

Chemistry Update

Newsletter 304, 19 December 2018

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Calendar of Events



UCAS Pre-Offer Visits

Dates: 8, 15 & 24 January
Time: 12pm—4pm

UCAS Post-Offer Visits

Dates: 29 & 31 January
Time: 12pm—4pm

McCamley Lecture

Speaker: Dr Libby Gibson,
University of Newcastle
Date: Wednesday 16 January
Time: 1pm—2pm
Location: C/A101

Physical Seminar

Speaker: Prof Helen Fielding,
University College London
Date: Wednesday 30 January
Time: 1pm—2pm
Location: C/B101

Chemistry Graduation Ceremony

Date: Friday 18 January
Time: 4.15pm—5.15pm
Location: Central Hall

Organic Seminar

Speaker: Dr Igor Alabugin,
Florida State University
Date: Wednesday 30 January
Time: 3pm—4pm
Location: C/A101

Organic Seminar

Speaker: Dr Simon Webb,
University of Manchester
Date: Tuesday 22 January
Time: 1pm—2pm
Location: C/B101

Date of Next Issue:
25 January 2019

York atmospheric scientist secures major sponsorship deal from high-tech company

An atmospheric scientist at the University of York has been awarded a £170,000 grant after the CEO of a major international company (Syft technologies, New Zealand) heard him speak at a conference and was so impressed he offered him a sponsorship deal.



Dr Marvin Shaw constructing one of the new mass spectrometers

[Dr Marvin Shaw](#) had just finished giving a keynote presentation at the prestigious annual British Mass Spectrometry Society (BMSS) meeting on the calibration of environmental instruments when he was approached by Doug Hastie, the CEO of [Syft Technologies](#), New Zealand. Mr Hastie was so taken with the presentation he immediately offered Dr Shaw a three-year research sponsorship deal. Consequently, Dr Shaw is currently on site at Syft Technologies in Christchurch for the next three weeks as part of a knowledge exchange exercise.

Dr Shaw is a research scientist in the [Wolfson Atmospheric Chemistry Laboratories](#), part of the Department of Chemistry, and an expert in

instruments for measuring urban air quality and pollution emission sources. He specialises in calibrating complex state of the art field instruments which measure gaseous volatile organic compounds (VOCs) of particular interest in urban and indoor air quality with a view to understand and quantify their emission sources and fates in the atmosphere.



L-R: Dr Marvin Shaw, Doug Hastie, Dr Daniel Milligan (R&D Manager Syft Technologies)

He will be sponsored by New Zealand-based Syft Technologies which design and manufacture high-tech devices to test air quality for industrial processes and outdoors.

Over the next three years Dr Shaw will work with colleagues at Syft to develop their Voice200 Ultra – a new chemical mass spectrometer and improve its ability to measure trace air pollution. In particular, he will develop technologies to fine-tune and calibrate the device to provide more exacting measurements.

Dr Shaw completed his PhD at York and has also spent several years working in government labs before returning to the University in 2015, having

gained further post-doctoral research experience at the Lancaster environment centre, Lancaster University.

He said: "This is a remarkable opportunity, I look forward to the opportunities that this sponsorship will provide, in particular working more closely with the Syft-Technologies to develop next generation analytical instrumentation for characterising the quality of the air we breathe".



Syft Technologies Production and Development Facility in Christchurch

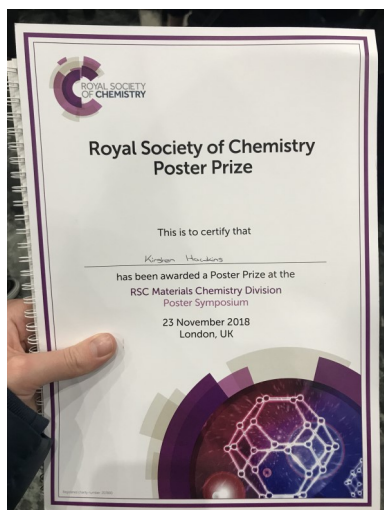
Alastair Lewis, Professor of Atmospheric Chemistry at the University of York, added:

"This is a fantastic achievement for Marvin and demonstrates that our lab's PhD graduates are not just first class atmospheric scientists, but also highly rated engineers with real entrepreneurial skills.

