Inside this issue:

Chemistry Admissions and Chemistry Highlights Newsletters 2012
Teaching Labs Reopened in Double-Quick Time
Visual Display Units
Pioneering Research Reveals Bacterium’s Secrets
Bruker Poster Competition
Richard Taylor Successful with EPSRC Grants
Richard Taylor’s Lectures
UK-Russia Expert Innovation Round Table
Caption Competition Winners
Is There Anyone Out There?
Discovery Days at the National Railway Museum
Relocation of Expenses Forms etc
Inside the New E Block
Caption Competition
Graffito in B-Block Teaching Lab
Seen in the Quad

Date of Next Issue: 27th April 2012

Calendar of Events

Organic Seminar—
Speaker and Time TBC
Date: Wednesday 25th April
Location: C/A122
Chemistry Admissions and Chemistry Highlights Newsletters 2012

The department has compiled its 2012 newsletters, both for prospective students and for our undergraduate students.

Chemistry@York has enjoyed another successful year and the newsletters give a flavour of some of the many recent achievements and exciting developments in our teaching and research. This includes sections on our new Chemistry buildings, employability and research highlights. The National Student Survey (NSS), which runs until the end of April 2012, is also mentioned in the Highlights newsletter - the Student Hardship fund will receive £1 for every survey completed.
Teaching Labs Reopened in Double-Quick Time

Chemistry undergraduates are back in the teaching labs doing practical work

Following a localised fire in part of one of our Chemistry Blocks on 2 February, Chemistry staff, working alongside university staff from Health, Safety and Welfare, and Estates Services, have worked around the clock to ensure that the undergraduate practical courses can be resumed in double-quick time.

We are delighted to reveal that, as of February 27, Chemistry undergraduates are back in the teaching labs doing practical work (see photos below). Although some repairs are still underway, we expect the practical courses in the remainder of this academic year to proceed uninterrupted - and all of the remodelling will be completed this coming summer so that practical courses next academic year will proceed exactly as planned.

At the same time, excellent progress is being made on construction of the £6.5 million final phase of the Dorothy Hodgkin Research Building, which will be completed in May. This will be followed by construction of a new £10 million two-storey building, due for completion in Autumn 2013. On the ground floor, extensive state-of-the-art Chemistry teaching laboratories will provide outstanding professional-standard training facilities to rank amongst the very best in the UK.

Visual Display Units

The Department has two Visual Display Units for general messages, one in the main foyer and one in the entrance next to the NMR Centre. Items for display should be sent to Tim Elsworth (tim.elsworth@york.ac.uk, 4186, A133) or Adrian Whitwood (adrian.whitwood@york.ac.uk, 4535, A136) using the following criterion:

- A complete slide in Powerpoint format - the display uses OpenOffice software which may require an alteration of the format of Powerpoint slides.
- Text and pictures can also be submitted as a Word document, any images should be sent as separate files (jpg, bmp format).

To achieve greater impact the slide should contain an image relating to the message.
Pioneering Research Reveals Bacterium’s Secrets

Ground-breaking research by an international team of scientists will help to make one of the most versatile of bacteria even more useful to society and the environment.

Though it lives naturally in the soil, the bacterium Bacillus subtilis is widely used as a model laboratory organism. It is also used as a ‘cell factory’ to produce vitamins for the food industry and, in biotechnology, to produce enzymes such as those used in washing powders.

The BaSysBio research project, carried out by a consortium of researchers from eight European countries and Australia including the Department of Chemistry at the University of York, is unprecedented in its scope and has given scientists an unrivalled level of understanding of the way the organism can adapt to diverse conditions.

Billions of years of evolution have shaped the performance of B. subtilis cells and the research has provided novel insights into the regulatory processes that help them to maintain their metabolism in prime condition.

Published in two papers in the latest edition of Science, the findings will enable scientists to engineer B. subtilis to become an even more effective producer of metabolites for a wide range of industries from pharmaceutical and chemical manufacturing to the agri and food sectors. The work also has medical implications as it will help scientists to understand how bacteria deal with changing conditions during infection.

B. subtilis is able to survive and grow in diverse and changing environments. The research used expertise from different fields ranging from molecular biology to bioinformatics and mathematics to investigate the cell as a system of interacting molecular components and the strategies it uses to adapt to varying conditions.
The researchers acquired and analysed large experimental data sets which were used with mathematical models to capture the complexity of the cellular system. They analysed the genes expressed under more than 100 different conditions that mimic the natural and laboratory environment of the organism.

