Chemistry Update

Newsletter 300, 31 August 2018

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Calendar of Events

Promotion Seminar for Academic, Teaching and Research Staff
Date: Monday 3 September
Time: 11am—12pm
Location: C/A121

Organic / Inorganic Plenary Talks
Speakers: various
Date: Wednesday 5 September
Time: 1pm—5pm
Location: C/B/101

Sustainability Metrics: Tracking, Measuring and Reporting Responsible Innovation
Date: Monday 10 September
Time: 9.30am—4.45pm
Location: C/F/106

University Open Days
Date: 15/16 September

Research Seminar
Speakers: Dr Emily Draper, University of Glasgow and Michaël De Paolis, Université de Rouen
Date: Monday 17 September
Time: 1pm—2.30pm
Location: C/B/101

Macmillan Coffee Morning
Date: Wednesday 19 September
Time: 10am—12pm
Location: YSBL & D Block Coffee Room

Postdoc Prize Winner Symposium
Date: Thursday 20 September
Time: 1pm—2.30pm
Refreshments will follow
Location: C/A101

Green Chemistry Croda Workshop: Opportunities for Novel Research
Date: Tuesday 25 September
Time: 10am—3pm
Location: C/F/106

Date of Next Issue:
28 September 2018

Science Book Success for York Alumnus

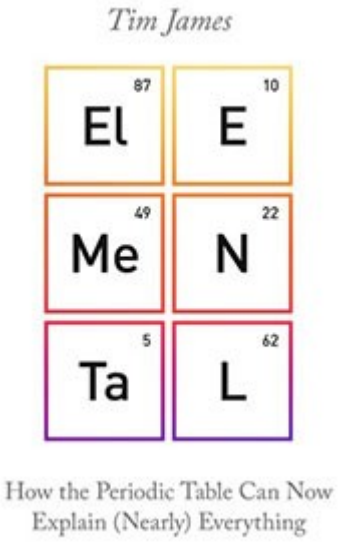
York alumnus, Tim James, has written a popular science book entitled, 'Elemental: How the Periodic Table Can Now Explain (Nearly) Everything'.

Tim graduated from the Department of Chemistry at the University of York in 2011 with a MChem degree, where he specialised in computational quantum mechanics in his final year project. He is now a secondary-school science teacher, YouTuber, blogger and Instagrammer, teaching science to anyone who will listen. He also gives annual lectures on the topic of popular science for the Institute of Physics.

In *Elemental*, Tim tells the story of the Periodic Table from its ancient Greek roots, when you could count the number of elements humans were aware of on one hand, to the modern alchemists of the twentieth and twenty-first centuries, who have used nuclear chemistry and physics to generate new elements.

Tim also answers questions such as:

- What is the chemical symbol for a human?
- What would happen if all of the elements were mixed together?
- How many bananas can you stand next to before you die of radiation sickness?
- Which liquid can teleport through walls?
- Why is the medieval dream of transmuting lead into gold now a reality?



Reflecting on the book, Tim says:

"If you want to understand how our world works, the Periodic Table holds the answers. This book shows you how to use it to understand all the ingredients necessary to make a world."

The book is collecting a string of five star reviews on Amazon, including:

"*Witty, pacy and fascinating, Tim James has a fantastic knack for capturing the magic of science*."

Read more or buy Elemental at Little Brown.

Visit Tim's YouTube channel.

Department Receives 97% Overall Satisfaction in 2018 NSS

Chemistry confirms its place at the top of the Russell Group in National Student Survey results.

This year, the Department has received 97% for the 'Overall Satisfaction' area in the 2018 National Student Survey, an even higher result than 2017.

