Chemistry Update

Newsletter 309, 31 May 2019

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Calendar of Events

E&D Lunchtime Forum: Celebrate York Pride with Us
Date: Monday 3 June
Time: 12pm—1pm
Location: C/A/122
Rainbow cake and tea and coffee will be served. At 1pm we will go to the flagpole in Greg's Place for the Pride flag raising.

Organic Seminar
Speaker: Dr Alison Stuart, University of Leicester; Prof Ed Anderson, University of Oxford
Date: Wednesday 5 June
Time: 1pm—3pm
Location: C/B/101

Chemistry Networking Techniques Workshop - Networking for people who hate networking
Date: Wednesday 5 June
Time: 4pm—5.30pm
Location: C/B/102
Further details on Page 20

Chemical Interactions Coffee Morning
Date: Wednesday 12 June
Time: 11am—12pm
Location: C/A/122

Physical Seminar
Speaker: Prof Susan Perkin, University of Oxford
Date: Wednesday 12 June
Time: 1pm—2pm
Location: C/B/101

Chemsoc Summer Barbecue
Date: Wednesday 12 June
Time: 1pm—evening
Location: 22 acres

Lunchtime wellbeing walk
Date: Friday 14 June
Time: 12.15pm—12.45pm
Meet 12.10 at Chemistry reception

Roger J Mawby Demonstrator Prize Awards event
Date: Monday 24 June
Time: 4pm—5.30pm
Location: C/B/101

University Undergraduate Open Days
Dates: 28 & 30 June

Date of Next Issue:
28 June 2019

Athena SWAN Gold Award Success

The Department was delighted with the announcement in May 2019 that it had received a new Athena SWAN Gold Award. In 2007, York Chemistry was the first department nationally to win an Athena SWAN Gold, and has held it continuously ever since.

Dr Leonie Jones, Dr Caroline Dessent, Dr Derek Wann and Dr Helen Coombs (clockwise from front) with the Athena SWAN Gold submission document

The award recognises the advancement of gender equality: representation, progression and success for all, to which the Department is committed. It reflects the innovative policies and practices that have been developed here, for example in the areas of flexible and part-time working schemes and supportive parental leave structures. Over many years, the Department has achieved a vibrant and open culture where Equality, Diversity and Inclusion are an accepted part of everyday life, providing a setting where the careers of individuals can flourish, regardless of who they are.

Head of Department, Professor Duncan Bruce said: "It is great to see the culture of the Department recognised in this way, especially as it is the first time we have gained an award under the recently revised Athena SWAN assessment scheme. This new Gold award recognises our long-term commitment to supporting the careers of women in chemistry and challenges us to continue to embrace diversity in its widest sense in the future."

The Gold Award submission was primarily prepared by Dr Leonie Jones, Dr Caroline Dessent, Dr Helen Coombs and Dr Derek Wann. The resulting document contains a fascinating overview of the Department, and the progress made in recent years. For example, recently the Department has begun to close the 'leaky pipeline' for female academics, and has worked very hard on mitigating unconscious bias in the recruitment of both students and staff, as well as providing training for undergraduate and graduate students on equality, diversity and inclusion issues. There has been particular focus on Early Career Researchers (ECRs), with the appointment of Dr Leonie Jones as Employability and Diversity Officer, and new roles of 'Post-doc Champion' and 'Fellowships Officer', leading to a significant growth in the career development opportunities we can offer.

The Department submitted an action plan for the next four years. In particular, the Department will be focussing on improving the recruitment processes used for senior academic positions, as well as enhancing support for mid-career academics through promotion to Professor, as well as up through the Professorial bands, including support for leadership training. Under the expanded Athena SWAN scheme, the Department considered the career progression of professional and support staff and identified a number of areas where further support for career development will be developed, for example through the Technicians' Commitment. The Department will also continue its sector-leading 'Beacon Activities', which aim to spread some of the best practice developed here both nationally and internationally.

York academic highly commended in Educate North Awards

Dr Glenn Hurst, Assistant Professor of Chemical Education in the Department, has been highly commended in the Teaching Excellence category at the Educate North Awards.

Dr Glenn Hurst attended the Awards Ceremony at the Hilton Deansgate in Manchester on Thursday 25 April, where the winners were announced at the culmination of the evening's celebrations.

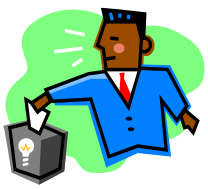
For the first time this year, the Committee included a "Highly Commended Award" in selected categories when the panel had difficulty reaching a decision. Only three of these were given, among the 21 categories. Glenn was one of ten finalists shortlisted for the Teaching Excellence Award.

Glenn said, "I'm delighted to have been highly commended in the Teaching Excellence category. It was a fantastic evening and I would like to thank my inspirational colleagues in the Department of Chemistry, as well as the amazing undergraduate and postgraduate students at the University of York."

The Educate North Awards are a prestigious awards event which recognises and shares best practice and excellence in the education sector in the North. Now in their fifth year, the awards have 19 categories, ranging from Business Collaboration and Social Mobility to Teaching Excellence. The awards are judged by a panel of industry leading experts and professionals. They use a rigorous two-stage judging process which includes pre-scoring to determine the shortlist and a further judging session to select the eventual winners.

Dr Glenn Hurst conducts research across all levels of green chemistry education through the Green Chemistry Centre of Excellence (GCCE). He has specific interest in using social media and game-based learning strategies to transform the student learning experience. He regularly publishes in various chemistry or higher education publications and is chair of the Royal Society of Chemistry Higher Education Group.

