

# LANBRIA

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

Issue 24 November 2006

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

## Interview: Mike Holmes

Michael Holmes was elected branch chair in June, and has very kindly given an e-interview with LANBRIA. See p2 for an e-interview with Steve Bailey, branch secretary, carpenter and nanoscale physicist!

### LANBRIA: What is your background?

Mike: I was born in Hull and was encouraged to study physics by an inspirational school teacher, although when I did my GCEs it was my worst grade! (Since I was good at physics, I didn't revise it so much as French, which I hated.) I went to Leeds University to study physics, and was all set to do a PhD in astronomy when I became interested in biophysics and the application of physics to biological and chemical problems. So for three years I worked on the structure and function of copper containing proteins extracted from pig's blood, horseradish peelings and bacteria using NMR (nuclear magnetic resonance) relaxation methods. The trips to the slaughterhouse for the blood were a particularly interesting part of the project! So far I have not regretted the change of direction.

### When did you arrive at UCLan? What have you done there?

I came to UCLan, or Preston Poly as it then was, in 1973 as a very junior lecturer. In my time I have taught most aspects of physics, some maths and some IT. Slowly I also built up my research, which had had to change from biological systems to chemical for practical reasons. By 1981 I was working on the liquid-crystal phases of surfactant-water mixtures and was lucky

enough to get a one-year Royal Society European Fellowship which took me to the University of Paris-Sud in Orsay, France. Having a year to concentrate on research was idyllic, particularly since it was a world centre for this type of work. I learned scattering techniques, I learned not to hate French, and I learned that I really liked French food! Returning to the UK, I got involved in a number of projects in both teaching and research. Since I could now speak French passably well, I was involved in setting up the first Erasmus link we had with Montpellier in France. This was closely followed by other links, with Germany, Spain and Sweden. In 1994 I was appointed as head of department.

### How did you get involved with the Institute of Physics?

I became a member when I graduated and have remained so ever since. I agreed to stand for the branch committee a few years ago when I had my arm twisted up behind my back, which I believe is the normal method for nomination!

### What are the best and worst parts of being head of physics?

As with most jobs, the best part of being a head of physics is when you celebrate success; when students graduate successfully or when we have research successes. Being a head of department is difficult because of the increasing amount of bureaucracy, league tables and performance indicators, etc. Being a head of physics is even harder, because almost by definition your

department will make a loss and will have great difficulty in recruiting students. We have not avoided making a loss, but we have been successful in recruiting students from unusual sources. We now compete head-to-head with the Open University in offering a BSc in astronomy entirely by distance learning, with over 300 students per year. We have also established a successful franchise of our physics degree to the Beijing Institute of Technology.

### What do you do to relax?

There is not much time to relax, but I have been going to the gym regularly for the last 20 years, which I find necessary to stay sane. Three years ago my wife and I took up ballroom dancing, which can be both physically and mentally demanding. So far the rock 'n' roll is fine and the waltz passable, but the tango is an uphill struggle!

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## The editor's lines on the leaves

This month *LANBRIA* brings you details of forthcoming lectures; e-interviews with Mike Holmes and Steve Bailey; a report on the upcoming Fabulous Physics schools outreach day; and news about an exciting new centre for astronomy education.

Sometime before the end of the year the Galactic Gig team will be giving more performances. See the notice on p4 if you'd like to get involved.

Amazingly, I have recently been awarded the 2006 Branches Prize by the chairs of branches of the Institute! This has come as a complete surprise. The citation apparently mentions "outstanding contributions across the breadth of branch activities and in particular... in revitalising the branch and creating the *LANBRIA* newsletter... and Galactic Gig".

The presentation will be in January in London, so I expect there will be more information with photos in the next issue.

Is it too early to wish you a Merry Christmas and a Happy New Year? Maybe, but as this is the last issue of 2006 I will have to give you these wishes now.

**Chris Bowdery, editor**

# Astronomy centre opens

We have a new astronomy centre in Lancashire. Funded by the Lawrence House Trust and hosted by historic Rossall School in Fleetwood, it was officially opened by Sir Francis Graham Smith (former Astronomer Royal) on Tuesday 26 September. I was fortunate enough to be present.

The Lawrence House Astronomy and Space Science Centre is the first centre dedicated to astronomy education to open in the UK and is the brainchild of Dr Nick Lister. He has for some time been enthusiastically promoting the idea of a centre to share his passion for astronomy with schoolchildren and the general public. Now it is up and running. The centre has a planetarium, as well as a telescope and a lecture room.

Public lectures are on offer, but at a charge of £6. Since previous lectures have sold out very quickly, it seems that the price does not put people off! See <http://www.rossall.co.uk/astronomy.html>.

Congratulations to Nick Lister, as well as the centre's marketing manager, Alex O'Toole.