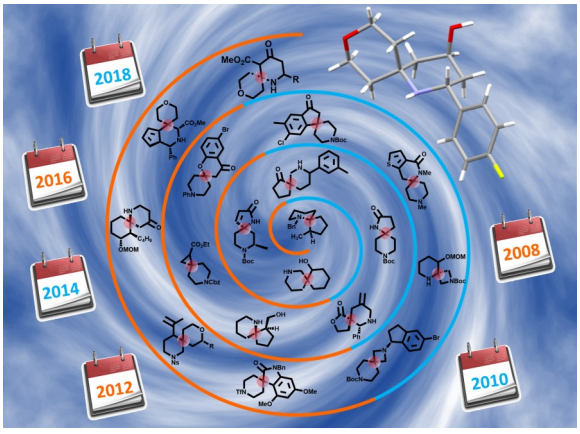
Chemistry at York has been placed first in eight out of the nine areas within the Russell Group, including 'Overall Satisfaction', 'Teaching on my course' and Learning Community'.

We've achieved over 90% satisfaction in six of the areas:

- Teaching on my course (94%)
- Learning opportunities (94%)
- Organisation and Management (95%)
- Learning Resources (93%)
- Learning Community (90%)
- Overall Satisfaction (97%)

The Department places a strong emphasis on teaching excellence, and has recently been ranked 3rd in the Guardian University Guide rankings (2019) and 6th in the UK in the Complete University Guide rankings (2019).

Clarke Group News



The Clarke group has published two more papers on the synthesis of spiropiperidines. The first is an invited review describing the advances in the synthesis of spiropiperidines over the last 10 years. The second is a research paper on the work of PhD student Sam Griggs, who has developed a new one-pot method for the synthesis of 2-spiropiperidines. Both papers can be found in *Org. Biomol. Chem.* **2018.**

Dr Paul Clarke has recently been elected Chair of the Yorkshire and Humberside SCI Regional Group. The SCI is an organisation which brings science and industry together. If you want to know more about SCI activities including student bursaries to attend conferences, the SCI college of scholars programme or other local activities then please come and see Paul or look online at https://www.soci.org.

Green Chemistry Solvent Selection Guide Success

A solvent selection guide developed in collaboration with York's Green Chemistry Centre of Excellence (GCCE) has been adopted by the ACS Green Chemistry Institute.

The freely available guide, designed to encourage chemists to seek out greener solvents, has been adopted by the ACS Green Chemistry Institute, a world-leader in green chemistry education, as their recommended method of selecting more environmentally friendly solvents.

Traditional and modern solvents

The guide ranks solvents according to safety, health and environmental criteria, to give a clear assessment of the environmental-friendliness of both traditional and more modern solvents. It is accompanied by an interactive tool which allows users to add new solvents to the guide and rank them as they are developed.

The guide was developed as part of the CHEM21 project by scientists from Sanofi, GlaxoSmithKline, Pfizer, the GCCE and Charnwood Technical Consulting Ltd. Initially working with four existing in-house guides, between which there were discrepancies, the collaborative research team developed a new methodology to rank solvents, which unified the existing guides.

Bio-derived solvents

An important feature of the new guide is the introduction of bio-derived solvents. These increasingly used solvents are renewable, but they do not always fulfil other green criteria, making their assessment alongside classical solvents essential.

Dr Rob McElroy of the GCCE said "This transparent and relatively simple ranking system, as compared to current pharmaceutical tools, offers scientists an easy-to-use, automated solvent-ranking-system.

"It also has the ability to be further populated by novel compounds and non-classical solvents, using information that is easily accessible and freely available. Adoption by the ACS Green Chemistry Institute vindicates the benefits of the new methodology and will significantly increase its impact."

ACS Green Chemistry Institute

Founded in 1876 and chartered by the U.S. Congress, the American Chemical Society (ACS) is the world's largest scientific society. Its mission is "to advance the broader chemistry enterprise and its practitioners for the benefit of Earth and its people."

The ACS Green Chemistry Institute seeks to be the premier change agent that has the knowledge, expertise, and capabilities to catalyse the movement of the chemical enterprise toward sustainability through the application of green chemistry principles. ACS GCI supports research, works to integrate

green chemistry into all levels of chemical education, aids companies with industrial implementation, hosts conferences, and coordinates efforts with an international network of green chemistry advocates.

CHEM21

The CHEM21 solvent selection guide was created as part of the IMI funded CHEM21 project (Chemical Manufacturing Methods for the 21st Century Pharmaceutical Industries). CHEM21 has received funding from the Innovative Medicines Initiative Joint Undertaking under grant agreement n°115360, resources of which are composed of financial contribution from the European Union's Seventh Framework Programme (FP7/2007-2013) and EFPIA companies' in kind contribution.

