

Front cover image: Student at Big Band Fair 2011

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ISSUE 6 - May 2011

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Science and Technology
Facilities Council

Exploring & Understanding Science

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Science & Technology
Facilities Council

New project will promote equality and diversity in HE research careers

A new project 'Every researcher counts' led by Vitae and commissioned by the Higher Education Funding Council for England (HEFCE) is set to improve equality and diversity for research staff within the HE sector. Many of the challenges relating to equality and diversity are systemic within the HE sector, particularly for research staff. These can create a difficult environment for researchers, but particularly disadvantages some groups including women, disabled and black and minority ethnic researchers.

The project is aiming to develop a network of at least 50 individuals to act as 'equality and diversity champions' from over 50 different HEIs across the UK. Vitae is currently seeking nominations from equality and diversity specialists, widening participation staff, Human Resources staff,

academics, HEI senior managers or principal investigators (PIs). Champions will be expected to raise awareness of the researcher equality and diversity agenda within HEIs, use and distribute resources to PIs and staff developers, attend regional 'train-the-trainer' events, and provide feedback to the project team.

The project is an important part of the HEFCE implementation strategy for the *Concordat to Support the Career Development of Researchers*.

More information about the 'Every researcher counts', its wider objectives and outcomes is available on the Vitae website www.vitae.ac.uk For ECU guidance to HEIs regarding equality and diversity please visit: www.ecu.ac.uk

The first science paper from the Research Complex at Harwell

Research by scientists in the Laser for Science Facility, based at the Research Complex at Harwell (RcaH), and colleagues at the University of Bristol has shown how the energy generated by chemical reactions in solution is dissipated to the environment in less than a billionth of a second.

Using the unique capabilities of STFC's ULTRA laser system, scientists from the University of Bristol have been able to watch a chemical reaction happening in solution with more detail than ever before. This could lead to improved drug design for medical therapies and catalysts for industrial processing, and pave the

way for further applications in bio- and atmospheric chemistry.

The superfast ULTRA laser system was able to monitor the transfer of energy from the reaction product to the surrounding solvent by following changes in chemical bonds much faster than was possible previously. The research is featured on the cover of the journal Science.

Science Paper. <http://www.sciencemag.org/content/331/6023.cover-expansion>



Getting ready for the world's biggest ever telescope

Plans for the world's biggest telescope - the Square Kilometre Array (SKA) - have advanced significantly with a decision to locate the project office at Jodrell Bank Observatory near Manchester.

The SKA is a €1.5 billion global science project to build the world's largest and most sensitive radio telescope. The SKA will be capable of answering some of the most fundamental questions about the Universe.

STFC's Professor John Womersley, chair of the Founding Board, said: "Given the current economic environment, it is reassuring that so many partners have recognised the importance of supporting the SKA."

Our partners have taken this step not only because of the inspirational nature of the discoveries that the SKA will make, but also because of the economic benefits that international megascience projects can bring to participating countries."

The SKA project will drive technology development in antennas, signal transport, signal processing, and software and computing. Spin off innovations in these areas will benefit other systems that process large volumes of data. The design, construction and operation of the SKA has the potential to impact skills development in science, engineering and in associated industries, not only in the host countries but in all project partners.



Artist's impression of the SKA dishes
(Credit: SPDO / TDP / DRAO / Swinburne
Astronomy Productions)

£11M investment destined to make air travel safer

Universities and Science Minister David Willetts announced £11M funding to build a new testing facility that will make electronics systems less susceptible to the potentially catastrophic effects of cosmic neutrons, during a visit to STFC's Rutherford Appleton Laboratory.

Funding from the Large Facilities Capital Fund will be used to build a new beamline on the world leading ISIS neutron source.

Called 'Chipir', the beamline will be used to simulate the effects of cosmic radiation which can cause the failure of microchips in sensitive electronics systems. Problems can vary from wiping a device's memory to the complete destruction of the electronics - a serious issue at altitude. In a single hour, ISIS will be able to replicate the effects of 100 years of flying time.

