New Zenith

The Monthly Magazine of the Vectis Astronomical Society

Vol 15 Issue 11 Dec 2007/Jan 2008

Society News

From the Chairman

It's funny how fuzzy blobs in space can raise people's interest. Friends who I didn't think would be interested in anything astronomical have been asking "where's this comet – can I see it?" Fortunately, comet 17P/Holmes has been relatively easy for non-astronomers to find, with reference to Cassiopeia (or the group of stars that looks like a "W"). For astronomers, it's in the constellation Perseus. However, most people expect to see a nice long tail, as in Halley's comet in the Bayeux tapestry. According to some members at the observatory, Comet 17P/Holmes looks more like a fried egg. As it is on the opposite side of the Sun from us, and as the tails of all comets always point away from the Sun, we are looking down the length of its tail, and so it appears either short and wide or non-existent. Don't worry if you haven't seen the comet for yourself yet - it should stay visible for most of the winter.

Another naked eye object in our skies is the International Space Station or ISS. Now that more solar panels and the Harmony Node 2 module have been attached, it is bigger and brighter than ever before. I think it's well worthwhile finding out when it will pass (e.g. on www.heavens-above.com) and going to have a look.

At this time of year, astronomy, comet hunting or even satellites spotting can be a good excuse for stealing another mince pie and going outside in the dark, particularly when Aunty Ethel decides it's time to play charades.

Lucy Rogers - Chairman

Monthly Meetings

December - No Meeting
January - See 2008 Programme on page 2.

AstroCalendars

Graham informed me that he has only half a dozen of the 2008 AstroCalendars left. Please speak to him as soon as possible if you want one! £3 each.

Brian Curd - NZ Editor

We wish all our readers a 'Wight' Christmas and a very Happy New Year!

VAS Website: www.vectis-astro.org.uk

Submissions 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: **brian@briancurd.com**

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

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Contents

Christmas Quiz

Here is a little puzzle, just in time for Christmas. For the first paid up VAS Member to contact me (Email preferred at johnvl@tiscali.co.uk) with the answer there will be a bottle of wine as a prize.

Question: In the sequence of letters S T N D R D * *, what are the next two letters indicated by the asterisks, and explain how you came to your answer?

Help your society

We **urgently** require someone to spend a couple of hours a month sending out the New Zenith Newsletter to our members. All you need to do is put a newsletter into each envelope, label it, put a stamp on it and send them off. We provide labels, stamps and envelopes.

Contact Lucy Rogers for more details
(chairman@vectis-astro.org.uk or tel 731759)

VAS 2008 - Meeting Programme*

Jan 25th	Large Scale Structure in Galaxies *Will Percival – Ports Uni*
Feb 22nd	Black Holes in Clusters of Galaxies *Robert Dunn – Soton Uni*
Mar 28th	Observatories - *Mike Maunder*
Apr 25th	History of the English Mounting *Peter Hingley*
May 23rd	The Outer Solar System *Mike Leggett*
Jun 27th	Colours in the Sky, Oddball Theories *Members Night*
Jul 25th	Subject TBA *Greg Smye-Rumsby*
Aug 22nd	Beyond the Eyepiece *Peter Burgess*
Sep 26th	Historic Telescopes of Cambridge University - *Mark Hurn*
Oct 24th	Astrophotography - *Philip Perkins*
Nov 28th	TBA

** Correct at time of publication*

Book Review

The de Vancouleurs Atlas of Galaxies

Authors:
Ronald J Buta; Harold G Corwin, Jr; Stephen C Odewahn

Publisher:
Cambridge University Press

ISBN:
13 978-0-521-82048-6 Hardback pp344

Price:
£70:00

This book, in large format (almost A4 in page size), is an excellent reference manual for professionals and the serious amateur astronomer. It is definitely no 'Coffee Table' publication, containing no pretty colour pictures. Instead, there are hundreds of varied galaxies.

It does contain, on the other hand, much detailed material on the morphology of said galaxies in all areas of the spectrum, depicted in honest black and white, and often in white on black where this makes the images easier to comprehend.

A major deviation over traditional books of photographic plates is that this Atlas is made up of exclusively digitally-produced images, with the odd exception of a few computer simulated pictures in illustration of certain points. Modern electronic sensing devices have certainly come of age here. The Authors' monochrome imaging conveys all required information, thus obviating the need for colour prints. It is good to see images taken in different bands of the spectrum and this information being used to show how galaxies evolve.

For those interested in becoming expert in the field of astro-imaging, there is an entire chapter devoted to how the pictures were obtained and presented. It is especially encouraging to discover that many amateur astronomers were invited to submit their own images to cover the instances where the usual professional sources could not assist.

