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Calendar of Events

UCAS Interview Afternoons
Date: 3, 4, 6, 11 & 13 Dec
Time: 12pm—4pm
Location: Hub DS/008

PG Open Day
Date: 16 January 2013
Time: 1.15pm—5pm
Location: A101

Organic Seminars
Date: 5 December
Time: 2pm—5.30pm
Location: A101

Admin & Tech Christmas Lunch
Date: Tuesday 18 December
Time: 12pm
Location: Guy Fawkes Inn

Mulled Wine & Mince Pies
Date: Thursday 20 December
Time: 2.30pm
Location: A122
Note: Staff Only

Date of Next Issue: 21st December 2012
Opening of Second Phase of Dorothy Hodgkin Building

A new £9.4 million second phase to a key research building – the latest stage in a major re-
development programme in the Department of Chemistry at the University of York – was
opened officially on 31 October. The first phase was completed in August 2004.

The second phase of the building named after Nobel Laureate, Dorothy Hodgkin, includes high
quality, purpose-built laboratory space for around 100 of researchers in medicinal chemistry,
materials/liquid crystals, organometallic chemistry and solar energy conversion.

Underscoring York’s enduring link with one of the UK’s outstanding scientists of the 20th century,
the new facilities were opened by Professor Michael Grätzel, the Director of the Laboratory of
Photonics and Interfaces at the École Polytechnique Fédérale de Lausanne in Switzerland.
Before opening the building, Professor Michael Grätzel gave a public lecture entitled ‘Power from
the Sun, solar cells that mimic photosynthesis’.

Michael Grätzel is famous for his invention of the dye-sensitised solar cells and has received
many prizes for his work including the 2012 Albert Einstein World Award of Science. His lecture
demonstrated the need for more use to be made of solar energy and illustrated the basis of the
dye-sensitised solar cell and its commercial scale development. Unlike conventional
photovoltaics, these Grätzel cells, as they are called, can be made on rolls of plastic and can be
fitted to transparent and curved surfaces for electric power generation including to windows. The
original invention was published in 1991, but it has taken twenty years of development to improve
its performance - Grätzel cells are now being manufactured by several companies including two
in Wales.

The new facilities are in the second
phase of the building named after
Professor Hodgkin, who completed her
pioneering research on the molecular
structure of insulin in York. They are
part of a £29 million phased investment
in Chemistry which will also include new
undergraduate teaching laboratories,
work on which is due to start next
month.
The Vice-Chancellor of the University of York, Professor Brian Cantor, said: “We take great pride in our association with Dorothy Hodgkin. This exciting research building, named after her, reflects our commitment to Chemistry in York. These excellent new facilities will help our talented researchers to continue their world-leading research and to make discoveries that make a tangible difference to society.”

The Head of the Department of Chemistry, Professor Richard Taylor, added: “The opening of this modern research building is the next phase in a major redevelopment of Chemistry research at York. The Centre for Hyperpolarisation in Magnetic Resonance (CHyM) will also be completed shortly and planning permission has been received for an Integrated Global Atmospheric Chemistry laboratory and a new two-storey teaching/research building which will house the Green Chemistry Centre of Excellence. Exciting times for Chemistry Research at York lie ahead!”

The day also featured tours of the new facilities and a scientific symposium including contributions from Professor Emma Raven, of the University of Leicester (“The many faces of heme in biology”), and Professor Dave Haddleton, of the University of Warwick (“Polymer bioconjugates from living polymerisation - improved therapeutics”), as well as a joint lecture by Dr John Slattery and Dr Jason Lynam, of the Department of Chemistry at York (“A mechanism-driven approach to the development of atom-efficient catalytic transformations: Experimental and theoretical perspectives”). These talks were chosen to reflect the areas of chemistry research being carried out in the new building and the large audience were captivated by the cutting-edge science with very lively question and answer sessions following all of the lectures.
L to R: Professor Michael Grätzel, Professor Emma Raven, Dr John Slattery, Dr Jason Lynam, Professor David Haddleton

L to R: Professor Robin Perutz FRS (former HoD Chemistry), Professor Paul Walton (former HoD Chemistry), Professor Michael Grätzel, Professor Brian Cantor, Professor Richard Taylor (current HoD Chemistry) and Professor Bruce Gilbert (former HoD Chemistry)
Scientists from the University of York and Korea gathered in York for a conference that will showcase ways of advancing green chemical technology.