David Willetts, Minister
for Science at STFC's ISIS
facility



Technology Breakthrough

Back in issue 2 we reported on the EMMA accelerator - A brand new technology that promises a range of applications from treating cancer to powering safer nuclear reactors. EMMA is located at STFC's Daresbury Laboratory. EMMA is a proof of principle prototype for a brand new type of particle accelerator, designed by an international team of scientists, including a number of the UK's top universities and institutes. A major part of the BASROC CONFORM project, EMMA is funded by the Research Councils UK (RCUK) Basic Technology programme.

EMMA has now achieved its most significant milestone

yet. For the first time, an electron beam was steered around the circumference of EMMA's ring and then successfully accelerated to 18 MeV. This momentous milestone, and a world first, not only confirms that the design of the most technically demanding aspects of EMMA is sound, it also demonstrates the feasibility of EMMA's technology, which now paves the way for the construction of a whole new generation of more powerful, yet more compact and economical accelerators.

<http://www.conform.ac.uk>

ALMA up date

On 30 March the ALMA Observatory, an array of millimetre wave telescopes being constructed in the Atacama Desert of Chile, issued its first Call for Proposals.

ALMA now has 16 of its planned 50 antennas available and is ready for early scientific exploitation. As the world's largest millimetre wave interferometer ALMA is a very powerful and complex instrument; to make it as easy as possible for astronomers to plan and make their observations, a special ALMA Observing Tool has been developed by a team led by Dr Alan Bridger of the UK Astronomy Technology Centre (UK ATC). The software, which is the Astronomers' main interface to ALMA, has been in development since 2002 and is already in use for commissioning of the facility. The tool is the first of its kind for an interferometer and its 500,000 lines of code were written by a team including members from Edinburgh and Mitaka (Tokyo), the team interacts with other ALMA developers in 12 sites across the world.

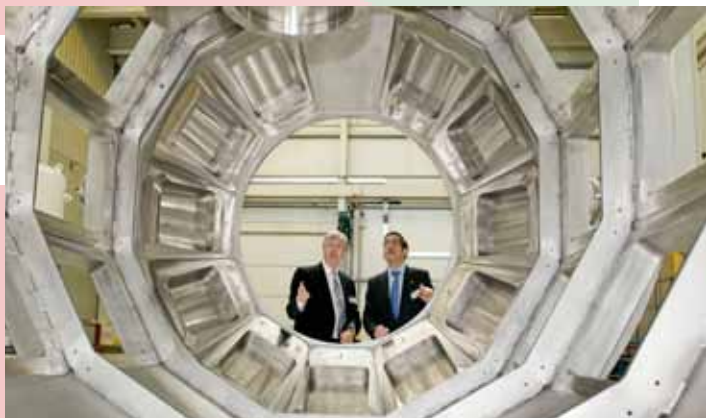
The UK ATC software group is part of a large collaboration, which includes the European Southern Observatory and the National Astronomical Observatory of Japan. Alan and many of his team have years of experience developing integrated observation preparation, execution and analysis software, examples of which were deployed on the JCMT and UKIRT telescopes in Hawaii during 1998 and 1999. Packages like this make planning and executing observations very efficient and flexible, so it is possible to match observing plans to atmospheric conditions and maximise the scientific return from these powerful facilities.

For more information visit
www.almaobservatory.org
www.ukatc.ac.uk

The Atacama Large Millimeter Array (ALMA)



Basque President marks success of international collaboration at ISIS



Patxi Lopez, President of the Basque Country and Dr Andrew Taylor, ISIS Director, with the steel vacuum tank manufactured in the Basque Country for installation at the ISIS Neutron Source.

The scientific and technical collaboration between STFC's ISIS neutron source and the Basque Country has been celebrated during a visit by the region's President Patxi Lopez.

International collaborations have enabled ISIS to continually push the boundaries of accelerator technology and neutron instrumentation to deliver innovative and high-impact science. Exchanging

technological expertise has enabled Basque companies to manufacture high-tech equipment for ISIS and other similar projects.

Dr Andrew Taylor, Director, ISIS, said: "For more than twenty years, ISIS has been a world leader, a position we maintain because of the excellence of our staff and of our international partnerships."

