

SOCIETY NEWS

Winter Skies

Yet again we seem to be having a run of bad weather on Thursdays! This has put a bit of a dampener on observing activities which should have been in full swing by now.

I suppose it's only early in the dark sky season but a number of members have been really keen to get on with the Messier Catalogue challenge mentioned a while ago. Graham Osborne has also suggested we could have a go at a challenge of 21 clusters from the Collinder List (mentioned in a recent edition of "The Sky at Night").

Don't despair though as we are still intent on making Thursdays active again. We have plenty of equipment, a load of keen astronomers, it really is just down to the weather!

Holidays



As this is the final NZ for 2011, I get a month off! The next NZ will be February 2012.

Please contribute any interesting astronomy news, photos or articles by 6th January 2012 to ensure inclusion. My email address and other details are shown over to the right of this page.

Merry Christmas & Clear Skies!
Brian Curd
Observatory Director

VAS Website: 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.

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Observatory Diary

Monday, 19.30hrs	Members Only. Telescope and night sky training. Contact Barry Bates 01983 872979
Thursday, 19.30hrs	Members and Public. Informal meeting and observing.

Contents this Month

<i>Society News</i>	1
<i>Monthly Meeting Calendar 2011</i>	2
<i>Monthly Meeting Calendar 2012</i>	2
<i>December's Sky Map</i>	3
<i>January's Sky Map</i>	4
<i>This Month's Night Sky</i>	5
<i>Essays from a beginner</i>	6
<i>Black Arrow and the Prospero</i>	8
<i>Mothly Meeting Report</i>	9
<i>The Clock in the Mountain</i>	11
<i>The Back Page</i>	12

Monthly Meeting Calendar 2011

Check the website for up to the minute information.

Travel for our monthly speakers is sponsored by:		
		
Date	Subject	Speaker
25 Nov	An introduction to visual observing and equipment	John Slinn

All details correct at time of publication.

Monthly Meeting Calendar 2012

Date	Subject	Speaker
27 Jan	Europe's first mission to the moon	Barry Kellet
23 Mar	Black Holes	Prof. Ian Morrison
27 Apr	Answering the Biggest Questions with the Biggest Surveys	Dr Thomas Kitching

Elaine Spear has already managed to get 3 speakers booked for 2012 and is busily contacting others to fill the rest of the calendar.

April's meeting is particularly interesting as Dr Kitching is an "Islander"..

ISLE OF WIGHT STAR PARTY

22nd - 26th March 2012

Come and Enjoy Some of the Darkest Skies in the South

<http://www.iowstarparty.org/> for more details

New Members

A very warm welcome to VAS for our new member:

- Sylvia Walsh

Thursday Meeting Notice

Please Note: On Thursday 24th November we are entertaining a group of Sea Scouts at the Observatory from 19.00 to 20.30 hrs.

The observatory will be open for the normal Thursday observing session after 20.30.

StarGazing Live! 2012

Plans are underway for our next StarGazing Live! event. To coincide with the next BBC series (16th-18th Jan 2012) VAS will host an evening of StarGazing on Friday 20th Jan.

More details as we get nearer to that date but in the meantime, if you can help in any way, please contact any committee member.

Time flies like an arrow. Fruit flies like a banana



Houston we have a problem!

