



Society News

From the Chairman

Saturn's ring will be invisible even through a large telescope on September 4th. This is because as the Earth passes through the plane of Saturn's ring the ring will appear completely edge on, or fully closed. As the ring is only one km thick it is too thin to be seen. This ring-plane crossing occurs about every 15 years so the rings will be fully open in 2016 and edge on again (or fully closed) in 2024. Unfortunately, during September, Saturn is very low in the West and will only just be visible in the twilight.

The International Space Station is now so large the amount of sunlight it reflects makes it visible in the daytime (if you know where to look), www.heavens-above.com gives details of when it passes. Go on, impress your friends and family, by predicting a bright light crossing the sky.

Sept 22nd is the Autumnal Equinox. The Sun will rise exactly in the East and set due West. On this day both day and night are twelve hours long. After this time, we get longer nights, and therefore more time to observe. Time to get the woolly hat back out.

Dr Lucy Rogers
Chairman, Vectis Astronomical Society

Tony Plucknett
Membership Secretary

VAS Website: www.wightastronomy.org

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

The Editor New Zenith
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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

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

Monthly Meeting Calendar 2009

Date	Subject	Speaker
Sep 25	The Search for Novae and Supernovae	Guy Hurst
Oct 23	Sloan Digital Sky Survey	Dr. Hubert Lampeitl
Nov 27	The Radial Velocity Experiment, the Gaia satellite & an historic coincidence	Dr. George Seabroke Open University

All details correct at time of publication.

New Members

A very warm welcome to our latest new members,

- Mr. Jonathan Draper
- Master Z. Draper

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International Year of Astronomy

VAS are planning events throughout 2009 and would appreciate the help of members during the year. If you think 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
A Thursday in September	Pavement Astronomy	Ad-Hoc outing depending on weather
9th October	Observing the night sky	St Thomas Pri Sch (Private)
Sat 21st November	Observing the night sky	Wellow Institute (Public)

For the latest IYA event list, visit the VAS website
www.wightastronomy.org.

IYA Helpers

If you can spare a few hours to help at any of the IYA events listed on this page, Bill or Brian would like to hear from you. We need members to bring their telescopes and/or expertise to these events.

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

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.

Starting as a Stargazer Part 4

The new telescope seemed much larger in my dining room than it had at the Planetarium. I read the 'quick setup' guide and skimmed the user manual, practised putting the bits together and watched the sky impatiently.

That evening was cloudy, but a crescent moon could be seen in gaps in the clouds. Out I went, ferrying equipment onto the driveway. It was theoretically very easy to assemble the telescope, though I was all thumbs in the gathering dusk. The 25mm eyepiece dropped into its place. Paul had set up the red dot finder for me to a usable accuracy - I suspect this would have been the most difficult part. I plugged in the controller and switched on.

Finding the moon was more tricky than I expected. I pushed buttons on the handset, bobbing up and down as I squinted at the red dot and the top of the scope and the moon, while the telescope buzzed and slewed. At last a bright light shone at the eyepiece, and after some more twiddles the moon appeared, crisp and undeniably mountainous. I goggled like a tourist, then groped in the box for the 9mm eyepiece and changed over. Far more features now appeared, including tiny craters. The family were marched out into the night so that each person could take a ceremonial look (one or two of them did actually want to) and I discovered how rapidly the sky moves, continually having to chase the moon to keep it in view.

Three or four nights later the weather improved enough to try again. The moon was nearly half full, again visible through high clouds. Once again I lined up the scope, and began to make a more serious attempt to recognise the maria and a few major craters. Even through thin cloud the light was dazzling, but the long shadows around the terminator gave wonderful clarity.

The cloud broke somewhat, and I turned to the bright star which I thought was Saturn. After some more buzzing and twizzling (often in the wrong direction) I finally got my red dot lined up. Peering in the 25mm eyepiece I saw a bright yellowish spot. I plopped in the 9mm, and eagerly looked at ... nothing. Returning to the 25mm, I assimilated the importance of centring the image before changing eyepieces, and tried again. This time a wobbling yellow doughnut presented itself. Groping for the focus knob I eventually turned it in the right direction and a wobbly disc appeared. The vibration settled down, and in the eyepiece floated a tiny serene Saturn and its rings, with two infinitesimal points of its moons punctuating the blackness.

Then the clouds came trooping over, and I dismantled everything and fled indoors.

Rebecca Mitchelmore

This Month's Night Sky

We are again at a time of year when the sky is changing at a fast pace. By the end of the month the Sun will be setting at about 7pm; those evenings when it was still light at 10, now just a fading memory were only a few weeks ago. This time of year is not good for evening observation of the Moon or planets. Both follow paths on, or very close to the ecliptic; that is the path through the stars that the Sun follows on its annual journey around the sky. Actually it is not the Sun that is moving but us here on the Earth who are in motion. As we orbit the sun we see different stars behind it at different times of the year. Imagine walking around a lake with an island in the middle, as your stroll progresses the scenery behind the island changes until you arrive back at the start. In the case of the Sun the background scenery is made up of the constellations that lay on the ecliptic. All this motion causes the Sun to appear to move to the left against the star background by about a degree per day. Left here assumes you are in the Northern hemisphere looking towards the sun during the day. At this time of year the Sun is heading lower in the sky, so at sunset at the equinox any planets or the Moon will be on a path that is heading for its lowest point due south. The Sun has been high in the sky during the summer so the ecliptic rises steeply from the eastern horizon at sunrise. At this time of year it is the early risers who get the best views of the planets and Moon.