This superb up-to-date informative reference work is one that should be in the possession of any galaxy enthusiast and, of course, observatory technical libraries.

John Langley and John Smith

(The above review was published in a recent issue of Astronomy Now, thanks to whom for permission to print it in New Zenith. Please note that the review copy now resides in the VAS Observatory Library and is accessible to any Member)

This Month's Night Sky

Moon Phases

New	1st Qtr	Full	Last Qtr
December			
9th	17th	24th	1st & 31st
January			
8th	15th	22th	30th

The winter solstice occurs on the 22nd of December at 06:08 when the sun reaches its most southerly point and starts to return to the northern hemisphere. The nights start getting shorter again from here.

At a distance of 0.9833 astronomical units, the Earth is at perihelion, it's closest to the Sun, on the third of January.

Planets

Mercury

Mercury is at superior conjunction (On the other side of the Sun from the Earth) on the 17th of December and is unobservable until the end of the first week of January. It makes a reasonable apparition in the south-western sky after sunset until the end of the month. There are unfortunately, no bright objects close by to act as guides to this elusive planet.

Venus

Continues to be a brilliant morning star as it rapidly drops towards the horizon during December, slowing its fall during January as the ecliptic makes a shallower angle with the horizon.

Mars

Well placed for observation during both December and January, being at opposition on Christmas day. By the end of January its diameter will be noticeably smaller than at the beginning of the month.

Jupiter

Jupiter is un-observable during December and January.

Saturn

Rises before midnight at the start of December, and by the end of January it is well positioned for observation for most of the night.

Uranus & Neptune

None of the outer planets are observable during December and January

Meteors

The peak of the Geminids shower on the 12th & 13th of December is favourable with the crescent moon setting early in the evening. Look for these bright yellow meteors between the 7th and 15 of December.

The Quadrantids shower lasts from the 1st to the 5th of January with a sharp peak lasting only an hour or so on the night of 3rd & 4th.

Deep Sky

NGC2264 RA 6h 41m Dec 9° 38' mag 4.1

This is a large relatively bright cluster surrounded by a faint diffuse nebulosity. It is visible to the naked eye as a fuzzy patch, but observation with a pair of binoculars will show the inverted triangle shape that gives this cluster is 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 magnitude 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.

NGC2244 RA 6h 32m Dec 4° 57' mag 4

This is the star cluster surrounded by the Rosette nebula that on the clearest nights is visible to the naked eye as a bright spot in the winter Milky Way. Binoculars show the brightest members of the cluster forming a rectangular shape.

The rosette nebula is a large object, about twice the diameter of the full moon, so is best observed visually using a rich field telescope; a nebula filter will help to increase the contrast with the background sky.

NGC2169 RA 6h 9m Dec 13° 58' mag 5.9

This cluster is easily visible in binoculars as a small parallelogram. In creasing the magnification to about 100 with a small telescope will reveal that the stars spell out this cluster's popular name, the '37' cluster. The 7 is quite clear if you can see down to magnitude 11, the 3 is less obvious but is there with a little imagination.