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.

Dr Alison Parkin wins Edward Frankland Fellowship

Dr Alison Parkin receives fellowship in recognition of research into sustained production of hydrogen in high levels of oxygen.

Dr Alison Parkin has been named winner of the prestigious Edward Frankland Fellowship from the Royal Society of Chemistry in recognition of her work on advancing the understanding of the molecular basis of oxygen tolerance in hydrogenase enzymes.

The research recognised by the award is inspired by how nature can use the energy from the sun to produce hydrogen from water. This could ultimately yield a carbon-free fuel, which is compatible with existing natural gas networks and boilers and can also be used as a transport fuel in cars. The problem is that the naturally occurring biological systems do not work in high oxygen levels, and so sustained hydrogen-production is impossible. At the University of York, the Parkin group develops new chemical tools to probe hydrogen-production enzymes from bacteria to work out how to make them continue producing hydrogen in high levels of oxygen.

On receiving the Edward Frankland Fellowship, Dr Parkin said: "I am honoured to receive this prize in recognition of my group's hard work. I feel very lucky to be celebrating success in doing a job that I love."

In winning the award, Dr Parkin also receives £2,000 and a medal. Dr Robert Parker, chief executive of the Royal Society of Chemistry, commented: "Over the years, our lives have been significantly improved by the chemical sciences, from medicines and food to the environment itself. We are proud of the contribution the chemical sciences make to our global community, which is why it is right for us to recognise important innovations and expertise such as these."

Chemistry at York maintains its place in the UK top five

This week the Department of Chemistry confirmed its place among the UK's most highly regarded departments for the subject of Chemistry. The Department is ranked 4th in the UK in the Complete University Guide 2020.

Published annually since 2007, the Complete University Guide ranks 131 UK universities, 13 Arts, Drama and Music colleges and conservatoires, and 70 subjects by quality measures important to students.

In total, five departments at the University were ranked in the UK top ten: Chemistry (4th), English (5th), History (6th), History of Art (6th) and Social Work (9th).

GloSAT looks to history to predict future climate change

York's Department of Chemistry will play a crucial role in a project to accurately estimate global climate change since the start of the industrial era, using data collated since the days of the Clipper ships over 200 years ago.

The GloSAT project will be led by the National Oceanography Centre (NOC) in collaboration with colleagues in the Universities of York, Reading, East Anglia, Edinburgh and Southampton, as well as scientists from the Meteorological Office's Hadley Centre.

Current observational estimates of temperature change are made through a combination of sea-surface temperature from the ocean, and air temperature over land and ice; a complex process which can be prone to inconsistencies.

Accurate data is essential in assessing the effectiveness of global efforts to limit increases in the Earth's surface temperature in line with the 2015 landmark Paris climate agreement.

GloSAT will improve consistency by creating a new observational record using air temperature over the ocean, and will even use data going back as far as the 1700s.

Air temperature was measured on ships for decades before sea-surface temperature, meaning scientists can extend the data record back further in time.

One source of early marine air temperature observations is the fleet of the English East India Company between 1789–1834 along trade routes from Europe to India and Southeast Asia. There are also observations from land stations before 1850 that have not yet been used in global datasets.

Professor Kevin Cowtan says analysing these additional observations will enable scientists to more confidently estimate temperature change over two centuries, giving a deeper understanding of climate changes and the influence of external factors such as increased greenhouse gas concentration, volcanic eruptions and solar changes.

He added: "The University of York will be assessing the reliability of the historical temperature data by performing exhaustive comparisons between different observations.

"Comparisons between nearby weather stations will help to identify changes in weather station equipment, while comparisons between coastal weather stations and ship observations will help to determine the reliability of ship observations. We will also try to understand how meteorological factors such as wind direction affect these comparisons."

The GloSAT project will commence in October 2019 and will run for four years, it is funded by the National Environmental Research Council. The University of York will receive £307,755 of a £3.7m grant.

Is your sunscreen as good as it could be?

Researchers investigating how sunscreen ingredients interact with UV light are calling for more scientific tests to determine how effective commercial sunscreens are in protecting people from the sun's harmful UV rays.

Following research into the organic compound oxybenzone, once widely used in sunscreen lotion, scientists argue that products should carry a standardised measure of when the chemicals start to breakdown, offering less sun protection to the user as it did in the initial hours of application.

The effect of individual ingredients in bulk sunscreen formulations has previously been a challenge to study, seeing as they exist alongside a number of other UV-absorbing components in solution.

Scientists at the University of York have now developed a novel method of isolating sunscreen molecules, like oxybenzone, in the gas phase and can test the ability of these sunscreens to absorb UV light after exposure to UV photons from a laser.

They found evidence that certain forms of oxybenzone display a tendency to break down when they interact with light, limiting its ability to protect against UV rays.

Dr Caroline Dessent, from the University of York's Department of Chemistry, said: "Oxybenzone is known to absorb UV rays and was once very widely used in sunscreen mixtures, until concerns were raised about its ability to penetrate the skin.

"Although it can be found in limited supply in some products, manufacturers now tend to use other compounds that carry less risk.

"It is, however, a valuable sunscreen chemical to use as a model for how other, more regularly-used, sunscreen compounds might react to UV rays, and is a good place to start when trying to develop new methods for testing how durable these types of chemicals are."