European Research Council to Fund Five-Year Research Project

Researchers in the Department of Chemistry will receive EUR 1.5m for vital Tropospheric Chlorine Oxidation work.

The European Research Council (ERC) has awarded a EUR 1.5m grant to Dr Peter Edwards in the Department of Chemistry.

Dr Edwards has been awarded the grant for his five-year research programme into 'Quantifying the impact of Tropospheric Chlorine Oxidation'.

"This career-changing grant will enable me to pursue one of the great uncertainties in the field of atmospheric chemistry," says Dr Edwards. "Gas-phase oxidants control the concentrations of important climate and air pollutants such as methane, ozone and particles.

"Over the last three decades there has been continual suggestion that the chlorine atom (Cl) may be an important atmospheric oxidant, but a lack of observations capable of informing our understanding of its chemistry mean that its role remains highly uncertain."

The award is part of a wider EUR 603 million grant for research to be carried out in 22 EU countries across a range of research areas. There was a huge demand for the funding with 3,170 applications made in total.

The grants are intended to help recipients build their own research teams, which the ERC estimates will lead to around 1,500 jobs being created, including post doctoral researchers, PhD students and other support staff.

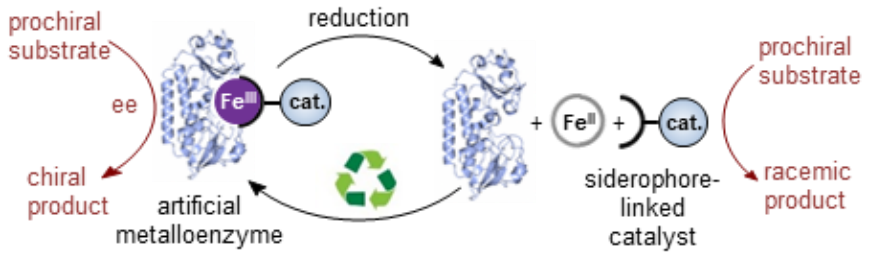
Dr Edwards says: "This ERC starting grant will provide a step-change in our understanding of atmospheric Cl chemistry by allowing me the resource, freedom and flexibility to develop and deploy new analytical techniques able to provide the much needed information on atmospheric Cl.

"The grant will also enable me to build my research group at the Wolfson Atmospheric Chemistry Labs here in York and position myself for future challenges in the field."

Making Artificial Metalloenzyme Assembly Reversible

A new anchoring strategy enables a synthetic catalyst to be bound strongly, yet reversibly, to a protein scaffold, thereby developing an artificial metalloenzyme that benefits from recyclable components.

Artificial metalloenzymes combine a reactive synthetic metal catalyst with a highly selective and biocompatible protein scaffold. In this way, they can combine the beneficial features of both – performing synthetic reactions with new levels of selectivity. In their latest research, the research team of Professor Anne Duhme-Klair and Professor Keith Wilson has developed a new reversible approach to combining these components.



A new reversible anchor has been developed to connect metal catalysts to proteins, creating artificial metalloenzymes combining the advantages of both components.

Inspired by the way bacteria use compounds called siderophores to uptake essential iron, the team decided to employ them as linking units for their artificial enzymes. In the presence of iron (III) the siderophore strongly connects the catalyst to a protein scaffold, creating an artificial enzyme, but on reduction to iron (II), dissociation takes place and the artificial enzyme disassembles.

They used their innovative reversible anchor system to connect a synthetic iridium-containing catalyst to the protein scaffold CeuE. Normally, their iridium containing catalyst would reduce imines non-selectively to produce a racemic product. However, once bound to CeuE, the metal catalyst becomes more selective and generates an excess of one enantiomeric product. In this way, the two units linked together cooperate to make a better catalyst – an artificial metalloenzyme.

Talking about the research, Professor Duhme-Klair said: 'Most importantly, the new reversible iron-siderophore anchor allows the metalloenzyme to function, whilst also allowing high value components, in particular the protein, to be reclaimed and reused. Hence, the replacement of catalysts that have lost activity, for example due to poisoning or decomposition, becomes possible. This has the potential to significantly extend the range of applications in which artificial metalloenzymes can be used.'