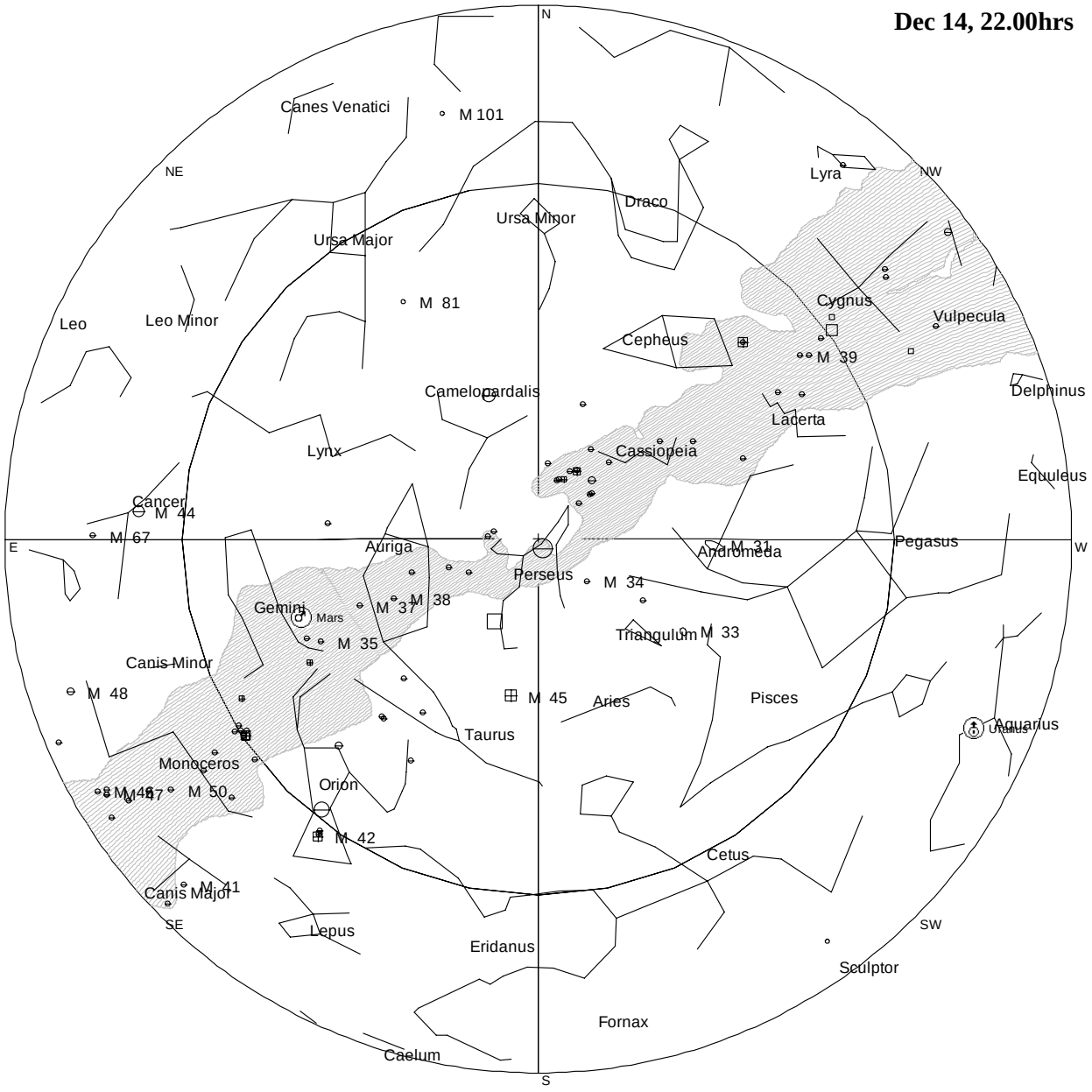
M78 RA 5h 47m Dec 0° 3'

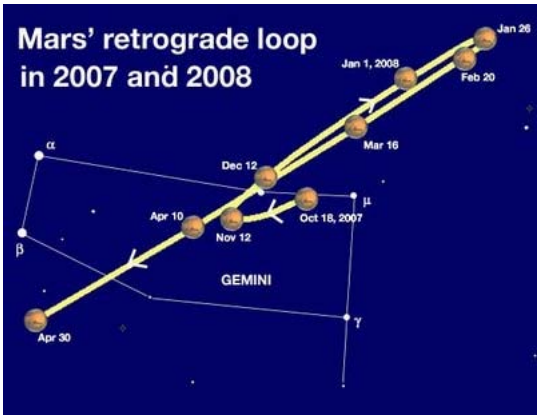
A small bright reflection nebula that is a part of the great Orion nebula M42 located in the sword. This nebula can be seen in binoculars but is rather small so is best viewed through a telescope.

Peter Burgess

Dec/Jan Night Sky Charts

Chart from Cartes du Ciel





Mars at a glance

Mars is the fourth of the Sun's nine planets - the next outwards after Earth. It is the planet that most resembles Earth and although now dry, Mars was once probably awash with water. Mars has two tiny Moons, Phobos and Deimos, which may be captured asteroids.

Mean distance from Sun: 228,000,000 km/141,700,000 miles (1.524 AU)

Diameter: 6,792 km (4,220 miles)