**Chris Bowdery**



PR2

*Sir Francis Graham Smith, far left, examines the unique Victorian telescope in the Lawrence House Astronomy & Space Science Centre Observatory. Watching are Lord and Lady Clitheroe, whose ancestors donated the telescope to Rossall School in the late 19th century, and Dr Nick Lister, Lawrence House principal.*

## E-interview: Steve Bailey, branch secretary

### **LANBRIA: What is your background? What did you do before studying physics at Lancaster?**

Steve: I started physics late – very late – at 43 years old! After leaving sixth form I went to Spain to run my brother's restaurant and ice-cream business, and spent six years there. I returned to marry and trained to become a self-employed carpenter, mainly converting barns with my own business but also doing some external contracting work. At the age of 43 I had an "argument" with a JCB and ended up lying in hospital thinking about what to do next, as it looked as though I would not be mobile enough to carry on building.

I had always been interested in physics, and in a mercenary way decided that the money might not be bad if I could gain a degree. Lancaster was the

obvious choice as I had a family to consider and would not want to live on campus. Luckily my wife Rita supported me, both with the money and the idea.

More luck followed. The staff at Lancaster University were very good. I liked physics and the studying and found computational physics exciting. Then Prof. Colin Lambert offered me the chance to do a PhD, which led on to doing research at the cutting edge of nanotechnology, and I have got to say I am very content with my lot.

### **What job are you doing now?**

We are aiding the development of new molecular devices by applying high-powered computing to develop realistic models to calculate the electronic properties of single molecules. Such nanoscale

systems are referred to as nanoelectromechanical systems (NEMS) and are a stage on from the sub-millimetre microelectromechanical systems (MEMS).

### **Tell us about the high-performance computer purchase.**

This is a very exciting development that encompasses Lancaster University, Daresbury Labs, Manchester University and Liverpool University – as the North West Grid. This gives us an enormous computing ability and allows us to carry out calculations few other research groups can do. The recent procurements were:

- Daresbury – 96 nodes
  - Lancaster – 48 nodes
  - Liverpool – 44 nodes
  - Manchester – 25 nodes
- Each node has four

processors (actually two physical chips, each of which is dual core). So you're looking at 852 processors.

### **What are the best and worst parts of being branch secretary?**

The best parts are that I like to be busy, and the contact with so many different people – not all of whom are physicists – is good, not least because there is never any real pressure. Being able to talk to some of the best minds around is a bonus that few people experience.

The worst part is having to produce minutes of meetings.

### **What do you do to relax?**

Play chess, socialise at the weekend, learn to play the guitar, do the odd building job, read the latest physics papers and do some calculations.

# Scientists gather in Cumbria to study planned particle collider

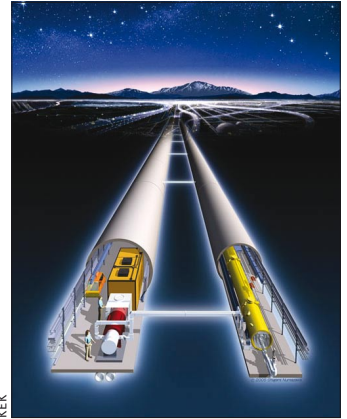
Some 47 physicists and engineers from nine countries assembled in Ambleside, Cumbria, in September to learn about the research challenges and opportunities that could open up if a proposed giant particle collider comes on-stream in 2016.

The Linear Collider Physics School 2006, organised by physicists from Lancaster University, took place at St Martin's College, Ambleside on 15–19 September. It featured lectures on the design of the collider, the experimental apparatus and today's best ideas on what will need to be measured in order to understand precisely how the universe works. "This school gave a detailed overview of the underlying theory, the physics potential, and detector and accelerator aspects. It brought together experts from the three different fields of research and we are very pleased that participants attended from Asia, North America and Europe," said the chairman of the organising committee, André Sopczak from Lancaster University.

Particle physicists gain vital insights by concentrating energy into incredibly small volumes and studying what is produced. This is done by first accelerating, and then colliding, electrons (the particles of electricity found orbiting every atom). Finally, the newly created



Chris Bowdery



KEK



Chris Bowdery



Tim Wooliscroft

Above left: the delegates of the Linear Collider Physics School. Above right: a schematic of the proposed International Linear Collider. Below: participants out walking after lectures.

particles that emerge from the collision are detected and studied in detail.

The new machine planned for 2016 resembles two enormous precision cannons, each 10 km in length, pointing

at each other. Known as the International Linear Collider (ILC), this gigantic facility (which is to be financed by governments around the world) will take advantage of the latest engineering technology, such as

superconducting radiofrequency accelerator cavities.

The Ambleside School was not all work. Participants had time on the Sunday afternoon to hike around the hills and later enjoy a hot drink and cakes in town.