Another consequence of the Sun's apparent motion is that the stars that are visible at sunset hardly seem to change from night to night. The Summer Triangle will be around until winter giving plenty of time to find all those tiny dim constellations that accompany it.

The sun crosses the celestial equator at 21:20 on the 22nd and marks the autumn equinox. Day and night are of equal length anywhere in the world on this date.

Moon Phases

New	1 st Qtr	Full Moon	Last Qtr
18th	26th	4th	12th

Planets

Mercury starts its best morning apparition of the year at the end of the month. It will be visible during the first few weeks of October along with **Saturn** and **Venus**.

Venus is dropping lower in the morning sky and diminishing in brightness, it is though still very bright. Between the 1st and 3rd **Venus** passes just south of the Beehive cluster M44. Binoculars will be needed to see the rather faint cluster low down near the horizon while the sky is still dark. On the 20th it passes just over half a degree north of the bright star Regulus in Leo.

Mars rises before midnight and is observable until daybreak. It is moving rapidly through Gemini while slowly increasing in brightness.

Jupiter is just past opposition and still well placed for observation throughout the evening.

Saturn is at superior conjunction and not visible.

Uranus is at opposition and ideally placed for observation. It is in an area of sky, under the circlet of Pisces that is sparsely populated with bright stars. The finder chart shows the path of **Uranus** until the end of the year.

Neptune is still well placed for observation. Use last month's finder chart to locate it in Capricorn.

Meteors

Piscids is a double peaked shower the first on the 9th is made unfavourable by a waning gibbous Moon, but the second on the 21st is more favourable. Rates for both peaks are around 5 per hour.

Alpha Aurigids' second peak of the year on the 15th

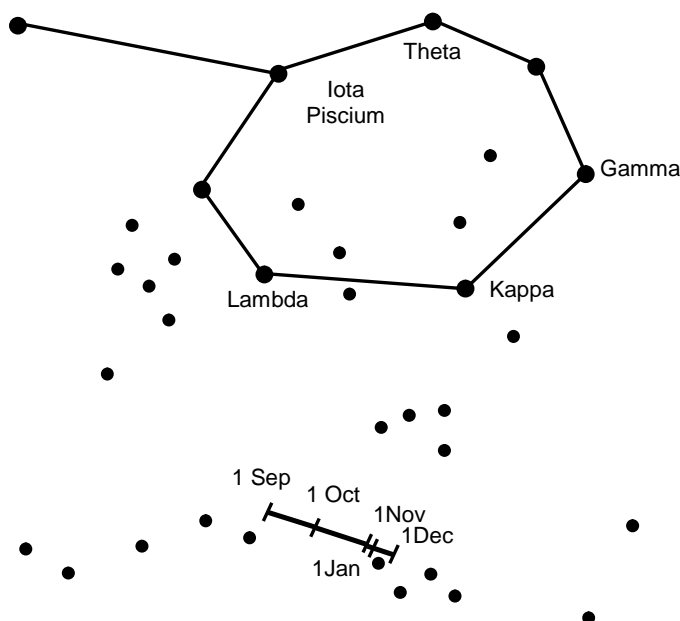
Deep Sky Objects

M39 Open Cluster R.A. 21h 32m Dec 48° 32' mag 4.5 - The Milky Way is full of star clusters, many are dimmed by intervening dusts or are so surrounded by other stars that it can be difficult to identify them. M39 can be spotted with the naked eye under good conditions, it is large, about the size of the full moon, so binoculars or a rich field telescope are the best instruments to use to observe this triangular shaped cluster.

NGC7009 The Saturn Nebula R.A. 21h 5m Dec -11° 20' mag 8.3 - Originally discovered by William Herschel in 1782 and named by Lord Rosse who saw its elongated shape for the first time. This tiny nebula is one of the few that can show some hint of colour, usually reported as light green. The high brightness allows the use of fairly high magnification and being so small this is needed if the Saturn shape is to be seen.

M15 Globular Cluster R.A. 21h 30m Dec 12° 10' mag 7.5 - This impressive globular is quite bright and very easily found in binoculars. Follow the line from Baham to Enif, about 4 degrees beyond the horse's nose to find this rather large fuzzy looking star. Through a telescope it reveals its self as a bright core surrounded by a halo of much fainter stars. As with all globulars the view becomes more impressive with increasing aperture. This is one of only a few globular clusters to contain a planetary nebula, it is however about 14th magnitude and for visual beyond all but those with the largest telescopes and best eyes.