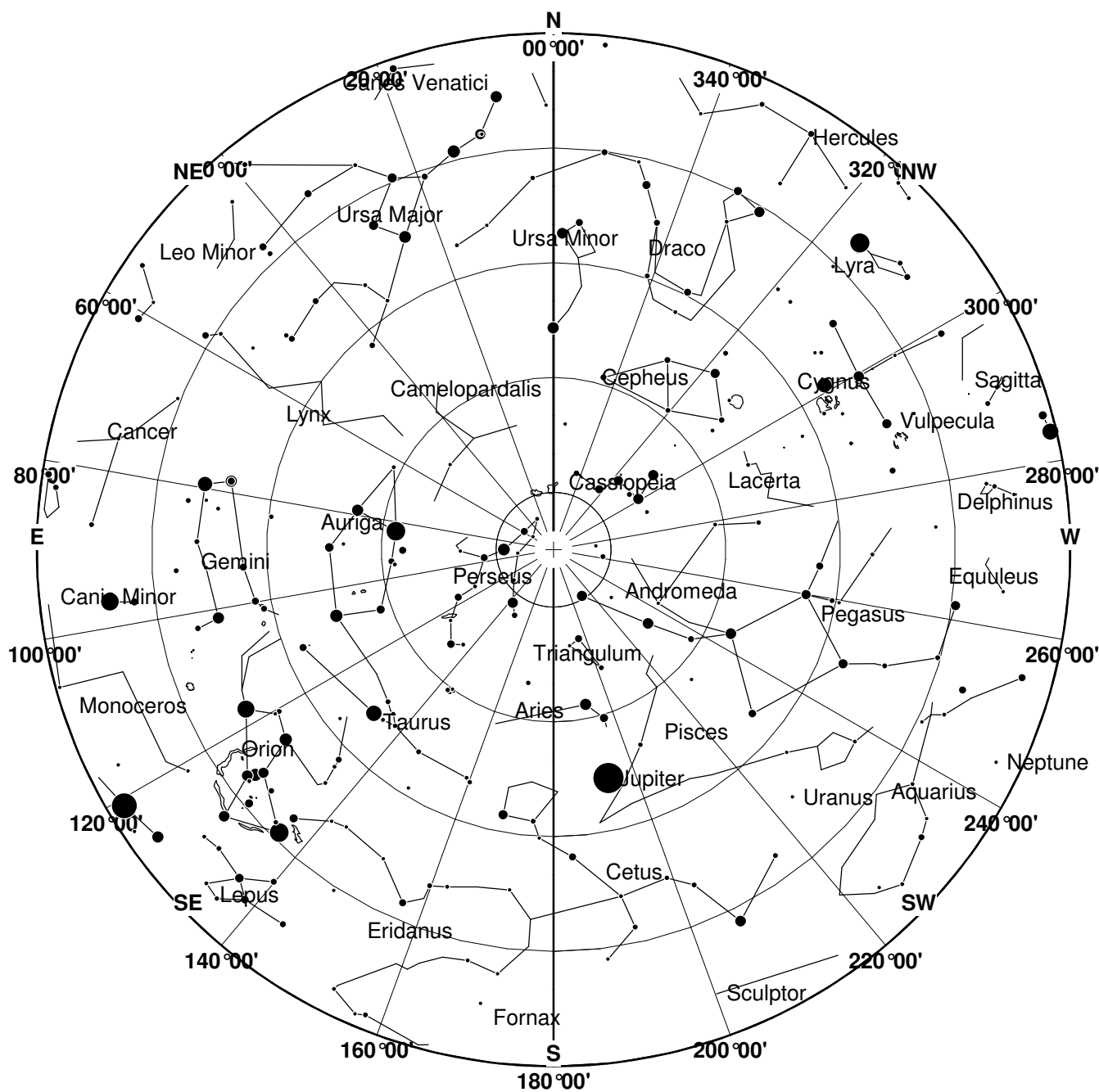
It seems that the observatory dome has become very attractive to flies. Last Thursday evening we opened the dome to be greeted by hundreds of the little blighters.

After emptying a can or so of flyspray into the area I think we got most of them this time. The problem is something we've seen before so we've decided that a more permanent solution must be found - a couple of electric UV fly zappers are on order and should be installed in the next week or so.

I am sure the infestation has not been caused by bad housekeeping but as ever, please make sure you remove anything that maybe attracting wildlife.

Brian Curd

December's Sky Map



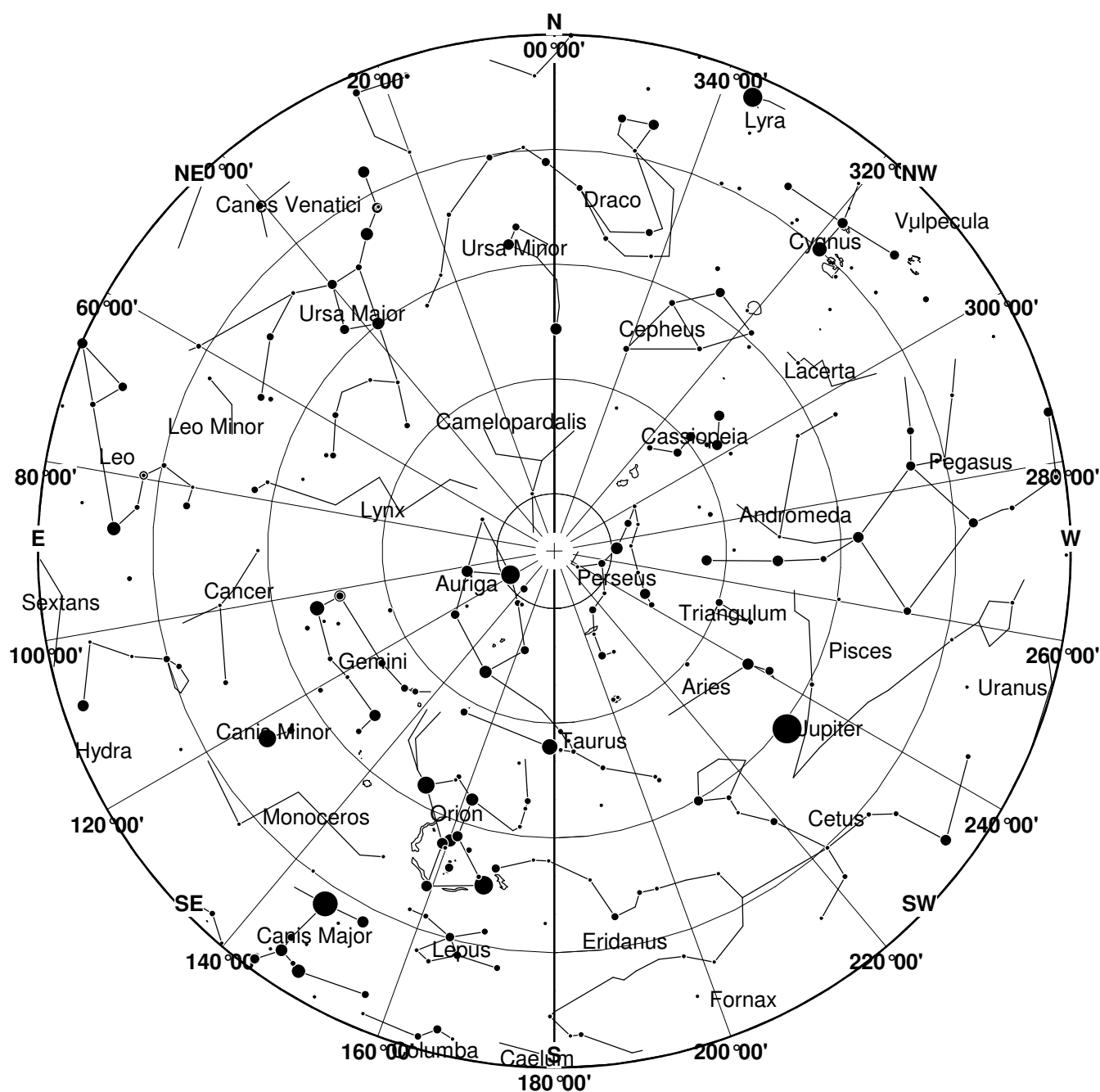
View from Newchurch Isle of Wight UK - 2100hrs - 15 December 2011



