New Zenith

The Monthly Magazine of the Vectis Astronomical Society

Vol 19 Issue 5 — June 2011

When Printed, this Newsletter costs VAS at least £1

Society News

I am a bit dissappointed this month. So far we have received just **one** entry to the competion to design a new society logo and **no** entries at all for the junior member's competition to win a telescope!

There are still a few days left for you to enter either or both so, please get your pens and pencils out and have a go.

On to better news....

Laser Collimator

Honorary member, Edna Cahill recently made a generous donation to VAS in remebrance of her husband Jim. At a recent Committee meeting, we decided to use some of the donation to buy a laser collimator which will be kept at the observatory. This is a valuable addition to our equipment list and will, I am sure, be regularly used (a collimator is used on a telescope to check if all elements are aligned on the optical axis). ***Many thanks Edna.***

Telescope Power Packs

The telescope power packs at the obsevatory have a very poor reliability record and we have decided to replce them with much simpler equipment.

The packs are quite expensive (around £100) and provide a lot of facilities in addition to the 12V output which is the only thing we ever use. Who on earth needs a built-in FM radio and a panic alarm?

The replacements will comprise a simple 12V battery with waterproof (Torberry) connectors allowing foolproof connection to the telescopes and suitable 2 stage chargers. The chargers allow batteries to be left connected for expended periods with no risk of over-charging.

Equipment will be ordered in the next week or so and should provide reliable power for some years to come.

Website Update

An online diary of events, meetings and observatory use is now available to all at ***wightastronomy.org***. Just click on "Diary of Events" on the main menu.

Still not enough rain, so "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:

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

Tel: **01983 864303** or email: **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

Registered Charity No 1046091

Observatory Diary

Monday, 19.30hrs	**Members Only**. Telescope and night sky training.
Thursday, 19.30hrs	**Members and Public**. Informal meeting and observing.

Contents this Month

Monthly Meeting Calendar 2011

Check the website for up to the minute information.

Travel for our monthly speakers is sponsored by:

Date	Subject	Speaker
27 May	Planetary Nebulae	Owen Brazell
24 Jun	The Transit of Venus 2012	Robin Gorman
22 Jul	Pluto	Greg Smye-Rumsby
26 Aug	Astro-Image Processing	Dr Jon Whitehurst
23 Sep	Accretion Discs? TBC	James Fradgley
28 Oct	Glow Bows and Haloes	Richard Fleet
25 Nov	Discs round Stars and Galaxies	James Fradgley

All details correct at time of publication.

Next Maths Society meeting should be fun
Thursday 16th June @ 7.30pm
Node Hill School
"How to Crack Chip and Pin"
by Chris Jarman
More Details at:
http://mathssoc.onthewight.com/

Lock Change

As mentioned in previous NZ, we have now changed the lock on the main observatory door.
If you have an old key, please return it to Brian Curd and you willl be issued with a replacement.

Space City Portsmouth

Just received this year's programme and the theme for is 'Space City' among the concerts, recitals etc are some lectures that may be of interest to VAS members:

- Stephen Robinson (Shuttle Astronaut) 'Endeavour and Discovery'
- Jocelyn Bell-Burnell (discoverer of pulsars) 'Women in science'
- Mark Butler (Virgin Galactic) 'Space Tourism'
- Steve Cole and Justin Richards (series writers) 'A celebration of Dr. Who'

You can even go observing with Hampshire Astronomical Group - whoever thay may be!

Full details at ***www.portsmouthfestivities.co.uk***

I will certainly be going to some of these so am happy to coordinate ticketing if there is any interest.

Richard Flux

Observatory Maintenance

Three of us managed to complete some "Summer maintenance" at the observatory last weekend despite the high winds.

Barry had the best job, cleaning the LX200 Meade and associated eyepieces and the inside of the dome while Thomas and I washed down the facias, doors,windows and guttering out in the wind!

We had hoped to wash down and paint the dome but the high winds prevented that as it wasn't safe to venture up on the roof.

