New Directions, New Opportunities

From Professor Geoff Cloke FRS, Head of Chemistry

This is an exciting time for Chemistry at Sussex as we welcome new colleagues to the department. Four new staff members arrive in the next few months bringing new directions in research, new specialisms to teaching and new opportunities for undergraduate and postgraduate students. Three are Organic Chemists, Professor Mark Bagley, who heads the organic group, begins in February and will soon be joined by Readers in Chemistry John Spencer and Philip Chan. They join a Department in which Professor Simon Ward’s Translational Drug Discovery Team (see below) brings a new impetus to research and teaching in Medicinal Chemistry. Together with faculty currently in post this will form a powerful and vibrant Organic Chemistry group.

Now well established is the Clean Energy Group led by Professor Geoff Cloke FRS. The principal research thrust concerns the globally transformative issues of energy sustainability and climate change. This Group will be augmented by a new senior appointment in Inorganic Chemistry over coming months. The Group’s activities range widely within the Clean Energy theme and include computational modelling of materials for the nuclear industry and of transition metal complexes for homogeneous catalysis, nanomaterials for hydrogen generation through photocatalytic cleavage of H₂O, new photovoltaics through nanoparticle technology and activation of small molecules through coordination to transition metals, lanthanides and actinides.

The Translational Drug Discovery Team headed by recently appointed Professor of Medicinal Chemistry Simon Ward (pictured below) plans to develop a wholly new approach to drug design and development. Simon moved to Sussex Chemistry in 2011 from a highly distinguished research career at the pharmaceutical giant GlaxoSmithKline. On joining the department that has housed three Nobel Prize-winners and fourteen Fellows of the Royal Society in its 50 year history Simon summed up his motivation for this career step very succinctly:

‘This is an incredibly exciting and timely move to Sussex. The traditional model of discovering new drugs in major pharmaceutical companies is no longer sustainable and creates a vacuum that must be filled to ensure that we deliver new medicines.’

The Translational Drug Discovery Team is drawing on fundamental scientific research at Sussex, bringing together the key biological and clinical disease understanding, and translating this into new treatments of cancer and neurodegenerative diseases. This represents a new paradigm in drug discovery and development that capitalises on untapped fundamental research and integrates the skills of both industry and University scientists.

For more information see:
http://www.sussex.ac.uk/lifesci/drugdiscovery/research

News in brief...

Winning design

The title for this new Chemistry newsletter was designed by Sophie Marsh, a third year BSc student. Sophie wins a £25 Amazon voucher for her entry!

Best poster prize

Congratulations to fourth year MChem student Gavin Roffe, who won the Best Poster Prize at the EPSRC UK NSCCS (National Service for Computational Chemistry Software) user meeting at Imperial College London in December.

Gavin presented his MChem research project work on the gas-phase activation of methane by multiply-charged metal ligand complexes. The aim of the project is to explore computationally both the energetics and kinetics involved in harnessing the potential of methane to react, and is part of the ongoing research of Dr Hazel Cox’s group.

Sussex hosts CPD event

Sussex Chemistry hosts an FE staff Continual Professional Development (CPD) event. Date: 29 February

For further information contact: tim.sorensen@sussexdowns.ac.uk

Visit to Japan

Professor Malcolm Heggie visited and lectured on his research at the Institute of Materials Research, University of Tohoku as a gesture of support for the post-tsunami rebuilding of the semiconductor research team led by Professor Ichiro Yonenaga.

Hot off the press


OH rotational spectra are widely used to measure the temperature of Earth’s upper atmosphere. This paper provides a mechanism for the surprisingly low rotational temperature of OH recently predicted by a computer model of energy flow in Earth’s atmosphere developed at Sussex.
Third year projects

Marketa Suvova talks about her 3rd year project devised and implemented with her lab partner Eugenia Geddes Da Filicaia.

Have you ever wondered what it is that makes grapes, blueberries or even onions purple? Or perhaps have you contemplated why chilli peppers are hot? One of the world’s hottest chilies has a heat content 52 times greater than the well-known jalapeno. Fortunately, no one’s taste buds were damaged in this test of hotness; two highly accurate and precise methods were used to measure these values via the detection of capsaicin and dihydrocapsaicin, the chemical compounds mainly responsible. These methods were High Performance Liquid Chromatography (HPLC) and Gas Chromatography-Mass Spectrometry (GC-MS), which separated a solution of extract into components, depending on their retention times. The detector was set to detect where the desired compounds were expected and as a result spectra representing capsaicin and dihydrocapsaicin content were obtained.

MChem poster presentation

On Wednesday 25 January the fourth year MChem students presented their research posters to the Chemistry faculty.

Teo Mertanen, working in the group of Dr Qiao Chen, presented his research (below). The project involves developing nano structured metal oxide semiconductor materials for water splitting. Both nanorods and nanotubes of ZnO have been created and used for harvesting solar energy into chemical energy by generating hydrogen from water through a photo-electrochemical process.

Charlie’s blog

The biggest decision (so far!)

When it’s time to look at the first university, you have no idea what to expect or what your priorities really are. But overall I do believe it’s a feeling that you can’t describe – almost of belonging – that really determines which one you choose. Having been through it, I chose the University of Sussex. Since arriving in October, it’s met all my expectations.

Not only was the teaching standard of the department one of the biggest influences on my decision, but also the campus and community in which I’d live in for my first year. Being away from home is both the most exciting and scariest time of your life - not knowing who you are living with or how much support is on offer is sometimes too overwhelming to contemplate. Currently I live in Northfield on campus and so far I have been delightfully surprised with the friendliness and help I’ve received from the staff who work here. The ease of being on campus and living so close to all of your friends really makes a difference to your happiness and ability to cope with the new change in your life.

So to sum up, my priorities are to be at one of the best universities, to gain a top quality degree, to feel like a part of the community and to live in one of the best towns in the country. That’s why the University of Sussex is the one for me.

Follow Charlie through her undergraduate degree in future issues.

Sudoku

...with a Chemistry twist

Fill in all the squares of the grid so that every row, column and 3x3 square contains each of the elements below.

Thanks to the C60 Chemical Society!

Solution in next month’s issue.