The Little Dumbbell Nebula, also known as Messier 76, NGC 650/651, the Barbell Nebula, or the Cork Nebula, is a planetary nebula in the constellation Perseus. It was discovered by Pierre Méchain in 1780 and included in Messier's catalog of comet-like objects as number 76. First recognised as a planetary nebula in 1918 by the Heber Doust Curtis. However, there is some contention to this claim, as Isaac Roberts in 1891 did suggest that M76 might be similar to the Ring Nebula (M57), being instead as seen from the side view.

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January's Sky Map



View from Newchurch Isle of Wight UK - 2100hrs - 15 Jan 2012



NGC 2264 is the designation number of the New General Catalogue that identifies two astronomical objects as a single object: the Cone Nebula and the Christmas Tree Cluster,

Two other objects are within this designation but not officially included: Snowflake Cluster and the Fox Fur Nebula.

All of the objects are located in the Monoceros constellation and are located about 800 parsecs or 2600 light-years from Earth.

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It uses material from the Wikipedia article "NGC 2264"

This Month's Night Sky

Winter solstice, the time at which the Sun is at its most southerly point, is on Dec 22 at 05:30. After this time the Sun starts heading back to the northern hemisphere.

There is a lunar eclipse at sunset on the 10th but like the eclipse earlier this year we only get to see the final moments after moonrise. Even for those with a perfect NE horizon this will be a disappointing event. The penumbral stage, when you can see the Earth's shadow on the Moon's surface, ends when the Moon is only 2° above the horizon.

Moon Phases

Dec 2011	New	1st Qtr	Full	Last Qtr
	24th	2nd	10th	18th
Jan 2012	New	1st Qtr	Full	Last Qtr
	23rd	1st & 31st	9th	16th

Planets

Mercury

Mercury - Azimuth & Elevation							
2011				2012			
Date	Time	Az	EL	Date	Time	Az	EL
10/12	07:20	128	5	1/1	07:30	137	7
15/12	07:30	135	10	5/1	07:35	136	5
20/12	07:30	137	10	10/1	07:35	134	3.2
25/12	07:30	137	9	15/1	07:35	132	1.6
30/12	07:30	137	7				

Mercury gives us a Christmas and new year treat with a morning apparition lasting almost a month. On the 23rd there is an early Christmas present; a photo opportunity with the crescent moon lying 4° below Mercury.

Venus

After an absence from our skies for almost a year Venus is now becoming a prominent object low down on the south western horizon after sunset. During the next few months it will draw away from the Sun to put on a magnificent show as the evening star.

Mars

Mars is still slowly brightening and is a prominent object against the stars of Leo. Its march slows down through Dec, and during Jan it halts its eastward march and begins to retrace its steps back towards Regulus.

Jupiter

Jupiter is still very well placed for observation during the evening hours.

Saturn

Saturn is an object for early risers being visible close to Spica the brightest star in Virgo. Contrast the bright blue of Spica with the distinctly yellow hue of Saturn.

Uranus & Neptune

Both must now be considered as unfavourable objects.

Deep Sky objects

NGC752 RA 1h 58m Dec 37°41' mag 5.7

This is an open star cluster a little larger than the full moon and just visible to the naked eye in a dark sky. A pair of binoculars will resolve up to 20 stars, and an 8" telescope with low magnification shows over 50. Some stars show colour, mainly yellow and orange.