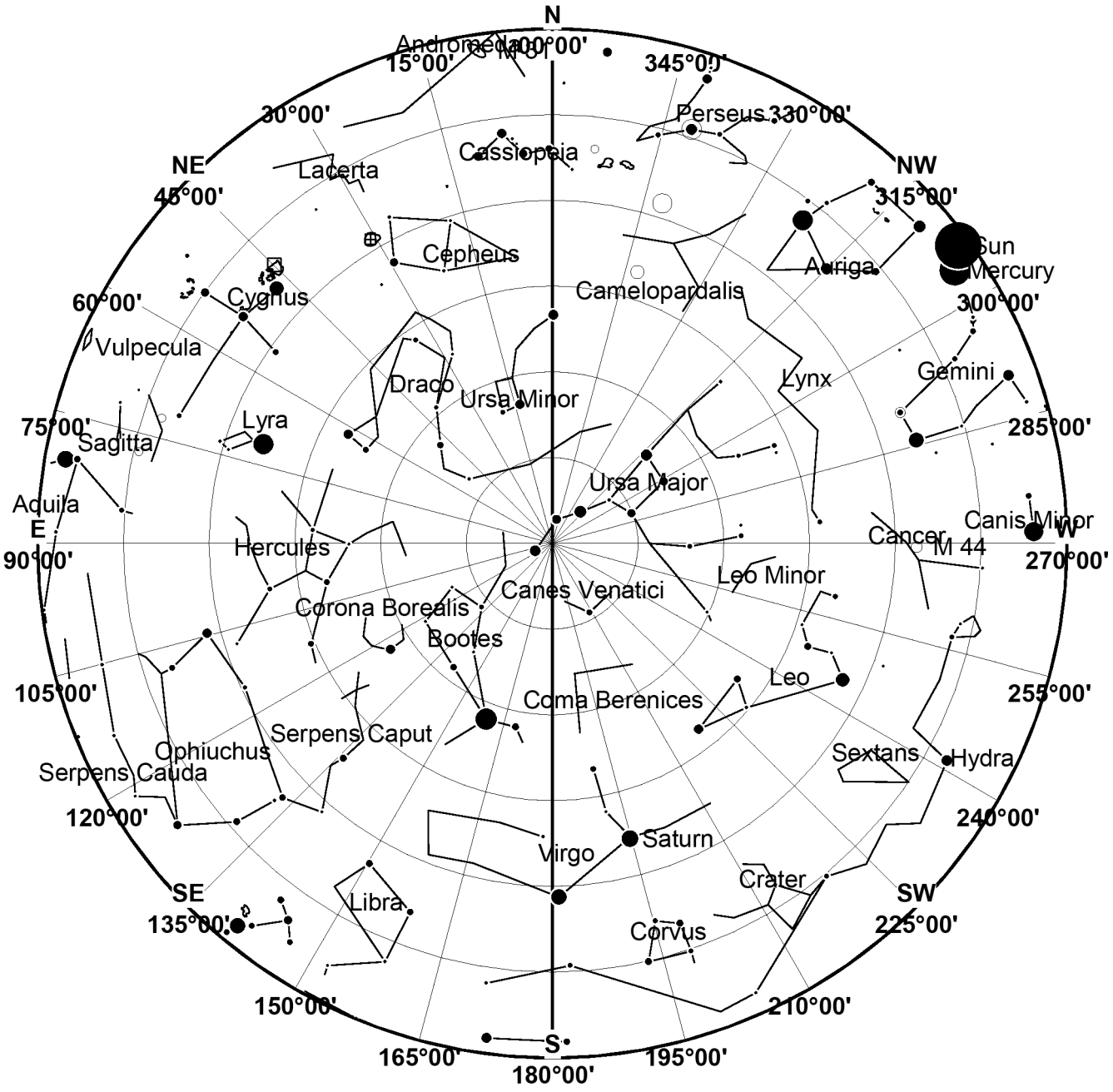
I will be arranging another Sunday morning sometime soon to paint the dome so if you can spare a few hours and don't mind getting covered in paint, give me a call or drop an email.

We also plan to paint the inside of the dome (perhaps with anti-condensation paint), but that will have to wait for a while - again if you fancy lending a hand with that, please let me know.

Many thanks to Barry and Thomas and special thanks to Julie for the rock cakes!

Brian Curd

This Month's Sky Map



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

Messier 92 (also known as M92 or NGC 6341) is a globular cluster in the constellation Hercules. It was discovered by Johann Elert Bode in 1777 and independently rediscovered by Charles Messier on March 18, 1781. M92 is at a distance of about 26,700 light-years away from Earth.

