



TRANSIT

The Newsletter of



13th May, 2005. Julian Day 2453504



No prizes for naming this galaxy. Normally it is all so spread out and only visible from a few places in the UK. It was only when I saw this fish-eye picture – from the astronomy picture of the day web site – that it dawned on me that we can see it all, edge-on. No doubt you had all realised that long ago. Oh, well.

Editorial

April meeting. Andrew Newstead, of Derby Astronomy Society, gave us the puzzling title of “How to get from There to Here” – or was it here to there? The problem of travelling from the Earth’s surface to an orbit in space around the Earth was tackled by the speaker. How space rockets are used, what propellants are employed, what speeds need to be achieved, were all covered in some detail. The talk was quite technical at times but held everyone’s interest.

May meeting. Friday the thirteenth of May, will be a lucky day, since our President, Jack Youdale, will give his annual address. Jack always finds a different and absorbing subject to entertain us with and we expect he will do the same this year.

April Puzzle Galaxy. It was NGC 1365, in the constellation of Fornax. In fact, it is a major member of the Fornax cluster of galaxies. To my amazement, there were members who knew it without having to look it up!! Astronomy Now this month has a picture of this galaxy, taken by Nik Szymanek on the Faulks telescope. A coincidence or an inspiration from Transit?

May’s Galaxy. Is this one in the charts or catalogues? It doesn’t have a Messier number, but someone may have recorded it somewhere and given it some sort of number? If not, why not? One of our members will know, I’m sure.

April Moon features. No excuse for anyone not to know that the four mare were a) Serenitatis, b) Tranquilitatis, c)Fecunditatis and d) Crisium. I keep trying to learn them by heart and always forget.

May Moon picture. An intriguing Moon feature, with a history of controversy as to what details people can see through their telescopes. This area raises almost the same emotions as the canals of Mars did many years ago. Journalistic rumour and speculation has it that our President once thought he saw the elusive feature(?).

Star Party at Selsey. I hope you all saw the last “Sky at Night” (or as the officionados say, S@N) programme, which followed a weekend of sky watching and photography by a group of the best amateur photographers in the country – including our own Keith Johnson. Keith may be spending another weekend down there soon and write up his experiences for us.



Following the article from Ray Worthy in last month’s Transit, on the evidence for large craters still being formed on the Moon, Neil sent this piece about similar observations made some centuries ago.

The Five Men of Kent
by Neil Haggath

In the April *Transit*, Ray Worthy found the story of Dr. Leon Stuart, who in 1953, observed and photographed what appears to have been the impact of a small asteroid onto the Moon, and the formation of a lunar crater. The piece said that Stuart was “the first and only human in history to witness and document” such an event.

Not necessarily! There is some historical evidence to suggest that someone beat him to it by nearly eight centuries – in the form of the remarkable story of the “Five Men of Kent”.

On 25 June, AD 1178, five English monks saw a strange event in the sky, which of course they had no way of understanding. It was later recorded in the chronicle of Gervase of Canterbury, one of the most reliable and respected writers of the era.

The monks were deeply troubled by what they saw, as their religious beliefs told them that it was impossible; the church, at that time, believed that the heavens were “perfect” and unchanging. Nevertheless, all five agreed on their description of the event, and swore to it under oath. Their story, as related by Gervase, reads:

“There was a bright New Moon, and as usual in that phase, its horns were tilted towards the east. Suddenly, the upper horn split in two. From the midpoint of the division, a flaming torch sprang up, spewing out fire, hot coals and sparks.”

While it’s impossible to be certain, this sounds very much as if the monks witnessed the impact of an asteroid – and one somewhat bigger than “Stuart’s Event”! In the 1970’s, astronomers Derral Mulholland and Odile Calame calculated that an impact of a certain size would produce a dust cloud rising from the lunar surface, causing a temporary obscuration consistent with the monks’ description.

So can we identify the crater whose formation was witnessed by the Five Men? From Gervase’s description, and the calculation of the Moon’s phase on the date in question, it’s possible to determine the region of the Moon in which the event took place. Very young craters can be identified by their pristine condition, the fact that they are superimposed on top of older features, and especially by their bright rays, which are eroded away, geologically speaking, relatively quickly.

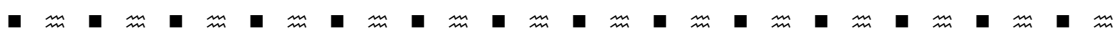
Jack Hartung pointed out that a small and very fresh-looking crater, with a prominent ray system, named Giordano Bruno, lies in exactly the right area of the Moon, and that its size is consistent with the size of impacting body postulated by Mulholland and Calame.

