CCLRC Facilities Times

CCLRC

Facts

Winter 2006 Issue 2

Electron excitement

The next generation of light sources has come a step closer with a momentous milestone for the 4GLS project; the first photoemission of electrons from the photoinjector gun has been recorded on ERLP.

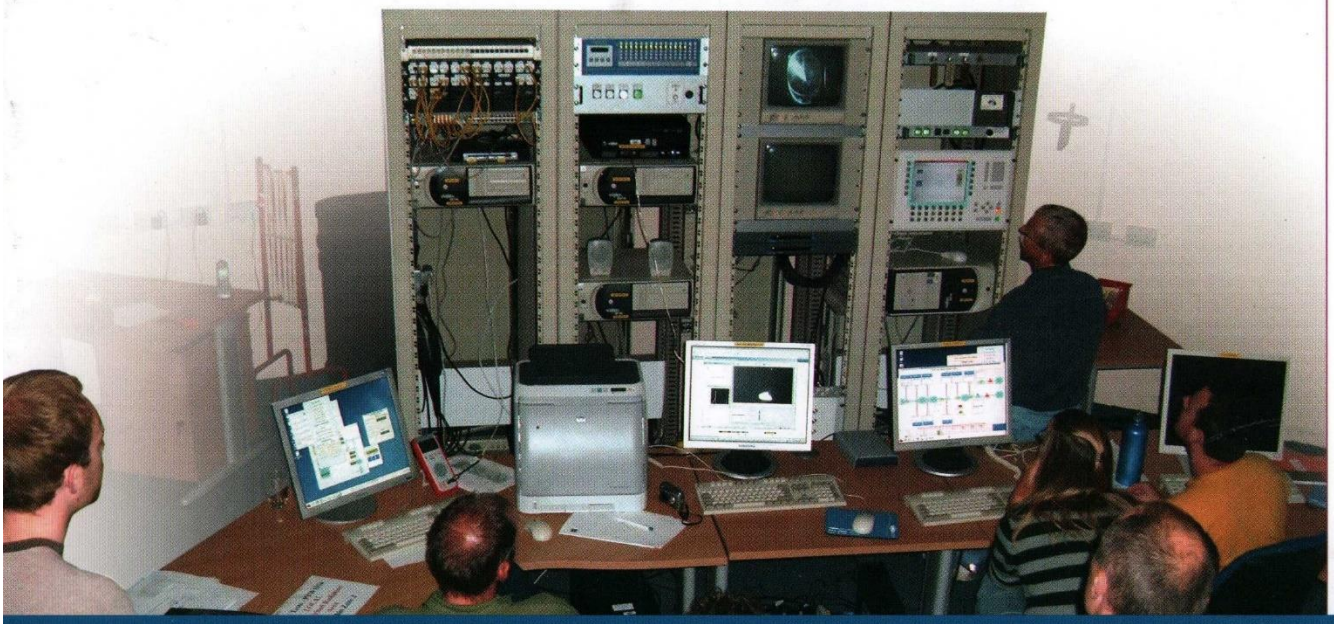
Although Diamond (a third generation light source) is still being commissioned, a multi-disciplinary team from FBU together with colleagues from Jefferson Lab is already considering what will come next. The Fourth Generation Light Source (4GLS) project will combine energy recovery linac and free electron laser (FEL) technologies to deliver synchrotron radiation and FEL radiation covering the terahertz to soft X-ray range.

The first step towards a successful bid which can turn a project from design to reality is to demonstrate that the technology works. In the early hours of 16 August, the ERLP commissioning team did just that.

Operating at just a fraction of its potential power, electrons were detected by the photoinjector gun's diagnostics – a satisfying moment for the Daresbury team which built the cathode and diagnostic screens.

The ERLP team celebrated with colleagues from Jefferson Lab who had been on-hand to help with the final stages of commissioning the cathode which was built to their design.

This is just one of many anticipated milestones for ERLP and the 4GLS project. Keep an eye on Facts for the latest news!



→ *The ERLP team anxiously waits for electrons to be detected.*

Movers and shakers

1 **Bill David (ISIS)** has received the 2006 Award of the European Society for Applied Physical Chemistry. The award is for his development of structural techniques and his long-term impact on structural studies of molecular materials using powder diffraction techniques. Of particular note is his work on structural phase transformations in C_{60} along with investigations of polymorphism in pharmaceutical materials and the developments of techniques for the structure solution of molecular materials from powder diffraction data.

2 **Richard Nelmes (ISIS)** has been awarded the Institute of Physics' Duddell Medal for 'pioneering new techniques and instrumentation that have transformed high-pressure structural science'. Richard is based in ISIS but is also a long-standing user of the SRS.