M34 RA 2h 43m Dec 42°48' mag 6.0

This open cluster in Perseus is a little smaller and slightly fainter than NGC752 it contains 70 to 80 stars and as with most star clusters it is best viewed using binoculars or a low magnification telescope.

M76 RA 1h 43m Dec 51°37' mag 12

Just under 1° in the direction of Cassiopeia from Phi Persei lies one of the faintest of the Messier objects M76; a small bipolar planetary nebula. At mag 12 it is beyond the reach of all but the largest binoculars, however in medium sized telescopes, with averted vision the two halves of the dumbbell can be seen. Once considered to be two distinct objects it was given two NGC numbers NGC651 & 651.

NGC2264 RA 6h 41m Dec 9°38' mag 4.1

This is a large relatively bright cluster surrounded by a faint diffuse nebulosity. Visible to the naked eye as a fuzzy patch, but with a pair of binoculars will show the inverted triangle shape that gives this cluster its popular name, the Christmas Tree Cluster. The brightest star in the group marks the trunk of this upside down tree. Just to the south of the 7th mag star on the top of the tree is the Cone nebula. This along with the other surrounding nebulosity is best observed using a CCD camera.

NGC1662 Open Cluster R.A 4h 49m Dec 10°54' mag 6.4

About 2° towards the Hyades from the northern tip of Orion's shield can be found this large but rather sparse group of stars. About half way along the lower edge is a small diamond of tenth magnitude stars that along with an 11th magnitude outsider form a group that has a resemblance to a miniature, slightly squashed Delphinus.

Peter Burgess

Essays from a beginner: *On doing it yourself*

This is not going to be one of those awe-inspiring articles telling you how the author constructed an optically perfect Dobsonian from a drainpipe, his wife's best Lazy Susan, and the insides of an old lawnmower. On the contrary: over the last 30 years, the main thing I have learned about do-it-yourself is never to do it myself if I can possibly avoid it. I have, however, been driven to take a few baby steps into DIY to help the astronomy habit.

An eyepiece container for the 5" telescope originated in clumsiness, as I tend to fall over things placed on the ground, or knock the eyepieces off the tray on the mount. The prototype was an ice cream tub with holes made using a cherry stoner, with baby ribbon threaded through. (I told you my DIY skills were rudimentary.) Mark II was a solid plastic box. To make holes I had to excavate the Black and Decker from the garage - serious stuff. I sit the box of eyepieces on the mount, tied to the legs so it can't fall off. Then I can carry eyepieces, scope, and mount outside in one journey. And the purple ribbons add a festive touch.

The truss construction of my 10" Skywatcher makes it vulnerable to dew and intrusive light. I made a shroud for literally nothing, using a foam camping mat which came free with a tent bought by my youngest. I cut this to size, then sewed on Velcro fastenings, with buttons on the back to prevent the stitches pulling through. The scope looks as if it is wearing a natty blue waistcoat, but the shroud weighs nothing, gives reasonable protection, and doesn't flap in the wind or fall off.

There's a helpful red dot finder on the 5", so I added one to the 10". I bought a Sky Surfer, which came with a number of gadgets for mounting it. I experimented incompetently to see which would work best and in what position. (*Fact of the day: it takes a long, long, long time to get fourteen badly-placed sticky fixers off a telescope.*) The best result was two gadgets one on top of the other, to give enough height to see the dot and have the right radius for the scope. I went to my neighbour, who keeps a library of fixings, came back with my two mounts securely connected with ancient brass bolts, and stuck this contraption on with yet more sticky fixers. Granted, it looks odd, but it hasn't come off yet.

These travesties will no doubt horrify the capable amongst you; as the possessor of ten thumbs, I give myself brownie points for initiative.

Rebecca Mitchelmore

FOR SALE



Celestron Neximage Solar System camera

Complete, brand new and boxed.

Would make an ideal Christmas present for some lucky astronomer.

This is an unwanted duplication of the camera I use for Moon and planetary pictures.

Listed at £120

For sale at £75

Contact Glyn on 403047

Pictures shown here were taken by me using an identical camera.



VAS 35TH ANNIVERSARY DINNER



To celebrate the Society's 35th Anniversary, a dinner was arranged at the Isle of Wight College Restaurant in Newport.

A record 56 people came along, and there was an excellent mix of old and new members, who enjoyed a three course meal of Fine Cuisine. They were served by the students who are doing various catering courses and learning the art of Silver Service. I think most would agree that they performed very well.

The tables were laid out beautifully with the added touch from VAS with Astronomical table names instead of numbers. The table plan seemed to work out well with people sitting with someone they knew.



During the quiet periods between courses members were entertained with instructions to make an Origami Rockets, and there were some interesting results!

After the dinner our chair Faith Jordan said a few words and thanked all committee members passed and present. She then asked us to take a moment to remember those members that are no longer with us.

Following on, Elaine Spear then stood up and said a few words to acknowledge and thank the founders members of the society for all their efforts and continued hard work.