Mulholland and Calame also suggested another line of evidence. Any sizeable impact on the Moon would trigger seismic vibrations, which would cause the entire Moon to “quiver”, or librate, very slightly. After as short a period as 800 years, this vibration would not yet have been damped out; while the movement would be tiny – with an amplitude of only a few metres – it should be detectable, by means of laser ranging, using the laser reflectors left behind by the Apollo astronauts.

Such measurements, over a number of years, showed that the Moon is indeed quivering, with a period and amplitude consistent with the theory that the crater Giordano Bruno was formed less than 1000 years ago.

So while it can never be proved conclusively, it’s distinctly possible that the Five Men of Kent did indeed witness the formation of a lunar crater.

There’s a remarkable irony here. I said earlier that the monks were troubled by what they saw, because it effectively cast doubt on their religious beliefs. Coincidentally, the very crater whose formation they may have witnessed is named after a 16th-Century Italian scholar, who was burned at the stake for heresy in 1600. Part of his “crime” – like that of Galileo a few decades later - was to defy the pre-Copernican astronomical dogmas of the Roman Catholic Church. Among other things, he believed that the planets were worlds, that there might be planets orbiting other stars, and that some of them might be inhabited.



This article by Rod Cuff represents not only an awful lot of work in finding and checking all the websites, but also requires a knowledge of the web and a skill in its use I would love to have. It would be worth keeping this article in a safe place for future use and study. To quote Rod – “I think it could be quite a useful source of many hours' entertainment and education”. I agree whole-heartedly. It is a very useful summary and selection from his past “Astronomy and the Internet” articles. Another demonstration of the expert people we have in the Society.

Astronomy and the Internet

from Rod Cuff (rod@wordandweb.co.uk)

Alex and I both independently thought it might be a good idea to put together a consolidated list of Internet links from these articles, the first of which appeared in *Transit* in June 2002. I've left out websites and news items of transient interest, grouped others into some sort of semi-coherent order, and checked and updated all URLs, which were valid on 31 March 2005. Happy surfing!

General

- Many amateur (and some professional) sites join together in the **COSMOS Astronomical Web Ring** – start at http://www.geocities.com/jawa_bazaar/WebRing/wr03a.html
- **The British Astronomical Association** has its home page at <http://www.britastro.org/main>, and its Campaign for Dark Skies at <http://www.dark-skies.org>
- To see the extent of **light pollution** globally, visit www.lightpollution.it/dmsp – but you can get away from it for a while by spending a few nights at **Astroholidays** at Fieldview, North Norfolk (www.fieldview.net/) or at **COAA** in the Algarve in Portugal (www.coaa.co.uk)
- **Astronomy Resources** at www.mpe.mpg.de/AstR has links to everything ... and **Astronomy Net** at www.astronomy.net has more links to everything
- **The Astronomy Picture of the Day** (<http://antwrp.gsfc.nasa.gov/apod/astropix.html>) is a great source of background pictures for your computer desktop.
- **Astronomy Now magazine's** online edition is at www.astronomynow.com
- **Tonight's sky** is described at www.earthsky.com/Features/Skywatching/today.html, and the *Sky and Telescope* site includes a discussion of what's around this week – see http://skyandtelescope.com/observing/ataglance/article_110_1.asp
- The Institute of Physics sponsors a **reference site** at www.tcaep.co.uk that lists details on all the currently known planets and their satellites, has a table of constellations with information on 3164 stars, and includes tables of moon phases for the next 20 years.
- Some excellent **distance-learning courses** are run by the University of Central Lancashire and other collaborating UK partners (www.studyastronomy.co.uk), including Jodrell Bank, whose impressive website is at www.jb.man.ac.uk
- Two sites to people to post **free for-sale/wanted ads** for used telescopes and accessories etc are <http://easyweb.easynet.co.uk/~chrish/aa-ads.htm> and www.astrobuysell.com/uk

History of astronomy

- A huge and impressive site claiming to be the “official” Web page for the **history of astronomy** is at www.astro.uni-bonn.de/~pbrosche/astoria.html, and www.stsci.edu/astroweb/cat-history.html is another big resource site.
- **Famous women in astronomy** are well covered at <http://cannon.sfsu.edu/~gmarcy/cswa/history/history.html>
- The UK national **Society for the History of Astronomy**, founded in June 2002, has its website at <http://www.shastro.org.uk/>