This Month's Night Sky

Moon Phases

New	1st Qtr	Full	Last Qtr
1st	9th	15th	23rd

The summer solstice, the time at which the Sun reaches its most northerly point and starts its journey back to the south is at 18:17 on the 21st.

Lunar Eclipse

On the 15th the full moon will already be in full eclipse as it rises at 21:30 with totality ending just 30 minutes later. The earths shadow will be seen taking a bite out of the moon for about another hour.

Planets

Mercury

Mercury makes a poor evening apparition towards the end of the month. Look very low down in the west after sunset during the last week. It will be a challenging object being at best around 10 degrees above the horizon at sunset.

Venus

Still in the morning sky Venus continues to get closer to the Sun. By the end of the month it is only 13 degrees away; so close that it can only be regarded as a challenge to merely glimpse it in the glare.

Mars

Very close to the horizon during the last vestiges of twighlight Mars may be glimpsed by those who are well equipped and have a perfect eastern view. It is not yet well enough placed to be considered a worthwhile object for observation.

Jupiter

Jupiter lies a little further west and higher up than Mars. Given this and its superior brightness it can be observed low in the east for an hour or so before sunrise.

Saturn

The scarcity of darkness at this time of the year means that the time available for observation is limited. It is prominent in the southwest at sunset and by the end of the month will be too low down for most by about midnight.

Uranus & Neptune

There is a short window of opportunity before sunrise to spot these outer planets, but they can not yet be regarded as being favourably placed.

Meteors

The low rate Ophiuchids has a double peak this month, the first on the 10th and the second on the 20th. The latter peak will be spoiled by the waning gibbous moon.

Deep Sky objects

M4 The Cat's Eye , Globular Cluster RA 16h 24m Dec -26° 33' mag 7.5 - At about 7200 light years this 10,000 million year old cluster may be the closest globular cluster to our solar system. This core of this cluster is rather looser than most globulars with a distinct chain of stars running across its centre.

M80 Globular Cluster RA 16h 17m Dec -22° 59' mag 8.5 - In contrast to M4 this cluster is a much smaller with a very condensed core. In 1880 a nova was observed here, one of only two novae ever seen in a globular cluster.

M13 The Herculese Cluster RA 16h 42' Dec 36° 26' mag 5.8 - On a dark night the Herculese globular can be seen with the naked eye as a fuzzy star part way down the right hand side of the keystone asterism. This is the brightest and many would argue the best globular visible from the norhtern hemisphere. It lies some 25,000 light years away from us, relatively close by globular cluster standards. As with all globular clusters the view improves with increasing apperture used to observe it. The view is of a sugar coated ball frozen in time, and surrounded by a flurry of sugar grains.

M92 Globular Cluster RA 17h 17' Dec 32° 7' mag 6.5 - Herculese has two magnificent globular clusters, if it were not for M13 this would be the norhtern hemisphere's showpiece globular. It is overshaddowed by its more famous companion. M92 has a slightly smaller, more condensed core surrounded by fewer halo stars,but should be a stop on anyone's tour of the night sky.

Peter Burgess

Garlic Festival 2011

20th & 21st August

Our major annual fund-raising event needs volunteer marshals.

You will be:

Patrolling the site, Helping visitors
Controlling traffic etc

If you can help, please contact

Richard Flux 883062

Junior Members' Competition

Recently VAS was given a Tasco Luminova 114mm Reflector Telescope as shown in the picture; it is boxed and in "new" condition, as it has only been used once or twice. This starter 'scope comes complete with tripod, 3 eyepieces a barlow lens, CD ROM and instructions.

For your chance to win, just send an article on any subject relating to astronomy to the Editor of NZ (contact details on the front page)

Competition Rules

1. You must be a junior member of Vectis Astronomical Society.
2. The article you submit must be your own work and not published anywhere else.
3. All submitted entries will be published in NZ.
4. Your entry should fill at least half a page of A4 paper - diagrams and photos are welcome.
5. Both electronic and paper entries are welcomed.
6. The closing date for entries is 31st May 2011 and the winner, as judged by the Committee, will be announced in the July New Zenith.