It was already known that the B. subtilis genome carries around 4,200 genes but the new research identified 512 new potential genes in the bacterium.

The project co-ordinator Dr Philippe Noirot, of the INRA Centre at Jouy-en-Josas, near Paris, says: “Besides their scientific novelty, these two studies also represent a potential blueprint for bacterial systems biology. Our work will potentially make B. subtilis an even more efficient producer of enzymes. The results and approaches used in our studies, suggest it is now possible to design specific experiments to unravel other, previously more intractable, cellular processes.”

Professor Tony Wilkinson, of the York Structural Biology Laboratory, says: “The work has thrown up surprises. In one instance, where we expected that a few simple tweaks would be sufficient to achieve an adaptation, we observed wholesale changes involving almost half the genes in the organism.”

Professor Uwe Sauer, of the Eidgenössische Technische Hochschule, Zürich, says: “The work represents a conceptual step forward in how to assess and understand cellular adaptation to new situations that is fundamental to basic science as well as applications in biotech and medical research.”

Prof Jan Maarten van Dijl, of the University Medical Centre in Groningen, adds: “These studies help us to understand how bacteria deal with changing conditions during infection such as when normally commensal bacteria such as Staphylococcus aureus that live in the nose and throat adapt and invade the body and cause disease. This provides a foundation for research into the development of agents to combat these invasive bacteria.”

The work has been backed by a €12 million grant from the European Union.
Bruker Poster Competition

The annual poster competition for 3rd year PhD students took place on 15th March with 31 participants displaying and discussing their posters with a wide audience from the Department as well as a panel of judges. A variety of research areas were covered and many people commented on the very high quality of the work being displayed.

After a busy morning spent viewing posters, discussing work with students and scoring the participants, the judges retired to consider their verdict.

The winners were:

**Andrew Marriott (JETO)** - Development of Biomass-Derived Porous Graphitic Carbon for Use in Separation Applications

**Louise Highton (SBD)** - Moving high sensitivity MRI towards clinical applications

**Christopher Windle (RNP)** - Solar fuel from carbon dioxide

Each winner will receive £400 from our sponsors, Bruker, to spend on research related items / activities. The announcement was followed by a seminar from our guest speaker Professor Pete O'Connor from the University of Warwick.

A big thank you to all the participants, and to the judging panel which also included Ian Sanders from Bruker as well as Pete O'Connor.

Left to right: Pete O'Connor, Christopher, Louise, Andrew, Ian Sanders (Bruker)
Prof. Richard Taylor Successful with EPSRC Grants

Richard Taylor was successful with two recent EPSRC grant applications (decisions announced in March 2012). Both were single applicant bids via the responsive mode system, each for postdoctoral support and consumables (around £800k in total) with start dates in September 2012.

The first grant [Cu(II)-Catalysed C-H Activation Routes to Heterocycles; Applications in Target Synthesis, EP/J000124/1] exploits a discovery made by Alexis Perry and later developed by Johannes Klein, David Pugh, Vil Franckeveicius, Cat Moody and Pauline Drouhin. In this new procedure, 3,3'-oxindoles are prepared in high yields from simple anilide starting materials via a formal double C-H activation process. The reaction employs catalytic amounts of the extremely cheap and readily available reagent, cupric acetate monohydrate, in hot toluene or mesitylene (Org. Lett., 2010, 12, 3446-3449). Given that many of today’s drugs are based on oxindoles, the potential of this methodology is very high. The main aims of this proposal are to explore the development of asymmetric variants and to apply the methodology to complex pharmaceutical and natural product target synthesis.

The second grant [Convergent Acyliminium Methodology: Diversity in Heterocyclic Scaffolds: EP/J016128/1] is concerned with a new and efficient procedure to prepare known and novel heterocycles by the acylation of imines by the direct use of readily available carboxylic acids. This chemistry was developed by Will Unsworth with help from Katie Gallagher and Christiana Kitsiou. As well as optimising the new methodology, applications in target synthesis, both natural product and synthetic, will also be investigated (e.g. loracarbef, tyrocidine A and 'upenamide).