The international symposium involved the University’s Green Chemistry Centre of Excellence at York and the Korea Research Institute of Chemical Technology (KRICT).

The two Centres have signed an agreement to establish a basic framework for conducting cooperative activities aimed at enhancing their respective scientific and technical knowledge.

It also included the exchange of researchers, and collaborations in green chemical technology such as microwave processing, heterogeneous catalysis and biomass-based conversions. There will be regular communication between the Centres, exchanges of science and technology information and joint initiatives, seminars and other events.

Director of the Green Chemistry Centre of Excellence, Professor James Clark, said: “KRICT is the only government-funded research institution in chemical technology in South Korea and the partnership between us promises to be both exciting and rewarding. Our visitors this week are from the newly established Division of Green Chemistry and Engineering Research in KRICT.”

The symposium at the King’s Manor in York on 8 and 9 November also involved presentations by researchers from the Environment Department and the Stockholm Environment Institute at York.
The University of York has welcomed its first students from Brazil under the Science without Borders scheme.

The scheme enables Brazilian students to receive scholarships for one-year study abroad programmes, full PhDs, sandwich PhDs and exchange at postdoctoral research level at selected UK universities.

The first nine students at York are undergraduates studying with the Departments of Biology and Chemistry, and are from a range of Brazilian universities including the University of São Paulo and the State University of Campinas (Unicamp).

Unicamp recently joined York as a member of the Worldwide Universities Network (WUN), which means the universities will be working closely on a range of research and exchange projects in the coming year.

Science without Borders student Camilla Moura, from the Federal University of Rio de Janeiro, is studying a mixture of graduate and undergraduate courses in Chemistry at York.

Camilla, 22, said “I am doing a Masters in Green Chemistry in Brazil and came to York because it is a centre of excellence in this area. Green Chemistry is a growing subject in Brazil and my studies at York will help my future career.”
Rafael de Souza, from the Federal University of Minas Gerais (UFMG), is studying Biology. Rafael, 22, said: “York’s Department of Biology has an excellent reputation for teaching and research, so this experience will definitely help my future career and provide me with some excellent contacts. It is among the three best departments of Biology in the UK, so I’m studying with excellent people. This is an amazing opportunity. The exchange is also allowing me to improve my English and my project-writing skills.”

The ambitious Science without Borders scheme will see 100,000 Brazilian students studying at top universities over the next few years.

Professor John Robinson, the University of York’s Pro-Vice-Chancellor for Teaching, Learning and Information, said: “We are very pleased to welcome the first Science without Borders students to York.

“Thanks to the excellence of our teaching, and the caring and supportive environment we provide to all students, we hope the Science without Borders students will leave us with many fond memories, having benefited both academically and personally from the experience.”

York has a long history of welcoming students from Brazil, as well as strong research ties with Brazilian institutions. Research partnerships are particularly strong in the areas of infectious diseases, archaeology, biorenewable and novel agricultural products, green chemistry, electrical engineering and integrated computing systems.

York recently signed a Scientific Cooperation Agreement with Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) to provide pump-priming funds for research collaborations involving partners in the State of São Paulo.

Ties were further strengthened in September when a York delegation of academics led by Vice-Chancellor Brian Cantor visited Brazil to meet fellow researchers from the University of São Paulo, the State University of Campinas (Unicamp), the Federal University of Rio de Janeiro, and the Oswaldo Cruz Foundation, Rio de Janeiro.

