Institute of Physics

LANBRIA

The newsletter of the Lancashire & Cumbria branch of the Institute of Physics

Issue 18 September 2005

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See http://lancashire.iop.org for details of committee members, events and how to join the Lancashire & Cumbria branch.

Gizmo cuts your bills

I recently purchased a Power Monitor Socket from Maplin Electronics (www.maplin.co.uk). This clever gadget plugs into a three-pin electric socket and displays the power being used by any electrical appliance that you plug into it. Its LCD display shows any one of the following: rms voltage, rms current, power, VA (rms V × rms A), frequency, power factor (power divided by VA), energy used since plugged in (in kWh) and elapsed time.

With this device I have been able to see how much electricity my household appliances are consuming. For example, my fridge/freezer uses about 0.6 kWh a day (i.e. 0.6 metered units of electricity). This is in line with the manufacturer's claim of 318 units a year, bearing in mind that I was not freezing any new food in the measuring period. My dehumidifier uses about 2.5 units a day. Consequently I have decided not to have it switched on all the time during dry periods. My PC's main unit uses 130 W and the TFT monitor, sound system and scanner use 47 W. The good news is that the monitor draws only 2 W when on standby.

Current affairs: the power monitor yields some surprising results.

My DAB digital radio draws 8 W in normal usage and 2 W in standby. Surprisingly the microwave oven draws 5 W when the only thing working is the clock! The cathode-ray-tube TV's power consumption is interesting. It draws between 50 W and 90 W depending on the picture. Dark scenes use far less power than views of the sky. It only uses 2 W when on standby, which is a nice surprise.

I can reveal that a Pace V2 Sky+ box (two satellite digital tuners and a hard-disk recorder) uses about 14 W when on standby. This rises to 18 W when recording in standby mode and to 21 W when on but not recording. My AV amplifier draws about 50 W in normal use and about 1 W on standby.

The power monitor is fairly easy to use although the instructions are in rather poor English and the buttons do not respond instantly. However, with a bit of patience, all of the functions do work. The main reservation is the price. At £24.99 plus postage, it is too expensive to justify the cost through any savings in electricity for a single household. However, if a group of people were to share the cost then it could make a significant contribution to saving electrical energy.

Chris Bowdery Energy saver

The editor's lines on the leaves

This month we have an article about SETNET and a request for volunteers as Science and Engineering Ambassadors (SEAs) from Barbara Tigar, SETPOINT Lancashire manager. (She has a PhD in biology and is an expert on beetles, by the way.) John Bradshaw, our branch support officer, has been a SEA for some years, taking physics lessons in a primary school. The whole *Galactic Gig* team have now become SEAs. This is a way for Institute members to get involved with educational activities, so do please consider becoming one too. You have the option of going directly to your local SETPOINT or **getting involved through the branch**, which would be even better for the Institute.

We also have an interview with Anne Small, who is finishing her PhD very soon. I hope she will remain a committee member and provide us with medical-physicist input.

Chris Bowdery Chair

Visit the branch website at http://lancashire.iop.org

How to inspire the next generation

Science and Engineering Ambassadors (SEAs) are enthusiastic volunteers who want to share their specialist knowledge of science, engineering, technology or mathematics with schools. They come from varied training and career backgrounds. SEAs act as role models who promote their subject areas and encourage young people to take an interest in science and science-related careers. The SEAs programme is coordinated nationally by SETNET (see "SETNET and SEAs" below) and regionally by SETPOINT Cumbria and SETPOINT Lancashire.

The most important requirements for an ambassador are a commitment to communicating with young people and a passion for science. Being an ambassador provides the chance to share your personal views on how science affects the world and influences our everyday lives.

The type and frequency of support that SEAs offer is flexible. It includes opportunities to contribute to local and national initiatives, such as:

- supporting Lab in a Lorry, the Galactic Gig and other IOP events;
- delivering hands-on physics workshops at SETPOINT Science Roadshows and taster events for primary or secondary schools;
- responding to teachers' requests to enrich the curriculum through specialist talks or practical demonstrations;
- attending careers fairs and giving science-careers talks to young people;
- working with schools on projects such as the Creativity in Science and Technology awards (CREST), K'nex Challenge, Jaguar F1 in Schools, LEGO 1st League and Young Engineer;
- judging regional science and technology competitions;
- helping with after-school science and technology clubs;
- e-mentoring schemes, such as Computer Clubs for Girls.