Barry Abraham, Richard Flux and Barry Bates were presented with a gift of a scarf embroidered with the new VAS logo.

The end of the evening saw a lively and very entertaining After Dinner Speech by Dr John Mason. His energetic style was warmly received by everyone and served to be a fitting end to a very enjoyable evening.

The event gave many members a chance to meet up with people that they hadn't seen for some time, and it also gave a chance for new members to chat and meet some of the very early members.



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40th Anniversary of the launch of Black Arrow and the Prospero Satellite at West High Down



On Friday 28th October a group of VAS members met up at West High Down, the site of the rocket testing facility years ago to celebrate the 40th anniversary of the launch of the satellite Prospero and also the development of the Black Arrow Rocket on the site. We were Lucy Rogers, Bill Johnson, Ryan and James Dinnock and me. The well attended event was organised by Dr Katayoun Dowlatshahi who had also set up an art exhibition in association with the event at the Quay Arts.

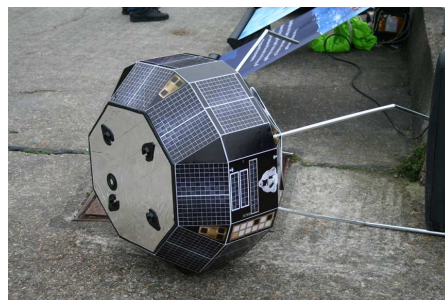


The programme consisted of talks on various aspects of rocket science and space exploration, as well as demonstrations of rocket developments by students/apprentices of Southampton Solent University in association with Astrium. These were a pulse jet engine and a valveless pulse jet engine. There was also a model of the Prospero satellite. The main event however was a scale model

of a Black Arrow Rocket which was launched successfully (after four or five attempts – the electrical connection kept falling off!). The event finished with the launch of many paper lanterns over the sea at dusk, a very stimulating experience.



The Prospero X-3 satellite was originally called Puck and was designed to conduct experiments to test solar cells and detect micrometeorites.



It was renamed Prospero when it was decided that it would be the last attempt to launch a satellite using a British rocket – the Black Arrow which was to be cancelled

afterwards. Prospero X-3 was launched at 04.09 GMT on 28th October at Woomera South Australia on a Black Arrow rocket. A tape recorder on board continued to play until 24th May 1973. Radio transmissions could still be heard in 2006 when the satellite tracking system was decommissioned.



The Black Arrow rocket was tested on the West High Down rocket testing site during the period 1965-1971. It was a development of the successful Black Knight rocket. It was a three stage rocket fueled by paraffin and hydrogen peroxide. The first and second stages were built at East Cowes by Saunders Roe which was merged into Westland Aircraft.



The pulse jet engine was invented in 1906 with a working model in 1907 but the valveless pulse jet engine superseded that in 1908. However this was overtaken by the turbine jet engine

in 1943. The pulse jet engine works by the ignition of a fuel/oxygen mixture in the combustion chamber by a spark which closes the valves. The flame escapes through the exhaust but this causes negative pressure behind which draws air into the chamber. Also some of the hot gases are sucked back by the negative pressure and the chamber fills with fuel as the valves open and ignition occurs again.



This is a self sustaining process and lasts as long as the air and fuel supplies last. The valveless pulse jet operates in the same way but does away with valves to control the inputs.

Bryn Davis

Atmospheric Effects: Glows, Bows and Haloes

Lecture report 28 October 2011 Richard Fleet (Newbury AS)

Without this lecture, it would be difficult to imagine the depth of this subject and how it relates to astronomy. Much time is spent by astronomers observing planets illuminated by the bright Sun, and our planet, even in broad daylight, must be included. In this lecture, the love of observing extends from the optical properties of water from dew drops to fog, to visual effects seen in ploughed fields, crops and forests, and phenomena associated with the light from the Sun and Moon, influencing what we see or fail to see, and all relevant to how planets and their moons can appear. From Richard's home location in Wiltshire, a considerable range of seasonal phenomena have been recorded, greatly assisted by a knowledge of the best place to aim a time-lapse camera. The subject contains optical mysteries too. You are urged to view Richard's very well presented images on www.dewbow.co.uk. The sketches in this report are mere scribbles on the wrapping paper of an Aladdin's treasure trove of images. Getting near to Xmas time, the liberty of adding some puzzles to these notes has been taken.

Bows are caused by liquid water, **haloes** by ice, and **glows** cover other phenomena such as incandescence, emission, scattering and shadows. Where better to start than with fractal lightning, using time lapse photography and similar methods for recording shooting stars?

A very bright **meteor**, a magnitude minus-6 fireball, seen in 2010, used two cameras to record it. When first colliding with the atmosphere, the streak was green due to ionization, the same green as in aurorae, followed by the white streak of the incandescent particle.

Aurorae. One seen in April 2000 was green at low altitude (up to 150 km) with a very distinctive red light above (formed higher than 200 km). Expect to see five to six in twenty years, the next several years are favourable.