Doug Hastie, CEO of Syft Technologies, added: "Syft Technologies are a growing company who are committed to supporting a skilled team of chemists, physicists, mathematicians, hardware and software

engineers at its facilities in Christchurch. Our research goals align with both Dr Marvin Shaw and the Wolfson Atmospheric Chemistry Laboratories at York, particularly our views toward the advancement of detection technologies for a wide range of applications applicable to the 21st century".

Clarke Group news



On 23 November, Kirsten Hawkins attended the RSC Materials Division Poster Symposium in London. It was a great conference with flash talks, posters and a plenary talk by [Professor Andrew Goodwin](#), University of Oxford. Kirsten received a great deal of interest in her poster and won a poster prize!

On 3 December, Kirsten Hawkins and Chris Maddocks both attended the RSC Organic Division Poster Symposium in London. The conference is one of the RSC Organic Division's flagship events and showcases work from PhD students across the UK and Ireland. Again, this was another great conference with lots of organic chemistry.

Kirsten commented that "It was a great conference to go to as a non-synthetic organic chemist - people were interested about gels and how they can be used for catalysis and why it relates to prebiotic chemistry".

Chris presented a poster on "The Asymmetric Synthesis of Pyrrolidines". Chris had discussions with

representatives from industry and academia about his project, which garnered much interest from a med-chem perspective.

Chris commented that "Many people shared feedback and thoughts on the work and it really gave an insight into how our methodology could be used in a pharmaceutical setting. It was a very enjoyable day with some very interesting chemistry presented from other participants."

Dr Paul Clarke has been on a research visit to the labs of Professor Mick Sherburn at the Research School of Chemistry, Australian National University in November to continue their collaboration. Paul also gave an invited lecture at the Royal Australian Chemical Institute's Organic18 RACI Organic Division National Conference at the University of Western Australia in Perth. Paul's lecture was entitled "New methods for the aminospiracyclisation of piperidines and pyrrolidines" and covered the work of Sam Griggs and Chris Maddocks. Paul was also an official student poster and oral presentation judge at the conference - which was a very tough job.



Perth—the Swan River



Perth



University of Western Australia

Dr Glenn Hurst at Times Higher Education Awards and Leicester talk

On 29 November, [Dr Glenn Hurst](#) attended the inaugural Times Higher Education (THE) Live Conference at the Montcalm Hotel in London. Professor Sir John Curtice gave the plenary lecture on assessing what surveys tell us about the political opinions and preferences of students, academics and graduates (with specific reference to the latter's particular views on Brexit and immigration), and polling's broader bearing on the national debate.

Glenn gave his own invited talk detailing his shortlisting in the 'Most Innovative Teacher of the Year' category. This session was a brilliant opportunity to learn about the work of the other nominees, providing a great deal of inspiration while celebrating the importance of excellence in teaching. Finally, there was a panel discussion between vice chancellors from numerous institutions together with Mary Curnock Cook, former CEO of UCAS and Nick Hillman, Director of the Higher Education Policy Institute. During this discussion, the University of York was highlighted as an exemplary institution for supporting students with mental health.

The THE Awards took place in the Grosvenor House Hotel in the evening. This was hosted by John Gill, editor of THE with Sandi Toksvig as the celebrity host. Theo Gilbert from the University of Hertfordshire won the award of 'Most Innovative Teacher of the Year' for incorporating compassion into the curriculum. York were also shortlisted in the 'University of the Year' category with the University of Essex taking the crown.



Dr Glenn Hurst at the THE Awards evening event



Dr Glenn Hurst giving his talk at the University of Leicester

On 5 December, Glenn gave an invited talk at the University of Leicester on his work in green chemistry education together with social media in higher education. An excellent programme of meetings was arranged allowing Glenn to explore how problem-based learning is facilitated in Chemistry at Leicester together with how Natural Sciences is coordinated.

Disability in STEM

What do these people have in common? They are all fantastic scientists with disabilities. As part of disability history month, Professor Robin Perutz and Dr Julia Sarju gave a talk introducing seven of their science role models.



Maggie Anderin-Pocock MBE, Space Scientist, Science Communicator, Superstar



"My advice to other disabled people would be, concentrate on things your disability doesn't prevent you doing well, and don't regret the things it interferes with."