The visit led to the signing of an agreement with the Oswaldo Cruz Foundation, a leading scientific institution for research and development in biomedical sciences. The agreement will mean close co-operation on a wide range of science, technology and innovation projects over the next few years, in particular public health and health care development, and historical and comparative perspectives in health and science.
Opening of Undergraduate Common Room

Our Head of Department, Professor Richard Taylor, cut the ribbon on 12 November to mark the opening of our Chemistry undergraduate common room and study area. The area, which contains comfy seats, bean bags, a whiteboard and chalkboard, and study spaces, was designed through consultation with our student chemical society, ChemSoc.

The common room was instigated following a suggestion from some of our undergraduate students, at our Staff-Student Committee. The Committee serves as a formal and important channel, between students and staff. Student feedback provides valuable input to the review and development of our Chemistry courses and inclusion of the additional social space is another example of how the Department has responded positively to issues raised by our students.
Sir John Holman is the current Master of the Salters’ Livery Company in London. On Tuesday November 20th, the Salters’ Company gave a gala banquet to welcome the new Lord Mayor of London, Alderman Roger Gifford (a Chemistry graduate from Trinity College, Oxford). John’s speech covered education, diversity, York and the aldol reaction while the Lord Mayor’s included a discussion of eutectic mixtures. Professor Richard Taylor was a guest of honour and music was provided by Les Canards Chantants, the York chamber ensemble. A grand evening was had by all!

New Starters for November 2012

Dr Lowri Williams, Research Fellow, working for Dr Fred Antson in YSBL.
Extension number: 8276, Room: B/K266, Email: lowri.williams@york.ac.uk

Dr Huw Jenkins, Research Fellow, working for Dr Fred Antson in YSBL.
Extension number: 8276, Room: B/K266, Email: huw.jenkins@york.ac.uk

Dr Timothy Hurst, Postdoctoral Research Fellow in Synthetic Organic Chemistry, working for Prof Richard Taylor.
Extension number: 2520, Room: D216/D217, Email: timothy.hurst@york.ac.uk

Dr Ananya Sen, Postdoctoral Research Fellow, working for Dr Caroline Dessent.
Extension number: 4525, Room: A050/A057, Email: ananya.sen@york.ac.uk

Marina Chanidou, Green Chemistry Research Technician, working for Prof James Clark
Extension number: 4547, Room: B031, Email: marina.chanidou@york.ac.uk
Scientists Detect CO$_2$ Accumulation at the Edge of Space

A University of York scientist is part of an international team of researchers which has reported the first direct evidence that emissions of carbon dioxide caused by human activity are propagating upward to the highest regions of the atmosphere.

The observed CO$_2$ increase is expected to result gradually in a cooler, more contracted upper atmosphere and a consequent reduction in the atmospheric drag experienced by satellites. The team has published its findings in the latest issue of Nature Geoscience.

Professor Peter Bernath, from the Department of Chemistry at York, along with lead author Dr John Emmert, Dr Michael Stevens and Dr Douglas Drob from the US Naval Research Laboratory’s Space Science Division and Dr Chris Boone, from the University of Waterloo in Canada, studied eight years worth of CO$_2$ measurements made by the Atmospheric Chemistry Experiment (ACE), a scientific satellite mission funded primarily by the Canadian Space Agency.

ACE determines vertical profiles of CO$_2$ and many other atmospheric gases by measuring how the atmosphere absorbs sunlight at different wavelengths as the sun rises and sets relative to the spacecraft.

Carbon dioxide adds to the greenhouse effect in the Earth’s lower atmosphere, driving up temperatures. But when this gas – a significant portion of which today is the result of human activity – rises above 30 miles into the mesosphere (ca 30-50 miles high) and even higher into the thermosphere (ca 50-500 miles high), it causes temperatures there to drop.

The researchers report evidence that CO$_2$ levels are increasing faster than expected in the upper atmosphere, which seems to be cooling and contracting at a pace that current models have not predicted. Reduction in atmospheric drag brought on by the resulting decrease in density could keep space debris in orbit longer, creating more congestion by this material.