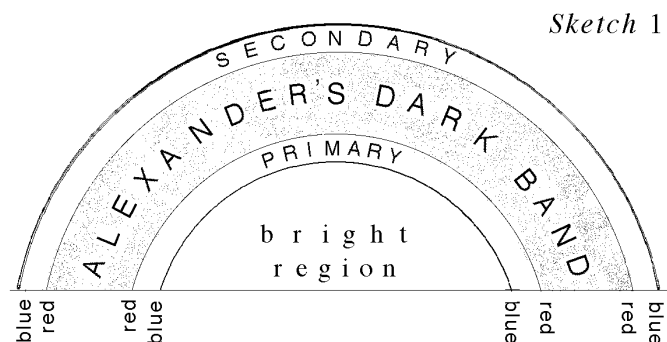
Haloes can be seen not only in the Antarctic, but here too in the form of '**sundogs**' about twenty degrees each side of the Sun. They can be very brightly coloured, red is nearside to the Sun. As cirrus clouds and contrails convey ice-crystals through the sundog positions, changing coloured shapes can be seen. Viewed through a polarizer, sundogs change slightly in position (a tenth of a degree) according to polarizer rotation.

Circumzenithal arcs can be caused by hexagonal ice flakes floating downwards in the sky, their ninety-degree corners in vertical section refract light to give the purest colours of the spectrum, forming a horizontal arc 46 degrees above the Sun - look high in the sky.

Circumhorizon arcs are very rare - these pieces of **parhelic circle** are seen more in the US than here, an amazing one was seen by Richard looking up in a busy street - alas, very few people saw what was happening overhead.

A **sunpillar** with the Sun below the horizon, is a layered column of reflections giving a vertically spread image of the Sun, above the horizon, following the Sun's azimuth around.

Rainbows: The sky being blue, sometimes the other colours show up more. "All the colours of the rainbow", is not a repertoire of pure spectral colours, because the red mixes across the other colours. If the rainbow is caused by light from a red sunset, then blue is very lacking (like seeing a picture on an old colour TV with a failing blue electron gun). In Sketch 1, inside the primary and outside the secondary, are whiter zones because the drops refract more light into them. In between these zones is Alexander's dark band, recognized for 2000 years.



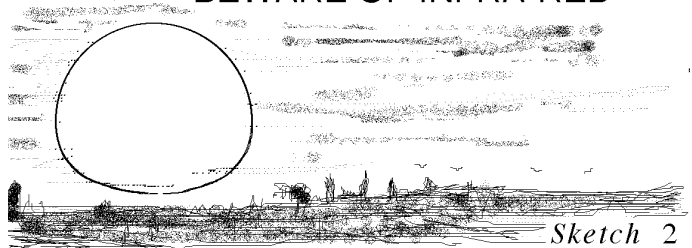
Puzzle 1: Invent an easy way using the name of this dark band so that you can remember for evermore which way round are the colours of the primary and secondary rainbows.

When the Sun is high, the whole rainbow is angularly lower, until a rainbow made by the Sun greater than 42 degrees altitude, shows just the secondary rainbow above the horizon, this too is liable to vanish when the Sun is higher than 52 degrees as it cannot easily outshine the earthly background. When the Sun is low, the scattered light is much whiter inside the primary, people have puzzled over the reason for this. Peering into the Victoria Falls, looking at rain from a balloon basket, or experimenting with a garden hose spray, can allow a full circular spray bow to be seen.

Supernumerary bows occur mostly just inside the primary, caused by interference, (near to the angles giving the rainbow, two ray paths through each drop giving rays at the same angle can interfere - easily simulated by computer). The brightest supernumeraries occur when the drops are similar sizes. Rainbow light is polarized parallel to the circumference, so a polarizer can enhance the colour relative to the surroundings. A panoramic picture requires rotating the filter.

Fogbows are white because, with smaller drops, interference dominates causing colour mixing, however, the supernumeraries are coloured, (see Richard's website for a fabulous picture).

BEWARE OF INFRA-RED



Sketch 2

Scattering: the blueness of the sky is caused by shorter wavelengths being scattered more than red. Without an atmosphere, the sky would be black. When the Sun is low, the light travels through a large atmospheric thickness, red light indicating hundreds of miles of clear air, a sign of good weather. *Beware, see Sketch 2, light from the red distorted Sun can still contain significant infrared rays, harmful to the eyes.* The atmosphere pushes the image upwards by refraction, there's twice as much at the bottom of the image than the top. But this sketch might be of the Moon instead, its vertical height being shorter than its width, contributes to aspects of the Moon illusion.

In June and July, when the Sun is ten to fifteen degrees below the horizon, **polar stratospheric clouds** up to 30 km height, can be illuminated, higher still **noctilucent clouds** can appear within the upper atmosphere, which is thinner than on Mars. Some such clouds, seen from Wiltshire, were as far away as over Northern Ireland; seen against the blackness of space, they exhibited a rolling structure, passing overhead.

Earthshine. On the Moon, the Earth shines brightly.

