

issue 5 | spring 2019



ChemYork

HIGHLIGHTS FROM A LEADING UK CHEMISTRY DEPARTMENT



**York
Chemistry
in the
Spotlight**

**Inspiring
the Next
Generation**

**Technician
Commitment**

Welcome

PROFESSOR DUNCAN BRUCE, HEAD OF DEPARTMENT, INTRODUCES THE SPRING ISSUE OF CHEMYORK

In the last decades, academia has developed in an environment of increased international cooperation, much of it within the EU through its various collaborative schemes and all facilitated over the years by better communication. I recall well my first professional trips to Spain being coordinated by Telex and then, as the technology moved on, the great reverence with which I was rung up by the University's sole fax operator (one machine for an entire institution) to let me know I had a fax ready for collection. Now we can chat for free by Skype, WhatsApp or WeChat in real time with our colleagues in Japan or China in the morning and those on the American West Coast later in the day, while exchanging the latest drafts of joint papers at the mere stroke of the keyboard... and we don't have to be in our office to do so.

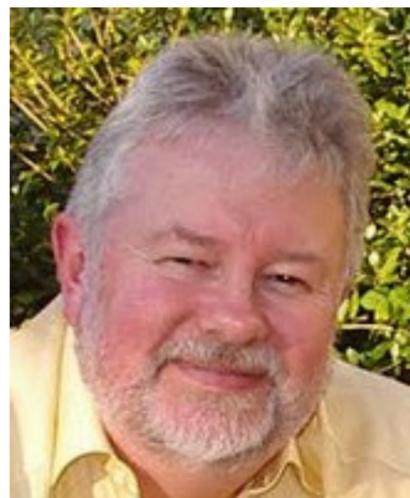
“So it is that we must always keep looking outwards, as we can learn so much from others by working together.”

This international approach to science brings a real richness to what we do and, for example, in my own group over more than thirty years, 80% of my postdoctoral fellows and 40% of my research students have come from over 20 countries outside of the UK with six international marriages resulting. So it is that we must always keep looking outwards, as we can learn

so much from others by working together. Elsewhere On page 6 you will read of Guirong Wang's, visit from Beijing University of Chemical Technology, and her experiences of outreach while spending a year with 'CIEC', a part of our organisation that spends all of its time reaching out from the Department and promoting science and industry with primary age children.

By looking outwards, we also have the chance to share with others the best of what we have to offer in different ways. One of these ways is, of course, our scientific research. The Department recently delighted in the news that Professor Lucy Carpenter has been elected a Fellow of the Royal Society. You will read more about this on page 9, but Lucy's work in atmospheric chemistry research and, for example, as lead author for the 2018 Ozone Assessment commissioned by the United Nations Environment Programme (UNEP) and World Meteorological Organization (WMO), has had a very important influence on how we understand ozone levels in the atmosphere.

Immodest as it may seem, sometimes we can influence by others looking in and observing what we do and, in the arena of equality and diversity, we were thrilled and humbled to be successful in our most recent application for an Athena SWAN Gold Award. Again, you will read more of this on page 9, but this award will see the Department's unstinting commitment to progressing this crucial agenda recognised at the highest level for over fifteen consecutive years until our next application for renewal. This is a lot to live up to, but a challenge we embrace with relish.



Last but not least, this desire to support all of those who work and study in the Department is reflected also in our active engagement in the national Technician Commitment scheme, and you will hear from two of the leading internal advocates, Abby Mortimer and Graeme McAllister on page 12.

By being the best we can be, those from elsewhere will take notice and will want to work with us. We strive for this in all we do from working with young children to promote the exciting world of chemistry, to teaching the wonderful groups of students who choose to study in York each year, to providing a place where all feel both supported and inspired in their work, to engendering a research environment that can enable us to compete at the highest levels. A challenge indeed, but one we are committed to embracing.

Front cover image: Centre for Industry Education Collaboration engaging primary school students with chemistry. Credit: CIEC.