This research is published in *Nature Catalysis*.

Online Department Suggestion Box

The online Equality and Diversity suggestion box has been extended to be a suggestion box for the whole Department. You can submit your thoughts /suggestions / ideas for general Departmental matters as well as matters relating to Equality and Diversity. You can find the Google form on the intranet homepage or at this link.

CIEC's High Quality Teaching Materials

This month we thought that you might like to hear a little bit more about just one of the things that we get up to in CIEC…

We produce high quality teaching materials that are used in primary schools. Our recent publication 'Enabling accurate teacher assessment in science', for example, supports teachers to assess children's science content knowledge in the three main areas that the primary curriculum covers (living things, forces and materials).

It has joined our already widely acclaimed 'Working scientifically in the primary classroom', which focusses on teaching and assessing the skills that children need to 'do science' such as asking questions, making comparisons, planning investigations, recording data and drawing conclusions.

We also continue to produce materials which support our core aim which is to support primary children and teachers to make links between the science that they do in schools and the science that happens in scientific industries. The soon-to-be published 'Potatoes to Plastics' was developed with support from York's Green Chemistry Centre of Excellence (GCCE). It starts with a practical activity where children extract starch from a potato and then use it to make bio-plastic. It then helps children to develop their understanding of the range of 'green solutions' that scientists have developed in response to some current environmental issues.

We also maintain a library of over 30 publications and interactive web based resources that teachers continue to use. Just one example is Healthy Teeth where children consider, among other things, the requirements of an effective toothpaste before making their own. This continues to be used to inspire engaging and productive science lessons as can be seen in this recent blog post from Julie Wiskow who is a teacher in the North West of England.

Our full range of resources can be found on the CIEC website.

Dr Glenn Hurst Talks at World Premier Chemical Education Conference and Invitation to the University of Chicago

From 29 July to 2 August, Dr Glenn Hurst attended the 25th Biennial Conference on Chemical Education (BCCE) at the University of Notre Dame in Indiana. Glenn co-led a session on 'Communicating Chemistry via Social Media' as part of a collaboration with the RSC Tertiary Education Group, which he chairs, and the ACS Division of Chemical Education with Rissa Sorenson-Unruh and Dan Sykes. As a 'BCCE first' this session was live-streamed globally and even included virtual presentations. Glenn presented his work on utilising Snapchat to facilitate engagement with and contextualisation of undergraduate chemistry, which has recently been published in the leading *Journal of Chemical Education*.

Glenn also presented how he, together with Rob Smith, redesigned our Graduate Teaching Assistant training course in the Department together with evaluating the efficacy from both UG and GTA perspectives. Finally, Glenn co-led a session with Amy Cannon, Executive Director of Beyond Benign on 'To Green or Not to Green? Approaches for Including Green Chemistry in a Traditional Academic Setting: Teaching, Research and Service' where he presented his published work on GRASPing the undergraduate curriculum together with related projects within green chemistry education. As part of this session, Glenn was fortunate enough to be able to catch up with Fred Schoene at the Federal University of Rio de Janeiro. It was fantastic to discuss with Fred how after jointly constructing a White Paper in 2016, green chemistry education has been enhanced in Brazil due to collaborative work with Glenn and the Green Chemistry Centre of Excellence (GCCE).