Free software

- For **planning and documenting astronomical observations**, search through Free Astronomy Software (www.davidpaulgreen.com) or Astrotips (c. 170 programs for use by amateur astronomers, at <http://astrotips.com/>); or download AstroPlanner (www.ilangainc.com/astroplanner) or Cartes du Ciel (www.stargazing.net/astropc).
- The Arkansas Sky Observatory has good **online tools** at www.arksky.org

Choosing a telescope

- There are comprehensive **equipment reviews** at Todd Gross’ Weather and Astronomy Site, www.weatherman.com
- For *all* there is to know about **Meade ETX telescopes**, delve into Weasner’s Mighty ETX site at www.weasner.com/etx/menu.html

Astronomy with webcams etc

- The **QuickCam and Unconventional Imaging Astronomy Group** has its site at <http://www.qcuiag.co.uk/>
- The **Astronomy Webcam Paradise** is an appallingly designed but nonetheless interesting site, at <http://sweiller.free.fr>
- Many fascinating links to both information and pictures from **amateur astrophotography** are at www.universetoday.com/html/directory/astrophotography.html

Observatories and their photography

- Our own excellent **Castle Eden Planetarium** website has a multitude of links (www.planetarium.btinternet.co.uk/index2.htm) that will give you many happy hours of exploration
- The **Armagh Observatory**’s home page is at www.arm.ac.uk/home.html, and the Armagh Planetarium is at www.armagh-planetarium.co.uk. The first Director of the Planetarium was, of course, Patrick (now Sir Patrick) Moore – there’s a page about him at the *Sky at Night* site at www.bbc.co.uk/science/space/spaceguide/skyatnight/patrickmoore.shtml
- The home page for the **Hubble Space Telescope (HST)** is at <http://hubblesite.org> – and that for its planned successor, the **James Webb Space Telescope**, is at <http://www.jwst.nasa.gov/>
- The HST’s **Advanced Camera for Surveys** produced “an image nothing short of breathtaking – the best-ever view of a distant, massive galaxy cluster and what lies behind it” (http://skyandtelescope.com/news/current/article_838_1.asp), and “the most spectacular light echoes ever seen” (http://skyandtelescope.com/news/current/article_840_1.asp)

- And for spectacular pictures it would be hard to beat the X-ray image of the Cassiopeia A supernova remnant at <http://spaceflightnow.com/news/n0408/23chandra>, in an 11-day exposure taken by the **Chandra orbiting telescope**.
- The most recent of the three great orbiting observatories, the infrared **Spitzer Space Telescope** (www.spitzer.caltech.edu), is picking up objects beyond the reach of Hubble and Chandra. There's a lovely picture of a twin of our own galaxy at <http://spaceflightnow.com/news/n0406/28spitzergalaxy>, and comparisons with what other scopes can see at <http://spaceflightnow.com/news/n0406/01hidden>. This latter was the result of the Great Observatories Origins Deep Survey (GOODS), when all three telescopes simultaneously studied a small patch of the southern sky containing more than 10,000 galaxies.
- **A free software plug-in for Adobe Photoshop** (<http://spaceflightnow.com/news/n0407/08hstsoftware>) has made a treasure trove of archival astronomical images and spectra from Hubble, Spitzer and many other famous telescopes accessible for anyone to **manipulate and adapt**. If you've ever wished you could do something spectacular with these sort of images, now's your chance. To realise just what amazing results this can give, see what the 23-year-old Danny LaCrue has done with the Tarantula Nebula at <http://spaceflightnow.com/news/n0412/15tarantula>

X-ray astronomy

- The **X-ray Astronomy Home Page** is at <http://www.mpe.mpg.de/xray/home.php>, and a NASA tutorial at http://imagine.gsfc.nasa.gov/docs/introduction/xray_information.html
- The University of Leicester Space Research Centre's site (www.src.le.ac.uk) includes the **LOBSTER project**.