As our skin is constantly being exposed to varying pH levels, with sweat being mildly acidic and chlorinated swimming pools being alkaline, the team at York have carried out their experiments on oxybenzone in both its acidic and alkaline forms.

Using a UV laser coupled to a mass spectrometer, which produces these chemical substances in their acidic and alkaline forms, the team were able to measure how strongly these forms of oxybenzone, in its gaseous state, absorb light from the laser.

The team reported that shining light on the alkaline form of the sunscreen oxybenzone produces free radicals, which are widely known to damage the skin's DNA and cause ageing of the skin.

Natalie Wong, PhD student in the Department of Chemistry at the University of York, said: "If you are

going to be in the sun for a number of hours, you would obviously want your sunscreen to maintain its high performance for a long time. You would ideally need these sunscreens to absorb the harmful UV rays and, in turn, release the energy as heat.

“Currently there is no commercial standard for stating that sunscreen will protect you over extended periods of time.”

The work being conducted at the University of York provides a basis for developing more rigorous testing regimes, and will now be used to investigate more commonly-used sunscreen chemicals so that manufacturers and consumers can be more informed about the best sunscreen products for protecting themselves for as long as they are in the sun.

Dr Jacob Berenbeim, from the University of York’s Department of Chemistry, said: “It is still imperative to use sunscreen. Here, we are investigating nuanced photochemical effects to better tailor future products and educate the public.

“The reduced rates of skin cancer as a result of methods of sun protection has shown that these products are needed, but research could offer even better protection now that we have improved methods of understanding the stability of their chemicals.”

In the future, researchers would like to see bottles labelled with a meaningful measure of the breakdown rate of these chemicals, so that consumers know when to re-apply the product for lasting skin protection.

The research is published in the journal *Physical Chemistry Chemical Physics (PCCP)*.

New starters

Dr James Firth, Lead Research Technician for Automated Chemical Reaction Screening with Professor Ian Fairlamb
Room: C/E114; Ext: 2584; Email: james.firth@york.ac.uk

Christopher Anthony, WACL Technician with Dr Martyn Ward
Room: C/G116; Ext: 4754; Email: chris.anthony@york.ac.uk

Rhiannon De Palma, Undergraduate Office Administrative Assistant with Katrina Sayer
Room: C/A109 & C/A119a; Ext: 3022/2512; Email: rhiannon.depalma@york.ac.uk

Dr Pavan Kumar Yerramsetti, Postdoctoral Research Associate with Dr Alyssa Avestro
Room: C/E202; Ext: 2593; Email: pavan.yerramsetti@york.ac.uk

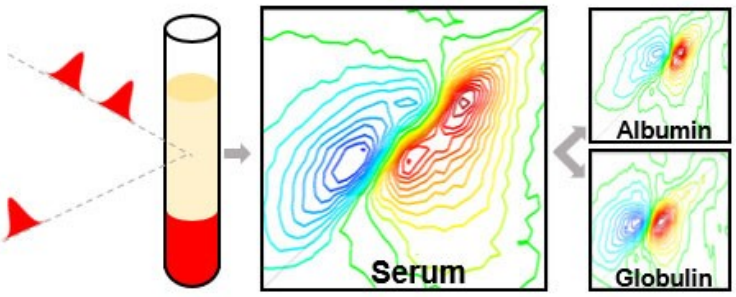
Elena Martin Arenos, WACL Technician with Dr Martyn Ward
Room: C/G116; Ext: 4754 ; Email: elena.martinarenos@york.ac.uk

Dr John Halfacre, Postdoctoral Research Associate with Dr Pete Edwards
Room: C/G119 & C/G020; Ext:1223; Email: john.halfacre@york.ac.uk

A multidimensional approach to blood serum analysis

A new spectroscopic technique that suppresses water absorptions allows infrared spectroscopic analysis of blood serum proteins for biomedical applications.

Infrared (IR) spectroscopy has long been a powerful tool used by chemists for determining the structure of molecules. IR produces a specific fingerprint for each molecule making it a potentially attractive method for analysing biofluids such as blood serum, where it could provide a broad chemical picture of the body's metabolism. This would be a useful clinical aid for the early diagnosis of disease.



Until now biomedical applications of IR spectroscopy have been prevented because water absorbs IR light at the same wavelength as proteins, masking a vital piece of the blood serum molecular jigsaw.

Research by Samantha Hume, a PhD student in the research group of Professor Neil Hunt at the University of York and the group of Matthew Baker at the University of Strathclyde in collaboration with the Science and Technology Facilities Council (STFC) Central Laser Facility located at the Rutherford Appleton laboratory has now shown that 2D-infrared laser spectroscopy (2D-IR) can avoid this problem.

2D-IR suppresses the water signal relative to that of proteins, and also offers the added advantage that each protein produces a unique 2D signature that enables differentiation of proteins in complex mixtures in a way that standard IR methods simply cannot match.

The team demonstrated the approach by measuring the concentration ratio of albumin and globulins, the major protein fractions in serum across a clinically-relevant range. Each sample required about 1 minute to capture, with no need for pre-processing of the serum samples. It was also shown that 2D-IR spectroscopy can go beyond the albumin to globulin ratio by detecting levels of minor globulin proteins.

Professor Hunt said: "This new technique opens up a straightforward spectroscopic approach to measuring levels of serum proteins that are currently only accessible via biomedical laboratory testing and could play an important role in the analysis of complex samples."

The research is published in *Chemical Science*, the flagship journal of the Royal Society of Chemistry.