High temperature optical sensors



Wave-Phire™ Sensor

STFC's spin out company OxSensis is developing fibre optical sensors for hostile environments, including extremely high temperatures and pressures. They will be used in ultra high temperature situations such as gas turbines for power generation, aero-engines industrial processes and other hostile environments such as poisonous gas detection and petrochemical processes.

This is contributing to the development of a range of internal combustion engines including reciprocating engines and gas turbines.

Internal combustion engine development continues to address a number of challenges including, for example, the management of stable lean burn combustion at temperatures up to 1000°C across wide operating ranges, and the use of varying fuel compositions. The drive to reduce fuel burn is relentless and early thermodynamic wins are now giving way to harder and more complex steps which are needed to ensure continued progress. Sophisticated control strategies are emerging, which require reliable and 'actionable' information in order to succeed.

Initially sensors were trialed in relevant test rigs constructed within OxSensis laboratory facilities. Such rigs are designed to recreate aspects of the harsh engine environment such as the high temperatures, pressures,

vibration levels and acoustic effects, however, none can truly combine all of these aspects to fully recreate the real-life environment.

After completion of these initial laboratory based demonstrations, the systems were deployed in full engine operation for land-based tests on smaller aero engines. A helicopter engine offered the first test berth, followed by a turbojet engine and other land-based aero engine tests, some of which are ongoing. A total of 50,000 combined running hours have now been achieved with five sensors at the Didcot B Power station.

OxSensis is extending its R&D experience into a number of reciprocating engine test environments during 2011. There are two main engine areas for evaluation; in-cylinder and exhaust manifold locations.

OxSensis will run dynamic pressure sensors in a commercial development engine, in a 1000°C location, upstream of a turbocharger. OxSensis will also trial in-cylinder sensors on another research automotive test bed.

The next stage will involve work with a number of research groups to provide them with the opportunity to evaluate multi-parameter sensing systems, first in the laboratory, and then in rigs and also engine tests.

<http://www.oxsensis.com/>

REAL TIME RACE

NOT JUST PLAYING GAMES

Based at the Daresbury Innovation Centre Real Time Race (RTR) develops three dimensional immersive video graphics, initially for the computer game market. If you look on its website www.rtr.co/ you will see how they produce a perfect video representation of the Lotus Test Track. This system, called iflex, has two advantages, it is significantly more efficient than using CGI, taking a fraction of the time of conventional means and it produces quality images with TV like reality.

The key to the patented system is sophisticated software that combines military grade GPS, high resolution laser range finding and 3D video. It is so sensitive that it can detect minor changes in the road surface, such as white marking lines.

Matching the iflex images with a physics engine enables you to design the capabilities of a virtual physics engine vehicle, be it a racing car, motorcycle or off road vehicle to replicate exactly the behaviour that you want.

This enables car manufacturers, advertising agencies and race track operators to have effective high quality simulations. Furthermore it can provide a realistic driver training aid for emergency services.

Of course the applications of this system are not restricted to racing simulations. The accuracy of the system makes it ideal for sophisticated engineering analysis. Caterpillar, the earth moving equipment manufacturer, uses the iflex system to accurately map quarry floors, including the surface, potholes and rocks and then match this with 3D videos of the suspension and tyre movements to get a better understanding of the impact of different environments on their vehicles endurance and performance.

The latest addition to RTR's range is itherm, merging iflex with a 3D thermal imaging system that enables mass surveys of cities, industrial plant, road surfaces etc

www.rtr.co/



OCF enCORE service uses STFC server cluster to power Lola Cars

The use of server clusters or 'supercomputers' to aid research and development is not new. However, accessing their processing power as a service from a third-party supplier is certainly an innovation.

In December 2010 STFC signed a unique agreement with OCF plc to make use of spare processing power from its own IBM iDataPlex server cluster. OCF will make that processing power available to UK businesses of any service through its enCORE service. Naturally OCF works very closely with STFC (including becoming a tenant at the Daresbury Science and Innovation Campus).

Phil Tiller, Senior Aerodynamicist at Lola Cars, a racing car engineering company, has been successfully using enCORE and STFC's spare power for around four weeks. He is testing Computation Fluid Dynamics (CFD) research and development cases.