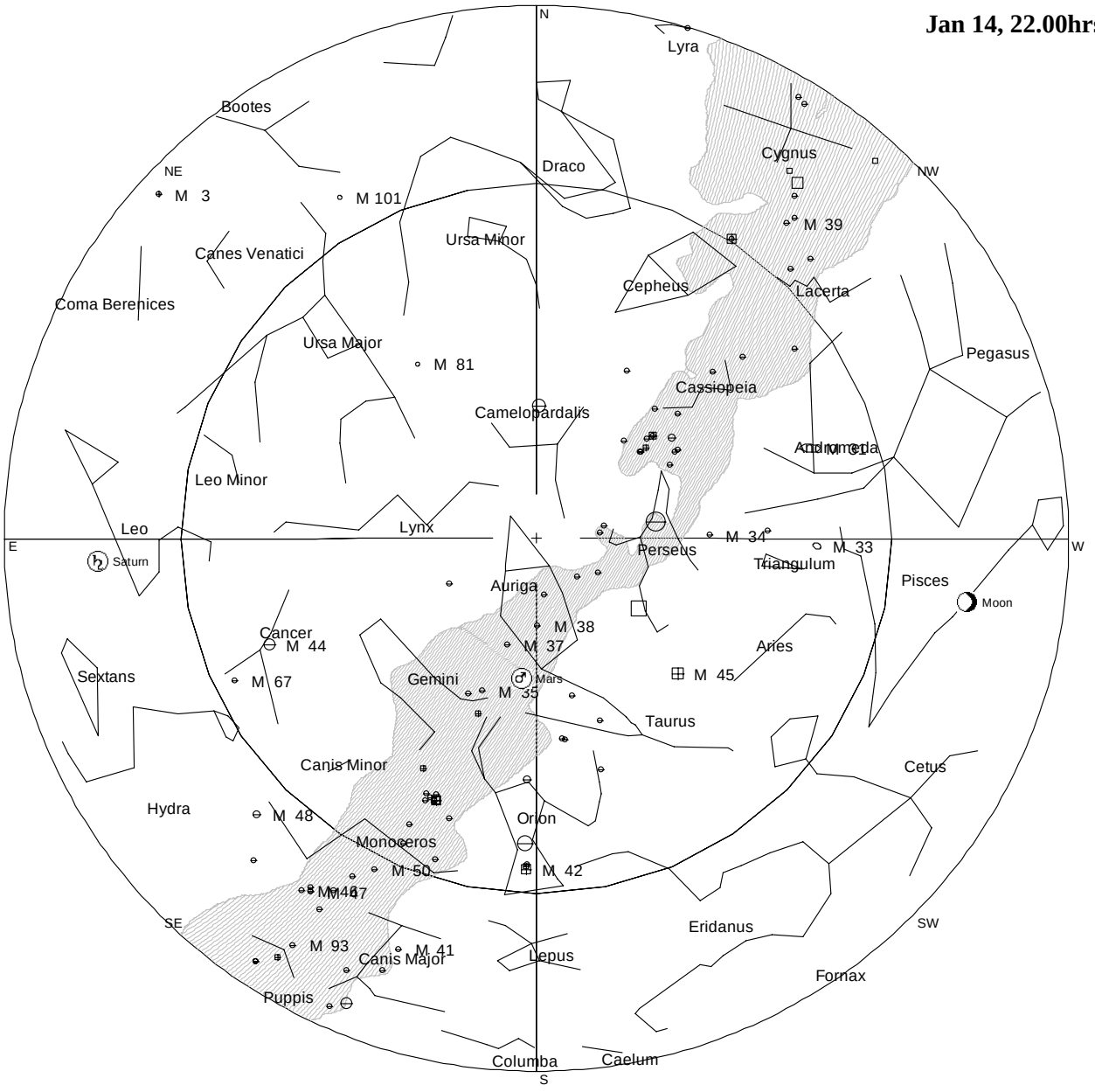
Length of year: 687 days

Rotation period: 24 hr 37 min

Mean orbital velocity: 24.14 km/sec (15 miles/sec)

Skymania - *http://mars.skymania.com/*

Chart from Cartes du Ciel



About the Object	
Object name:	Messier 81, M81, NGC 3031, UGC 5318
Object type:	Spiral galaxy
Position (J2000):	RA: 09h55m33.20s Dec: 69d03m55.00s
Distance:	12,000,000 light-years (3.6 Mpc)
Constellation:	Ursa Major (the Big Bear)
Magnitude:	7.9

Comet 17p / Holmes

Well the skies cleared just in time for this fantastic display. The comet 17p/holmes near Perseus in the North Eastern sky suddenly brightened from magnitude 17 to less then 3 between the 23rd and the 27th October, giving the impression of a triangle asterism at the western end of the constellation. The comet is still with us but its rapid expansion has diminished its apparent magnitude so that to the naked eye it is comparable to the Great Orion nebula.

17p/holmes is a short period comet of approximately 7 years, and was originally discovered in 1892 by the British astronomer Edwin E.Holmes whilst in America observing M31 (the Andromeda galaxy). The elliptical orbit was fixed by two independent observers; the German astronomer Heinrich Kreutz, who discovered and named the Kreutz Sun grazer comets and the American George Mary Searle. Additional observations by L. Boss, L. Schulhof, Berberich, V. Cerulli, and J. R. Hind eventually established the perihelion date as June 13 and the period as 6.9 years.