Save the Date • Friday 19 July • Chemistry Summer Picnic

This year's Staff/Family Picnic will take place on the afternoon of Friday 19 July. The legendary Rounders Match, for anybody who's interested in taking part, will take place prior to the Picnic. Further details to follow.

Green solvent wins Environmental Leader Top Product award

An environmentally-friendly solvent developed in our green chemistry laboratories has won a top US industry award.

The bio-based solvent Cyrene is designed to replace toxic solvents like Dimethylformamide (DMF) and N -Methyl-2-pyrrolidone (NMP). The solvent was created in response to the need for chemicals to meet stricter regulation requirements for both employee safety and environmental sustainability. Initial studies and testing have found Cyrene to be a more sustainable, safer option when compared with DMF and NMP. It can also outperform these traditional products in some applications notably in the synthesis of some advanced materials.

The product launched last month and has won the prestigious Top Product 2019 at the Environmental Leader (EL) and Energy Manager Today (EMT) Awards. The awards recognise the most innovative and successful environment, sustainability and energy products and projects. The judges said that Cyrene "replaces an otherwise toxic substance with a natural, gentler alternative without compromising quality or function. This product has the potential to change the solvent landscape for the better."

Cyrene was also recognised by the 2017 European Bio-Based Innovation Awards as the Bio-Based Chemical Innovation of the Year for its superior performance against toxic solvents.

Cyrene was developed as a result of a partnership between the University of York's Green Chemistry Centre of Excellence (GCCE) and Circa Group. Utilising its expertise in green chemistry, researchers in GCCE worked to determine potential applications for the solvent.

Professor James Clark, director of York's GCCE said: "We are delighted to see the continued success of Cyrene which has moved from discovery to commercialisation in a remarkably short time. This can be largely attributed to the excellent collaboration between the GCCE team and Circa."

Roger J Mawby Demonstrator Prize Awards event

Monday 24 June • C/B/101 • 16:00

Message from the Graduate Office: All GTAs/Demonstrators and staff involved in undergraduate labs/ workshops are invited to this event for a drinks reception to celebrate the end of term and to say thank you for all the hard work and dedication shown by our GTAs throughout this academic year. Thanks to the generous bequest made in memory of Roger J Mawby, a founding member of the Department, we are able to award 5-6 prizes to some of our GTAs who have gone above and beyond the requirements of the role. A list of nominees will be shown at the event and the winners will be announced. Please sign up on this Doodle poll to ensure we provide sufficient drinks and nibbles.

North Group update

The last few weeks have been busy ones for Professor Michael North. At the end of April he travelled to New York to deliver a lecture on carbon dioxide utilisation to postgraduate students at Columbia University. The visit was also an opportunity to discuss research with staff at the Lenfest Center for Sustainable Energy in the Department of Chemical Engineering and highlighted the importance of green chemists and chemical engineers working together to develop and scale up sustainable processes.

Then in May, Professor North spent two weeks in China on a GCRF funded visit to develop new links in the area of sustainable polymers. His visit started in the south western city of Guiyang which houses the Department of Polymeric Materials & Engineering of Guizhou University. The group of Professor Xie there are active in the synthesis of biobased polymers from waste biomass such as lignin and Professor North presented work on sustainable polymers that had been carried out in the GCCE as part of the EPSRC funded platform grant on Material Substitution.

From Guiyang, Professor North travelled North to Chengdu where he was hosted by the College of Chemistry of Sichuan University. His host in Chengdu was Professor Yu who is doing exciting work on synthesis of potential monomers incorporating carbon dioxide. Professor North gave two lectures at Sichuan University, a research seminar on his work on carbon dioxide utilisation and an undergraduate lecture on sustainable solvents. The latter was also attended by academic staff and led to potential collaborations on the use of cyclic carbonates as green solvents.

Next, Professor North travelled to the city of Changchun in north east China where he was hosted by Professor Wang. Professor Wang is one of the world leaders in the area of synthesis of polymers from carbon dioxide and has taken his fundamental research to pilot plant and to full industrial scale. In addition to giving a seminar at the Changchun Institute of Applied Chemistry, Professor North was able to tour the pilot plant and see how carbon dioxide based polymers were being used to prepare both biodegradable mulching film for farmers fields and water based adhesives for Chinese rail carriages.

The final stop was Beijing where Professor North was hosted by Yanrui Ran of the Chinese Academy of Environmental Sciences and had discussions on how China regulates the treatment of solid waste. Overall it was a very positive visit and highlighted the scope for collaboration between the UK and China in the area of sustainable polymers to solve the global challenge of waste plastics, especially those which end up in the oceans.

Professor North at the Universities of Guizhou, Sichuan, the Changchun Institute of Applied Chemistry and examining carbon dioxide derived mulching film at the polycarbonate pilot plant.

Clarke Group news

Dr Paul Clarke attended the SCI Strategy meeting on 15-16 May at SCI Headquaters in Belgrave Square London, where the direction of the society for the next year was discussed. Paul is Chair of the Yorkshire and the Humber Regional Group of SCI and if you want to know more about its activities please go and see him for a chat or check out the SCI website.

Chris Maddocks gave a talk at the biannual RSC International Heterocyclic Meeting in Grasmere, the Lake District (9-13 May). Chris' talk was entitled "An Enantioselective Aza-Michael Approach to Spirocyclic Pyrrolidines" and detailed his PhD research so far. See the next page for a full report of the meeting.