Uranus - 1st Sept to 31st December



Uranus 1st Sept to 31st December. 17x12deg field of view. Stars to mag 7

Peter Burgess

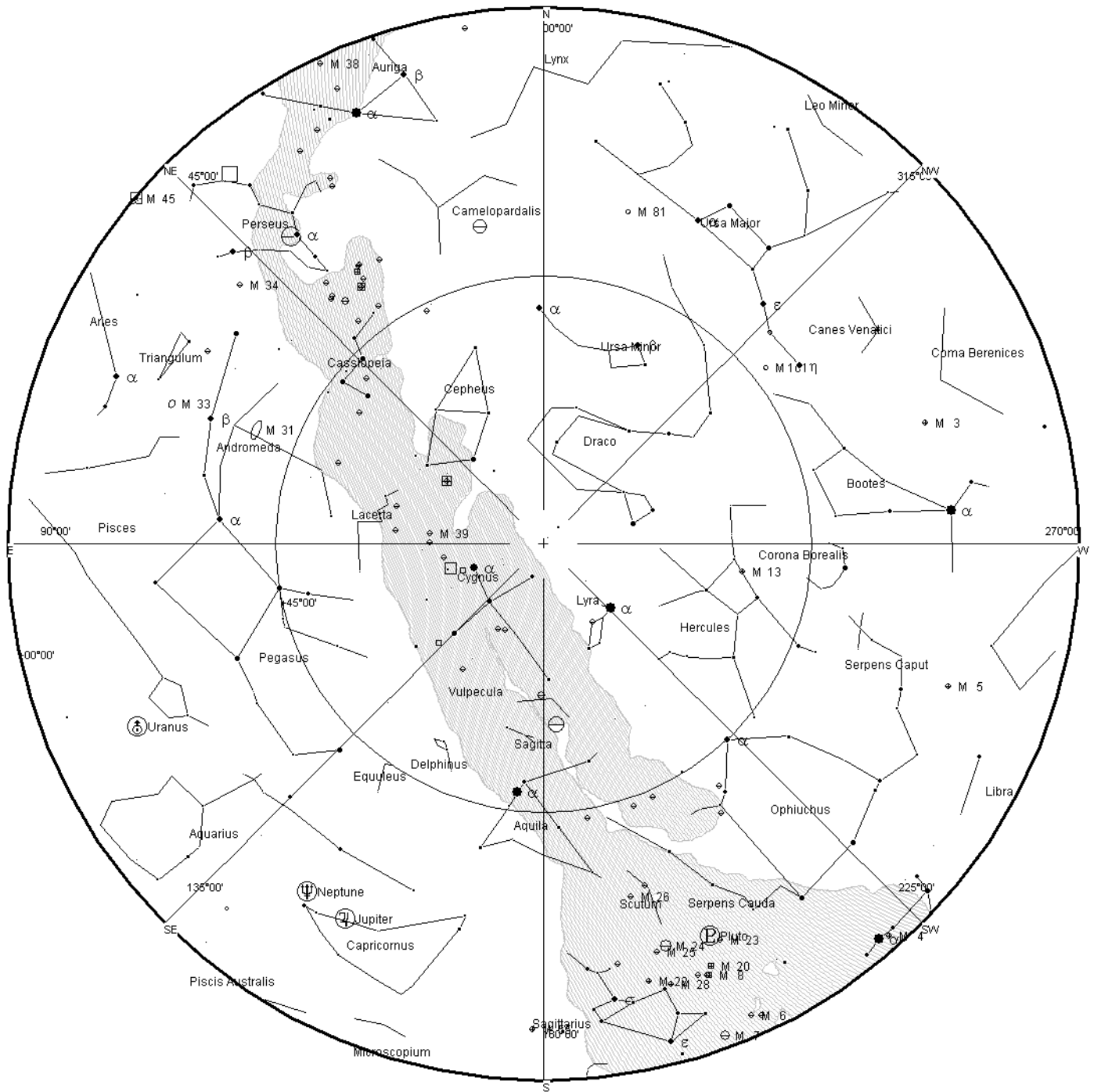
Books For Sale

Title	Publisher	Author	Price
Eclipse	Headline	Duncan Steel	£6.00
Hubble Vision	Cambridge U.P.	Petersen & Brandt	£9.50
Hubble's Universe--a new picture of space	Constable, London	Simon Goodwin	£5.00
Introduction to Practical Astronomy	Grange Books	Brian Jones	£6.00
Science & Technology Encyclopaedia			£9.50
Antique Scientific Instruments	Blandford	Gerard Le Turner	£3.00
Science in the 18th Century	Science Museum	Alan Q Morton	£4.00
Stargazing with a telescope	Philips	Robin Scagell	£5.00
Britain from Space/Atlas of Landsat Images	NRSC	Bullard/Dixon-Gough	£9.00
Complete 35mm Source Book/The world of 35mm photography	Reed	Michael Busselle	£9.00
Cambridge Guide to the Constellations	CUP	Michael E Bakich	£8.50
Elements of Navigation & Nautical Astronomy	Brown, Son&Ferguson	Charles H. Cotter	£8.50
The Universe in A Nutshell / sequel to A Brief History of Time	Bantam	Stephen Hawking	£14.00
The Cambridge Concise History of Astronomy	CUP	Michael Hoskin	£9.50
The Enigma of Sunspots	Floris	Judit Brody	£8.00
Heavens Mirror/ story of Ancient Astronomy	Penguin	Hancock/Faiia	£9.00
Time/From micro to Millenia	Headline	Alex.Waugh	£8.00
Atlas of the Universe	Philips	Patrick Moore	£9.50
Universe/ Wonderful volume of Astro-Photographs	Smith-Davies	Nicholas Cheetham	£15.00
Turn Left at Orion/means of finding night sky objects	CUP	Guy Consolmagno/Davis	£9.50
Atlas of the Constellations	Amber	Giles Sparrow	£8.50
Non Astronomical Books			
Science Desk Reference/New York Public Library	Macmillam	Barnes-Svarney(Ed)	£11.00
The Atlas of Discovery/The history of exploration	Bloomsbury	Gail Roberts	£11.00
The World Treasury of Physics, Astronomy & Mathematics	Little,Brown	Tim Ferris(Ed)	£10.00
Gods in the Sky	Channel 4	Allan Chapman	£12.50

All books are in first class condition - Any prospective buyer is welcome to come and view on appointment by ringing me on 854267. You may also contact me at astroshepherd@talktalk.net. First come--first served!!

Dennis Sheperd

This Month's Sky Map



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



Uranus is the seventh planet from the Sun, and the third-largest and fourth most massive planet in the Solar System. It is named after the ancient Greek deity of the sky Uranus the father of Kronos (Saturn) and grandfather of Zeus (Jupiter). Though it is visible to the naked eye like the five classical planets, it was never recognized as a planet by ancient observers because of its dimness and slow orbit. Sir William Herschel announced its discovery on March 13, 1781, expanding the known boundaries of the Solar System for the first time in modern history. Uranus was also the first planet discovered with a telescope.

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VAS Accounts 2009**Income & Expenditure - Year ending 30/06/09**

Income	2009	2008