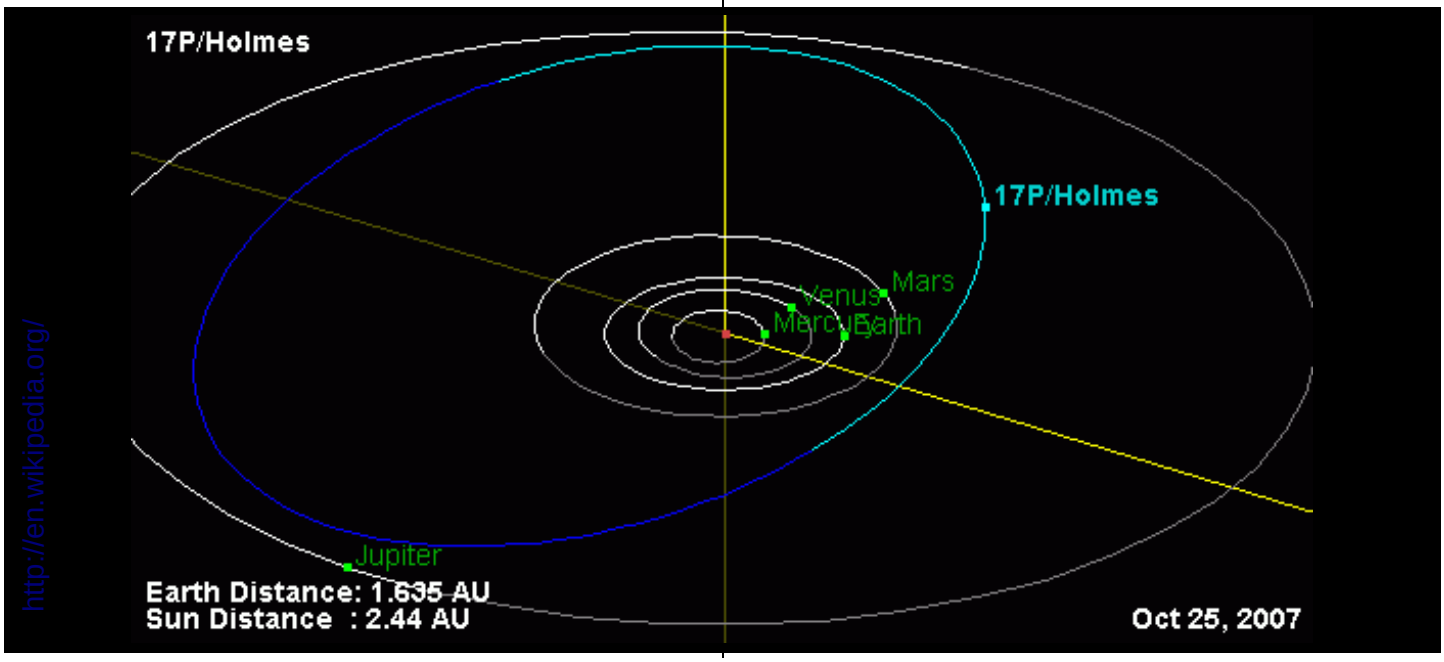
At that time it was faintly visible naked eye at magnitude 4 or 5 but after two visits was promptly “lost” in 1906. It remained so until its 1964 return when painstaking calculations by Dr Brian Marsden predicted its location, enabling Elizabeth Roemer from Arizona to fix it again. Marsden was responsible for rediscovering other “lost” comets including Di Vico-Swift in 1965 a 6.3 year short period comet that had not been seen since 1894.

The nucleus is calculated to be 3.4 km in diameter and some photographic images show pronounced streaky outpourings (or possibly tail) beyond the coma which is currently calculated at nearly 1 million miles diameter, to put that in perspective it is larger than the orbital diameter of the Moon around the Earth, and about 70% of the solar disk diameter.

The comet coma appears round because as it has brightened it is near opposition and we are looking “straight down” the tail.

Comet 17P/holmes will be with us well into 2008 as it appears to circle Perseus in a clockwise direction, however predictions are that it will dim rapidly to its more normal 13 or 14 magnitude, and previous observations have described the comet as being barely visible using averted vision and a 15cm refractor by the second week in December! So there is no time like the present if you haven't already seen it.