Chris giving his lecture.

Chris on top of the world after his lecture.

24th Lakeland Symposium – Grasmere 2019

Several members of York's organic section attended the biannual RSC International Heterocyclic Meeting in Grasmere, the Lake District (9 - 13 May). Attendees included James Rossi-Ashton (RJKT/WPU), Aimee Clarke (WPU/RJKT), Chris Maddocks (PAC), Andres Gomez-Angel (PAOB), Matthew Gill (PAOB), Giordaina Hartley (PAOB), Alex Hindle (PAOB) and Dr Will Unsworth. Professor Peter O'Brien also did a fantastic job at chairing/organising the event. There were also several ex-York attendees including Michael James, featured in the pictures below, who was a former RJKT/PAOB member and is now working for Dr Frank Glorius at Münster University. The four-day programme included a fantastic plenary speaker line-up combined with some well-organised afternoon walks. Posters were presented by James, Andres, Matt, Giordaina and Alex, whilst Aimee and Chris were selected to give short talks at the meeting which both went very well.

The weather was very pleasant and most of the York representatives completed the Katritzy Memorial walk on Sunday afternoon from Grasmere over into Borrowdale (through some rather boggy patches along the way despite the sunny weather!). Aimee won the runner up prize for her short talk entitled "Me, Myself and Y(nones) – Silver-Catalysed Synthesis of Spirocycles, Heterocycles and Polycyclic Scaffolds Using Ynones" which was well received by all the delegates.

Professor Robin Perutz in Switzerland

Professor Robin Perutz reports back his recent visit to Switzerland.

I spent two weeks in Switzerland giving a research lecture in each of five different universities. Among the highlights were speaking to both Jack Dunitz and Hans-Beat Bürgi. Jack knew personally three of the people after whom we name our colleges: Robert Woodward, Rosalind Franklin and Dorothy Hodgkin. In 1953 with Leslie Orgel, Dunitz proved the sandwich structure of ferrocene and demonstrated by symmetry-adapted ligand field theory that it should be a closed-shell molecule. Twenty years later, Bürgi and Dunitz were the first to show how crystallographic data can map a reaction coordinate, the start of data mining in chemistry. Bürgi asked some penetrating questions at my lecture that I am still discussing with him.

In addition to the chemistry lectures, I was the guest of honour for the ceremony to mark the naming of the Jungfraujoch Research Station as a "Chemical Landmark". My own distinction was based on inheritance – my father studied the crystallography of glacier ice at the research station in the 1930s and the mechanism of glacier flow in the 1940s. The research station opened in 1931 as one of the world's first international research facilities. Perched on a rock face at 3500 m between the even higher peaks of the Jungfrau and Mönch, it has been used over the years for research in cosmic rays, solar astronomy, glaciers and human adaptation to altitude. Nowadays, the majority of research concerns the atmosphere, especially climate and pollution. At a symposium in Bern for the Chemical Landmark, I gave a lecture entitled "The Jungfraujoch and Max Perutz: expeditions that shaped our understanding of glaciers". On the following day, we took the historic train to the Jungfraujoch, where I gave a speech in the wine cellar (!) There, I spoke about Professor Lucy Carpenter's atmospheric measurements at the research station as well as Max's work. Moving from the wine cellar to the lab, it was a great thrill to see spectroscopy in action for understanding the changes in climate and the transport of pollutants. It's amazing to see how much kit you can cram into these tiny labs, most of which can be monitored remotely. Finally, I gave an interview for Swiss TV that you can watch in French or Italian. We went up to the Jungfraujoch with snow and a dismal weather forecast, but to our delight, the cloud curtain gradually cleared and the dramatic view of the glacier and peaks was revealed. If you're interested, there should be a chance to hear my lecture in York in the Autumn.

Left: edible trophy for the speakers; Right Robin with Silvio Decurtins, President of the International Foundation for High Altitude Reesearch Staions Jungfraujoch and Gornergrat, Jungfrau behind (4158 m).

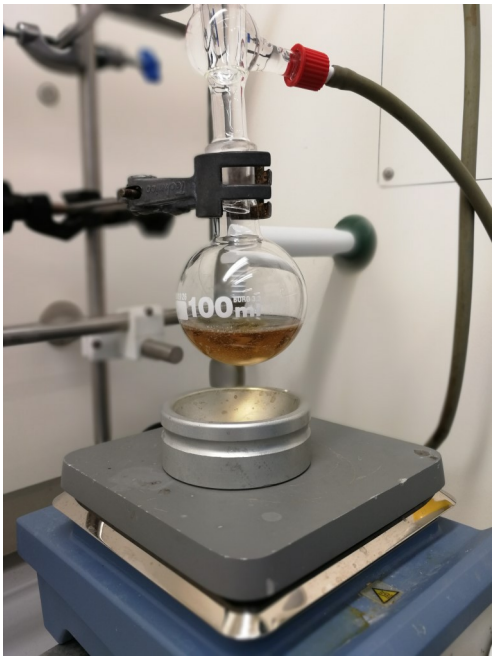
Lab Experience Day

On Monday 13 May, around 20 members of staff took part in a Lab Experience Day which was a four-hour session organised by Teaching Laboratories. Matthew Badham, Chemistry Administration Manager, reports back his experience of the day.