Donations	1137.50	2362.43
Subscriptions	1860.00	1752.00
SAGAS event		140.00
Sputnik & Star parties	243.00	393.07
Sales		110.00
Sundries	239.94	291.74
	3590.44	4939.24

Expenditure	2009	2008
SAGAS event		212.31
Anniversary event		142.15
Rent & Observatory rates	747.45	656.43
Insurance	564.97	538.62
Monthly meetings	589.38	528.47
Postage	282.51	271.49
Observatory sundries	276.90	478.19
Sputnik & Star parties		310.95
Sundry expenses	365.14	222.58
Depreciation & write off	1320.21	3757.53
	4288.71	6976.57

Income over expenditure	(698.27)	(2037.33)
Grant rec'd - Garlic Festival	400.00	500.00
Excess for year	(298.27)	(1537.33)

NOTE: Donations include a Power Pack given (£90 value) and £534 from talks/lectures given by Society members.

Balance sheet as at 30th June 2009

Fixed assets	2009	2008
Observatory & Dome	36420.00	36420.00
Telescope & Equip	20075.00	22312.00
Additions	949.21	1301.00
Depreciation & write off	1320.21	3538.00
	56124.00	56495.00

Current assets	2009	2008
Society bank accounts	4716.43	3580.06
Nationwide deposits	310.00	280.00
Cash in hand	8.57	29.56
Debtors		1042.65
	5035.00	4932.27

Liabilities	2009	2008
Nationwide key deposits	310.00	280.00
	60849.00	61147.27

Represented by

Accumulated funds @ 1st July 2008	61147.27
Excess for year	(298.27)
	60849.00

Graham Osborne
Treasurer

Treasurers Report - August 2009

I must firstly apologise for my absence from this year's AGM. I failed to consider the date of this meeting when booking my summer holiday!!!

Once again I'm pleased to report the Society's finances are in good health. As can be seen from the Balance Sheet, our bank accounts are well in the black, and we have no outstanding debtors. The income from Donations is back to the expected level this year, after last year's inflated figure due to an education grant being awarded from our Local Authority.

The loss of £298.27 for the year is again due to depreciation and write-offs of £1320.21.

We have been able to put away £2,500 into a Deposit account during the year, but I accept that this action would now have limited benefit for us due to the so called 'recession' and low interest rates.

If any of you have questions about the accounts, I confirm that I intend to be at our September meeting on the 25th and will be happy to answer any issues there. Alternatively, email me at graham.seaviewstar@virgin.net

Graham Osborne
Treasurer

Survey Report - Initial Findings

Earlier in the year it became obvious that a poll of the membership was required in order to ensure that the Society was meeting the needs of the members, and to uncover what areas we might be able to improve. We also wanted to know what skills and time we might be able to harvest from the membership in order to better run the Society.

To that end we circulated a survey to the entire membership and the results have now been collated. With some initial findings and actions already in place, it is likely that the surveys will inform the committee for some time to come.