Compiled by David Smith

Designed by Cookie Graphic Design

Award winners



British Mass Spectrometry Society Lecturer

Professor Jane Thomas-Oates was named as the British Mass Spectrometry Society Lecturer for 2019. This Lectureship is awarded every three years to someone who has made significant contributions to mass spectrometry research. Jane's team is focussed on the structural analysis of biologically-active molecules - characterising systems as diverse as biomolecules from archaeological samples and the signal molecules involved in nitrogen fixation.

Roger Parsons Medal

Dr Alison Parkin was awarded the inaugural Roger Parsons Medal of the Royal Society of Chemistry Electrochemistry Group. The Medal recognises an independent early career electrochemist working in the UK or Ireland for their contributions to any field of electrochemistry. Alison's team use electrochemistry to understand how transition metals in proteins activate chemical reactions that are essential for life. Understanding such processes is fundamentally important, and can underpin the development of new antibiotics or offer new solutions to environmental problems.



HEA Senior Fellowship and Educate North Award

Dr Glenn Hurst became a Senior Fellow of the Higher Education Academy in recognition of his 'influential educational and pedagogic work. Glenn has developed a number of innovations in Green Chemical Education, and uses social media methods to assist student engagement. In recognition of his dynamic contributions to chemical education, Glenn was also 'Highly Commended' in the Teaching Excellence Category of the Educate North Awards.

Enterprise Fellowship

Dr James Comerford, part of the Green Chemistry Centre of Excellence, received an Enterprise Fellowship to enable him to develop his research into the effective recycling of plastics containing complex chemical additives, in close collaboration with organisations potentially interested in commercial use of the technology.

Process Chemistry Award

Professor Ian Fairlamb was awarded the 2019 AstraZeneca, GlaxoSmithKline, Pfizer and Syngenta Prize for Process Chemistry Research in recognition of his expertise in transition metal catalysis and the mechanistic theory underpinning these industrially-valuable processes. Several key breakthroughs from the Fairlamb research group have been influential in industrial process chemistry.

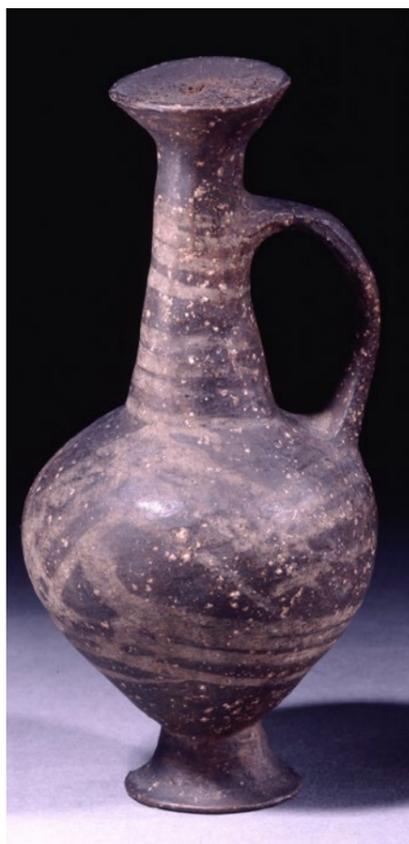
Haworth Memorial Award

Professor Gideon Davies was awarded the 2018 Haworth Memorial Lectureship from the Royal Society of Chemistry in recognition of his structural and chemical investigations of the biological roles of carbohydrates, dissection of enzyme reaction coordinates and the application of ligands for cellular insight.



Dorothy Hodgkin Fellow

Dr Alyssa-Jennifer Avestro was awarded a Dorothy Hodgkin Fellowship and joined the new Molecular Materials research grouping in York in January 2019. Dr Avestro is leading a multi-disciplinary research programme to develop robust organic molecular materials and assemblies with potential applications in energy technology. Dr Avestro's award is jointly funded by the Global Research Challenges Fund recognising the potential to benefit UK-led partnership and innovation in developing countries.



Traces of opiates found in ancient vessel

RESEARCHERS AT THE UNIVERSITY OF YORK AND THE BRITISH MUSEUM HAVE DISCOVERED TRACES OF OPIATES PRESERVED INSIDE A DISTINCTIVE VESSEL DATING BACK TO THE LATE BRONZE AGE IN THE EASTERN MEDITERRANEAN.