Science and Engineering Ambassadors help to encourage children's interest in science, engineering, technology and mathematics.

If you want to develop an activity to promote physics in schools, your local SETPOINT can offer advice about planning, risk assessment and the National Curriculum, as well as helping with publicity, marketing and contacting teachers.

Profile of a physics SEA

Sophie Michel is an MPhys student at Lancaster University studying physics, astrophysics and cosmology. She is an active member of the Lancaster University Physics and Astronomy Society as well as treasurer of the Sailing Club. She devotes much of her spare time to organizing the club and competing in national events.

Since becoming a SEA in January, Sophie has taken part in SETPOINT Roadshows, Chemistry at Work and an Engineering Challenge Day. Her first experience as a SEA was working on circuitboard activities: "I really enjoyed the event and it was great to help so many children to understand more about circuits. It was amazing how much they learned in 20 minutes. You could see their confidence growing as they progressed.

"I took part in activities of this type at school. They helped me to choose what I wanted to do and showed me a viable career path. I hope that through my involvement as a SEA I can encourage others to see that science and engineering are interesting subjects, and a good option for further education."

To become a SEA, please complete an application form with your contact details and an idea of how you think you can support schools. We will help you to navigate the Criminal Records Bureau disclosure application process and invite you to a SEAs induction briefing. This helps you to understand the school environment and the kind of work that SEAs undertake. It also helps you to consider how to develop appropriate communication and presentation skills for schools. Your local SETPOINTs will be organizing training sessions for Institute members in Lancashire and Cumbria during October and November 2005.

Further information

You can find details of SEAs at www.setnet.org.uk.
You can also contact your local SETPOINT:

- Dr Barbara Tigar, SETPOINT Lancashire, Darwen House, Walker Business Park, Guide, Blackburn BB1 2QE tel: 01254 584020; email: setpoint@lebp.co.uk; www.setpointlancashire.co.uk.
- Tony Gill, SETPOINT Cumbria, Studio 5, The Courtyard Suite, Clawthorpe Hall Business Centre, Burton-in-Kendal, Carnforth LA6 1NU tel: 01524 784334; e-mail: tony@setpointcumbria.co.uk; www.setpointcumbria.co.uk.

Barbara Tigar SETPOINT Lancashire manager

SETNET and SEAs

The science, engineering, technology and mathematics network (SETNET) seeks to stimulate the interests of young people in these areas. It is a unique collaboration of more than 100 member organizations, created by the Department of Trade and Industry in 1996.

The aim is for more young people to choose a career related to science, technology, engineering and mathematics (STEM) and to cultivate a population more suited to a technological world.

SETNET has local SETPOINTs and partner organizations that co-operate to deliver high-quality STEM activities and experiences to schools and young people.

The current primary function of SETPOINTs is to serve as single, authoritative sources of information for teachers about what local and national STEM materials and activities are available to enrich their teaching. SETPOINTs also offer both advice and assistance in delivering these activities to schools, in particular by using the SEAs to interface with young people.

SETNET is a registered charity that relies on the support of the government and businesses. Sir Gareth Roberts, former Institute president, is the chairman.

- This information is taken from www.setnet.org.uk.

PhD student prepares for future

Anne Small is a branch committee member who is studying for a PhD at Lancaster University and hails from Scotland. Regular readers will know that she played Cynthia in the *Galactic Gig* roadshow. She kindly agreed to an e-mail interview with *LANBRIA*.

Anne Small (left) with her Lancaster University graduating class in 2002.

***LANBRIA*: How did you become interested in physics and why did you do an MPhys at Lancaster?**
AS: I'm not sure. It was a bit of an accident. I knew at school that I was good at, and enjoyed, physics and maths, so I applied for six university courses, all involving physics and/or maths. I went to various open days and decided that I really liked Lancaster. I thought the people were friendly and I liked the city and campus. It turned out that at Lancaster I had applied to do a physics degree, so that is how I became a physicist.