The survey was taken from 125 members and there were 22 returns. (17.6%) and comprised just 11 questions. If the most popular responses are taken from each question and taken as indicative of the whole membership's view, then we have a membership that is generally happy with the society, its talks and magazines, and its observatory although it needs upgrading. There is an even split between members who feel they can help out, and those who are unable to. There is a 3:1 bias towards visual over photographic astronomy and many of the membership feel that they would benefit from more education.

It is tempting to leave it at that and pat ourselves on the back for doing it right, however we must not ignore other issues that have been highlighted.

Other replies to the survey have demonstrated that there is not as much organised or structured observing as 18% of the membership would like. That 23% of the respondents think that the Thursday night sessions at the observatory are not meeting their needs in some way with one survey going as far as to call it unfriendly!

The idea of outings is a very popular one (82%) and something we do not address at all at this time.

But by far the largest clear responses from the survey make it clear that 86% of the membership would like to explore education further, both informal training sessions on equipment and techniques, and formal leading to recognised qualifications.

Already, in response to the issues raised the observatory is open on more nights, (Mondays from 19:30) to do more visual astronomy and to give people a more flexible timetable during which they might attend. We are looking at opening on Tuesdays also from 19:30 to address some educational needs although the details are yet to be finalised. There are plans to reorganise the observatory building to make it easier to use and friendlier to approach. But there is very much more to do.

We turnover approximately 20% of our membership each year, and maintain a reasonably even membership of about 125. The Island has a static and clearly demarcated population with only a small percentage who are prospective members. We cannot afford to continue this turnover of members or we will achieve a position where we have no new intake, and membership is our main source of income.

Bill Johnston

THE VECTIS ASTRONOMICAL SOCIETY

A HISTORY 1976 — 2009

BY BRYN DAVIS

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

Price £6

So how do waves work?

(Part 4 of Waves, Diffraction and Interference)

Much knowledge about the Universe comes via electromagnetic waves, such as radio and light. This nice simple experiment may help you to understand waves.

Note: Please take appropriate safety precautions during this experiment.

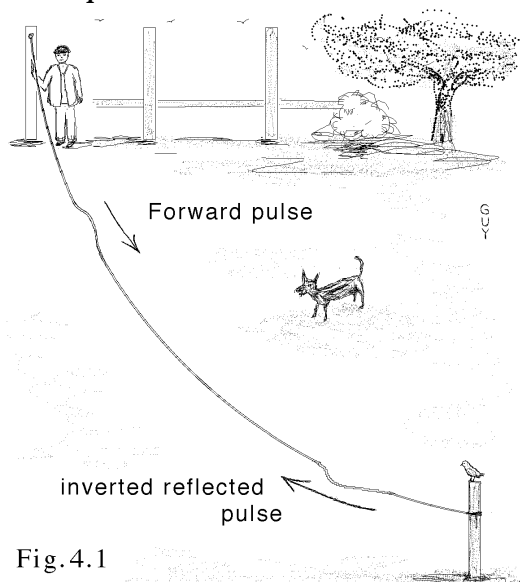


Fig.4.1

1. You need a piece of electrical wire or cable (not string, wool or cotton, and washing line is too light), about 10 metres length or longer. Tie the cable at the far end to a fixed point, see Fig.4.1. **The cable is a tripping hazard, it must be attended at all times and removed afterwards, don't pull the cable too tight.**
2. Either hold the cable at your end very steadily with one hand, enabling the tension to be adjusted easily, or tie the cable to another fixed point at your end. Wait for the cable to show no movement.
3. *Looking lengthwise along the cable*, tap sideways once on the cable at about one foot from the fixed point (using your free hand). Other viewers need to be next to you so that they too can *look along the length of the cable* (viewing the cable from the side is useless).
4. You should see a wave in the form of a sideways pulse propagate along the cable, see Fig.4.1. It is carrying energy and is travelling. Because the cable moves *sideways* at right-angles to the direction of wave travel *along the length* of the cable, it is called 'a transverse wave'. And it's a 'travelling wave' not a 'standing wave' because it travels.
5. The wave carries energy, and energy cannot be destroyed. As the far end of the cable is fixed, something interesting must happen there. The wave cannot dissipate its energy in the fixed support.

Somehow the cable must keep moving - it does this by making a reflection.

6. The reflected wave is inverted, coming back to you on the *opposite side* of the cable.
7. At the far end of the cable, because the forward and the reflected waves have opposite sideways motions and equal amplitudes, the net movement at the far support is zero. Conversely, it is because the support won't move that causes the reflection. The wave doesn't vanish at reflection, the forward and reflected waves pass through each other at the far end, adding up to a zero cable deflection at exactly the right place - the fixed cable support. **Needs a good long think!**
8. Tapping the cable horizontally sideways gives 'horizontal polarization'. Tapping vertically gives 'vertical polarization'. Transverse waves (as opposed to sound waves which are longitudinal) are polarized - but the polarizations may be jumbled randomly like the quanta of light from a filament lamp.
9. Increasing the tension increases the propagation speed - see how slow you can make a pulse travel by reducing the tension. Wait for the cable to settle before tapping again to avoid a 'composite wave jumble'.
10. Note: waves do not need to be sinusoidal, this mechanical experiment uses pulses.
11. To see 'standing waves' (Fig.4.2) tap the cable at the right moment as the pulse returns to increase the cable energy. Do that a few times and the waves going there and back add together, giving greatest movement half-way along, Fig.4.2(a). The cable is now 'resonating' at its fundamental frequency, every point on the cable is in phase and moving sideways, with greatest amplitude in the middle. A standing wave like this is made by superposing forward and reflected waves.
12. Move the cable end in small perpendicular circles to give circular polarization.
13. Standing waves like Fig.4.2(b) are easiest to make using circular polarization.