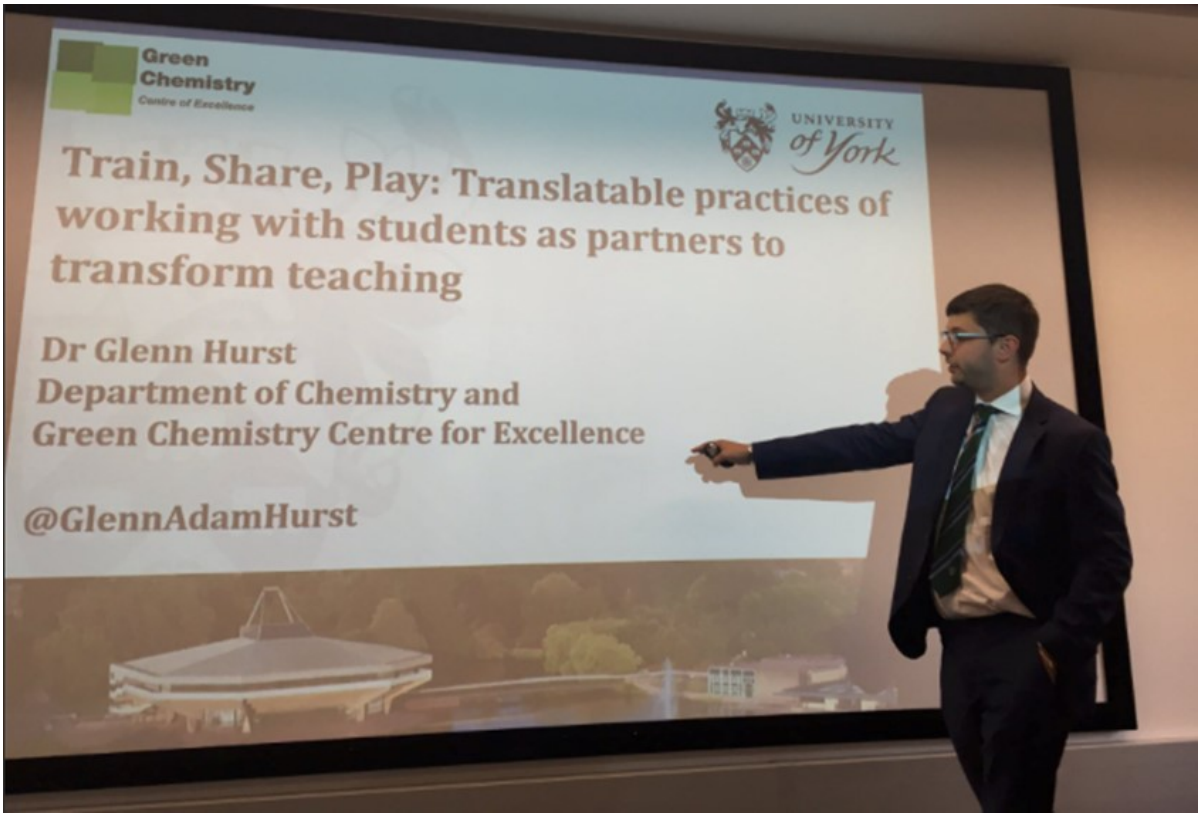
Following the conference, Glenn was invited to give a talk at the University of Chicago. This was a fantastic opportunity for Glenn to be able to outline his innovative work in green chemistry education together with other projects, to include game-based learning. Both the conference and the invited talk at the University of Chicago were fabulous opportunities for Glenn to network with world-leaders in chemistry education.

Finally, Glenn was able to meet even more chemical educators on the golf course! This time, Glenn played at the Warren Golf Club in Indiana, which will be home to the 2019 US Senior Open. No birdies on Glenn's card this time but a good number of pars made for a competitive tournament in the 40°C heat.

Glenn brought in three external grants in 2018 to support attendance at this event and others. Glenn also wishes to gratefully thank the Department of Chemistry for supplementary financial support.