This type of 'juglet' had long been thought to have links with opium use because when inverted these vessels resemble opium poppy seed heads. The vessels were widely traded in the eastern Mediterranean ca. 1650 – 1350 BC.

Initial analysis by scientists at the British Museum showed that the juglet residue was mostly composed of a plant oil but hinted at the presence of opium alkaloids, a group of organic compounds derived from the opium poppy, known to have significant effects on the human body. To conclusively detect the alkaloids,

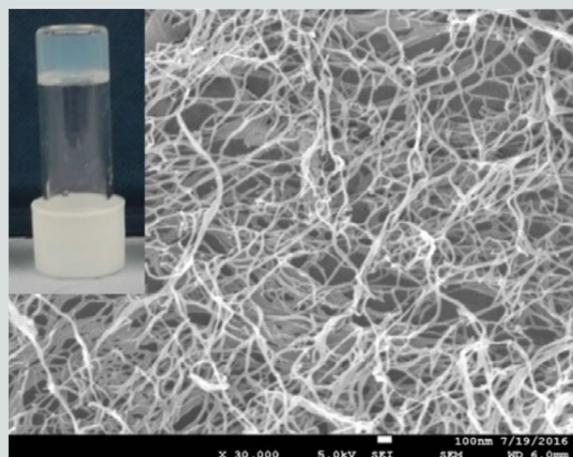
however, a new analytical technique was needed and samples were shared with Professor Jane Thomas-Oates and her team here in York. As a part of her PhD, Dr Rachel Smith developed a new mass spectrometric method that enabled the analysis of this residue. It was found that opiate alkaloids that can resist degradation were present in the juglet, with the results being reported in *Analyst* 2018, 143, 5127. This is the first time that reliable chemical evidence has been produced to link the opium poppy with a base-ring juglet, despite many previous attempts.

A simple recipe for highly conductive gels

YORK CHEMISTS LED BY PROFESSOR DAVID SMITH HAVE RECENTLY REPORTED THAT GELS, SELF-ASSEMBLED BY SIMPLY MIXING SUSTAINABLE, COMMERCIALY-AVAILABLE INGREDIENTS, HAVE HIGH CONDUCTIVITIES AND GREAT POTENTIAL FOR USE IN ENERGY TECHNOLOGY.

These conductive gels are formed in 'deep eutectic' ionic solvents, created by mixing together two simple environmentally-friendly solid components. The use of deep eutectic solvents as electrolytes in energy applications such as batteries and solar cells is limited because of the risks of liquid leakage. However, gel-phase versions that retain the high

conductivity, would be much easier to handle and safer to use. The innovative step of Professor Smith's team, reported in *Angewandte Chemie International Edition* 2019, 58, 4173, was to generate gels by simply mixing a sorbitol-derived small molecule additive into the deep eutectic solvent. This molecule self-assembles into nanofibres that form a gel network, preventing the



flow of the bulk liquid, but allowing the liquid to retain its molecular-scale mobility, and hence its conductivity.

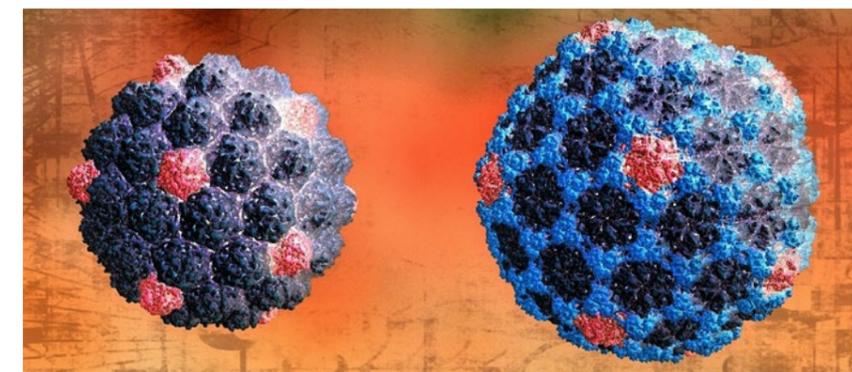
Professor Smith noted: "The low-cost nature of this system is particularly attractive – all components of the system are commercially available, cheap and sustainable. In principle, these gels could be directly applied in energy technology with very little further development."