Bill Johnston



Images Coming Up On Hooke

After biking home from Professor Allan Chapman's fantastic lecture The Astronomical Researches of Robert Hooke (see NZ September 2007), I eagerly tucked into my blackberry and apples-from-Alverstone pie and mentioned to my brother Richard that Newton had destroyed Hooke's portrait and apart from various written descriptions, nobody seems to know what Hooke looked like.

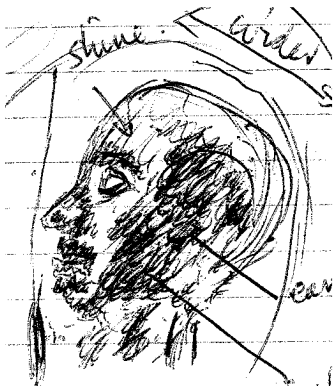
Richard said, "I saw some images of Robert Hooke way back in the 1960s." I laughed and went to bed. Faraday's laws are Faraday's laws, it makes no difference to me if Faraday lived on sprouts and honey sandwiches and wore a straw boater, but historians appear to want pictures of the people they write about, and then debate their authenticity.

The last time Richard saw the images of Hooke was when he helped a colleague at Guy's Hospital Medical School, experimenting with 1-inch magnetic tape in the 1960s, make a test 'film' on the history of the microscope. Staff from the Natural History Museum came to see it. We don't know what happened to the film but the images of Hooke had been seen in some of Arthur Mee's encyclopedias of the 1920s.

At Guy's Hospital, Richard was working on the physics of randomness, building a computer, with help from IBM and the Leverhulme. It was full of GPO equipment, bi-directional uniselectors, photocells and Strowgers, having applications in cytoarchitectonics - or how cells form tessellated structure. A very demanding sideline was making fresh illustrations for Gray's Anatomy (starting with the 35th British edition).

An autumn bike ride to the County Records Office in Newport and Guy was surprised to be shown Hooke's seal (document NBC1/85) so quickly. The IoW History Centre News Archive (http://freespace.virgin.net/roger.hewitt/iwias/home.htm), displays a photo of the seal, suggesting it might be Hooke's likeness. Borrowing a magnifier from the helpful staff - the best way to get to know about something like this is to draw it - with a few minutes left before closing, my quick result is given here. It looks very different from the aforesaid photo, but seals, with their high relief, are susceptible to lighting and viewing angle. Perhaps some additional clues on the signet used to make the seal might be found in Hooke's diaries, but, at present, we cannot spend the time searching them.

Recently a neighbour gave us a book "on some gent called Robert Hooke, before he goes to charity". Soon the book acquired marginal notes disagreeing with the text, so we bought more books on Robert Hooke, hoping to become better informed, but we found the logic tangled, sometimes absurd, and quotes from the same sources varied. Conflicts in information may go back to the sixteen hundreds, Richard suggested setting off to London, to sort some things out, but I said, "We've spent far too long on all this already, it's up to the historians to sort it all out!"



The existence of images in Arthur Mee's encyclopedias of the 1920s, means that either an original portrait of Hooke or an intermediate source, was available to the copyists who set out to make drawings, sketches and acquire photographs and information, long after Newton had put the boot into Hooke. Given it appears that paintings have been mislabelled, Arthur Mee's images may lead to a new identification of an old painting.

We hope the Arthur Mee images will soon be seen. Follow the wordworm beetles to your attics, look underneath your veteran car junk, examine those books propping up your 3-legged wardrobes, there could be a Hooke in that cranny. Search for Arthur Mee's Harmsworth Popular Science, his Children's Encyclopedia, or his I See All, the World's first picture Encyclopedia.

Back to our physics - we nitpick not the periwigs!