Dr Glenn Hurst Gives Invited Talk at University of Leeds

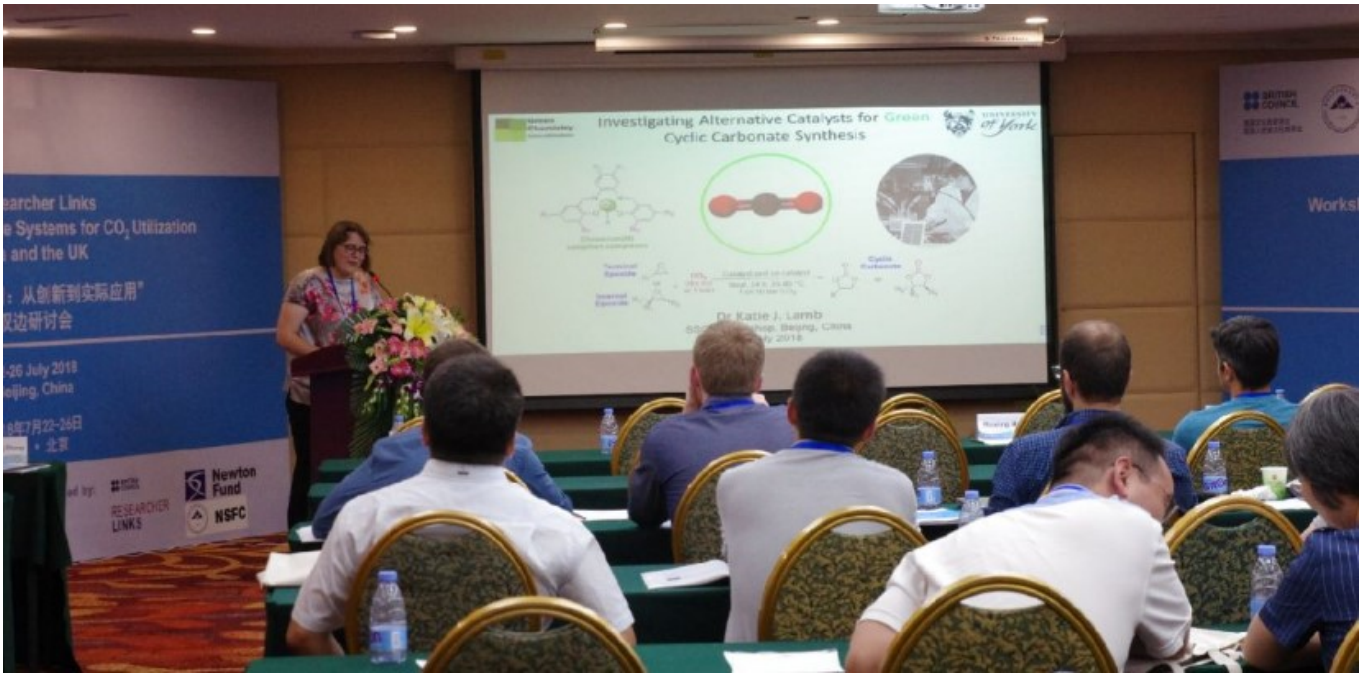
On Wednesday 25 July, Dr Glenn Hurst was invited to give a talk entitled 'Train, Share Play: Translatable practices of working with students as partners to transform teaching' at the University Leeds as part of their Festival of Teaching organised via Leeds Institute for Teaching Excellence.



The seminar was extremely well attended with a full room of over 45 participants. It was fantastic for Glenn to catch up with colleagues such as Nimesh Mistry, Paul Taylor (one of our current undergraduate external examiners), Samantha Pugh and others; together with meeting other enthusiastic and committed researchers and practitioners while sharing innovative work being conducted here in York.

Dr Katie Lamb Attends International Workshop in Beijing, China on Carbon Dioxide Utilisation

In late July, Green Chemistry Centre of Excellence (GCCE) Postdoctoral Research Associate Dr Katie Lamb attended an international UK-China Researcher Links workshop in Beijing, China. The workshop focussed on "Sustainable Systems for CO_2 Utilisation: from Innovation to Practical Implementation", with the purpose of establishing new collaborations between UK and Chinese researchers, with a united goal to sustainably reduce global CO_2 emissions via Carbon Dioxide Utilisation (CDU). Attendees included UK and Chinese academic researchers, chemical engineers and industrial collaborators. Dr Lamb was awarded a Newton Fund scholarship to attend the workshop, joint funded by the British Council and National Natural Science Foundation of China, and was therefore invited to give a talk at the workshop. Dr Lamb gave a presentation on her PhD and postdoctoral research into sustainable CDU, titled "Investigating Alternative Catalysts for Green Cyclic Carbonate Synthesis", which she has performed at the GCCE under the guidance of Professor Michael North. Dr Lamb found the whole experience extremely enjoyable and is looking forward to establishing new collaborations between fellow CDU researchers in the UK and in China (some of which she will meet again at the ICCDU XVI conference in Brazil this upcoming August).