"It felt a little bit like 'back to school' for me and my fellow support staff as we had our safety briefing in advance of entering the labs. Briefed on the experiment which was a conversion of Aspirin to salicylic acid - a real experiment that is usually used for all first year Chemistry students - we donned lab coats and safety specs and entered the teaching labs. Following a demonstration from lab staff of the first part of the experiment we were then let loose with flasks, clamps, measuring cylinders, condensers and separating funnels. Luckily the demonstrator was then close at hand as I negotiated my way through each stage of the experiment. I was very pleased and relieved not to break anything!

What was the point of this? Well, for someone like me, who hasn't been in a lab since the late-nineties it was an invaluable insight into the work that goes on in labs. It was fascinating to see all the facilities and all the hard work of designing, preparing, briefing for, demonstrating and carrying out an experiment. Not to mention the very delicate operation of washing up once you've finished. It felt like having long or very flexible arms were a must for any chemist trying to clamp apparatus and reach right to the back of the fume cupboard. Recording weight and appearance at various stages, towards the end of the experiment we got to see a variety of equipment at the various stages of synthesis and even analysed the final product using an infrared spectrophotometer before some final calculations to see how successful our final yield was. Apparently my off-white powder aka salicylic acid was 74% which is a decent result.

Thanks to all those who organised the day which I know I and lots of the other staff all really enjoyed. Particular thanks to Helen Burrell, David Pugh, Adrian Whitwood, Charlotte Elkington, David Pugh, Emma Dux, Gregg Addicott, Laurence Abbott, Liza Binnigton, Scott Hicks, Will Duckworth and Phil Helliwell for their involvement in setting up and running the day. It was really great to step outside of our normal roles and gain a new understanding of work that takes place in another area of the Department."



Yann Lie and Dr Glenn Hurst attend 4th Green and Sustainable Chemistry Conference

From 5-8 May, Yann Lie and Dr Glenn Hurst attended the 4th Green and Sustainable Chemistry Conference in Dresden, Germany.

Yann gave an oral presentation on 'Platform and fine chemicals production from microalgal biomass: a multi-component "Chemicalgal" plant'. Yann's presentation was an opportunity for him to give an overview of the work he has conducted so far as a PhD student at the GCCE. Using the CMF process as a key reaction for the use of the carbohydrate and lipid fraction of the biomass he developed the multi-component biorefinery concept so-called "Chemicalgal" plant. He further linked his worked on the decarboxylation of glutamic acid as a means to valorise the protein residues left after the CMF reaction. Finally, the synthesis of bio-derived UV-filters for sunscreen application was demonstrated using the platform molecules produced from microalgae. This talk was also an occasion to show the use of the BioLogicTool developed in collaboration with VITO's researchers and to highlight his personal views on societal and economical changes that are needed to address the ecological challenges that we face.

Glenn gave a keynote lecture on 'Systems thinking approaches to facilitate international green chemistry education'. As part of this new work, Glenn discussed his participation in an IUPAC-funded project on embedding systems thinking into chemistry education via green chemistry. Glenn highlighted the students as partners approach that he takes, outlining publications in the *Journal of Chemical Education* with both Y4 MChem (York) students but also Y3 miniproject students.

The conference was an excellent opportunity to network with leading scientists, industrialists, educators and publishers within the green chemistry community and beyond. Furthermore, it was great to be able to reconnect with ex-York staff such as Dr Javier Remon Nunez, Dr Alexandra Inayat together with Professor Karen Wilson, with whom Glenn co-chaired a session with. Glenn will submit an invited manuscript to *Current Opinion in Green and Sustainable Chemistry* to capture his lecture.

Dr Nigel Lowe reports on the RSC Directors of Undergraduate Teaching and Admissions Tutors meeting

Dr Nigel Lowe attended the Royal Society of Chemistry's annual 'Directors of Undergraduate Teaching and Admissions Tutors' meeting at Burlington House on Monday, 13 May. He reports back on some of the content of the meeting that may be of interest:

RSC Chemists' Community Fund Student Hardship Grants (RSC Benevolent Fund)

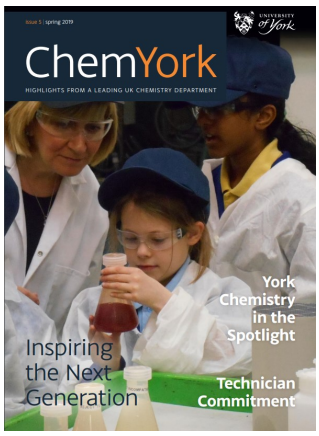
Since April 2019, eligibility for these grants has been extended to include RSC student members with less than three years RSC membership. This means the grants will offer support for all RSC student members including undergraduate and postgraduate students in circumstances such as illness, disability, estrangement from parents, bereavement or caring responsibilities etc.. This support can be offered for up to 12 months and is capped at £45 per week. This is a possible source of support that supervisors might be able to direct student towards in exceptional cases (and all such cases would be expected to have pursued support from local hardship funds before applying).

Nuffield Research Placements

Sharmila Metcalf (Head Nuffield Placements) addressed the meeting to try to enlist help with the offer of projects for students from disadvantaged backgrounds in the summer at the end of their Year 12 to spend 4-5 weeks working in a chemistry research environment. Typical students who might be eligible for the placement would come from a disadvantaged background where they might have potential to be the first entrants to HE from their families. Yorkshire was one of the areas with a current shortage of placements. Whilst the advantages of this scheme for the Year 12 students are clear, anecdotal evidence was presented for the benefits for the host institution such as development opportunities for PhD students paired up with the placement students. Anyone wishing to learn more can visit this page on the Nuffield Foundation website, or, to offer an opportunity of this type, contact Sharmila at smetcalf@nuffieldfoundation.org.