Earth and near-Earth

- Photos of **atmospheric phenomena** at www.meteoros.de/indexe.htm show halos, pillars, green flashes, coronas, noctilucent clouds and many more; or you can simulate your own solar halos via www.sundog.clara.co.uk/halo/halosim.htm
- You can keep tabs on **current potential aurora conditions** at <http://spaceweather.com>
- The world of **impact researchers and near-Earth object hunters** is unveiled at www.pibburns.com/catastro/impfolks.htm, and the **Spacewatch** project at Kitt Peak Observatory is described at <http://spacewatch.lpl.arizona.edu>
- The **Near-Earth Asteroid Rendezvous (NEAR)** site includes video (<http://near.jhuapl.edu>) of the final moments before the Shoemaker spacecraft touched down on the asteroid Eros in February 2001. The similarly named **Near-Earth Asteroid Tracking (NEAT)** project is at <http://neat.jpl.nasa.gov>

The Moon

- The **Full Moon Dictionary and Glossary of Lunar Terms** is at www.lunarrepublic.com/info/glossary.shtml ...
- ... and the same website has a complete series of **interactive lunar maps**, with more than 2,500 geographic formations identified simply by moving your mouse cursor over the feature. It's at <http://www.lunarrepublic.com/atlas/index.shtml>

- If you're particularly interested in observing the Moon, then **Lunar Phase Pro** (www.nightskyobserver.com/LunarPhaseCD) looks like a terrific piece of software to buy, at around \$35–40. You can download an evaluation copy free of charge. Another free downloadable program is the **Virtual Atlas of the Moon** at http://astrosurf.com/avl/UK_index.html
- A comprehensive guide to **lunar occultations** (for instance, it will list all the occultations visible in a coming month) and the resources of the Robinson Lunar Observatory are at www.lunar-occultations.com/entersite.htm

The planets

- There are a series of specialist sites each covering **information and news about a particular planet**: www.mercurytoday.com, www.marstoday.com, www.jupitertoday.com and www.saturntoday.com
- General information about **Venus**, with links to much more, is at www.nineplanets.org/venus.html – and although the website at <http://www2.jpl.nasa.gov/magellan> for the **Magellan** probe to Venus is no longer maintained, it provides a full coverage of the project's activities and achievements.
- The **Cassini–Huygens mission to Saturn and its satellites**, with its daily stream of spectacular pictures, is covered at <http://saturn.jpl.nasa.gov>, with the Huygens probe itself at www.esa.int/SPECIALS/Cassini-Huygens
- **Space Audio** at www-pw.physics.uiowa.edu/space-audio has turned the signals from various space probes into sound – so now, for instance, you can listen to Cassini's recording of the shock wave of the solar wind hitting Saturn's magnetic field.

Asteroids

- Good coverage of **asteroids** is at www.solarviews.com/eng/asteroid.htm and <http://seds.lpl.arizona.edu/nineplanets/nineplanets/asteroids.html>
- To see the first natural object known, apart from Venus and Mercury, with **an orbit entirely within Earth's**, see http://skyandtelescope.com/news/current/article_879_1.asp

Comets and meteors

- **Comets in general and in particular** are covered at www.cometchaser.de/new_en.html and <http://cometography.com>
- Particularly if you have a computer-controlled telescope, you may find <http://cfa-www.harvard.edu/iau/Ephemerides/Comets> a very useful site for coverage of **all comets visible at any given time**. **Meteor showers and currently visible comets** are also covered at <http://comets.amsmeteors.org>
- Not only will '*Your Sky*, the interactive planetarium of the Web' (www.fourmilab.ch/yoursky) produce **maps for any time, date and observing location**, but from the orbital elements of an asteroid or comet it will compute the object's current position and plot it on the map. Each map is accompanied by an ephemeris for the Sun, Moon, planets and any tracked asteroid or comet.

Extra-solar planets

- The **Open University's Astronomical Research Group** run the site at <http://physics.open.ac.uk/~chaswell>, while the **California and Carnegie Planet Search** is at <http://exoplanets.org>, and **STARE (STellar Astrophysics & Research on Exoplanets)** is at www.hao.ucar.edu/public/research/stare/stare.html

- **Exoplanets in general** are covered at www.astrobiology.com/extrasolar.html, with the **Extrasolar Planets Encyclopaedia** at <http://cfa-www.harvard.edu/planets>

Brown dwarfs

- A *Scientific American* article at http://universe.nasa.gov/press/background_info/000521_browndwarfs_sciam.pdf outlines what we know about **brown dwarfs**.
- The less journalistic **Brown Dwarfs Home Page** is at www.bahnhof.se/~davidgr/browndwf/bd_home.html

Astrophysics

- There's an animated **Hertzsprung-Russell diagram** at <http://instruct1.cit.cornell.edu/courses/astro101/java/evolve/evolve.htm>
- A good primer on the **cosmic background radiation** (CMB) is at http://map.gsfc.nasa.gov/m_uni/uni_101bbtest3.html... or there's a nice "viewgraph" presentation at <http://background.uchicago.edu/~whu/beginners/introduction.html>
- The CMB, of course, is a direct result of the hot **Big Bang**, covered at <http://csep10.phys.utk.edu/astr162/lect/cosmology/hotbb.html>