Dr Katie Lamb presenting her research at the workshop

A visit to the Great Wall of China with fellow CO_2 researchers

The YSBL/Biology and Chemistry Dept MacMillan coffee morning will be held on

Wed 19th September
10.30-12 noon
in the Biology Atrium and Chemistry D block
Offers of cakes etc gratefully received!

Please contact Wendy Offen (YSBL) and Helen Burrell (Chemistry) for further info.

WORLD'S BIGGEST COFFEE MORNING

Registered with FUNDRAISING REGULATOR

MACMILLAN CANCER SUPPORT

Organised in aid of Macmillan Cancer Support, registered charity in England and Wales (261017), Scotland (SC039907) and the Isle of Man (604). Also operating in Northern Ireland.

Chemical *Inter*Actions' SpeedQuizzing Fundraiser

On Thursday 5 July, Chemical *Inter*Actions organised a SpeedQuizzing fundraiser for St Leonard's Hospice in memory of Robin Virgo. With Alan Leach as Quiz Master, the event was a huge success with 11 teams (70 people) from all areas of the Department participating. The quiz comprised of several rounds ranging from music to general knowledge and science. With the amazing prize of three periodic table mugs and three periodic table water bottles at stake, the pressure was on all the teams to win. Unfortunately there could only be one winner and with teams jumping from last to first in the fast-track round, team 'Swindon Roundabouts' won the illustrious prizes.

We would like the thank Alan Leach and Phil Qua from SpeedQuizzing, Chemical *Inter*Actions and the RSC for sponsorship and to all of you who attended and donated. We are awaiting the final total from St Leonard's which we hope to announce in the next issue of Chemistry Update.

- Jenny and Emma

New Starters

Matthew Popely, Apprentice Mechanical Workshop Technician
Room: C/A006; Ext: 2514 / 2518; matty.popely@york.ac.uk

Matthew Badham, Chemistry Administration Manager
Room: C/A136; Ext: 1196; Email: matthew.badham@york.ac.uk

Dr Christopher Spicer, Lecturer in Chemistry - Applied Molecular Materials
Room: C/E203; Ext: 2606; Email: chris.spicer@york.ac.uk

Dr Jamie Blaza, Lecturer in Cryo-Electron Microscopy (YSBL)
Email: jamie.blaza@york.ac.uk

Sarah Harper, Undergraduate Office Administrative Assistant
Room: C/A109; Ext: 3022; Email: sarah.harper@york.ac.uk

Clare Docking, Primary Science Advisory Teacher (CIEC)
Room: based primarily at the Johnson Matthey and Sartorius Stedim sites in Royston
Email: clare.docking@york.ac.uk

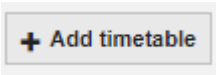
How to Add Your Teaching Timetable to Google Calendar in the Department of Chemistry

This is a quick reference guide for synchronising teaching timetables with Google Calendar. If you would like more detailed instructions or instructions for synchronising with Microsoft Outlook, Google Calendar, Apple Calendar or a calendar app on your smartphone, then please visit:

https://timetable.york.ac.uk/help#introduction

It is useful to synchronise teaching timetables with Google Calendar so that you may receive automatic updates to your Calendar if changes are made to your teaching timetable. Your teaching will show as a booked time in your Calendar and this is useful for managing and sharing your availability for meetings. Additional links to information are included in these booked appointments, for example maps to your teaching room location and the option to email students who are attending that teaching session.

Synchronising Teaching Timetables with Google Calendar

1. Go to the timetable website https://timetable.york.ac.uk/
2. Click 

3. Search for a timetable by module, route, student or staff name
4. Select ☑ the timetable that you would like to see and select ☑ "Synchronise these timetables with my connected calendar applications" then click *Add timetables*
5. After you can see your teaching timetable on the screen, left click on the 'connect calendar' symbol 
6. Select *Google Calendar (push)* from the drop down list of options
7. Click *Connect Calendar*
8. Choose your Google account from the list

Helpful Hint

If you need to view multiple teaching calendars at once, it is easier to do this on the timetable website. If you synchronise more than one teaching calendar to your Google Calendar, then it becomes difficult to identify which person the teaching event belongs to.