Richard Taylor’s Lectures

Richard Taylor has been visiting industry and academia to give research lectures in March. First he was guest lecturer at UCB-Celltech in Slough and then he presented an invited lecture at the Freie Universität Berlin In both places the title of his talk was "New Approaches to Heterocyclic Diversity". While in Germany, Richard also visited Analyticon, a start-up company in Potsdam, where he has research collaborations in the area of obtaining new drugs from plant sources.
In February, Duncan Bruce visited Ekaterinburg, Russia, at the invitation of the British Embassy in Moscow, to participate in the first UK-Russia Expert Innovation Round Table to be held in Ekaterinburg, following related successful events in Moscow and St Petersburg. Duncan was the UK speaker and he talked about the use of nitrogen heterocycles in materials chemistry, in particular relating to liquid crystals. The Russian speaker was Professor Valery Charushin who emphasised the role of heterocycles in drug design. The visit and event helped to continue the development of strong ties between Chemistry in York and in Urals Federal University.

The event, which was covered in the Russian media, was attended and addressed by senior local politicians as well as the British Consul.
Thank you to all who entered last issue’s Caption Competition. The winners are:

Mike Clark - “It was a lovely wedding, but the guests weren’t impressed with the choice of reception venue.”

Adrian Whitwood - "Delux penthouse for pigeons is installed in chemistry."

The rest of the entries are below:

New Teaching Labs fire blanket being fitted, just in case

Chemistry B-Block pioneers 'big tent' approach

New atmospheric chemistry Lab nears completion!

University initiates new economy drive on building materials

Why are they building a sports hall on top of B Block?

money must be tight this year!

WELCOME TO THE CHEMISTRY ROOFTOP GRADUATION MARQUIS.!

Strong wind hits York.

B&*$#R! We've built the roof in the wrong place! Quick: bodge those wheels on the bottom of it...

Vice-chancellor denies rumours of new degree in circus studies.

Chemistry branches out as new wedding venue.

The new covers for the Dick Norman Memorial cricket pitch.

Forget Monty Python, here comes Chemistry’s Flying Circus
Is There Anyone Out There?

About to be launched as number twenty in the CIEC Promoting Science collection of interactive teaching resources, Is there anyone out there? is an innovative way to introduce the space element of the KS2 science curriculum and if you require it can be extended to KS3 as a transition project or a cross curricular challenge.

Is there anyone out there?, funded by the UK Space Agency, was launched at the ASE conference in January. The resource for 9-12 year olds is set in the context of space missions seeking to find evidence of past or present life on Mars!

Full to overflowing, the room was buzzing, as 30 primary teachers from all over the UK, together with some from Northern Ireland, Sweden, Denmark, Holland and Norway joined several members of the space community in trying out some of the exciting practical activities from the resource. There was much enjoyment mimicking lava flow by making chocolate volcanoes, producing craters by dropping ‘meteorites’, investigating and searching for possible evidence of microorganisms in Martian soils and debating the best landing site for a Mars Rover!

One teacher summed up the session: ‘These activities are so exciting, affordable and so easily resourced. I will definitely try them back at school.’

The resource will be available as a free download on the CIEC website and on the STEM e-library from April.

Mimicking lava flow with a chocolate volcano!
Discovery Days at the National Railway Museum

The Green Chemistry Centre exhibited at the National Railway Museum for Discovery Days again this year, as part of National Science and Engineering Week (NSEW) in March. About 1000 key stage two pupils from 18 primary schools took part in a range of interactive workshops on scientific subjects. The Green Chemistry Centre ran a workshop, led by Masters students, on ‘Making Glue from Milk’, in which children were invited to watch and learn how the environmentally friendly glue is made, before trying out the glue themselves. The children enjoyed making their own artistic creations using the milk glue and tissue paper, and meeting Fabs the Green Chemist.
Relocation of Expenses Forms etc

A reminder that the expenses forms, postage stamps and DHL forms have been relocated as below:

- Expenses forms: **Photocopier room (A117)**
- DHL forms and postage stamps: **HoD's Office (A121)**

Inside the New E Block

These pictures show progress with the new labs in E-Block. As can be seen the rooms are beginning to look more like laboratories with the installation of fume cupboards and benching.
Caption Competition

Caption Competition—a prize for the best caption to the photo below:

Please send your entries to Luiza Morrell ([luiza.morrell@york.ac.uk](mailto:luiza.morrell@york.ac.uk)) by 20th April for a chance to win a bottle of wine!
Graffito in B-Block Teaching Lab

The stripping out of the B-Block teaching lab has revealed the following graffito, unseen for nearly 48 years.

Seen in the Quad

Underneath the walkway in the corner of the quad near B- and C-Blocks is a nest of blackbirds, the photo shows the female and two gaping beaks awaiting food.