Exoplanet near Gliese 581 star 'could host life'

A red dwarf star 20 light-years away is again providing hints that it hosts the first definitively habitable planet outside our Solar System.

The planet Gliese 581d is at the colder outer edge of the "Goldilocks zone" in which liquid water can be sustained.

Now a study in Astrophysical Journal Letters suggests its atmosphere may keep things warm enough for water.

The solar system also hosts another contender for habitability, unconfirmed planet Gliese 581g announced in 2010. However, the existence of that planet has since been called into question.

Gliese 581d is less controversial; it was discovered along with the planet Gliese 581c in 2007, occupying the outer and inner edges of the Goldilocks zone, respectively.

Read more here

Lonely planets float near galaxy's centre

SYDNEY: A population of 10 Jupiter-mass exoplanets have been identified floating freely in the Milky Way galaxy, apparently unbound to any host star, a new study has found.

At a distance of more than 10 times that of the Earth to the Sun from their nearest star, the objects are either in a far-flung orbit or not gravitationally linked to a parent star, researchers said. They also conclude that these Jupiter-mass objects are nearly twice as abundant as stars.

The finding, published in this week's issue of Nature, could transform current ideas about how planets are formed and raises an interesting question about how planets end up in distant orbits or detached entirely.

"It is the first time to find that such free-floating planets are as common as stars," said co-author Takahiro Sumi, an astronomer from Osaka University in Japan. "Previous observations only tell us about planets that are surviving in orbits now. This finding informs us how many gas giants have formed and scattered out."

Read more here

Puzzle corner: Lunar-biker Solution

This problem (April NZ) was prompted by

1. Michael Cull's excellent talk about Moons,
2. a recollection about a spacecraft 'to be controlled by wheels', and
3. the setting up of the new IoW Mathematics Society.

Solutions were received from Walter Naumann in Santa Barbara, and David Broughton of the IoW. First - apologies - the low Earth orbital velocity was too fast (due to a faulty calculator), please correct this to 7.67 km/sec. We all get similar answers for the moon's radius and orbital period but we differ over bicycle traction. When in orbit, the tendency to spin or not may result in letters to the NZ.

The question: A space-jogger running at 3m/s around a spherical moon (non-spinning as David points out), of the same density as Earth, finds that with a bend of both legs, it is possible to go into low orbit without further exercise. Given that low orbital speed for the Earth is 7.67 km/s and its radius is 6000 km:-

(a) what is the diameter of this moon? Take a mass m in circular orbit with speed v, very close to the surface of a uniform sphere of mass M, of radius R and density r. Equating centripetal force to gravitational attraction, then

$$\frac{mv^2}{R} = mg = \frac{GmM}{r^2} \qquad (1)$$

g is the acceleration due to gravity at the surface of the sphere and G is the gravitational constant.

Equation (1) gives

$$v^2 = \frac{GM}{R} \qquad (2)$$

so

$$v = \sqrt{\frac{GM}{R}} \qquad (3)$$

Using mass is volume times density then

$$M = \frac{4}{3}\pi R^3 \rho \qquad (4)$$

and substituting for M in equation (3) gives

$$v = kR \qquad (5)$$

where k is a constant, so low orbit circular speed is proportional to the moon's radius. Whence the radius of the moon is the ratio of orbital speeds multiplied by the Earth's radius so

$$R = \frac{3}{7670}6000 = 2.347\,\text{km} = 2347\text{m}.$$

double this so the diameter = 4.7km.

(b) how long does it take the jogger to get round it? The orbital period is the circumference divided by the speed = (2 x p x 2347 / 3) seconds = 1 hour and 22 minutes the same as a satellite in very low Earth orbit (if it had no atmosphere).