Note: Post Office engineers timed the mechanical pulses on overhead wires to set the tension and sag correctly - explaining the origin of this experiment.

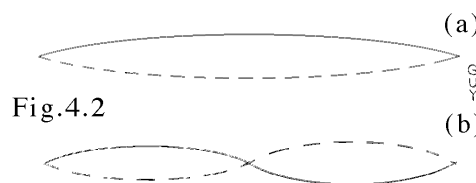


Fig.4.2

Dr. Guy Moore

Exploring Titan with the Cassini Huygens Probe

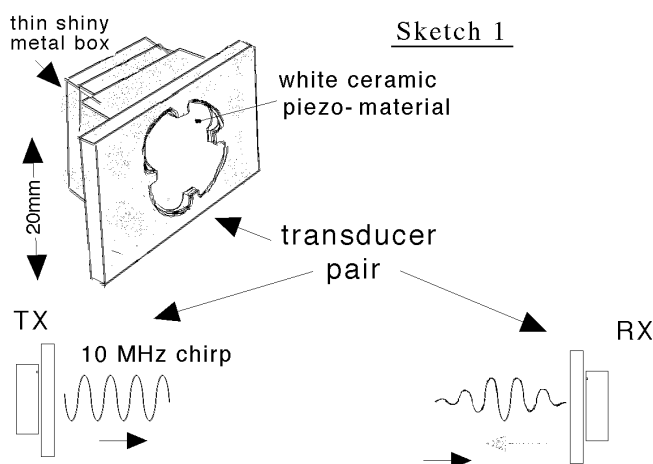
Lecture to VAS of 24 July 2009 by Dr. Axel Hagermann of the Open University

Notes by Dr. Guy Moore

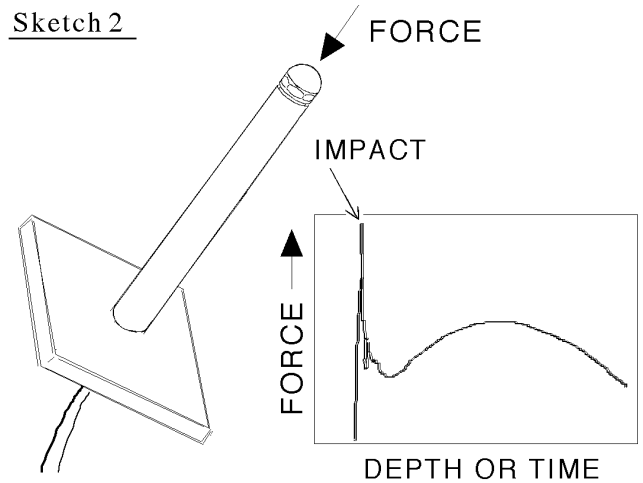
During the various announcements by Dr. Lucy Rogers who opened the meeting, Roger Haywood suggested I'd "just volunteered" when I expressed thanks to Roger Young - who was applauded - for the many brilliant lecture summaries he has produced over the years. Given that I hope to continue with other contributions, I hope somebody will continue this important task which makes the **New Zenith** useful for reference purposes, keeps absent members entertained and informed, and provides a record of many excellent lectures.

Launched in 1997, the Huygens Probe arrived at Titan in 2004. The size of a top-hat, this masterpiece of technological magic (my interpretation) contained a range of the simplest and reliable experiments, to send back basic data on this secretive but peaceful Moon concealed beneath a cold, calm, misty weather system with its stratified clouds and peacefully wind-free thick atmosphere. As the probe parachuted slowly downwards, spiralling and slowly spinning, we saw an amazingly suggestive black and white picture of a distant coastline - a "holiday shot" - like the photo of the coastline of America getting larger when looking out of an aircraft window.

After all the millions (not sure which currency) spent on the rocket launch, what a surprising treat for the audience, when Axel passed around two of the probe's sensors for hands-on examination, identical to the ones transported across the solar system to this moon of Saturn. One, a carefully wrapped 10MHz transducer of a pair, see Sketch 1, was used to measure the speed of sound across the base of the magic top-hat. Very light to handle, weight was kept to a minimum.



The other light alloy probe, passed around, slightly heavier and larger than a clothes peg, see Sketch 2, was a force sensor with a polished tip, mounted pointing downwards to record the impact. Would the probe land on solid rock, in sand, powder, mud, liquid or what?