Phil comments: "We have been able to use enCORE to reduce processing time for our test cases to just five hours, down from up to two days. It means we can get information out to the engineers on the track in advance of weekend racing."

He continues: "We always want a bigger computer, but the

business does not have infinite resources. Using enCORE is like a pay-as-you-go mobile, you can spend as you use it, when you use it and not at other times. It becomes a manageable running cost."

enCORE has been successfully tested by a range of companies since December, including Lola Cars, and is now available to any UK business.

www.ocf.co.uk



Dyson Racing Lola-Mazda
LMP at Long Beach
(Credit Lola/Regis Lefebure)

Using X-rays to fight tooth decay

Tooth decay is very common, and affects people of all ages. The problem is caused by sticky deposits called plaque that collect, most commonly around the gum line and the grooved surfaces of the teeth. So how could a team of researchers from the UK and Japan use the Diamond synchrotron, based at the Harwell Oxford Campus, and the Photon Factory in Tsukuba City, Japan, to solve the 3D structure of an enzyme that plays a key role in tooth decay caused by sugar?

Tooth decay can occur when a biofilm, or dental plaque as it is more commonly known, is formed by a large and sticky glucose polymer called glucan. The glucan biofilm contains bacteria and food debris and forms on the surface of the tooth. As they grow, the bacteria secrete acids which break down the tooth's hard enamel on the surface. The structural information published in the *Journal of Molecular Biology* provides a critical insight into how the enzyme 'GTF-SI', a glucansucrase, forms glucan, the sticky biofilm substance.

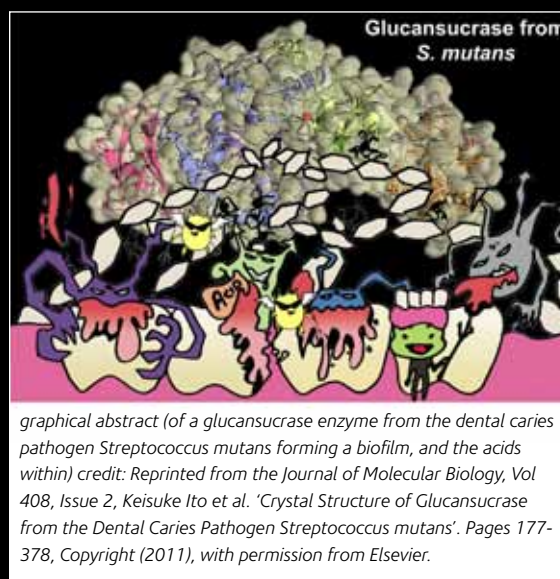
"With the use of the Diamond synchrotron and the Photon Factory we have been able to solve not only the structure of the enzyme alone but also its structure when bound to an existing inhibitor," says Sohei Ito from the Laboratory of Food Protein Engineering at the University of Shizuoka in

Japan, and lead researcher on the project. "Several inhibitors that prevent this type of enzyme forming glucan have been identified but to date there has been little structural information available. With the data we collected at Diamond and the Photon Factory, we now have a better understanding of how the enzyme functions and how it can be stopped. This structural information should be useful in the design of novel

inhibitors that will prevent the biofilm formation by glucansucrases and reduce the risk of possible side effects such as hypoglycaemia. These novel inhibitors could be incorporated into toothpaste and mouthwash, making them more effective at preventing tooth decay."

The structural data collection at the Diamond synchrotron was carried out on the I02 Macromolecular Crystallography (MX) experimental station. Principal Beamline Scientist, Professor Thomas Sorensen, says, "Knowing the 3D structure of the enzyme is like knowing the shape of a lock you need to find a key for – it makes it much easier to find the right key that will fit. In this case, the inhibitor acts like the key, fitting into the lock in just the right way so that it can do its job."

www.diamond.ac.uk, University of Shizuoka
visit <http://eng.u-shizuoka-ken.ac.jp/index.html>



graphical abstract (of a glucansucrase enzyme from the dental caries pathogen *Streptococcus mutans* forming a biofilm, and the acids within) credit: Reprinted from the *Journal of Molecular Biology*, Vol 408, Issue 2, Keisuke Ito et al. 'Crystal Structure of Glucansucrase from the Dental Caries Pathogen *Streptococcus mutans*'. Pages 177-378, Copyright (2011), with permission from Elsevier.