Black holes

- To learn all about **black holes**, start with <http://physics7.berkeley.edu/Education/BHfaq.html>, then go to the series of linked pages from the University of Illinois at <http://archive.ncsa.uiuc.edu/Cyberia/NumRel/BlackHoles.html>, then explore the references in http://directory.google.com/Top/Science/Physics/Relativity/Black_Holes

Catalogues and galleries

- The **NGC and IC Images Archive** at www.ngcic.com/dss/dss_images.htm will become a complete set of images of all the deep-space objects listed in the New General Catalogue and Index Catalogue produced by the Royal Astronomical Society (www.ras.org.uk) roughly 100 years ago.
- From www.ngcic.com/oblstgen.htm you can generate a **personalised list of NGC and IC objects** to look for, in a constellation of your choice.
- Images and positional info on all of the 110 **Messier objects** are at www.seds.org/billa/dssm/messier.html, and CCD images at <http://zebu.uoregon.edu/messier.html>

Cosmology

- **Modern cosmological thought** is explained in NASA's "Cosmology 101" at http://map.gsfc.nasa.gov/m_uni.html; and a UCLA lecturer's site at www.astro.ucla.edu/~wright/cosmolog.htm has excellent, detailed and up-to-the-minute explanations.
- A good central directory of cosmological information on the Web is at <http://directory.google.com/Top/Science/Astronomy/Cosmology>

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The CaDAS Interview – Ros Balmforth

It was that perishingly cold day in early April - the North York Moors had a dusting of white - when I went to Linthorpe to interview Ros. The welcome was warm and friendly and so was the house. We chatted in a light, airy room with lots of pictures and mementos of trips here and there – of which more later. It was so easy to open a conversation with such an outgoing and bubbly lady.

Wait a minute, wait a minute, we are getting too far into the interview without me taking some notes and switching on my ancient tape recorder. Ok, go. We were talking about all your other interests.

Having lots of other interests is my excuse for not being able to go to as many CaDAS meetings as I should, and as I should like to, attend. We were talking about music Yes, that is one of my major interests. I play the piano. *Do you practise and do scales?* Oh, yes, it's taken seriously. A friend and I play duets whenever we can. To be accurate, we play a Roland electronic keyboard because the piano gave up the ghost – the soundboard was cracked – and pianos are difficult to maintain.

Any other musical interests?

I sing in the Cleveland Philharmonic Choir and I'm on the committee as well. That's Tuesday evening. Then there is the small group who come round here to my house to sing and enjoy ourselves.

What sort of things do you sing?

Oh, anything anyone suggests. Early English music, Bach, the Beatles. We used to sing in public, too, at weddings and receptions generally and church halls; that sort of thing, but age has crept up on us, and we now just sing for our own enjoyment.

So that's two evenings a week at least?

Yes, then there's the literature class which used to be held in Harrow Road, run as an outstation of Leeds University. The pattern is that the tutor gives us a book and we read it up and then discuss and criticize it. I recall Kafka's "America" and Anita Brookner and Austen. It is mostly fiction. We don't read technical or astronomy books. *Shame! I think you should suggest something by Patrick Moore.*

You pretend you don't understand the CaDAS lectures and yet you have the interest to go to the Friday nights.

My astronomy is star-gazing, rather than a technical interest. I remember a school book prize I chose called "Observing the Heavens" fired my interest and the Astronomy badge with the Guides meant learning a few constellations. I was just fascinated by looking out into the infinite. I find it quite an emotional and spiritual experience thinking about it out there. I was brought up in a devout and spiritual family atmosphere, so it seemed to fit in, somehow. They encouraged an attitude of the wonder of nature. "What is man that thou art mindful of him?" But my parents didn't directly introduce me to astronomy.

Where were you educated?

I went to school in Manchester. Viv Blundell and I were school friends; in fact, that's how I came to join the astronomy society. She rang me up one day after a number of years out of touch and said she lived not far away and off we went again. I went to University in Manchester as well, reading Latin and Greek. My father taught Latin at Manchester Grammar School and my husband, Phil, taught Latin here in Middlesbrough. We met at University. *Did you enjoy Manchester and your education generally?* Oh, yes, very much. I loved Manchester. I spent 28 years there, brought up there. I have a brother, who still lives in Manchester and a sister, who now lives in Northamptonshire. But I'm not sorry to have left. This part of the world is so friendly and it is so easy to get into the hills around.