Professor Bernath says: “CO$_2$ increases close to the Earth’s surface cause temperatures to rise but, surprisingly, CO$_2$ higher up results in just the opposite. In the upper atmosphere, the density of CO$_2$ is too low to maintain greenhouse warming. Instead, the gas absorbs heat from its surroundings and radiates much of it away from Earth.”
His work with the research team derives from his role as mission scientist for the ACE satellite mission, which has been collecting important information about ozone chemistry, climate change and air pollution since 2004.

Data from ACE has set the standard for measurements of the concentrations of constituents in the Earth's middle atmosphere. Its Fourier Transform Spectrometer (FTS) routinely measures approximately 35 gas species in the atmosphere; some of these are in the parts-per-billion range of concentration.

When the research team checked measurements from 2004-12 by ACE-FTS at altitudes of about 60 miles, it found CO$_2$ concentrations that were surprisingly high. “To date, CO$_2$ trends have been measured only up to 35 kilometres (22 miles). Here, we present the first direct evidence that upper atmospheric CO$_2$ concentrations – the likely primary driver of long-term thermospheric trends – are increasing,” the researchers report.

The researchers consider several possible explanations for this trend including swings in solar activity. They even estimate the amount of CO$_2$ that may have been deposited in the upper atmosphere by the exhaust of orbital launch vehicles, but the total of 2,700 tonnes above 50 miles high cannot explain the overall trends they found.

**Professor James Clark’s Lectures**

In late October, James Clark was a guest of the Universidad Autonoma de Nuevo Leon, one of Mexico’s largest and most important universities, for the formal start of their Green Chemistry Programme including the construction of a new Green Chemistry Centre next year - on about the same timescale as ours! James gave a lecture about the research and educational work in the York Centre to an audience of 1,600 people - quite an experience!

In November, James gave the Gambrinus lecture in Dortmund, Germany - an annual public lecture for that region of Germany. He talked about resource depletion and waste valorisation. His audience of about 200 people included the Lord Mayor as well as local industrialists, business people, and senior academics. Later in the same week he gave the first Clariant Clean Technology Lecture on Green Chemistry and Sustainability, in Basel to an audience of industrialists and academics from the University of Basel.
**CHyM Building**

We have moved into the new CHyM building and are currently installing equipment. You can see below some of the pictures of the laboratories taken by Julia Walton prior to occupancy. We would like to invite those of you who would like to have a tour of the facilities to attend between 4 - 5 pm on Wednesday 5th Dec. We will provide, a tour guide, mince pies and soft drinks. Please contact Lyndsay Muschamp ([lyndsay.muschamp@york.ac.uk](mailto:lyndsay.muschamp@york.ac.uk)) if you would like to come.
CIEC Promoting Science visit a Nanjing Primary School

Gayle Pook and Joy Parvin, of CIEC Promoting Science, have recently returned from a visit to South East China University, Nanjing where they were delivering primary workshops to primary teachers and advisors.

The workshops included context based practical enquiry, classroom communication strategies and assessment for learning techniques which compliment the Handsbrain- doing to learn ethos being developed at the University. The teachers enthusiastically got down to work on the CIEC activities. Although Joy and Gayle were there primarily to deliver professional development, one of the highlights of their stay was visiting a local primary school.

At the school they were greeted by some of the pupils giving a presentation (in English) about their school and its history and expertise in calligraphy. This was followed by observing a very active science lesson where the children were exploring conductors and insulators. There was also an opportunity to discuss education in China with the principle of the school.

Beth being greeted at the school

Working together to find answers

A human circuit to show what happens if there is a break
**Travel to Work**

“You are able to make big savings on the cost of new bikes and related safety and security equipment under a Government initiative (Green Transport Plan) aimed at getting more people to travel to work on their bikes. The University of York has linked with a partner company, 'Cyclescheme', who provide cycle purchase vouchers that are accepted by a wide range of bike retailers. The University offers a scheme, **Cycletowork Extra**, whereby you can order a Cyclescheme voucher to purchase a bike and additional safety equipment, worth up to £1,000 in total, through a salary exchange agreement with the University over a 12 month period.”

http://www.york.ac.uk/admin/hr/resources/forms/rewards_extra/cycletoworkextra_faqs.pdf

Your nearest cycle storage locations can be found here: [http://www.york.ac.uk/admin/estates/transport/cycling/storage/index.html](http://www.york.ac.uk/admin/estates/transport/cycling/storage/index.html).