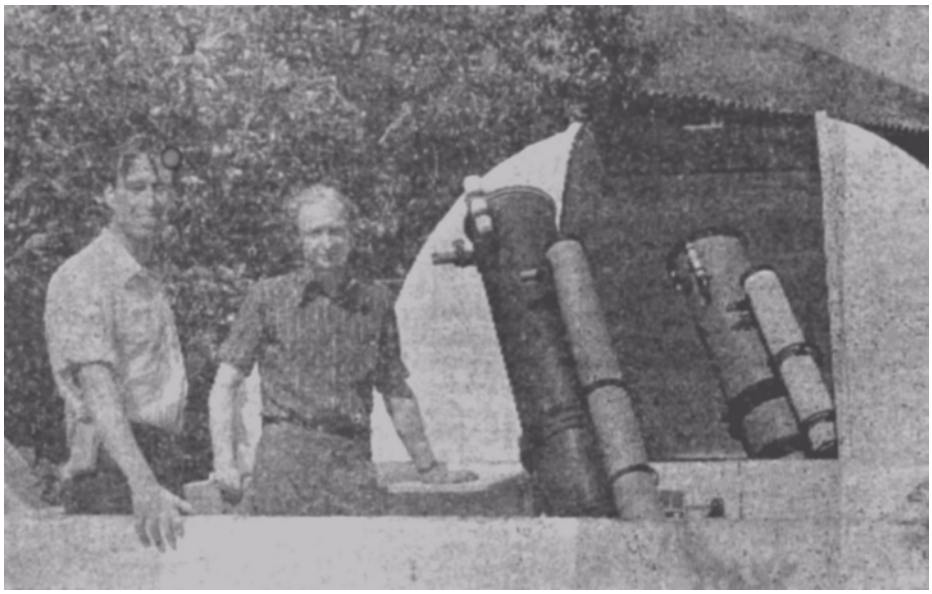
Thanks are expressed to the County Records Office.

Dr Guy Moore and Dr Richard Moore

A Page in History...

This article is taken from the pages of a local IOW newspaper from some years ago. Unfortunately the date of publication isn't shown on the scan but judging by the photo of **Roger** and **Barry**, it's a few years ago!

Hotel view is out of this world...



Mr. Peter Hayward (sic.) and Mr. Barry Bates beside the smaller of their telescopes. A larger model inside a 10 ft. dome stands in the background.

Picture by Brian Bradbury

Star attraction at the Chester Lodge Hotel, Sandown, is the view - from the observatory in the back garden. Still in the course of development, it is one of the most sophisticated amateur astronomy set-ups in Southern England, and due to become the study centre for a new group of star-gazers.

Friday night is viewing night for holidaymakers, not around the television but through telescopes offering 450 times magnification and 'overheads' out of this world...

Hotelier Mr. Roger Hayward, 33, and fellow astronomer Mr. Barry Bates, 30, of Appley Rise, Ryde, have put months of work, and £2,500, into the venture: Former members of the IW Astronomical Society, they are forming a Vectis Astronomical Society and recruiting members who will hold their first meeting on November 5th.

New Heights

"We are on friendly terms with the IW group," said Mr. Hayward, but we want to try something a bit more ambitious. Their members are welcome to come and use the observatory."

An impressive layout greets the eye. There are two electronically controlled reflecting telescopes, of 10 inches and 8 inches, each housed in its own unit. The larger is within a professional - type rotating dome 10.5 feet tall, framework for which was constructed at the Trucast metal castings factory in Ryde, where Mr. Bates is a radiographer; the smaller is in a flat-topped square housing, still being completed.

Nearby is a photographic centre in a small timber buildings. Moon 'shots' and those of other stars and planets taken through the large telescope with specially adapted single-lens reflex cameras are developed and printed here, and featured in a display which is a highlight of the Friday sessions.

Popular

Said Mr. Bates: "We get crowds of people along, not only from this hotel but others. We are members of the Southern Area Group of Astronomical Societies (SAGAS), and have guest speakers lined up from the Island and mainland once we start in earnest in November. News of this sort of an observatory is sure to create a lot of interest in SAGAS, which operates between Southampton and Brighton."

Once fully operational, the new group will meet on the first Friday of every month for lectures and discussions at a large room in the hotel (nicknamed 'the planets suite'), and hold Saturday night viewing sessions.

Mr. Hayward, the hon. secretary, welcomes members. He is available at the hotel Sandown 2773).

Eclipses

An eclipse of the sun can be total when the whole solar disc is hidden or annular when the moon appears slightly smaller than the sun. The latter occurs when the moon is at or near apogee so that the shadow of the moon does not quite reach the Earth. Conversely, at perigee the Earth will be well inside the moon's shadow which will be 220km across on the Earth's surface.

The reason the moon appears so closely matched in size to the sun is that the sun is roughly 400 times as far from the Earth as the moon, but is 400 times the diameter. The elliptical orbit of the moon about the Earth causes the variation between total and annular eclipses. In some instances a hybrid eclipse occurs that is total at the mid point of totality but annular towards the ends of the path.

The plane of the moon's orbit about the Earth is inclined at about 5° to the plane of the Earth's orbit about the sun (the ecliptic). An eclipse will only occur if the moon is within 17.5° of the ecliptic at the time of full moon (lunar eclipse) or new moon (solar eclipse). The relative motion of Earth and moon in their rotation about the sun leads to a cycle of eclipses that repeats every 18 years. When the moon crosses the ecliptic moving from south to north it is said to be at the ascending node. Conversely the descending node is when the moon crosses the ecliptic moving from north to south.