I-TAC Tenants secure £270,000 of funding

The Innovations Technology Access Centre (I-TAC) prides itself on supporting SME's in the early stages of their business development by providing access to world class facilities, high specification equipment and STFC expertise. After its first year in operation, I-TAC has achieved significantly more than expected. Tenant companies have employed 12 new people, £270,000 of funding and investment has been secured by the tenants and over 200 people have been shown around I-TAC.

Within I-TAC, tenants cover the areas of energy, healthcare and environment, in line with the government's and STFC's strategy for addressing solutions to these grand challenges. The running of the I-TAC Futures Challenge (detailed in Fascination issue 5) allowed companies to win access to I-TAC's facilities in these key target areas. The STFC Futures Programme was the support behind the competition.

The Futures Programme was STFC's response to ensuring that skills and technology originally developed to address fundamental research questions are harnessed effectively to provide solutions to the global challenges.

Since they have been on site this is what just three of the companies have achieved;

The logo for Butters Innovations Ltd, featuring the word "butters" in a white, lowercase, sans-serif font on a green rectangular background, with a small white square icon containing a pencil tip to the right.

Butters Innovations Ltd has gained £195,000 in funding since being based in I-TAC. £25,000 came from achieving a Disruptive Innovation Award from a Technology Strategy Board (TSB) competition. This has enabled them to commission the Engineering Technology Centre on the Daresbury Science and Innovation Campus (DSIC) to co-develop the software, electronics and mechanical elements of their MoRoW II stroke patient rehabilitation device. A working electro-mechanical prototype will undergo clinical trials later this year. The same project gained Butters Innovation a £10,000 Strategic IP Audit grant from the UK Intellectual Property Office; they have also received £160,000 from the NHS I4I programme. "It's very exciting to work with such an experienced and talented team of hardware and software engineers. Working at I-TAC has enabled us to fill a gap in our own capabilities. We have also recently incorporated a new company called MoRoW Ltd who are helping us commercialise the device we are building. Working with the team at I-TAC has helped us apply for equity funding which will help us fully commercialise the project." Butters Innovations Ltd project partners include University of Salford, Medilink North West and PDS Engineering.



TopCat Research Ltd aims to provide effective and cost conscious analytical products for the food, pharmaceutical and environmental markets with products based on immunoassay (ELISA) and DNA detection (PCR) platforms. Director, Anthony Cope, said "Bringing my business to I-TAC has enabled me to gain £50,000 from the NW Fund to achieve proof of concept. We're developing a pregnancy testing technology that will be used to help breeding programmes for endangered animals - nothing like this exists at the moment. Being based at I-TAC was a huge positive when applying for funding. This type of support was not available anywhere else. I look forward to growing and developing my ideas and taking on new staff in the months ahead."



BiSN Technologies Ltd offers a range of services to help oil and gas operators in a variety of areas, from materials testing to research and development in microbiologically enhanced oil recovery. BiSN has recently gained £25,000 in funding from the Technology Strategy Board. Paul Carragher and Leo Richards said: "The equipment and facilities, both at Daresbury and throughout the STFC network, allow us to compete at a world leading level. The range of services we can now offer matches, and in most cases exceeds, what our competitors can offer. In addition, the STFC and campus network has already proved valuable, having linked us to academic and industrial contacts. "

www.itac.stfc.ac.uk and www.stfc.ac.uk/Futures

National Science and Engineering Week goes off with a BANG



Like many organisations STFC was heavily involved with events during and around National Science and Engineering week.

With over 29,000 people attending The Big Bang 2011, one of the UK's biggest science events for young people celebrating science, technology, engineering and mathematics, STFC were proud to send a team from ISIS. The team together with experts from Cella Energy (Fascination issue 5, STFC spin out company) had a stand on the theme of low carbon energy. The stand featured mini hydrogen-powered cars and an array of novel hydrogen storage material samples.

For the scientists and engineers working on the stand, it was a rare opportunity to talk to children and young people about their work at ISIS: "I had an excellent time", said Atahl Nathanson, a UCL PhD student working with ISIS on hydrogen storage. "It was an excellent opportunity to explain how hydrogen fuel cells work to a completely different audience. It was also a great chance to see what other organisations are up to!"