All the people I know in the Society have this enjoyment of learning. They are life-long learners. You are the same?

Yes. Anything and everything. Bird watching, botany, mountains, hill walking. I enjoy it all. Astronomy has this mind-boggling infinity about it. Just when you think everything is going to be known it all changes and there is more to know and more to find out.

Is there any special memory of astronomy that you have?

One I remember very well. We were on holiday in Greece and they advertised a star watching evening on a boat. We were taken out to an island, where the skies were really dark, and we lay flat on our backs and just gazed at the sky while the organiser pointed out things in the heavens. He had this big spotlight and he pointed the beam up into the sky and said things like "This is such and such a star and such and such a planet and constellations and This went on for hours, because it was warm and comfortable on the sand. Altogether a very memorable experience. He kept reminding us of the romance of it all and the mythology in the naming of the constellations.

You have done quite a lot of travelling, haven't you? You said on the phone you were just back from a three-month tour of the world. Tell me about that.

We went on January 5th and came back on March 31st. The story is that my husband, Phil, and I have both recovered from life-threatening illnesses in the last 5 or 10 years. We decided that we wanted to see as many of the World Heritage sites as we could reasonably fit into three months. The first place was in Cambodia., the site of the ancient Buddhist temples. They had been lost for centuries and recently re-discovered and rescued from destruction by the rain forest. There are lots more which haven't been found yet, it is believed.

The next port of call was to see friends in Australia and go snorkelling on the Great Barrier Reef. After a bit of teaching how to use the equipment you just go off and enjoy it. Then off to New Zealand and some wonderful skies, both North and South Island. There was the Southern Cross and the sky is all the wrong way up and very confusing. We had to buy a southern planisphere to sort it all out. Orion is the wrong way round. It's all very confusing. Phil is a big Tolkien fan so we went to see the places where they filmed Lord of the Rings.

Easter Island was amazing. The Moai, the big sculptures, are just fantastic. The quarry has about 400 half-finished ones. It all came to a sudden end, for some reason. There is only one road and one petrol station. People ride around on horses a lot.

From Easter Island we went to Peru and the Inca, Machu Picchu ruins. The temples have astronomical connections, with the Summer Equinoctial Sun shining into a building and all that sort of thing. And the setting, the surroundings are stunning mountains.

In the USA the big thing to see was the canyons in Utah and Arizona – Zion, Bryce and, of course, The Grand Canyon. No pictures of the Grand Canyon can give you any idea of what it is like to be there. We both had a very emotional response to seeing the grandeur of it. This contrasted starkly with Florida, where my memory is of very large people eating vast quantities of food.

It must be difficult to get back to normal after being away for 3 months?

There are two aspects to that, really. It was a wonderful and educational experience and we enjoyed it a lot. It was a big investment in time and money but well worth it. On the other hand it's comfortable to be in the home you like and doing the familiar things. The important thing is to keep a balance in all these things, I think

Is your own family nearby?

We have two daughters. Hannah is living locally and has two small children. We do grandparent duties quite often and love interesting the children in lots of things – drawing painting, the beach, natural history. They lap it all up and are very enthusiastic. Zoe is in Leeds, which is near enough for plenty of visiting. And keeping in touch. They were born and brought up in the North East.

You mentioned walking in the hills.

We both like to keep fit and do lots of walking. We walked Hadrian's Wall recently, both being interested in Latin and things Roman. We took about 8 days, with pre-planned stops to be sure my diet would be ok. My diabetes is helped by taking at least an hour's walk a day. It's essential, really, to keeping myself well and avoiding some of the possible consequences of diabetes. We get into the North York Moors and around Ripon. We are planning to do the Dales Way when we can get round to it. That's about a week's walking as well.

Any other holidays?

Narrow boats on the canals we enjoy very much. Hiring a boat and then inviting the family to join us has been a really good way to have family holidays. It's all at a human pace, in quiet and peaceful surroundings. Lots of wildlife and botany and fresh air. It's wonderful.

What about the Society? Tell me what you like about it and what you would change.

I wouldn't change anything. The lectures are always absorbing and interesting – although, as I say, Viv has to explain some of it to me afterwards. You feel welcome at the meetings, although I don't know many people to talk to. I always read the monthly bit in the Guardian about what's happening in the sky and that helps with the lectures sometimes. But I feel I don't know very much. Certainly not compared with many of the

experts who are at the meetings. We bought a small Russian telescope and we really must get it out more. It's all the time thing, again.