The orbital motion of the moon about the Earth causes the moons shadow to move eastwards at 3400km/hr. The rotation of the Earth on its axis equates to a rate of 1700km/hr eastwards on the equator. With a maximum diameter of the moons shadow (the umbra) of 220km at perigee the maximum duration of an eclipse is therefore 7.75 minutes.

The length of the month can be measured in a number of ways. The time between successive new moons (a lunation) is 29.53059 days. However the Earth/moon system is in orbit about the sun so a nodical month, the time between successive ascending or descending nodes is only 27.21222 days. The elliptical orbit of the moon precesses due to the sun's gravity so the time between successive perigees, the anomalistic month, is 27.55455 days. The differences between these numbers can be used to calculate when eclipses will occur.

Over a period of 18.03 years (the Saros) there will be 223 lunations, 242 nodical months and 239 anomalistic months so the cycle of eclipses will repeat over this period. Similarly over 28.95 years (the Inex) multiples of the three numbers coincide but this time in anti phase so that the equivalent eclipse occurs at the opposite node. These ratios were well known to ancient astronomers who used them to predict eclipses to their kings.

The moon has to be within 17.5° of the node for an eclipse to occur. As the position of the node moves this limits the rate at which eclipses can occur. Only very rarely can eclipses occur in successive months. Typically they are separated by 5 to 6 months so that there will be at least two eclipses per year but there can be a maximum of five.

A total eclipse of the sun is one of nature's most spectacular events and is well worth travelling to see if the opportunity arises.

October Meeting by Alan Drummond

Reported by Roger Young

THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

Web Links

*VAS and its officers are not responsible for the content of the web sites linked here. It is **your** responsibility to ensure you are protected against viruses and malware.*

Free Software - http://www.prospector.cz/Freeware/Education-and-Science/Astronomy/

Salopian Web - http://www.r-clarke.org.uk/

Asynx Planetarium - http://www.asynx-planetarium.com/

Hubble Space Telescope - http://hubblesite.org/

Astronomy News - http://www.dailyastronomy.com/

Capturing Satellite Weather Pictures

Included in last month's report about the Sputnik Party was a picture captured from the NOAA 17 weather satellite. The picture clearly shows large parts of the UK and Europe and the cloud formations above.

The picture was captured live as NOAA 17 passed overhead and the equipment used was fairly modest, the software used is available free of charge.

Equipment:

- Dell 486 PC running Windows 98
- Soundblaster compatible sound card
- Icom IC-229H 2m receiver (137-138Mhz)
- Turnstile antenna
- Various connecting leads

Software:

- Tracking - WXtrack: http://shortlink.co.uk/peg
- Decoding - WXtoImg: http://www.wxtoimg.com/

Setup

The setup was very simple: The antenna was connected normally to the radio receiver and the audio output from the radio was connected to the sound input of the SoundBlaster card - *other soundcards may work but they MUST be SoundBlaster compatible as the decoding software uses the Digital Signal Processing abilities of that device.*

Software configuration is beyond the scope of this document but full details are available at the links above. In general terms the systems all work "straight from the box" and little adjustment is required. That said, a simple calibration is needed the first time the decoding software is used, this ensures the audio output from the receiver is adjusted to correct levels.

I use the Icom receiver for convenience but almost any general purpose scanner, capable of receiving between 137 and 138MHz can be used instead.

The tracking software simply shows a world map and the location of the satellites in real time - it makes it easy to predict satellite passes.

Results

Once a satellite is within range, the decoding software automatically decodes the "beeps" and produces a picture on the PC monitor. The image can be saved or exported for further enhancement using any image editing tool.

If you would like further information please email me: brian@briancurd.com

Overheard in the Observatory

"It'll work better if you take the lens cap off..."

"I really think XXXX's opinions have some merit"

...and finally...

There is a theory which states that if ever anyone discovers exactly what the Universe is for and why it is here, it will instantly disappear and be replaced by something even more bizarre and inexplicable. There is another theory which states that this has already happened.

Nothing travels faster than the speed of light with the possible exception of bad news, which obeys its own special laws.

Space is big. You just won't believe how vastly, hugely, mind-bogglingly big it is. I mean, you may think it's a long way down the road to the drug store, but that's just peanuts to space.

Douglas Adams

Apologies

Sorry, we had a few problems with delivering NZ last month and understand that some members did not receive their copies until quite recently.

If you can help ensure a regular posting of the magazine to other members, please see the note on page 2.