Puzzle 2: How brightly? If the albedo of the Moon is 0.07 and that of Earth 0.35, the Moon's radius is 1000 miles and the Earth's is 4000 miles, is it 4, 5, 20, 28, 80 or 700 times brighter?

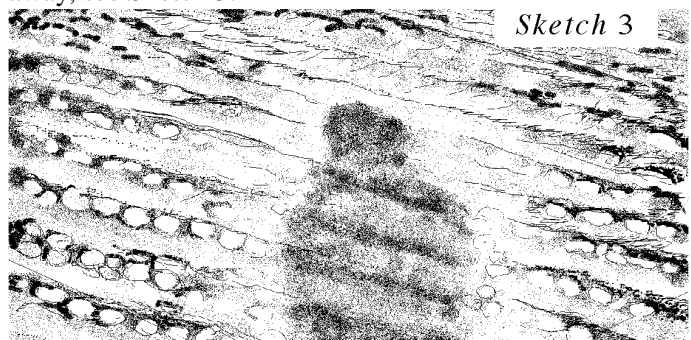
- solve this puzzle and you might expect the Moon's dark side to show up more - of course its brightness varies according to the Earth's cloud and ice cover reflecting varying light. (Note: additional light is emitted by the Moon during high solar activity, see NZ June 2010 p5.)

Zodiacal light, caused by light scattering from cometary detritus, is best seen from the tropics, but is just visible here two to three hours before sunrise or after sunset, preferably when the ecliptic plane is at a high angle to the horizon.

Puzzle 3: So what times of the year are favoured?

Crepuscular rays are formed in misty conditions, parallel rays from the Sun can make shadows and bright beams, like in a forest, and perspective makes the beams and shadows appear to radiate from a point. Of course, this point corresponds to the position of the Sun, which needs to be obscured by trees, clouds, or objects on the horizon, allowing bright rays to shoot out from behind the obstruction.

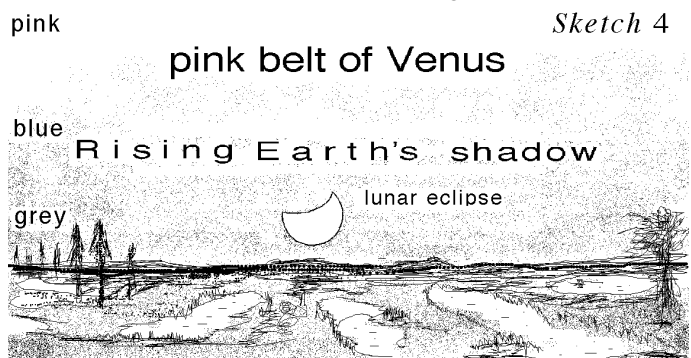
Opposition effects. Many effects are seen when facing away from the Sun. When looking at your own shadow on a ploughed field, at the edges of your shadow, you are looking parallel to the Sun's rays, so the shadows of lumps of soil are hidden, whereas the shadows show up further away, see Sketch 3.



Sketch 3

Puzzle 4: On an FBI night-training course, the agent, pistol in one hand, is instructed to hold the torch... .. to illuminate the target. Each dot indicates the missing letter of a word - what could be the words?

Belt of Venus: The Earth's shadow appears twice in Sketch 4, firstly on the distant eclipsed Moon, and secondly in the foreground where it rises into a blue sky beneath the pink 'belt of Venus' of clouds and water vapour, reflecting light from the red sunset behind the observer, mixed with blue scattered light.



Sketch 4

Puzzle 5: Sketch 4 shows Earth's shadow taking a bite out of the top of the Moon. However, the Moon is above the horizon so shouldn't the Earth's shadow take a bite from the bottom of the Moon instead?

Heiligenschein. Standing on the top of a hill after sunrise in the summer, look at the shadow of the hill on distant wheat fields. Dew drops, reflecting light directly

back to the observer give a bright area beyond the shadow of the summit.

A **single dew** drop is quite a scientific target, it needs a steady hand to suspend one on the end of a picked leaf, and move it to various positions to produce single rainbow colours. (Newton describes in his *Opticks* p.176 Antonius de Dominis and Des-Cartes, experimenting with a glass globe filled with water, viewed in the Sun's rays at either 42 or 50 degrees.) With magnification (possibly using a telescope?) parallel bands of interference patterns can be seen in a dew drop (again, see Richard's website.)

Puzzle 6: Given the huge spherical aberration exhibited by a complete sphere acting as a lens, how can parallel interference bands appear right across a dew drop? Aerial glory: peering (outwards) through the window of an airliner, the shadow of the aircraft itself on a cloud is surrounded by a halo that geometric optics cannot explain.

Moon corona, coloured interference bands around the Moon, quite close, are caused by micron-sized water drops. A 22-degree dark halo with the Moon at the middle suggests it will rain, coming ahead of a cold front from the Atlantic.

Plenty more effects were seen such as a **solar corona**, requiring shadowing of the camera, a **circumscribed halo** seen in the tropics, a grey volcanic sunset seen in Hawaii in July 1991 at the time of the eclipse, and images from a balloon.