Other sensors recorded refractive index, thermal conductivity, acceleration of the craft (in case of up and down wave motion), tilt, and liquid density using a float - all simple experiments housed in this 'Surface Science Package'. An onboard very stable oscillator was monitored for Doppler shift giving data on wind speed (and Titan's motions and seismic vibrations?)

The descent by parachute took a gentle 3hrs, providing a rich source of data, plus 'holiday snaps' through the clouds, and 72 mins of data transmitted from the surface; some data came directly to Earth, some via the orbiting satellite. On the spot analysis (of immediate news value) was done back on Earth, but other data took far longer to interpret and is still being done.

The atmosphere is thick, has a pressure of 1.5 bar at the surface, and with gravity at 0.6 that of Earth, this prompted a later question - "do you think we will ever go there?" The place sounds attractive, almost accommodating, apart from its lack of oxygen and coldness. Axel drew attention to the similarity between a system of rivers seen in a 'holiday Titan snapshot' and a river system of the English South Downs, to the same scale, an exciting view of this 'new world'.

The atmosphere is mostly nitrogen, mixed with methane, creating a puzzle - methane should be destroyed within a short few million years by photolysis, so what's it doing there? They're working on two theories, one of them: a sub-surface reservoir releases methane in episodic events. From the back of the lecture I saw a cut-out structural core picture of this moon, like the ones we see for our planet - but if I noted everything these notes would be many pages longer! (so what about the other theory? - sorry I missed it!)

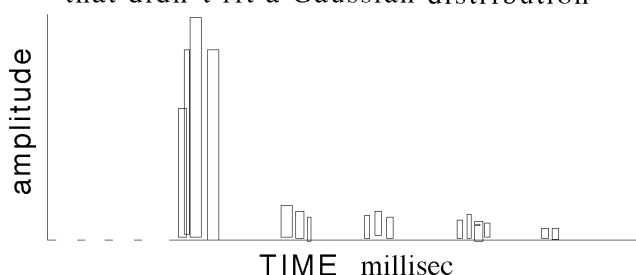
Radar: Near one pole, two lakes were spotted, one contains liquid methane, the other a dried up shoreline at a higher level, perhaps one lake recently emptied into the other. A **perspective picture** from the surface showed ten-centimetre **pebbles** worn smooth, having graunched along in **rivers** of fast flowing slurping **liquid methane**, now deposited on a dried-up sedimentary beach. All this **fluvial activity** prompted searching questions like - how fast would a liquid methane river need to flow to pick the stones up and wear them smooth, and what flow speed enables them to settle? They're well ahead providing answers using **fluid mechanics** - 1m/s to pick them up, 0.2 m/s to make a beach. Replace water on Earth by liquid methane and you get a fair picture of the place.

Plenty of data for the technically-thoughtful: as the probe descended, acoustic ranging that would measure the depth of any lake or sea the Huygens probe might land in, gave altitude data, and interesting problems in data analysis which Axel hinted at. Axel elaborated on two of the probes. The experiment, see Sketch 1, measured the transit time of 'acoustic chirps' at 10MHz to the receiver. Physics provides a simple formula for v the sound speed.

$$v = \sqrt{\frac{\gamma RT}{m}}$$
 where γ is the ratio of specific heats (gives data on mean atomicity or number of atoms per molecule), R is the known gas constant, T the measured absolute temperature and m is the mean molecular weight (difficulties here).

Already looking complicated, this formula failed to cope with all that happened. They got a **puzzling periodicity** in the plus and minus velocity values, not a Gaussian error distribution, see Sketch 3. But using a bigger formula applying to gas mixtures, and Bayesian statistical analysis, they obtained data on the **ratio of methane to nitrogen** during descent - Axel supplied us with more data in numerous graphs, with comparisons to saturated two-phase mixtures, made more complicated by inhomogeneities. The less than 10% methane at an altitude of 20km makes **cirrus clouds** of frozen droplets, at 10km altitude the cloud droplets are liquid.

Sketch 3: the unexpected reception of chirps by the ultrasound receiver that didn't fit a Gaussian distribution



At impact, see graph Sketch 2, the force gave a sharp peak followed by a rise and fall, characterizing **the soil** which they have modelled here on Earth using an impact simulation test rig - we saw more dynamic pictures on screen - the simulation is not easy since granular material on Earth absorbs atmospheric water which alters friction and soil characteristics.

Acknowledgements by the lecturer were to a list of a dozen or so persons and especially included Professor J.C.Zarnecki.

Discussion: Questions from some 80 members present and about four visitors included:

Q: "Would methane as opposed to water have any effect on lubrication and plate tectonics?"

A: "a very interesting question" - (Axel was puzzled, but elaborated on the possibilities.)

Q: "What is the reason for Titan having a thick atmosphere whereas no other moons in the solar system manage to retain one?" (sorry I missed the answer)

Q: "Do you think Man will ever travel there?"

A: "not in our lifetime..."

Q: "Lightning is associated with the formation of complex organics...was lightning detected?"

A: "No."