Wanda Diaz Merced, Astronomer



John Nash, Nobel Prize in 1994 for "pioneering analysis of equilibria in the theory of non-cooperative games."



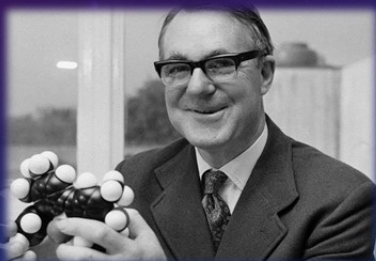
Jeremy Burdett, Theoretical Chemist



Dorothy Hodgkin, X-ray Crystallographer

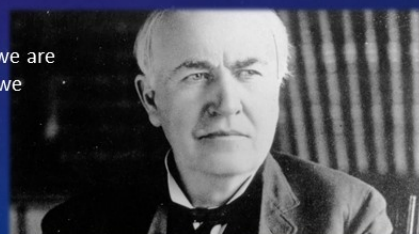


John Goodricke, Astronomer



John Cornforth, Nobel Prize Winning Chemist

"If we all did the things we are really capable of doing, we would literally astound ourselves."



Thomas Edison, Inventor Extraordinaire

Here is a brief introduction to each of them:

First up, [Dorothy Hodgkin](#), who contributed hugely to our understanding of the structure (and hence function) of biologically relevant molecules such as vitamin B12, penicillin, and insulin.

Next, **John Goodricke**, an astronomer in the 18th century who observed the periodicity of binary stars and was elected a fellow of the Royal Society aged 19, no mean feat! Find out more about this [very famous Yorkie](#).

Then, we have **John Cornforth** who was awarded a [Nobel Prize](#) in 1975. He traced the stereochemistry of enzymatic synthesis by introducing methyl groups substituted with deuterium and tritium.

Jeremy Burdett was a gifted theoretical chemist with a skill for simplifying complex chemistry problems.

Cheryl Alexander (nee Smith), a superstar chemistry teacher, ex-Yorkie, and one of the [RSC's 175 faces of Chemistry](#).

Wanda Diaz Merced leads the AstroSense project and the South African Observatory's Office. She helped to develop a way of processing information from space into sound so that you can [listen to the stars](#).

And last but by no means least, we have **Jack Fellows**. Jack has inspired us with their enthusiasm and passion for science and science education. They are now studying for their PGCE after being awarded an RSC teacher scholarship. We are sure Jack will be a role model for so many students and teachers alike.

We plan to make the case studies available online, if anyone has any suggestions for other science role models; please get in touch with either [Robin Perutz](#) or [Julia Sarju](#).

Unconscious Bias Observer Training Workshop



On Wednesday 12 December, an Unconscious Bias Workshop took place for members of the Department and staff across the University to provide training in becoming an unconscious bias observer. The training was led by Dr Leonie Jones with support from Dr Caroline Dessent, who commented: "For people external to the Department, this allowed us to share information on how they could set up a similar scheme in their Department. The workshop was very well attended, with 30 participants, and about half coming from

outside the Department. Feedback on the event was very positive, with several of the participants leaving the workshop with plans to establish their own scheme."

"The Department has now run the scheme for several years where an unconscious bias observer is present in short-listing and interviews, to ensure that recruitment activities are consistent for all applicants. Anyone interested in learning more about how unconscious bias can affect recruitment might like to [view the video](#) that was produced as part of a project by the European Research Council."

- Dr Leonie Jones and Dr Caroline Dessent

Athena SWAN Gold application submitted



L-R: Caroline Dessent, Leonie Jones, Derek Wann and Helen Coombs

Following many months of work that included gathering, analysing and plotting data, reviewing the results of our culture surveys, holding focus groups, and developing the action plan, the Department's Application for a Gold award was submitted on 30 November. Commenting on the submission Dr Caroline Dessent notes "I think that it's fair to say that this was a challenging process—as Leonie's picture of the pile of final week drafts illustrates! But those of us involved in putting together the application were proud of the document submitted."

"Although the Department was awarded three previous Gold awards, this latest submission is not a

"renewal" but a stand-alone application under the revised Athena SWAN scheme which has been in place since 2015. The revised scheme focuses broadly on gender equality, rather than women's progression, and includes all professional and support staff as well as students and academic staff.