3 **Jim Clarke** and 4 **Neil Marks (ASTeC)** have been appointed visiting professors at Liverpool University. Jim is the Magnetics and Radiation Sources Group Leader with a major role on both 4GLS and the International Linear Collider. Neil is a world expert on magnets and also leads the Cockcroft Institute's educational programme. Jim and Neil both led teams during the design phase for Diamond.

And finally, FBU welcomes the 2006 intake of graduates. We'll let them introduce themselves:

5 **Ben Warnes – Engineer, ISIS**
Having graduated from the University of Surrey with a Masters in Mechanical Engineering, this is my first position as a qualified engineer. I am working in the Project Engineering Department (PEG) in the Instruments section for TS-2. Being a football fanatic, I have signed up to play for the PEG team – my debut lasted only two minutes when I was forced to stop playing after nearly being knocked out!

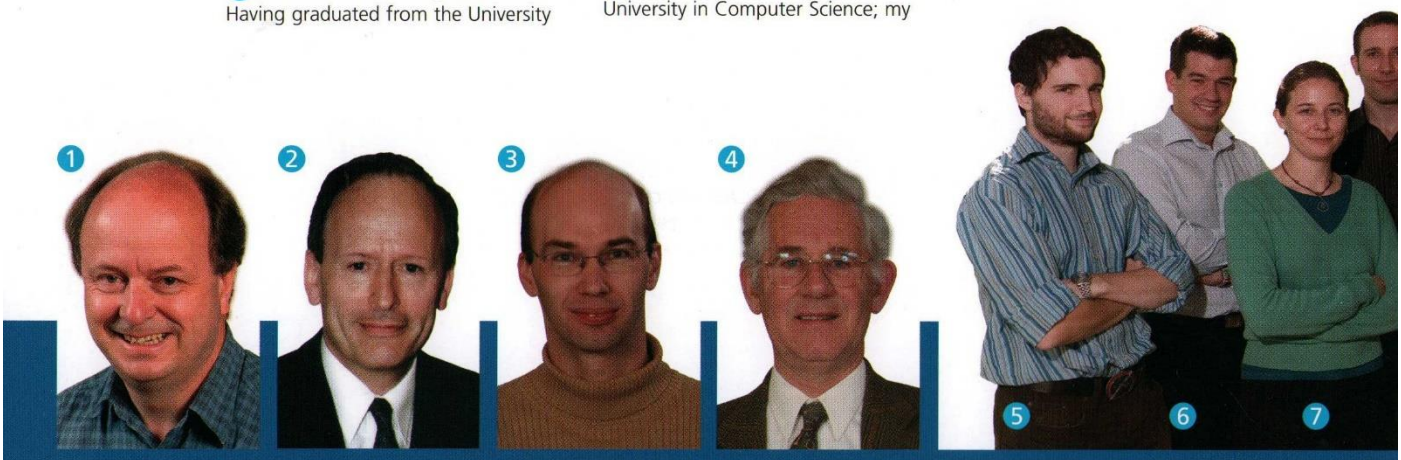
6 **Peter Barnes – Diagnostics Support Engineer, ISIS**
Before starting work at RAL I spent four years at Southampton University doing a Masters in Electrical Engineering. I now work as a Diagnostics Support Engineer in the ISIS Diagnostics Department developing and maintaining the equipment used to monitor ISIS. For the past two summers I have spent a month in Kenya as a leader on an expedition doing a variety of activities including community work, climbing Mount Kenya and white water rafting.

7 **Steph Tomlinson – Engineer, ISIS**
I went to Imperial College London where I studied Mechanical Engineering. I now work in the Project Engineering Group of ISIS on the detectors. I'm looking forward to moving my horse nearer to work so that we can explore the Ridgeway together.