We all really enjoyed it and found the level about right - quite challenging but grounded in things that they were familiar with. It brought the subject alive for the students. Please add us to your mailing list!

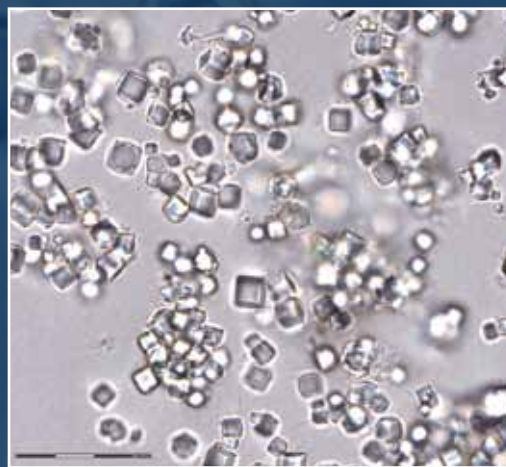


Pulling together to get top results

How do you see inside something if it is too small to see even with the most powerful microscope? To look inside a molecule and see the arrangement of the atoms? Crystallography is one potential answer. Crystallography is a process which provides 3-dimensional information from proteins and helps provide basic understanding of biological processes on a molecular level.

Crystallography is the method that gives you the best resolution. Out of the original seven beamlines at Diamond three were specifically for use with this process and now 5 dedicated instruments for macromolecular crystallography (MX) are operational. Microfocus MX beamline provides X-ray beams down to 5 microns allowing investigations of samples with dimensions of only a few micrometres, instead of a few tens of microns for standard experiments.

A brand new set up at the Harwell Oxford Campus is expected to open up a whole new realm of possibilities in crystallography. For the first time micro-crystals can be captured and placed onto sample holders used on the Diamond MX beamlines in a very specific way through the use of laser tweezers – previously this has been a random selection process. For X-ray studies being able to select the bigger crystals can improve the resolution of the obtained protein structure significantly. Using laser tweezers makes the capture of specific sized crystals in the sample possible.



Typical CPV crystal preparation.
Average sample size is around 5 x 5 x 5 microns.

A 'spiders web' has been designed by STFC's Micro and Nanotechnology Centre (MNTC) to sit under the mesh that the identified crystals are placed on – this ensures that even smaller crystals can be captured. This means many more crystals can be examined – usually those samples would be lost because there was no system capable of analysing them so important information could have been lost. The overall time for capturing and analysing crystals will be drastically improved. It will be far more time effective than the random process. Previously you may have needed to go through as many as 300 samples to collect results from the

correct size of crystal now you can just collect the specific samples you need.

The collaboration stretches right across the Harwell Oxford Campus. The facilities involved are Diamond, Central Laser Facility MNTC and the Research Complex at Harwell together with Zeiss Microimaging. Although not yet fully operational this collaboration will offer many benefits. Once the required modifications to the process have been made the plan will be to integrate this system into the Diamond proposal system.

ESA TTN Showcase STFC Daresbury Laboratory, 17 May

including an introduction to STFC
and UK ESA Technology transfer activities
<http://www.stfc.ac.uk/Business+and+Innovation/22067.aspx>





Daresbury's first I-TAC tenant cleans up with supermarket giant



Bug battling firm Byotrol, which researched and developed its revolutionary hygiene technology at STFC's I-TAC, has worked with McBrides, Europe's leading provider of Private Label Household products, to launch a ground-breaking cleaning spray for Tesco.

Byotrol's patented technology, which is used in wipes, sprays and mousses to combat the spread of viruses and superbugs, including MRSA, is the main bacteria-killing ingredient in Tesco's own-brand multi-surface spray. In contrast to old technologies, Byotrol contains no alcohol or bleach so is gentler on skin and the environment and is significantly longer

lasting than traditional but harsher cleaning products currently on the market.

Manchester-based Byotrol relocated its entire R&D division from Germany to Daresbury's I-TAC in 2009 to develop and enhance its patented technology.