"Professor Duncan Bruce has already sent an e-mail out to thank the key people who contributed to compiling the submission, but this is a good opportunity to thank many members of the Department who provided quotes, photos, completed surveys, took part in focus groups and provided comments on the draft application. All of these efforts are really important in ending up with a submission that properly reflects the whole Department.

"While the application is being assessed, we will not be distributing electronic copies of the submission, but we are very happy to provide paper copies to anyone who would like one."

- Caroline Dessent, Chair of the Equality and Diversity Group



Final week drafts of the Athena SWAN Gold application

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](#).

Systems Change Thinking - Closing the Loop



Attendees of the event gather for a festive group photo

On Monday 3 December, the [Green Chemistry Centre of Excellence \(GCCE\)](#) hosted the 'Systems Change Thinking - Closing the Loop' event at the Ron Cook Hub Lakehouse on Heslington East. The event commemorated the completion of the collaborative EPSRC funded project 'Sustainable Alternative Uses for food waste in the Circular Economy (ReSAUCE)' between the GCCE, the Food Science department at University of Nottingham and the SMART centre at Loughborough University.

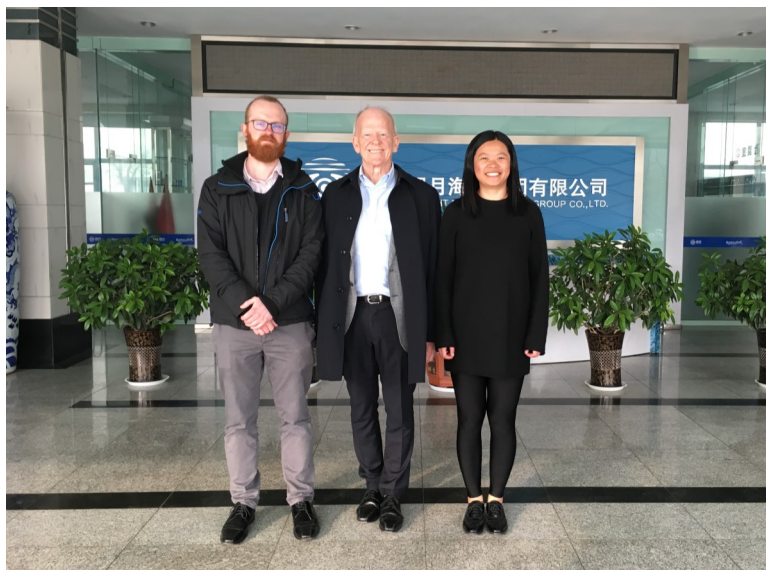
Chaired by [Dr Avtar Matharu](#), the event featured two very Yorkshire-themed talks. The first, by the GCCE's [Dr Tom Dugmore](#) told the story of the successful scale-up to 20L of the centre's microwave-assisted pectin extraction of pectin from citrus peel – a process currently carried out by boiling in dilute hydrochloric acid. Pectin is increasing in demand as an alternative bulking agent, gelling agent and viscosity modifier to sugar and fat in many foodstuffs. In his talk, through both the data obtained from the extraction runs and process modelling through SuperPro Designer, Tom demonstrated that the GCCE's microwave process had the potential to boost extraction yields by up to 64%, reduce the process time by 33-50% and reduce energy costs by >60% compared to current commercial processes. In turn, LCA work carried out by Loughborough University (and presented by Dr Guillermo Garcia-Garcia) estimated this could lead to a reduction in negative environmental impacts, such as greenhouse gas emissions, human toxicity effects, resource use and ozone depletion by up to 75%.

The second talk, from Dr Randa Darwish at University of Nottingham, demonstrated the recovery of a nutrient-rich juice from discarded pea vine. The Green Pea Company is a farming co-operative that harvests acres of land between York and Hull for Bird's Eye's frozen pea range, every year leaving behind several tonnes of discarded pods, leaves and stalks on the field. Randa demonstrated that, whilst the high cellulose content of this material renders it inedible to humans, the extraction of the chloroplast rich fraction of the juice has the potential to supply enough vitamin A for 30 million people per year from UK pea production alone. Collection of this juice is an issue, as enzymatic degradation of the vines begins to occur almost immediately after harvesting, and Randa has been investigating methods such as freezing, steaming and (in conjunction with the GCCE's microwave team) microwaving the material to knock-out the enzyme's activity, whilst retaining the nutrient content.