(c) since orbital speed varies with height, does the jogger tend to tumble forwards or backwards and estimate the tumble rate ('slightly tricky'). David calculated the orbital speed for an object at head height, tending to topple the jogger backwards. The 'smart way' into this is to keep M constant in equation (3) take logs and differentiate, or use a small increment in radius and a binomial expansion - same result) giving

$$\frac{\delta v}{v} = \frac{-\delta R}{2R} \qquad (6)$$

which is the fractional reduction (hence the negative sign) in orbital velocity in terms of fractional increase of orbit radius. If the jogger is 2m tall, this comes to 0.000426m/s reduction in speed for the head compared to the feet - I get a 60 degree backward tumble per orbit of revolution, although oscillations are liable to occur, heavy boots strongly attracted downwards. Eventually tidal forces may be important, causing a braking torque [1] until, like our Moon with a synchronous spin, the jogger ends up, as described by Walter, orbiting synchronously feet down because of differential gravity. So both solutions are correct, how long it takes to get from David's to Walter's depends on dissipation rates, really not soluble by mathematics!

(d) if the intrepid jogger bounces elastically off patches of high ground, does this tend to give retrograde or prograde orbital spin? The friction force at contact is backwards hence prograde, i.e. tumbling forwards. Walter suggests the first bounce would elongate the orbit, the second bounce would tumble the jogger forwards.

(e) is a bicycle or a rocket needed to get up enough speed to escape from this moon? The escape speed is found by putting kinetic energy equal to the work needed (force times incremental radial distance integrated) to reach infinity giving

$$\frac{mv^2}{2} = \int_R^\infty GmMr^{-2}dr = \frac{GmM}{R} \qquad (7)$$

whence the escape velocity v is given by

$$v = \sqrt{\frac{2GM}{R}} \qquad (8)$$

which is the square root of 2 times the circular orbit speed given by equation (3), so this comes to 3 x 1.414 = 4.2m/s = a reasonable running speed, but the problem is foot impacts, upward bounce, keeping contact and getting the traction. A bicycle would give a smoother run.

Check first if the jogger can jump vertically to achieve escape without bike or rocket. A high jump with a 'run-up' is very awkward, hence test the jogger on Earth jumping vertically to a height h, from rest, with legs bent and straightening them, an upward arm swing helps. I get a 0.2m jump (my mass is 80kg). The energy on earth is mgh=80 x 9.81 x 0.2 =160 joules. Put this equal to the kinetic energy of motion in a moon jump, so the launch velocity Vup is given by

$$\frac{1}{2}mv_{up}^2 = 160 \qquad (9)$$

whence $v_{up} = \sqrt{320/80} = 2$ m/s - not fast enough.

Now try a bike: A horizontal launch is possible, trajectories are computed in Fig.1. A horizontal lauch at 4.2m/s achieves a parabolic orbit, with just enough speed to escape. Less than this speed gives elliptical orbits, returning to the place of launch. Greater launch speeds give hyperbolic orbits, and escape for sure.

With a shovel clear a straight line chordal launch track, perhaps 200 metres long. To reach 4.2m/s down this track requires an acceleration of (use velocity squared = 2 x acceleration x distance) giving 4.2 squared over 400 = 0.044 m/s2, and since force = mass x acceleration, a horizontal force of 80kg times this = 3.5 Newtons. The back wheel needs to push backwards with this force, pushing me forwards (Newton's third law) with equal force, but I need enough weight to hold the bike down, at the front.

My weight = mass x local gravity. Local gravity, from equation (1), is GM over R2 = circular orbit speed squared, from equation (2) over the radius of the moon = 9/2347 =0.0038 m/s2. So my weight in newtons is 80kg times this acceleration =0.3N. (Divide newtons by 9.81 to obtain the weight in 'kilograms-force' kg-f, then by a thousand, gives about 30 grams-force = one ounce force = ten old farthings or 10 new penny coins in terrestrial weight.)

There is no shortage of traction force available from the cyclist who can develop more than 100N but it will help to have a large wheel base and add loads of ballast - no problem taking that into orbit too. Whizz down into a crater, up the far side and out into space - so a rocket is not needed!

(f) having achieved orbit, what happens to the rider's spin if the bike brakes be suddenly applied? As David points out, the angular momentum is transferred to the whole system so the rider would tend to fall over the handlebars. Given the slightest friction in the wheel bearings, this will happen very slowly anyway, so the biker needs to spin the rear wheel from time to time as necessary, to stabilize the whole system, benifitting from gyroscopic effects too.

Thanks to Walter and David for their solutions!

And thanks to Brian for dealing with all these equations!

Reference

[1] tidal lunar slow down to synchronous orbit is described in 'Guide to the Moon' Patrick Moore, Book Club Associates, London,1976 pp.37-38.