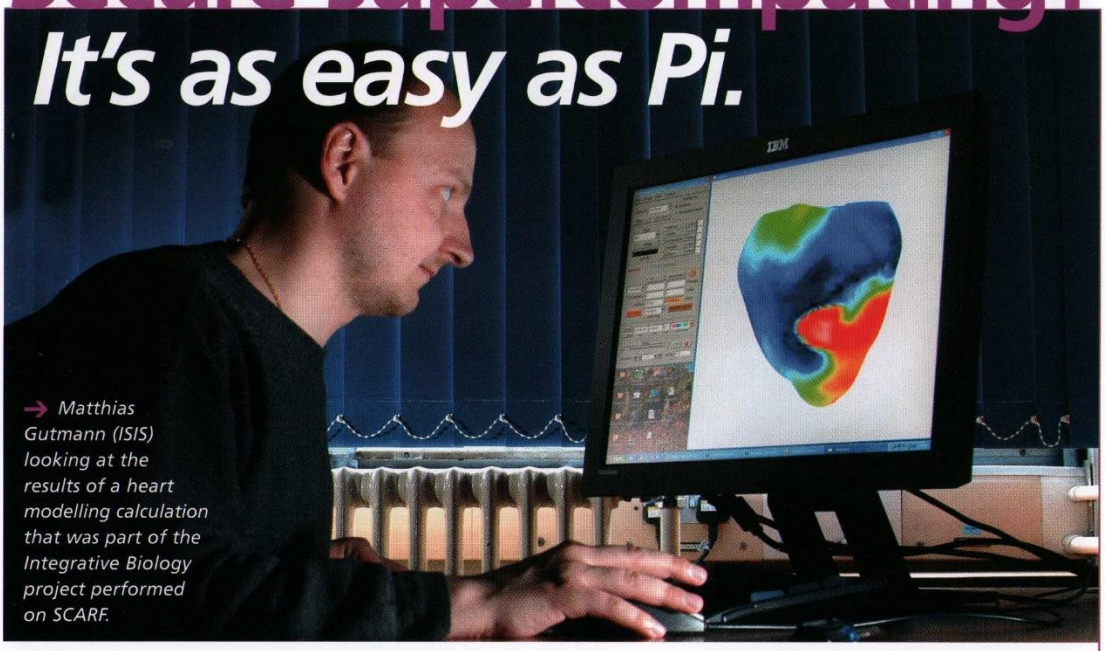
8 **John Taylor – Imaging and Visualisation Developer, e-Science**
I recently graduated from Birmingham University in Computer Science; my final year project was Computational Astronomy which gave me a taste for science research. I now work in the e-Science visualisation group; I'm currently working on cancer tumour modelling. Outside work my main interest is martial arts; I'm a qualified Wing Chun Kung Fu instructor and will hopefully get a class together.

9 **Mina Maniopoulou – Applications Engineer, e-Science**
My first degree was in Physics at the Aristotle University of Thessaloniki, Greece and subsequently I went to Southampton to do my PhD in the Applied Maths Department in the field of Relativistic Astrophysics. I have recently joined the High Performance Computing Services Group in e-Science. At the moment I am installing software applications to the clusters which are mainly used by bioinformatics scientists.

10 **Rob Williamson – Accelerator Physicist, ISIS**
I studied for a Masters in Physics at Trinity College, Oxford University, graduating in 2005. For the past year I've been working as a full-time volunteer youth worker for the Diocese of St Albans organising youth events and residential weekends. I now work in the ISIS Synchrotron Group as an accelerator physicist, helping to make the particle accelerator more efficient in the hope of producing more neutrons for experiments.



Secure supercomputing? It's as easy as Pi.



→ *Matthias Gutmann (ISIS) looking at the results of a heart modelling calculation that was part of the Integrative Biology project performed on SCARF.*

Imagine being able to run powerful scientific applications on a high performance computer cluster without having to log in, register or even install any software. The e-Science SCARF cluster is championing the deployment of easy to use Grid software and the integration of seamless, invisible Grid security. Offering the flexibility of running applications directly from your desktop, or the ability to log in without passwords, SCARF is already being used by over 70 users, from eight CCLRC departments.

SCARF is a 256 processor, 800 gigaflop computer cluster, with one terabyte of main memory, over 20 terabytes of data storage space and high-performance networks. Over the last six months, CCLRC scientists have clocked up over $^{3}/_{4}$ million CPU hours – equivalent to running a powerful, modern PC non-stop for 85 years!

Single sign-on allows users to access resources from their desktop with just a single login. By managing account details centrally, and integrating with the facility user databases, it removes the need to manage multiple identities and is inherently more secure than traditional password-based systems.

The e-Science Visualisation group works with users to adapt existing programs for SCARF and create bespoke user interfaces. These interfaces enable the programs to be run as if on the user's desktop PC, but with the speed of a state-of-the-art cluster. For example, Matthias Gutmann (ISIS) reviewed another eScience project (Integrative Biology) to see whether a similar approach would suit his application. He is now processing his single crystal diffractometer data on SCARF, and achieving a five fold improvement in the speed of his data analysis.

Work is underway to integrate single-sign on into more applications and to extend the framework to include web-based application portals. It will soon be possible to access a whole suite of powerful scientific software seamlessly from the lab intranet, safe in the knowledge that your data and results are protected by the strongest security available.