A-level students tell us what they think of this year's Particle Physics Masterclasses

Hundreds of A-level students went to STFC's Daresbury and Rutherford Appleton Laboratories during National Science and Engineering Week (11-20 March 2011) to take part in Particle Physics Masterclasses. The classes are designed to inspire students to pursue careers in science and fill key jobs in science, technology, engineering and mathematics.

STFC Press Officer Lucy Stone went to speak to a few of the students at Rutherford Appleton Laboratory (RAL):

Audio file of Lucy Stone's interview with Masterclass students <http://www.stfc.ac.uk/resources/mp/PPMFINALAUDIO.mp3>

The students at RAL learnt about contemporary research in particle physics. Their day included a visit to the ISIS neutron source or Diamond Light Source, two of the world's leading centres for materials research, both driven by high-power particle accelerators. The event included talks by particle physicists from RAL and CERN, and a computer-based workshop using real data from the Large Hadron Collider.



Students from schools across the North West joined scientists from the Cockcroft Institute (CI) at Daresbury Laboratory for the annual Particle Physics Masterclass. Building on the successes of previous years, and acknowledging the unique opportunities available in running a masterclass at a national laboratory, the CI outreach group obtained agreement from the Institute of Physics to shift the emphasis towards accelerator design and performance, thereby showcasing the technologies that facilitate particle physics experiments. This was essentially the first particle

and accelerator physics masterclass.

Some new activities were run this year, including an exercise to show how the basic design parameters for the Diamond Light Source were calculated from the target specifications, and a new and challenging exercise to study how an electron bunch is both compressed and rotated in space to maximise the peak current before it is used to drive the free-electron laser on the ALICE accelerator. These were backed by other tried-and-tested exercises to estimate the injector beam energy in ALICE using only some basic physics and a few simple measurements, plus particle physics simulations, and further supported by lectures

on the quark model of particle physics and aspects of particle accelerator science.

Scientists and engineers from RAL Space were also very busy engaging with over 1000 members of the public in science week: On 11 and 12 March, families and members of the public received expert tuition on the stars in our night

sky during activities organised as part of the Reading Science Week. Barry Kellett, from RAL Space, explained the make-up of our Moon with a hands-on display of Moon rocks and meteorites, whilst Reading Astronomical Society were on hand to assist with stargazing.

Several graduates from the robotics team took a robot challenge to the Changing Perspectives Festival at Bristol, organised by Bristol University; <http://www.bristol.ac.uk/public-engagement/events/2011/37.html>.

Access all areas Backstage Science



Science is a subject that fascinates most of us. What makes our science so exciting, the study of materials, the solving of problems?

Have you ever wanted to look inside a particle accelerator? Meet a plasma scientist? Here is your opportunity to take a peak inside STFC.

Backstage Science is a small selection of videos about STFC. The footage includes interviews with some of our scientists and a fantastic unparalleled opportunity to see behind the scenes at many of our facilities, most of which can't easily be accessed.

From fitting a new instrument on ISIS (set of super microscopes) to creating a vacuum better than on the Moon - STFC science and technology covers many areas.

Take a look for yourself:
<http://www.youtube.com/BackstageScience>

Royal Society pairing scheme: for MPs, civil servants and scientists

The Royal Society is looking for scientists to take part in its pairing scheme for MPs, civil servants and scientists.

The scheme starts in Autumn with the 'Week in Westminster': a programme of activities for the scientists including seminars, workshops, shadowing opportunities and a tour of Westminster.

Applications are now open to scientists with an interest in science policy, a proven ability to communicate their research and at least three years of post-doctoral research experience.

For more information, please visit: royalsociety.org/pairing-scheme

Contacts

Science and Technology Facilities Council,
Polaris House, North Star Avenue, Swindon,
SN2 1SZ

Tel: +44 (0)1793 442000
Fax: +44 (0)1793 442002
Email: fascination@stfc.ac.uk web: www.stfc.ac.uk
Fascination is produced six times a year.

To subscribe please go to:
<http://www.stfc.ac.uk/stfcforms/NewsletterBooking.aspx>
Edited by Jane Binks.
Designed by STFC Media Services. Printed by the Research Council's Joint Reprographics Service.
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