I chose to do the MPhys rather than the three-year BSc because I wanted to be good at my subject before I finished it. Anyway, degrees in Scotland take four years, so it felt a bit like a three-year course wasn't doing enough.

What is the subject of your PhD?
It is experimental particle physics, which means that I am looking for different ways to study the particles that our universe is made from. In particular I am looking for ways to detect (at CERN's Large Hadron Collider) a new particle – a bound state of gluinos, which are hypothetical particles related to gluons that bind quarks together. I really enjoy it. It's a challenge.

What are you going to do when you finish?
On 16 September I am starting as a trainee medical physicist at Royal Liverpool University Hospital. As much as I have enjoyed my PhD, research isn't where I want to stay. I am really looking forward to the challenge of starting a new chapter in my life, and doing a job that I hope will be exciting and fulfilling.

How did you meet Michael, your husband?
Believe it or not I first met Michael, who is also a physicist, about five years ago at a branch "do". During my second year I was persuaded to go to a branch lecture and dinner. Well, never one to give up the chance of a free meal (I think the branch chair wanted to ensure an audience), I went along with some friends. Michael was also there, receiving a branch MPhys prize. We chatted a bit and the rest, as they say, is history.

Anne with her husband Michael.

Was playing Cynthia in the *Galactic Gig* your first acting role? Would you like to do more acting? More schools roadshows?
I had done some acting before. At school I was a rose seller and one of Fagan's boys in *Oliver*. I wouldn't mind doing more acting but I have nothing lined up, and I wouldn't say that I am a natural at it.

Have you ever had any difficult experiences as a woman in the world of physics?
No, I haven't had any difficulty at all. In fact, when I graduated there were 11 girls and 3 boys in the class.

What do you do to relax?
I like to read and go for walks. Michael and I walk every day, even if it is just around the park near where we live in Preston. I also like going to the seaside – St Annes, Southport, Lytham, even Morecambe. I get a hotdog, eat ice cream and walk through the sand with my socks off.

What books do you like to read?
I like the "bestsellers", such as Patricia Cornwell's books. At the moment I'm reading Kathy Reichs and Karin Slaughter. I also have all of Iain Banks' novels. I recently read the trilogy *His Dark Materials* by Philip Pullman and thought they were fantastic.

I try every now and again to read "worthy" novels like *The Ground Beneath Her Feet* by Salman Rushdie, and I enjoy them, but I couldn't read them all the time.

Do you have any advice for physics students?
Hmm, not really. All I can say is "keep going". It's not that hard. If I can do it then anyone can.

Thank you very much for giving us an insight into your world.

AUTUMN PROGRAMME OF BRANCH EVENTS

The branch is trying to relaunch a monthly lecture series and arrange local and other events. See the branch website and e-mail announcements for news.

Thursday 8 September
Superconductivity
Dr Shaun Fisher, Lancaster University
7.00 p.m. M49, Maudland Building, UCLan, Preston.
This lecture will include the awarding of the 2004 A-level physics prizes to the top AQA board students in Lancashire and Cumbria. All welcome.

Wednesday 12 October
West Cumbria members meeting: Double pulsars and relativity
Dr Duncan Lorimer, Jodrell Bank/University of Manchester
This lecture will expand on the exciting work described in the cover article of the March 2005 issue of *Physics World*.
7.30 p.m. Westlakes Research Institute, Whitehaven, Cumbria.

Wednesday 19 October
Joint meeting with British Nuclear Energy Society, Cumbria
Simon Franklin, director of Reactor Operations & Safety, Imperial College, will talk about recent efforts to secure the future of the last civilian research reactor at Silwood Park, Ascot, and also to plan for decommissioning of the facility.
7.00 p.m. (to be confirmed) Westlakes Research Institute, Whitehaven.