As well as the talks, there were also live demonstrations of the juicers used to extract the chloroplast rich fractions from other leafy green materials such as spinach and kale, and an orange juicer to illustrate the scale of waste orange peel produced from the juicing material. By extension, this also demonstrates the abundance of feedstock available for the processes developed at the two universities – feedstock that, at present, largely gets consigned to waste.

Green chemists in China

Professor James Clark, Dr Alice Fan and Dr James Sherwood of the [Green Chemistry Centre of Excellence \(GCCE\)](#) have recently returned from a Royal Society funded scientific exchange to China. Before arriving in Shanghai, all journeyed to Singapore to give presentations at the 'Asia-Oceania Conference on Green and Sustainable Chemistry', and visited the National University of Singapore, before travelling to Fudan University in Shanghai. Here, Professor Clark gave a series of lectures and engaged in research discussions with staff at the Department of Environmental Science and Engineering, who have recently moved to a magnificent new purpose-built campus.



Dr James Sherwood, Prof James Clark and Dr Alice Fan at Bright Moon

There were also visits to East China Normal, Shandong, and Ocean Universities, where Professor Clark gave invited lectures. The team joined former GCCE students when meeting with the HK Towngas (Shanghai) and Bright Moon (Qingdao) companies. Bright Moon is the supplier of alginic acid the GCCE use to produce its Starbon® mesoporous materials.

Finally, Professor Clark gave a plenary lecture at the 'International Symposium on Environment and Health', and Dr Sherwood an invited lecture to the 'International Workshop on Green Bio-refineries for Biomass Waste and the Environment' before returning to York.



Dr James Sherwood, Prof James Clark and Dr Alice Fan at Fudan University

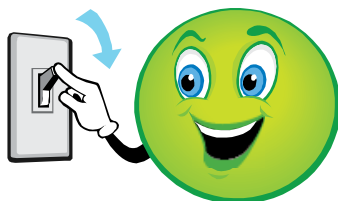
Green Impact

Please switch-off over Christmas

The Chemistry Environmental Performance Group would like to wish everyone a happy and safe holiday.

Over the Christmas break, please can you ensure the following is turned off (preferably turn off at the wall):

- Computers
- Printers
- Monitors
- Lights
- Photocopiers
- Any equipment that does not need to be kept running over this period



Please turn down the heating to the minimum settings where possible (radiators, thermostat controls and thermostatic radiator controls). Please also turn off any air conditioning as well.

You can access your office PC (if it is managed) or an equivalent virtual PC and work remotely by following the links on the University of York's [‘Work off campus’ page](#). If you just want to use your personal device, you can also log in to the [Virtual Private Network \(VPN\)](#). You can either install the Pulse Secure software or just use the more limited Web VPN. This allows you access to most webpages plus the central file stores, York Information Management systems and more.

Save your Christmas stamps!

Used stamps are collected and given to the Royal National Institute of Blind People (RNIB). The charity sells the stamps to generate revenue for their work.

Any and all stamps welcome!

Find a collection envelope located at **Chemistry reception**.



Green tips for Christmas

- ◇ **Heating** - try not to turn the heating up too much - wrap up in a jumper/blanket instead and wear layers.
- ◇ **Recycling** - recycle as much as you can - you might even be able to recycle wrapping paper (check on your Council's website - may need to remove sellotape) or use up old Christmas cards for scrap paper.
- ◇ **Food waste** - try not to cook more than you need or try to use up left over food the next day or store in the fridge or freezer.
- ◇ **Water** - try to wash up rather than using the dishwasher (and turn the tap off between each use). Only boil as much water as you need in the kettle.
- ◇ **Oven** - don't open the oven door if possible as this wastes energy. Cook more things at the same time by using smaller oven trays, for instance.
- ◇ **Fridge** - don't open the fridge too often (leave the door open for a longer period of time while you take out the items you need is more efficient than opening and closing the door several times).
- ◇ **Driving** – try to reduce the number of trips you have to make, for example try to combine outings, go shopping fewer times. Also, in the cold weather, try not to keep your car running when you start it up in the morning (it is more efficient to go straight away – de-ice your car before you turn the engine on).