ChemYork Spring Issue 2019 - now available

We are pleased to let you know that Issue 5 of our ChemYork external magazine page is now available: www.york.ac.uk/chemistry/news/chemyork-ext-mag.



This issue includes recent prizes, high impact news stories and features on interesting aspects of departmental activity such as:

- A look at CIEC's innovative work to inspire primary school students with chemistry, from the perspective of visiting researcher Guirong Wang (Beijing University of Chemical Technology)
- Interview with Abby Mortimer and Dr Graeme McAllister on the Technician Commitment
- Fun feature awarding 'Oscars' for recent media coverage of work in the Department

Green Impact

Drinking Water

There is drinking water available in the Chemistry Foyer outside A101, by B101 and in the Student Common Room in B Block. Please use reusable bottles, glasses or mugs wherever you can instead of the plastic cups to reduce plastic waste.

Sustainable Shopping

Consider buying products that reduce impact on the environment. Perhaps looking at the products you buy, seeing if they contain things like 'palm oil', also consider where the products have come from and trying to buy more locally. Consider buying some products in bulk and reduce packaging generally. Also using re-useable bags where possible.

The following websites give information on buying more sustainable/ethically sourced products:

- www.ethicalconsumer.org - click on 'Full A to Z list' to find out about products (out of 20, the higher the rating the better). The surface level detail is free, for more detail you will have to pay a subscription.
- www.thegoodshoppingguide.com is similar to the above. There is also an app.

Buy FSC certified wood products and Rainforest Alliance certified products. Consider buying environmental cleaning products, such as Ecover.

Information on what and where to buy Fairtrade products: www.fairtrade.org.uk/en/buying-fairtrade

BigBarn—find local food: www.bigbarn.co.uk.

Why buy new books? Simply buy second hand books online:
www.worldofbooks.com (free delivery) and www.abebooks.co.uk

Buy from charity shops – reuse items rather than buying new (and save money!). There are quite a few charity shops in York (see Goodramgate). Search for 'charity shops' in York on www.yell.com.

Support your local shop! www.visityork.org/shopping is a good websites for information about which shops to go to in York.

Eat Seasonably

On the Eat Seasonably website, you can click on the different types of vegetables and tips are also displayed on how you can use them.

Best to eat in **May** – cucumber, cauliflower, spinach, asparagus, rhubarb

Best to eat in **June** – same as above, in addition, courgettes, broad beans, peas, strawberries

Consider also growing your own vegetables – you don't need much space. See the Eat Seasonably website on what to grow, when.

The York Festival of Ideas 2019: Festival Fringe Family Fun Afternoon

Date: Saturday 8 June
Time: 1-4.30pm
Location: Ron Cooke Hub, Campus East, University of York

The York Festival of Ideas 2019 will take place this summer between 4-16 June, under the overarching banner of "A World of Wonder". The event, first launched in 2011, is a exciting partnership between the University of York and numerous cultural, social, and business organisations both within the city and at a national level, and offers the opportunity for PhD students and university staff alike to showcase their research to the public, and contribute to the education, social, and cultural development of York and Yorkshire.

As the largest free festival in the UK, the York Festival of Ideas will deliver an extensive programme of interesting talks, workshops, performances, exhibitions, and panel discussions. The York Festival Fringe Family Fun Afternoon, which will take place at the Ron Cooke Hub on Saturday 8 June 2019 between 1-4.30pm, will offer younger audiences between the ages of 5-11 an afternoon of energetic, scientific, and historical fun.

This year, in particular, postgraduate students within the Department of Chemistry's Physical Chemistry section will be hosting a series of engaging and fascinating activities, and will aim to introduce the ideas behind the "Wonders of Light". Throughout the afternoon, such activities will primarily focus on using lights and colours to introduce the underlying concepts of UV and Visible spectroscopy. With the aid of ThinkFun's Beam-Bending Laser Maze Logic Game, young participants will also be able to explore the magical (and exciting) world of laser alignment, using Class 1 lasers, mirrors, prisms, and beam blockers!

The Festival Fringe Family Afternoon will definitely be jam-packed with a range of activities suitable for children of all ages. Be sure to pop along to check out all the activities on the day!

New arrivals

Dr Lianne Willems and husband Sebastiaan are delighted to announce the arrival of their twin boys, Julian Matthew and Finley Benjamin.

They were born on 19 May, weighing 2.2 kg each. Mother and babies are doing well.

Chemistry Networking Techniques Workshop

-networking for people who hate networking

Wednesday, 5 June

16:00 – 17:30 C/B/102

All Chemistry postgraduates and staff welcome

What will the event involve?