Q: "What's this liquid methane like - how do you picture it - is it like petrol or what, and would it be safe to smoke there?" (laughter - but earlier in the lecture a 'strange chemical reaction' was mentioned by Axel that could be 'slowly burning' below the surface.)

Dr.Lucy Rogers proposed the vote of thanks, and Axel was again applauded with enthusiasm from an audience concurring in good wishes for future work.

Axel spent further time discussing the project with members of the VAS before venturing on the next stage of his journey, not to Saturn, but a hovercraft voyage back to the mainland, mentioned with excitement by the lecturer at least twice during the lecture, as if it were an unusual adventure. For us, however, his story of the visit to Titan was a lot more unusual!

Suggestion: please write to the editor, particularly if you asked a question and obtained an answer not covered by the above notes, or spoke to Axel afterwards and please correct any inaccuracies in this report and make up for various omissions - there must be many, the biggest being the absence of all the pictures and providing only a taste of the enthusiasm of the lecturer and the atmosphere of a jolly evening supplemented by the usual very informative talk by Peter Burgess which really deserves another report - I was particularly interested in the illustrations and discussion of early computing for space work.

Further information at: http://atmos.pds.nasa.gov/data_and_services/atmospheres_data/Huygens/Huygens.html

Dr. Guy Moore

IYA Event Report

Nettlestone Camp

July's VAS IYA event was at a Buckinghamshire Schools Summer Camp in Nettlestone in July. A group of VAS members to telescopes and binoculars along on a rather cloudy Saturday evening.

The sky cleared quite a bit as darkness fell and our efforts were rewarded with good views of the Moon, Jupiter (and some of its moons) and the inquisitive attentions of about 120 school children, along with their teachers, who were visiting the IOW for their Summer Camp from a selection of schools in Buckinghamshire and Hertfordshire.



The children were somewhat distracted by calls for supper but, as usual, VAS members were impressed and sometimes "floored" by the questions they asked!



After the children had retired, we continued with a rather more relaxed viewing session for the teachers with the Telescopes closed for viewing at about 23.30 as the clouds once again rolled in and condensation became a problem.



Many thanks to all the helpers who attended a very successful event.....

Brian Curd

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LINKS, COMMENTS AND OBSERVATIONS

News and Events



I suspect it'd be safer to say nothing about this picture BUT, if you feel like sending in a caption for it.....

I might even be able to find a small prize for the best one.

Email me:

editor@wightastronomy.org

Hubble, Gemini Spot 'Hyperactive' Stars in Small, Young Galaxies

Back in 1996, astronomers discovered a strange object in the asteroid belt. They decided it was either a "lost" comet or an icy asteroid, as it ejected dust like a comet but had an orbit like an asteroid. No one had ever seen anything like the object, called 133P. Ever since it was found, astronomers have wondered if it was just an oddity - one of a kind. We now know it is not, and the discovery of more of these half asteroids/half comets means there is a new class of objects in our solar system.

One of these new objects, 176P/LINEAR is emitting dust as it orbits in the asteroid belt. It was found by Henry Hsieh at Queen's University, Belfast in Northern Ireland. Hsieh has been working to figure out the unusual behavior of 133P. He hypothesized that either one of two things could explain the existence of the comet-asteroid: "1.) 133P is a classical comet from the outer solar system that has evolved onto a main-belt orbit, or 2.) 133P is a dynamically ordinary main-belt asteroid on which subsurface ice has recently been exposed," Hsieh wrote in his paper. "If 1) is correct, the expected rarity of a dynamical transition onto an asteroidal orbit implies that 133P could be alone in the main belt. In contrast, if 2) is correct, other icy main-belt objects should exist and could also exhibit cometary activity."

Hsieh thought it was unlikely a comet could have been kicked around enough to end up in orbit in the asteroid belt, so he followed the assumption that 133P was a dynamically ordinary, yet icy main-belt asteroid. He set out to prove the hypothesis that 133P-like objects should be common and could be found by an well-designed observational survey. Hsieh made 657 observations of 599 asteroids in the asteroid belt and found 176P/LINEAR and determined the asteroid is partially made of ice, which is being ejected following a collision with another object, thus the comet-like attributes.

Additionally, since there is evidence for past and even present water in main-belt asteroids, Hsieh says statistically there should be around 100 currently active Main Belt Comets as these objects are called, among the km-scale, low-inclination, outer belt asteroid population.

Technology Review blog offered name suggestions for these new objects that are half comet and half asteroid: "Comsteroids? Asteromets? Hsiehroids?"

Sources: *Technology Review Blog*, *arXiv*

Matthew Grattage

THE UNIVERSE
YOURS TO DISCOVER



INTERNATIONAL YEAR OF
ASTRONOMY
2009

Quotations

"I simply haven't the nerve to imagine a being, a force, a cause which keeps the planets revolving in their orbits and then suddenly stops in order to give me a bicycle with three speeds."

Quentin Crisp

"Perhaps when distant people on other planets pick up some wavelength of ours all they hear is a continuous scream."

Iris Murdoch

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.