Dr.Guy Moore

Photographer captures entire Milky Way galaxy in one photo

A US photographer has captured the entire Milky Way galaxy in one photograph comprised of more than 37,000 images.

Seattle, Washington-based photographer Nick Risinger made the 5000-megapixel photo from 37,440 pictures, which he shot and stitched over the course of one year.

To make the photo, Risinger says he travelled 45,000 miles by air and 15,000 miles by land – roughly the equivalent of 2.5 passes around the equator – to photograph the sky from different locations around the globe.

Because star light is very weak, Risinger used long exposures that were several minutes long. He also used six cameras to photograph each section, which were 12 degrees wide.

Read more here

Exoplanets

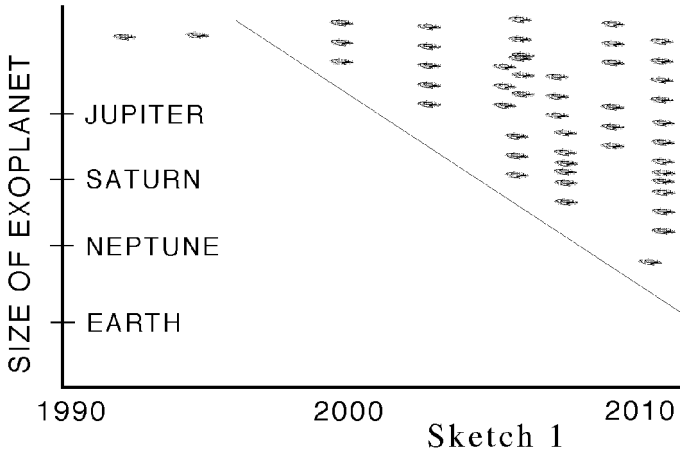
Professor Don Pollacco

Astrophysics Research Centre QUB (Belfast)

29 April 2011 Lecture report

Stellar astronomer Professor Pollacco often visits the Hampshire Astronomical Society, this time venturing over the water to give us a very well attended talk, including in the title the thinly veiled "Where are our alien neighbours?" the talk really being about exoplanets - but we'll see how discoveries made over the last fifteen years have upped certain probabilities in the Drake equation of advanced civilisations existing elsewhere.

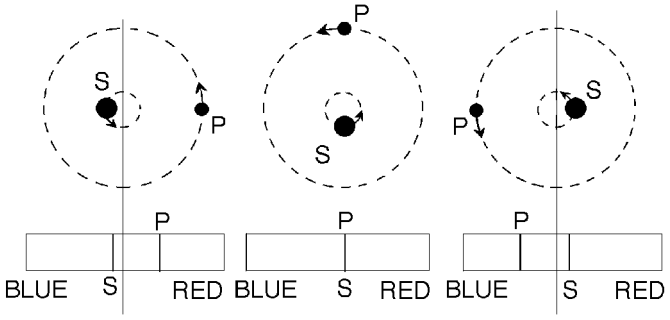
Using the Arecibo telescope, the first exoplanet was discovered orbiting pulsar B1257+12, by Wolszczan & Frail in 1992 using very accurate pulsar timing. Then came 'hot Jupiters' discovered around main sequence stars by Mayor & Queloz in 1995. The approximate data in Sketch 1 shows the rapid increase in discoveries, with smaller exoplanets now being found. The total discovered now runs into hundreds. A composite movie of their orbits appeared (from the back of the room) more like a map of bumble bees gathering honey in a rectilinear flower bed, some bees working in pairs. It is expected that rocky Earth type exoplanets will be soon be found.



Sketch 1

The various detection methods are as follows:-

Doppler shift: most exoplanets have been found by this means - a very good simple orbit movie related an exoplanet and host star travelling around a common centre of mass, with the star much nearer to the centre and the planet further out. Starting on the left in Sketch 2, the star S moving towards us (we are 'down below' in the plane of this diagram) is slightly blueshifted, the planet P has bigger shift but into the red. In the middle diagram, with S and P travelling sideways to our line of sight, no Doppler shift occurs giving an 'at rest' spectrum. On the right the opposite shifts are seen, blue for the planet, red for the star. But without knowing the mass of the star, there are plenty of orbital unknowns to overcome. A coronograph can be used to block the light of the host star - just like it would be impossible to see a candle held next to a floodlight on a football stadium without turning the floodlight out or blocking it somehow.