For further information, please contact Duncan Tooke (SCARF), Jens Jensen (Single Sign-on) or Lakshmi Sastry (Visualisation).

11 Andy Newton - Software Developer, eScience

I've just graduated from Southampton University with an MEng in Software Engineering. I'm now working in the Grid Deployment Group in eScience; at the moment I'm helping to rewrite the Grid Operations Centre Database system (GOCDB), a website that provides information about resources on the grid. At uni I was a member of the film society, where I trained as a projectionist (fun but tiring!)

The value of visits

FBU departments regularly host school visits, and many of you give up your time to show students around your laboratories and experimental areas. Sometimes it is difficult to gauge whether this is time well spent because getting meaningful feedback from teenagers can be a challenge!

Back in March, ISIS, CLF and TBU hosted a visit from St Olave's School in Orpington, Kent, and the teacher asked her A' level students to provide feedback on their visit. Here is an extract from one student who is now studying physics at Imperial:

"The Rutherford Appleton Laboratory really did provide an insight into the type, and sheer scale, of equipment researchers are using in the modern day, as well as what they are trying to discover. *[The visit]* was particularly relevant to anyone thinking of doing physics, or any type of scientific research or engineering, which to be honest probably accounts for half the year group!"

And some comments from the teacher:

"*[The visit made]* such a difference to those I took last year. Three were planning to read physics and have carried on further inspired, one has changed from computer science to physics and the two Y12s are going on to apply for physics courses. We have got 45 students doing A2 physics *[this year]* and I would very much like to do the trip again."

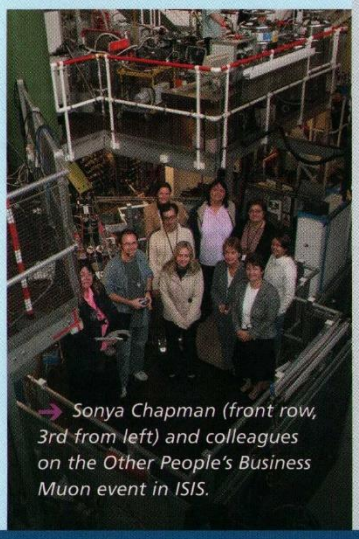
Other People's Business hits 100!

More than 100 members of FBU staff have now signed up for events in the Other People's Business programme. The events are intended for non-technical staff in the Resources team but they are also proving very popular with scientists and engineers who are keen to see other parts of FBU.

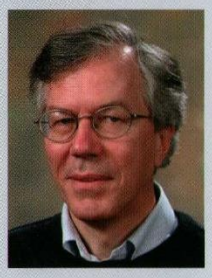
The 100th person to sign up was Sonya Chapman (HR) who took part in her first OPB event just four days after joining CCLRC! Philip King hosted an ISIS muon event where Sonya and colleagues from around FBU enjoyed a quick overview of ISIS followed by a tour of the ISIS muon facility. Feedback from the event was excellent. The next ISIS muon event is already full but we hope to arrange more dates in 2007 when ISIS re-opens after its maintenance period.

The OPB programme at DL is also underway with new dates being added all the time. Remember that wherever you work, you are welcome to attend events at both sites!

To register for OPB, go to **http://fbu.clrc.ac.uk/index.htm**



Sonya Chapman (front row, 3rd from left) and colleagues on the Other People's Business Muon event in ISIS.



Damian Mac Randal
1951-2006

It was with immense sadness that we heard of the death of Damian Mac Randal on 12 October, after a short illness. Damian worked in the e-Science Centre where he has been a leading figure in Grid systems. He was the chief architect of the Integrative Biology project and heavily involved in the new XtreemOS project.

From Strathclyde University, Damian joined the Informatics Department at RAL in May 1985, initially modelling the energy flow in buildings. Since then he worked on a huge range of computing projects, from business process modelling, via the Web, to the Grid. His in-depth background in software design meant he became a system architect par excellence.

On a personal level, Damian was not just a technologist. He had an excellent insight into the major issues of the day. He enjoyed good food and wine, and had a taste for malt whisky! He was amusing, unflappable in a crisis, and an excellent team member, always ready to listen and to give sound advice.

Some 20 current and former colleagues joined a packed congregation at St Mary's Catholic Church, East Hendred on 21 October for a beautiful memorial service. Juan Bicarregui gave an appreciation of Damian's career and read out messages from his friends across the world. A private green burial followed two days later.

Our sympathies to his wife Caryl and their family.

Brian Matthews

If you have a story for FACTS please contact Jane Binks extn. 3235 or Steph Hills extn. 5398.