In conclusion, dozens of effects can be seen, you **must** see them on Richard's website. If you know how they work and where to look, then you are far more likely to see them and understand the visual effects seen from space, and how volcanic plumes, cometary tails, and images of other moons and their atmospheres and geology require this knowledge to help interpretation.

Dr. Guy Moore

Solution 1: Know you that the last three letters of Alexander reversed, spell 'red' - the border colours of Alexander's band - so red is to the outside of the primary and to the inside of the secondary. No muddles with blue - 'Alexander' contains no 'u'.

Solution 2: Albedo is the ratio of light reflected to light received, so the Earth reflects 5 times more than the Moon. The total light reflected is proportional to area, varying with the square of the radius. Since the Earth is four times bigger than the Moon, then the 'full Earth' is $5 \times 4 \times 4 = 80$ times the brightness viewed from the Moon, compared to the full Moon viewed from here on Earth.

Solution 3: Near to the equinoxes.

Solution 4: "at arm's length on the opposite side" - this gives bigger target contrast and misdirects any return fire. (Source: a 1960s Nat. Geog. Mag.)

Solution 5: After the Sun has set behind the observer, the Earth's umbra, if it could be seen at the range of the Moon, has risen like a black invisible but transparent dish above the horizon. If the Moon wanders into the black dish, then a shadow is cast on the Moon, top, bottom or elsewhere.

Solution 6: Perhaps Robert Hooke observed similar things since he used very small spherical lenses. I do not know the answer yet

Warning: a pot of Guy's dark marmalade is offered as a reward to the writer of any credible solution appearing in the NZ

The Clock in the Mountain



There is a Clock ringing deep inside a mountain. It is a huge Clock, hundreds of feet tall, designed to tick for 10,000 years. Every once in a while the bells of this buried

Clock play a melody. Each time the chimes ring, it's a melody the Clock has never played before. The Clock's chimes have been programmed to not repeat themselves for 10,000 years. Most times the Clock rings when a visitor has wound it, but the Clock hoards energy from a different source and occasionally it will ring itself when no one is around to hear it. It's anyone's guess how many beautiful songs will never be heard over the Clock's 10 millennial lifespan.

The Clock is real. It is now being built inside a mountain in western Texas. This Clock is the first of many millennial Clocks the designers hope will be built around the world and throughout time. There is a second site for another Clock already purchased at the top of a mountain in eastern Nevada, a site surrounded by a very large grove of 5,000-year-old bristlecone pines. Appropriately, bristlecone pines are among the longest-lived organisms on the planet. The designers of the Clock in Texas expect its chimes will keep ringing twice as long as the oldest 5 millennia-old bristlecone pine. Ten thousand years is about the age of civilization, so a 10K-year Clock would measure out a future of civilization equal to its past. That assumes we are in the middle of whatever journey we are on – an implicit statement of optimism.

More at: <http://longnow.org/clock/>

THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

Here we go again (or is it come again?) ...

Neutrino experiment repeat at Cern finds same result

The team behind the finding in September that neutrinos may travel faster than light has carried out an improved version of their experiment - and found the same result.

If confirmed by other experiments, the find could undermine one of the basic principles of modern physics.

Critics of the first report had said that the long bunches of neutrinos used could introduce an error into the test.

The new work, posted to the Arxiv repository, used much shorter bunches.

It has been submitted to the Journal of High Energy Physics, but has not yet been reviewed by the scientific community.

More at: <http://www.bbc.co.uk/news/science-environment-15791236>



NASA releases sharpest ever Moon elevation map

The US space agency (Nasa) has released the sharpest ever elevation map of the Moon. It will enable scientists to accurately portray the shape of the entire Moon at a higher resolution than ever before.

The map was produced using data sent back by the Lunar Reconnaissance Orbiter (LRO) spacecraft, which was launched in June 2009.

It reveals troughs and bumps over nearly the entire Moon with a pixel scale close to 100m (328 ft).

More at: <http://www.bbc.co.uk/news/science-environment-15778142>

Feeling Rich this Christmas?



\$13,000 doesn't sound much for the Pillars of Creation does it? Well no it doesn't except that this won't of course buy you the real thing. Instead you can buy a handmade quilt depicting the scene.

Of course there are a few cheaper options - you can get a real bargain, M83 is just \$5000!

http://www.etsy.com/shop/stellarquilts?ref=seller_info#

Observatory

For your own safety, when visiting the VAS observatory, please bring a torch. Also, please make sure you close and lock the car park gate if you are the last to leave - if you need the combination to the lock, please contact a member of the committee.

Articles Needed

New Zenith welcomes letters, articles or pictures related to all aspects of astronomy. Contributions to the Editor at the email or postal address on the front page.

“It is no good getting furious if you get stuck. What I do is keep thinking about the problem but work on something else. Sometimes it is years before I see the way forward. In the case of information loss and black holes, it was 29 years.”

Stephen Hawking

Quotations

“It is not clear that intelligence has any long-term survival value.”

“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