Sketch 2 - 'spectral movie'

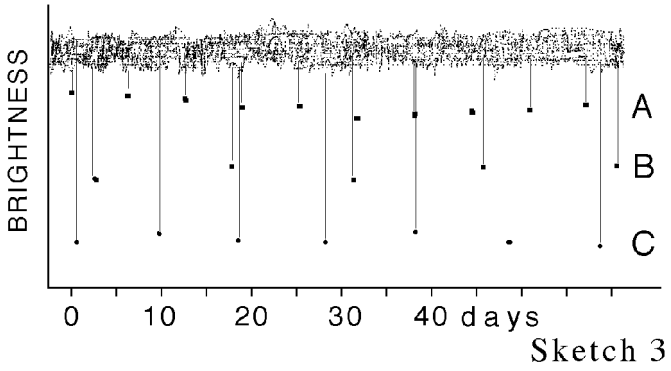
Gravitational microlensing: when a star plus exoplanet have a 'source star' directly behind, then the exoplanet and host star can be magnified. Otherwise, at present, it would be impossible to resolve a planet like Earth orbiting a host star.

Transit method: this depends upon our chance location very close to the orbital plane of an exoplanet, so transits across the host star are seen. By plotting brightness, measured with great sensitivity, regular dips of one percent or so are detectable. This effect was seen when the team used similar apparatus to when they observed comet Hale-Bopp and discovered sodium vapour in its trail. The depth of the dip is greater the bigger the planet, allowing an estimate of size, relative to the host star. Our Jupiter seen against our Sun would give a dip of 1%.

Apparatus: A combination of amateur telescope quality not costing much - compared to millions on more elaborate projects - combined with a very high quality detector gives good results. The reason for this prototype arrangement, coming out in more detail in discussion with VAS members, is because of the nature of the 'flat field' detector. Each pixel of a detector responds differently compared to adjacent pixels. This means that if star-tracking fails to hold an image of a star exactly on one pixel, then a false varying signal is obtained as it wanders over adjacent pixels. To overcome this, the telescope, bizarrely, is defocussed, spreading the stellar image over twenty pixels, then if the image wanders slightly, but stays on 18 of the original pixels, then the 'flat field' problem of the detector is considerably reduced. A 40cm Meade with a good detector gives results comparable to a 2m telescope.

Stellar activity, like sunspots, produces signals too, but the general type of data seen is given in Sketch 3. The band at the top is the normal stellar brightness variations, but contains regular sudden downward blips manifest as weeny specks, the 3 trains of specks in this sketch would

correspond to exoplanets A, B and C, with their individual orbital periods, each of the order of a few Earth days.



Sketch 3

The object **Kepler 9b** has produced data like this corresponding to 5 Saturn-sized planets orbiting their host star, with periods up to 60 days in a very coplanar orbital system. Our solar system is not sufficiently coplanar to give such an effect for a distant observer. This remarkable system was spotted using the Kepler Schmidt telescope, launched in 2009. It keeps watch on 105 square degrees of sky, aiming to find Earth-like exoplanets. One such planet, Kepler 10b, detected on 10/1/2011, is sized at 4 Earth masses, is 1.4 times as big, but has a surface temperature of 1000° C, and an orbital period of 0.83 day.

SuperWasp, is a ground based project, with instruments in an eight-camera array in La Palma and South Africa. A 4-camera mosaic picture of Orion had the grainy appearance of finely-ground amber-glowing oatcake, but every grain was a star. Very high quality detectors are needed and a high quality site. The instruments can be controlled robotically from back in Belfast. The project CoRoT, Convection Rotation and Planetary Transits, is like SuperWasp but in space, concentrating on a small piece of sky, with faint stars.