**The deadline for your contributions to the February 2007 issue of this newsletter is:**

**Friday 5 January 2006**

Please e-mail your materials to [chris.bowdery@physics.org](mailto:chris.bowdery@physics.org)

## Free download: Fortran 95 for personal use!

In issue 2 of *LANBRIA*, we reported on Salford Software's Fortran. The latest version of its Fortran 95 compiler is now available as a free download for personal use, from a partner company called Silverfrost (<http://www.silverfrost.com>). It comes with a new version of Plato, Salford's interactive development environment.

This version no longer allows the user to enter link libraries in an easy way. However, these can be specified using LIBRARY directives in the source files, which is perfectly satisfactory.

If you wish to use my graphics library, EZPLOT, please contact me using the details on p1. Full documentation is available.

**Chris Bowdery**

# So will the lights go out?

On Wednesday 11 October, Prof. Max Irvine (chair of the Manchester branch) gave our members a very impressive overview of the energy issues that this country faces over the next 10 to 20 years. Max has been involved with an energy review panel and so is well informed about the facts. Apparently the biggest concern is transport, which is the largest energy user. The only realistic replacement for oil in the UK is hydrogen, and this is still a long way from being a commercially viable fuel.

The situation regarding electricity generation is dominated by the imminent closure of half of our coal power stations (due to emissions regulations and global warming concerns) and most of our nuclear power stations (which are coming to the ends of their lives). The government seems to favour a new generation of nuclear power stations, but they are only suited to providing a constant amount of electricity. (Any excess electricity could be exported or used to produce hydrogen from water.)



British Energy

*Can we afford to waste useful heat with cooling towers?*

It is possible that coal could be processed to produce hydrogen for transport use or for burning to make electricity. The carbon dioxide gas could be pumped into oil wells for long-term storage. This all sounds ideal and trials are under way.

Gas burning is going to continue being a major source of our electricity, but we will have to import it in increasing quantities as the years go by. In the long term this will conflict with our need to reduce carbon dioxide emissions.

Wind power does not appear to offer a solution because it is intermittent, and it is costly

to provide grid connections at the most windy locations. The current surge of new wind farms is only economical because of government subsidies. Maybe wave power and small-scale photovoltaic solar power will help on the renewable front.

Reducing energy wastage in homes and power stations would be a big help. Above all, the government and the power industry need to stop saying that it is not their problem.

Thankfully there are people like Prof. Irvine who are doing their bit to help keep the lights on, as well as keeping us informed.

**Chris Bowdery**

## Fabulous day

SETPPOINT Lancashire, in association with the branch, is organising a schools' event at the Leyland Civic Centre on Wednesday 30 November. It is to be called Fabulous Physics, and will need help from physics students in our region. If you can help, please contact me (see p1 for details) or Barbara Tigar (barbara.tigar@lebp.co.uk). Some assistance with travel costs will be available.

Fabulous Physics will include tried-and-tested, fun demonstrations plus new ones – using the resource box provided by the Institute for physics departments. This event is funded by a Physics in Society grant from the Institute.

**Chris Bowdery, outreach coordinator**

## VOLUNTEERS WANTED

### Could you help with our Galactic Gig schools roadshow?

We need actors and people able to help backstage. We plan to give five performances before the end of this year, and further ones in 2007.

So if you're interested and have time during the school day or in the evenings, please contact Bob Jones (robert.jones@lancaster.ac.uk) or Chris Bowdery (details on p1).

## BRANCH EVENTS

### Wednesday 15 November

#### Forensic stamp collecting

Robin Hoole, Forensic Science, UCLan

6.00 p.m., M49 Maudland Building, UCLan, Preston

### Thursday 7 December

#### Soft matter *in silico*

Dr Andrei Zvelindovsky, UCLan

6.00 p.m., M49 Maudland Building, UCLan, Preston

### Wednesday 13 December

#### Exploration of Mars

Royal Institution Christmas Lecture

Prof. Colin Pillinger, Open University

7.30 p.m., Darwin Lecture Theatre, UCLan. Ticket only.

### Wednesday 17 January 2007

#### Listening for cosmic ray neutrinos

Prof. Terry Sloan, Lancaster University (retired)

6.00 p.m., Cavendish Colloquium Room, Lancaster University

### Wednesday 21 February

#### Pet imaging

Joint meeting with the Institute of Technology and Engineering

Dr Tony Hughes, Department of Nuclear Medicine, Royal Preston Hospital

6.00 p.m., M49 Maudland Building, UCLan, Preston

### Wednesday 21 March

#### Diamond light source

Simon Alcock, Diamond Light Source Ltd

6.00 p.m., Cavendish Colloquium Room, Lancaster University

**Got an idea for a branch event?**

**If so, let us know**

**E-mail: s.bailey@lancs.ac.uk**

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