Wednesday 26 October
Einstein Year event
Using ideas from the *Galactic Gig* roadshow and volunteer branch members, we hope to give away Einstein Year freebies and interest shoppers in the wonderful world of physics.
All day at St George's Shopping Centre, Preston

Wednesday 23 November
Mass and energy in Einstein Year
Dr Chris Bowdery, Lancaster University/branch chair
7.00 p.m. George Fox Building, Lancaster University

December
Einstein Year Christmas social event to be announced

Let us know if you have any ideas for branch events!

Key Insight Business Briefing: Homeland Security and Defence R&D in the UK

Monday 10 October
4.30–9.15 p.m. with dinner
Institute of Physics, London

We are delighted to announce the next event in our Key Insight Business Briefing (KIBB) series. Our key speakers will be Sir John Chisholm, CEO of QinetiQ, and Prof. Paul Wiles, chief scientific advisor to the Home Office.

Joining them on the VIP panel for discussion will be Prof. Sir Keith O'Nions, director-general of research councils at the Department of Trade and Industry, and Alan Pratt, director of the Home Office Scientific Development Branch.

Please see http://industry.iop.org for the programme, full event details and online registration, or to download a copy of the booking form. The booking deadline is 2 October, but we recommend that you book as soon as possible because numbers are limited.

Places cost £60, including the drinks receptions and private dinner. Organizations that are part of the Institute's Business Partners Network may claim a quota of complimentary places.

KIBB chairman Sir Gareth Roberts and the rest of the KIBB team look forward to seeing you.

For all enquiries about this KIBB event, please contact Williamina Lazaro:

Tel: 020 7470 4849. E-mail industry@iop.org.

Mobile Careers Interview with Vishanti Lall

4 January 2006
The Tickled Trout Hotel, near Preston

An opportunity for branch members to have one-on-one careers advice.

Bookings will be taken nearer the time.

Prefer another venue or maybe the 5th? If so, contact John Bradshaw:

E-mail: john.bradshaw@iop.org.

Worms invade *LANBRIA* from a parallel universe

This newsletter delights in the name *LANBRIA*, chosen as a contraction of Lancashire and Cumbria. However, it is very easy to mistype the letters giving rise to other names.

"Lambria" is one example, and, like *LANBRIA*, is a contraction of Lancashire and Cumbria. Curiously enough, a search on the Web reveals that Lambria is a fantasy land, part of something called the Morphyry World. I am not sure who invented it, but it is interesting to think that perhaps a parallel world of physics exists out there in cyberspace.

Of course, Lambria could evoke memories of the young woolly grazing mammals, often to be seen in our two counties. Perhaps someone artistic could produce a cartoon for us: "Would Sir like mint sauce with his branch newsletter today?"

Other worldly: is LANBRIA *at risk?*

Another variant is Lumbria, and a further Web search reveals that *The Marquis of Lumbria* is a novel by Miguel De Unamuno, so Lumbria is another parallel world.

Allowing a bit of licence, Barbara Tigar pointed out that there is a species of earthworm called *Lumbricus terrestris*. A search on the Web reveals a worm database: LumbriBASE.

So we even have a strong worm connection. Perhaps these parallel worlds could be reached by a wormhole!

Solid iron surface for the Sun?

While reading a news article on *physicsweb* recently, I saw an advert for an amateur website, www.thesurfaceofthesun.com. Curious, I investigated it and found the remarkable claim from Michael Mozina that the Sun has a solid iron surface! He has come to this conclusion by studying raw images from various satellites, such as SOHO.

He claims that they show more detail than the processed images that the professional researchers are using. The solid-surface theory comes from seeing features on the solar disc that all rotate at the same rate.

I have not looked in detail at this, but I suspect that the raw images have artefacts in them that the experts have removed to create usable images. It would not be surprising if these artefacts appeared to shift across the solar disc together, giving the illusion that it has a solid surface.

The deadline for your contributions to the November issue of this newsletter is:

Friday 7 October 2005

Please e-mail materials to chris.bowdery@physics.org

The branch newsletters are published by Institute of Physics Publishing, Dirac House, Temple Back, Bristol BS1 6BE, UK.

Printed by Warners (Midlands) plc, Bourne, Lincolnshire, UK.

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