Staff and students can both benefit from discounted rail tickets. For more information, please see: [http://www.york.ac.uk/admin/estates/transport/public_transport/bus/staff.html](http://www.york.ac.uk/admin/estates/transport/public_transport/bus/staff.html) for staff, and [http://www.york.ac.uk/admin/estates/transport/public_transport/bus/student.html](http://www.york.ac.uk/admin/estates/transport/public_transport/bus/student.html) for students.

As well as this, there is a University Car Share Scheme that has over 390 members. Benefits include saving money, priority parking, reduced pollution and less wear and tear on your car. For more information, please see: [http://www.york.ac.uk/admin/estates/transport/carshare/index.html](http://www.york.ac.uk/admin/estates/transport/carshare/index.html)
Simple tips on being more Green

- Switch off equipment - “Leaving a single computer and monitor switched ‘on’ for 24 hours-a-day will cost over £50 a year. Switching it off and using ‘stand-by’ features when you are not using it could reduce this to £15 a year. Doing this may also prolong the lifespan of the equipment.” (Carbon Trust - www.carbontrust.co.uk)

- If you are the last one to leave, turn all the lights off.

- If computers have to be left on overnight, check if the monitor can be turned off.

- Before ordering more chemicals/stationery from stores, ask colleagues to see if they have any extra or spare that they can give you.

Please join our team!
(this is an on-going project)

www.nus.org.uk/greenimpactuc
Gideon Davies awarded an ERC Advanced Grant

Professor Gideon Davies has recently been awarded an ERC Advanced Grant entitled "Glycosylation: Programmes for observation, inhibition and structure-based exploitation of key carbohydrate-active enzymes". The GlycoPOISE project, valued at 2.5M Euros, will start in 2013 and run for five years.

SCI Yorkshire & the Humber Group Annual Awards Ceremony

University of Huddersfield, Wednesday 12th December

Chemistry for Industry Award: Prof Phil Kocienski, University of Leeds

Science for Society Award: Prof Sir John Holman, University of York

Followed by Public Lecture on Reactions, Catalysts and New Medicines: the Impact of Modern Chemistry. Prof Joe Sweeney, University of Huddersfield

Poster competition on "Novel reactions and catalysts with the potential to produce new drugs": prize of £250 for poster with best commercial potential (enter by December 7th)

Chemical InterActions January Quiz

Chemical InterActions will be hosting a departmental quiz on Wednesday 30 January in A102 at 6.30pm.

All staff and students, both undergraduate and postgraduate are welcome.

Bring your own drinks and international themed food to share!

For more information or to register a team (of 4-6 people), e-mail chem-interactions@york.ac.uk with your team name, number of participants and names by 23 January. Please also let us know if you can bring any food or drinks.
SCI (The Society of Chemical Industry) held a Careers Options Seminar in Chemistry on 14\textsuperscript{th} November. Over 60 people attended this event, including undergraduates, postgraduates and research staff, and enjoyed the opportunity to talk to the speakers at the networking buffet afterwards.

John Stanford (SCI), University of Leeds and SCI Yorkshire & Humber Group, introduced the session and told us about SCI Scholarship and Professional Development activities which include:

- Careers Options Seminars.

- Scholarships offer financial support to the tune of £5000 over two years plus career-developing opportunities to 2nd year PhD students. The SCI College of Scholars provides scholars with mentors, help to publish papers, more opportunities to give presentations and provides links with SCI Regional and Technical Interest groups.

- Travel bursaries for PhD students’ and postdoctoral researchers’ travel to conferences and labs to broaden their vision and share knowledge. (Value £400-1,500).