- Develop your 'Elevator Pitch'
- Networking: What is it? Why do it? How to be good at it?
- Good networking/Bad networking exercise
- Speed-problem solving
- Get to know others in the department

Refreshments provided - please sign up below

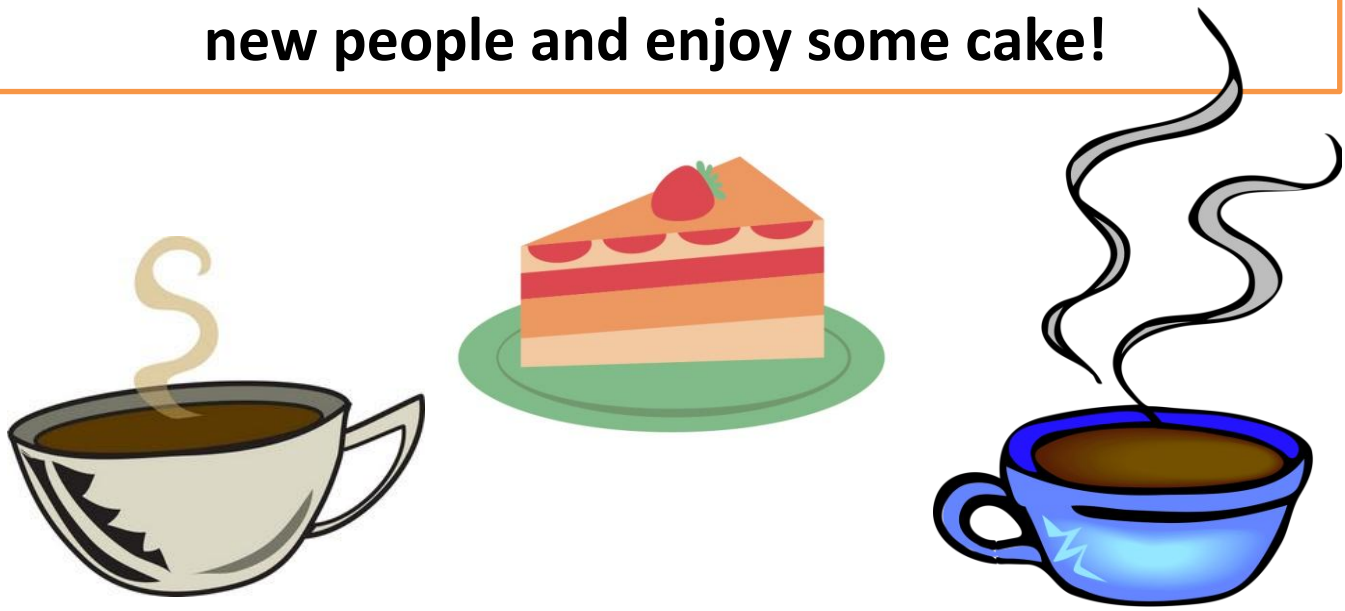
Register for this event: PGR students on Skills Forge CHE2086
Staff email – chemgrad@york.ac.uk

Chemical *Inter*Actions

Coffee Morning

Chemical *Inter*Actions is a social group open to all in the Department of Chemistry.

Come along to our coffee morning to meet new people and enjoy some cake!



All staff and students, both undergrads and postgrads, welcome!

Please bring your own mugs if possible

Wednesday 12th June

11am in C/A122

chem-interactions@york.ac.uk

www.facebook.com/ChemInteractions

CO_2Chem Network Events
2nd to 6th September 2019

The Diamond, University of Sheffield, 32 Leavygreave road, Sheffield, S3 7RD

The CO_2Chem Summer School – Exploring CDU - 2nd to 4th September 2019

The CO_2Chem Workshop – Vision to Reality - 5th September 2019

3rd CO_2Chem Annual Status Conference 2019 - 6th September 2019

Context

Carbon dioxide has been an important chemical feedstock for decades. There is growing interest in expanding this utilisation, including for chemicals, polymers, building materials and fuels. Development and deployment of these modern applications is accelerating around the world. Unlocking the new potential of Carbon Dioxide Utilisation (CDU) is a multi-disciplinary challenge and requires connectivity between discovery, scale-up and deployment. Future energy pathways dictate deployment strategies, while regulatory and fiscal regimes influence process viability. The CDU agenda links closely to those of climate change, energy security, circular economy, industrial renaissance, resource management and sustainable consumption.

Aacademics, industrialists and policy makers working to explore the utilisation of carbon dioxide as a chemical feedstock.

These events are grant supported as part of a EPSRC Grand Challenge Network. Interest from potential sponsors or media partners are most welcome. Exhibition space will be available during the workshop and status conference. Please contact info@co2chem.co.uk with any queries and for terms/availability.

Aim of the Summer School

The CO_2Chem Summer School will explore the CDU agenda, including socio-economic and environmental underpinnings, central research challenges and latest drivers, progress and opportunities. The course suits post-graduates and early career researchers from across the engineering, physical and biological sciences – helping you to contextualise your current research, develop high impact lines of new enquiry, and engage and influence, or indeed forge careers, beyond academia. Early bird and standard registration will run until the end of May and from June to August, respectively.

Aim of the Workshop

The CO_2Chem workshop is a new edition to the CO_2Chem events calendar. This standalone event, tailored for CDU professionals from across academia, industry and government, provides insight, training and discussion on key themes relating to CDU. The workshop is a great opportunity for Continuing Professional Development. The programme assumes a general knowledge and active interest in the field. For those with less experience, the preceding summer school would provide an excellent foundation and we encourage you to attend the two together.

Aim of the Annual Status Conference

The CO_2Chem Annual Status Conference offers a showcase of research from CO_2Chem members based in the UK and beyond. The conference is an opportunity to explore the full scope of CDU research. This year, the themes of Frontier Development, Products and Process, Industrial Applications, Technical Assessment and Policy will be discussed. Invitations are open for oral and poster presentations until midnight 7th July 2019.

Register your place at
http://co2chem.co.uk/eventsweek

EPSRC
Engineering and Physical Sciences Research Council
CO2Chem is an EPSRC funded Grand Challenge Network

CO2Chem

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