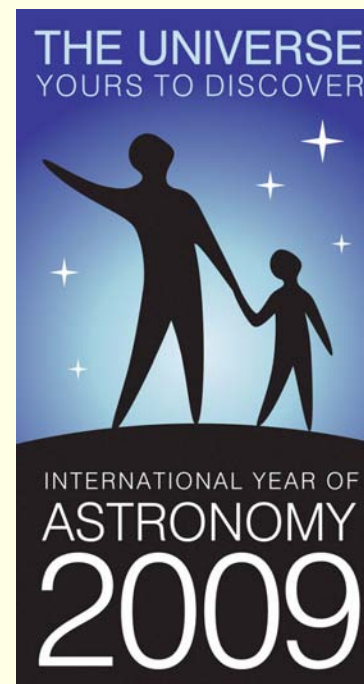
Those phones would have more reliable service and would also be more difficult for hackers to intercept, Singleton said.

Speedy radio waves could also revolutionize the computing industry. Data could be transferred more quickly, and if used in semiconductors, it would mean faster caches and the ability to communicate across separate pieces of silicon nearly instantly.

In the health field, faster than light radio waves could be in extremely targeted chemotherapy, where a patient takes the drugs, and the radio waves are used to activate them very specifically in the area around a tumor, Singleton said.

<http://www.universetoday.com/>

*Thanks to Matthew Grattage for this item*



### **Quotations**

*"We are just an advanced breed of monkeys on a minor planet of a very average star. But we can understand the Universe. That makes us something very special."*

— **Stephen Hawking**

*"The sum of intelligence on the planet is a constant; the population is growing."*

— **Cole's Axiom**

### **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.