- The website: www.soci.org/Awards has more details.
Matthew Thornton told us about Materials Knowledge Transfer Networks and their role in linking between academia and industry. Matthew is currently a Materials Advisor at The Institute of Materials, Minerals and Mining (IOM3). He is also the Mining and Polymer Sector Leader at the Knowledge Transfer Network which is responsible for engaging with the UK plastics and rubber communities.

Gareth Ensor left the University of York and gained a job as a Chemist in Process R&D at AstraZeneca’s Charnwood site. In 2007 he gained a promotion to Senior Chemist and in 2011 he became Senior Scientist in the Chemical Science function in Pharmaceutical Development at the Macclesfield site.

Dan Woolaston, Harrison Goddard Foote, studied chemistry at the University of Oxford and then remained there for a PhD in synthetic organic chemistry. He then spent three years as a post doc in Paris and York and finally entered the patent law profession in Leeds in 2010. He told us about what attracted him to an intellectually challenging career in patents.

Finally Jason Lynam, University of York, spoke about his experiences of working academia

If you would like to see the presentations or get in touch with the speakers please contact Sue Couling.

The SCI write up for the seminar is at http://www.soci.org/News/Yorks-careers-2012
Innovative Medicines Initiative - CHEM21 project

Professor James Clark, Professor Ian Fairlamb, Professor Richard Taylor, Mrs Louise Summerton, Dr Andy Hunt and Dr Rob McElroy travelled to GSK House in Brentford on 14th and 15th November to attend the Kick-off meeting of the CHEM21 project – ‘Chemical Manufacturing Methods for the 21st Century Pharmaceutical Industries’. CHEM21 is Europe’s largest public-private partnership dedicated to the development of sustainable manufacturing routes to pharmaceuticals and is funded by the Innovative Medicines Initiative (IMI). CHEM21 brings together 6 pharmaceutical companies together with 13 University groups and SME’s, with the common goal of developing novel catalytic technologies for chemical synthesis. CHEM21 will focus in particular on base-metal catalysis, biocatalysis and synthetic biology and will provide a research hub for European efforts in this area. In addition, CHEM21 will also act as a source of up-to-date information on green chemistry metrics and will develop training packages to ensure that the principles of sustainable manufacture are embedded in the education of future scientists. CHEM21 will run initially for four years with a total budget of €26.4M, of which ca. €1.5M is allocated to York.

The York team will be involved in all but one of the six project work packages, and will look at in particular: Cu(II)-catalysed routes to heterocyclic scaffolds bearing quaternary stereocentres (RJKT); C-H bond activation and cross-coupling reactions using stabilised Pd nanoparticles and clusters (IJSF); silica-catalysed versus Pd–catalysed amide bond formation – let the green metrics decide (IJSF/DJM); and biocatalysis in neoteric solvents (AJH). James Clark is leading a work-package on medicinal and process chemist education, which will include developing new greener routes to APIs (active pharmaceutical ingredients) and the development and implementation of a unified sustainability metric toolkit to verify ‘greyness’ of new methodologies from the consortium as a whole. Chem21 is already fostering new collaborative projects, for example between Prof. Bert Maes (Antwerp) and IJSF on the role played by Pd nanoparticles in Csp3-H bond activation processes.

Five new PhD students (see photo) joined the department in October to work on the project, and two postdocs and an Education and Training Associate will also be recruited to the project in the near future. Additionally three Masters students from the GCCE will work on CHEM21 project during their research project every year, bringing the total number of Chemistry Department members working on the project to 18 once everyone is in place!
Kirsty Penkman Awarded Philip Leverhulme Prize

Kirsty Penkman has been awarded one of the 2013 Philip Leverhulme Prizes. The Prizes commemorate the contribution to the work of the Trust made by Philip Leverhulme, the Third Viscount Leverhulme and grandson of the Founder.

Each Prize has a value of £70,000; use should be made of the award over a two or three year period. Prizes can be used for any purpose which can advance the Prize holder’s research, with the exception of enhancing the Prize holder’s salary.