Who has influenced you the most?

Oh, dear, what a question. I would have to say my husband, Phil. He is always so encouraging and supportive of all the things I want to do.

You are very enthusiastic about everything you do and are involved in all sorts of things. Do you ask yourself where this enthusiasm comes from?

No. I've never asked myself the question. I think it's built in at a very early age. If you are encouraged as a child in your interests, I think this probably feeds the enthusiasm. And the opposite, of course. If you are constantly stopped from doing things it will blunt any natural enthusiasm. I think positive participation is the key to it all.

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Ray Worthy sent this news of some sensational-sounding software. It is free from NASA, at the site given below, coming down as a 170Mbyte file, which installs on the hard disc as a 580Mbyte program. Ray has downloaded the setup file and put it on to a cd, which he sent to me. If anyone wants a copy, to avoid a long download, please contact the Editor. As it installs, there may be some additional files to download from the Microsoft site, depending on what you already have on your hard disc. The install wizard tells you about them as you go along. It may be better to visit the website first and have a look at the home page and the FAQ's.

New NASA Software

Hi All

There is a NASA web site with what must be some of the most beautiful software ever created for casual and scientific use. It could be a very powerful educational tool, or one can use it to plan occultation expeditions, navigate, etc.

It is called 'World Wind' (version 1.3) and it is what may spell the end of atlases. Basically a 3D globe of Earth, it has added information about the geographic activity on the planet of multiple sorts. It is linked via the web (a cable connection is - very - desirable...) so that current and recent satellite information is updated into your Earth model. Using the mouse, you move to ****any**** location you wish and zoom in, roll and pan, engage vertical exaggeration, resolution, set labels, specify what information you do and don't want to see...it goes on. It features current events, also. You have the option to map out the recent tsunami, for example.

The web site, where you can download the software, is <http://worldwind.arc.nasa.gov/>. Be warned, a program like this ain't small.... Here's their introductory blurb:

"World Wind lets you zoom from satellite altitude into any place on Earth. Leveraging Landsat satellite imagery and Shuttle Radar Topography Mission data, World Wind lets you experience Earth terrain in visually rich 3D, just as if you were really there. Virtually

visit any place in the world. Look across the Andes, into the Grand Canyon, over the Alps, or along the African Sahara.”

Ray

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From the Daily Express of April 2nd, 2005.
by John Crowther

Q Why is the apparent size of the sun and the moon exactly the same, such that the moon just covers the sun in an eclipse? Is this just an incredible coincidence or is there a scientific reason?

A It really is just a coincidence. The sun is about 400 times further away than the moon but it is also 400 times wider, so we get a perfect fit. In another 100 million years or so, this will no longer be the case because the moon will have moved further away in its orbit. It wasn't true 100 million years ago, either. We're just lucky to live at a time when eclipses are particularly beautiful.

Q Please can you explain this odd visual phenomenon: prior to leaving for Johannesburg from the UK I noticed a crescent moon curving from the right-hand side. But when I arrived in Jo'burg, the moon was curving from the left. Obviously the moon can't change so please explain.

A At all times we can only see the side of the moon that is facing the sun (moonlight is reflected sunlight), so the outside (convex) curve of the crescent moon faces the sun, with the "horns" pointing away from the sun. When the sun is about to rise (in the east) the horns face west, when it's about to set (in the west) the horns face east. As you say, it's not the moon that changes, it's the sun (at least from our perspective).

John writes: Are these the correct answers?

Comment on Answer 1. One hundred million years ago, was the moon nearer the earth and were the eclipses of longer duration?

Comment on Answer 2. Surely the explanation lies in the fact that the questioner travelled from the northern hemisphere to the southern. The moon would then be in the northern sky and would appear reversed, as do the constellations. Wild life documentaries take in the southern hemisphere show lunar features misplaced to our way of thinking. The answer given to the question appears to indicate that a new moon can change to an old moon in less than 24 hours!

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Rosetta performs ESA's closest-ever Earth fly-by

ESA press release from Ray Worthy

The European Space Agency's Rosetta spacecraft performed ESA's closest-ever Earth fly-by, gaining an essential gravity boost in its ten-year, 7.1 billion kilometre flight to Comet 67P/Churyumov-Gerasimenko. At closest approach, Rosetta passed above the Pacific Ocean just west of Mexico at an altitude of 1954.74 km and a velocity relative to the Earth of 38 000 kph.