We would like to know the composition of these exoplanets and their atmospheres. Our terrestrial atmosphere is really very complicated, gradually changing over billions of years, so the simpler models of theorists may be an over-interpretation of the observations. When an exoplanet transits a star, light passes through its atmosphere, but the comparison process with light from the star without the transit, is an exceedingly difficult process. It has been tried with the HST and Spitzer telescopes. [Carl Sagan described the atmosphere of Earth as "thinner than the layer of shellac varnish on an old globe".] Exoplanets are so diverse - really there is a need to look at the details of each individually. Although Earth contains water, it is not a 'water planet' which would have density more like that of water. Voyager looking back at Earth may have seen dust in the plane of the solar system.

For the future, there is a need to find bright targets, with brightness magnitude dips of 0.001 to 0.002. A prototype telescope is being tested ready for a bigger design at Paranal, Chile. The NG-WASP project being built now is very red sensitive at wavelength 900nm, and will target red stars, whereas the light in our galaxy is dominated by blue light from blue supergiants. n-dwarf and g-dwarf stars haven't evolved yet, and the evolution of the many billions of m-stars, is very slow.

The project PLATO scheduled to launch into space in 2018, aims to find Earth's analogue and look for bio-markers. It will obtain information on the oscillations and wobblings of stars, which will yield stellar mass, angular momentum and age, allowing different types of orbiting exoplanet to be identified. Dynamic computer models of the oscillations of stars were fairly 'mind boggling' - [especially for those who study vibrating systems such as musical instruments or aircraft, bridges and buildings in wind tunnels - reminding us that astrophysics blends nicely with many disciplines from civil engineering to the behaviour of falling raindrops.]

This talk finished with another look at the Drake equation, where the factors have now changed. The number of stars detectable in the Milky Way has been doubled to 200 billion. The fraction with planets is running at 50%, three to five percent of them being habitable. With the other factors, this gives an estimated 20,000 advanced civilizations in our galaxy. The prospects for finding rocky planets are good, we are thinking about looking for signs of life in atmospheres and "we live at a very special time".

The lively discussion included doubts over the concept of dark energy, stellar evolution being different at different epochs, plus some of the obvious sheer amazement at how amateur equipment can be hooked together to get such amazing data!

Dr.Guy Moore

THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

Gravity Probe B confirms Einstein effects

Nasa's Gravity Probe B has produced remarkable new confirmation of some key predictions by Albert Einstein.

The satellite's observations show the massive body of the Earth is very subtly warping space and time, and even pulling them around with it.

Scientists were able to see these effects by studying the behaviour of four perfectly engineered spinning balls carried inside the probe.

Read more at: ***http://www.bbc.co.uk/news/science-environment-13286241***

Jonathan Amos

Science correspondent, BBC News

Alien Solar Systems Are Much Different Than Our Own

Alien solar systems with multiple planets appear to be common in our galaxy, but most of them are quite different than our own, a new study finds.

NASA's Kepler Space Telescope detected 1,235 alien planet candidates in its first four months of operation. Of those, 408 reside in multiple-planet systems, suggesting that our own configuration of multiple worlds orbiting a single star isn't so special.

What may be special, however, is the orientation of our solar system's planets. Some of them are tilted significantly off the solar system's plane, while most of the Kepler systems are nearly as flat as a tabletop, researchers said.

Read more here

Solar flare was sparked by five spinning sunspots

The giant solar flare unleashed in February was caused by five rotating sunspots working in concert, the UK's National Astronomy Meeting has heard.

Images released from the Solar Dynamics Observatory (SDO) clearly show the sunspots, which are centres of magnetic activity on the sun's surface.

As the magnetic fields build up, they "break", releasing vast amounts of energy in the form of heat and light.

The "X-class" flare was accompanied by 40 smaller flares in the same period.

Daniel Brown, an astronomer at the University of Central Lancashire, reported the results at the meeting in Llandudno, Wales.

Read more here

VAS 35th Anniversary Dinner

Thursday 3rd November 2011

The Isle of Wight College, Medina Way,
Newport, Isle of Wight, PO30 5TA
Further details as we get closer to the event

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.

"Science is a framework designed to remove the effects of human prejudice"

Prof. Brian Cox

Quotations

"In the beginning the Universe was created. This has made a lot of people very angry and been widely regarded as a bad move."

Douglas Adams

"Light thinks it travels faster than anything but it is wrong. No matter how fast light travels it finds the darkness has always got there first, and is waiting for it."

Terry Pratchett

"In football, time and space are the same thing"

Graham Taylor