Created by the Chemistry Google Working Group: chemgoogleworking-group@york.ac.uk

https://www.york.ac.uk/chemistry/chem-intranet/staff-intranet/working-chemistry/how-do-i/

SUSTAINABILITY METRICS

Tracking, Measuring and Reporting Responsible Innovation

Monday 10th September 2018, 9.30am—4.45pm

Green Chemistry Centre of Excellence, Department of Chemistry, University of York

Aim of the Workshop

Measure and monitor your supply chain's performance with appropriate and easy-to-use sustainability metrics. Existing industrial sustainability metrics primarily focus on the chemical process, although awareness of the need to consider the 'bigger picture' and incorporate both upstream and downstream of the process steps into such assessment is growing. This event is dedicated to sharing the best practice in sustainability assessment across the supply chains within the framework of responsible innovation.

Speakers

Confirmed speakers include:

- Dr Guillermo Garcia-Garcia, Post-doctoral Researcher, Loughborough University
- Dr Julia Creasey, Sustainability Specialist, Croda
- Dr Jane Murray, Global Head of Green Chemistry, Merck
- Dr Li Shen, Assistant Professor, Utrecht University

Context

There are a number of decision-making stakeholders post-trade / distribution that influence the success / progress of a value chain: consumers, internal / external policy - makers, investors, retailers, media etc. There is mounting pressure to balance these factors by optimising the operational value-chain and organisational behaviour via sustainability tracking, reporting and effective communication. However, undertaking these responsibilities to the highest accuracy, extensiveness of scope of reporting, transparency among cross-border stakeholders, and ultimately, the commitment of time and appropriate investment into these activities are currently major challenges. This event aims to create an awareness of the various methods available to trace and quantify how sustainable a supply chain and its actors are.

This event has been organised as part of the STAR-ProBio and Re-SAUCE projects.

The STAR-ProBio project has received funding from the European Union's Horizon 2020 Research and innovation action under grant agreement No 727740 with the Research Executive Agency (REA) - European Commission. Duration: 36 months (May 2017 – April 2020). Work Programme BB-01-2016: Sustainability schemes for the bio-based economy.

The Re-SAUCE (Sustainable, Alternative Uses for food waste in the Circular Economy) project has received funding from the EPSRC under grant

Register your place for free at
https://sustainabilitymetrics.eventbrite.co.uk

EPSRC Engineering and Physical Sciences Research Council

STAR ProBio

Green Chemistry Centre of Excellence

University of York

Green Impact

Discounted Bikes

Save up to 42% on the cost of a new bike, see:
https://www.york.ac.uk/admin/hr/employee-benefits/travel/cyclescheme/

Alternatively there are regular sales of recycled bikes at the monthly '**Bike Doctor'** events.

Pool Bike Hire Scheme

Please see the section 'Free bike hire' on this webpage:
https://www.york.ac.uk/staff/travel/cycling-walking/

There are a small number of bikes available to hire for 48-hours at a time located at James, Halifax and Goodricke Colleges and King's Manor. You need to join first (free) and then when you would like to hire a bike just visit the Ron Cooke Hub, Halifax College or King's Manor receptions with your membership card and £10 for a refundable deposit.

Claim 10p Per Mile if Using Your Bike on University Business!

Claim 10p per mile if using your bike on University Business – only for business trips, not for commuting. See the section 'Mileage rates' further down the following webpage:
https://www.york.ac.uk/staff/finance/goods-services-equipment/expenses/

Car Sharing

https://liftshare.com/uk/community/york

Why car share?

- Save money (typically around £1000 per year!) by sharing your travel costs
- Find a space with ease… priority parking is available in designated car share spaces
- Obtain a reduced price parking permit (see below)

Reduced Price Parking Permits

Parking Permits are only £30 per year for those who car share! (2 or more people must be in the car).

Part-time parking permit – reduce your parking permit charges by only travelling a certain number of days per week by car, cycling the other days.

Please see the following link for more information:
https://www.york.ac.uk/staff/travel/cars-parking/