The passage through the Earth-Moon system allowed ground controllers to test Rosetta's 'asteroid fly-by mode' (AFM) using the Moon as a 'fake' asteroid, rehearsing the fly-bys of asteroids Steins and Lutetia due in 2008 and 2010 respectively. The AFM test ran for nine minutes during which the two onboard navigation cameras successfully tracked the Moon, allowing Rosetta's attitude to be automatically adjusted.

Before and after closest approach, the navigation cameras also acquired a series of images of the Moon and Earth; these data will be downloaded early today for ground processing and are expected to be available in March. In addition, other onboard instruments were switched on, including ALICE (ultraviolet imaging spectrometer), VIRTIS (visible and infrared mapping spectrometer) and MIRO (microwave instrument for the Rosetta orbiter), for calibration and general testing using the Earth and Moon as targets.

The fly-by manoeuvre swung the three-tonne spacecraft around our planet and out towards Mars, where it will make a fly-by on 26 February 2007. Rosetta will return to Earth again in a series of four planet fly-bys (three times with Earth, once with Mars) before reaching Comet 67P/Churyumov-Gerasimenko in 2014, when it will enter orbit and deliver a lander, Philae, onto the surface. The fly-bys are necessary to accelerate the spacecraft so as to eventually match the velocity of the target comet. They are a fuel-saving way to boost speed using planetary gravity.

Yesterday's fly-by came one year and two days after launch and highlights the valuable opportunities for instrument calibration and data gathering available during the mission's multi-year voyage. In just three months, on 4 July, Rosetta will be in a good position to observe and gather data during NASA's spectacular Deep Impact event, when the Deep Impact probe will hurl a 380 kg projectile into Comet Tempel 1, revealing data on the comet's internal structure. Certain of Rosetta's unique instruments, such as its ultraviolet light instrument ALICE, should be able to make critical contributions to the American mission.

Rosetta is the first mission designed to both orbit and land on a comet, and consists of an orbiter and a lander. The spacecraft carries 11 scientific experiments and will be the first mission to undertake long-term exploration of a comet at close quarters. After entering orbit around Comet 67P/Churyumov-Gerasimenko in 2014, the spacecraft will release a small lander onto the icy nucleus. Rosetta will orbit the comet for about a year as it heads

towards the Sun, remaining in orbit for another half-year past perihelion (closest approach to the Sun). Comets hold essential information about the origin of our Solar System because they are the most primitive objects in the Solar System and their chemical composition has changed little since their formation. By orbiting and landing on Comet 67P/Churyumov-Gerasimenko, Rosetta will help us reconstruct the history of our own neighbourhood in space.

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New Links for Radio Telescopes
from Ian Miles and Networking Magazine

Manchester University has awarded a contract as part of it's e-MERLIN project to establish high-capacity links between five radio telescopes across England and the Jodrell Bank Observatory in Cheshire, home of the Lovel Telescope. The five remote telescopes and the 76 metre Lovel Telescope will form an array called MERLIN - a unique instrument for high-resolution radio imaging that is the only general purpose, ground based astronomical facility that routinely matches the resolution of the Hubble Space Telescope. The e-MERLIN project will replace the current microwave technology with a 650km fibre network which will boost the sensitivity of MERLIN by a factor of 30, simultaneously increasing its range more than five-fold and allowing detailed radio observations of the most distant galaxies.

The new links will carry astronomical signals at a sustained and constant rate of 30Gbps from each telescope. The total traffic rate converging on Jodrell Bank will be approximately five times the total UK public Internet traffic.

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Transit Tailpiece

Quote/Unquote

If God had consulted me before embarking on creation, I would have recommended something simpler.

Alfonso X, King of Castile, 1252.

The book of the Universe cannot be understood unless one first learns to comprehend the language and understand the alphabet in which it is composed. It is written in the language of mathematics and its characters are triangles, circles and other geometric figures, without which it is humanly impossible to understand a single word of it. Without these, one wanders about in a dark labyrinth.

Galileo Galilei, 1618

Articles Please send contributions for the newsletter to Alex Menarry, 23, Abbey Road, Darlington, DL3 7RD, 01325 482597 (a.menarry@virgin.net) or to John McCue, 01642 892446 (john.mccue@ntlworld.com). Copy deadline date is the 25th of each month

The Back Page Pictures



Our Interviewee this month is Ros Balmforth, who professes to find some of the lectures baffling but I don't really believe her.

The Moon Picture for May



This may be a bit fuzzy but you are supposed to see a very special and controversial Moon feature (??).