Structure of heat-loving virus revealed

STUDIES OF A VIRUS ISOLATED FROM A NATURAL HOT WATER SOURCE IN KAMCHATKA, RUSSIA, HAVE PROVIDED CLUES ABOUT HOW THE CAPSID PROTEIN SHELLS OF VIRUSES ASSEMBLE AND EXPAND.

Bacterial viruses (also called bacteriophages) which infect the *Thermus thermophilus* bacterium are found in natural hot water sources. Due to their high stability and evolutionary links with human and animal viruses, these bacterial viruses are excellent model systems for understanding virus assembly.

In a study led by Professor Fred Antson, published in *Proceedings of the National Academy of Sciences* 2019, 116, 3556, advanced cryo-electron microscopy and data processing techniques were used to reveal structural changes that occur as the virus capsid shell



matures and expands. The research unexpectedly showed that these capsids have evolved an increased storage capacity, without increasing the number of protein subunits that constitute the capsid shell.

The virus utilises a very unusual modification to a classical virus capsid protein, which allows a doubling of the capsid volume whilst maintaining its structural integrity up to the boiling point of water – as experienced in the hot spring environment. Reflecting on

the surprising discovery, Dr Oliver Bayfield said: "We had to double-check the microscope was calibrated correctly, as it was quite unexpected".

The researchers also developed a way to package DNA into the purified empty capsids in a test tube, providing the opportunity to further study the mechanism of virus assembly under controlled laboratory conditions. In the future, these capsids have significant potential to be employed as nanocages in biotechnological applications.

Inorganic aromaticity switching

NEW THEORETICAL STUDIES HAVE PREDICTED THE FIRST INORGANIC RING THAT CAN SWITCH ITS AROMATICITY ON ELECTRONIC EXCITATION.

Disulfur dinitride (S_2N_2) was first formally reported by Frank Burt, working at University College London over 100 years ago. In the years since, the nature of the bonding in the square, four-membered inorganic ring has been the subject of considerable controversy, with a variety of bonding models being suggested on the basis of theoretical studies, and incorporated into textbooks.

The latest study from Dr Peter Karadakov and co-workers, published in *Chemistry A European Journal*

2018, 24, 16791, calculates and analyses the magnetic shielding surrounding the molecule for each electronic state. In this way, they have shown that for S_2N_2 , whereas the ground state is aromatic, and has delocalised bonding electrons around the ring, the singlet excited state is profoundly anti-aromatic – to the extent that bonding interactions are completely removed. This helps explain the experimental observation that S_2N_2 can decompose explosively when being struck or heated above 30°C.

S_2N_2 is therefore the first example of an inorganic ring for which theory predicts aromaticity switching upon electronic excitation. The results demonstrate that the range of compounds with 'Jekyll and Hyde'



behaviour in different electronic states is wider than previously thought, providing new directions in the search for molecules with tuneable properties, for applications in electronics, photovoltaics and molecular motors.



The Centre for Industry Education Collaboration – a global view

WE EXPLORE THE INNOVATIVE WORK OF CIEC FROM THE VIEWPOINT OF DR GUIRONG WANG, A VISITOR FROM BEIJING UNIVERSITY OF CHEMICAL TECHNOLOGY, WORKING WITH CIEC STAFF.

As an integral part of the Department of Chemistry, the Centre for Industry Education Collaboration (CIEC), is a unique unit that aims to engage children, especially those in primary school, with the chemical industry. This hopes to change stereotypical views and encourage young people to consider careers in chemical and industrial science. Over the past year, as part of her postdoctoral research, Dr. Guirong Wang, from Beijing University of Chemical Technology has been working with the staff from CIEC. We thought this was an ideal opportunity to explore the innovative work of CIEC from her viewpoint.

Why did you choose to visit CIEC for a year?

I met Sir John Holman in November 2017 when he visited Beijing – he was attending an academic event as the President of Royal Society of Chemistry. He told me about the world-class outreach work CIEC has been doing for thirty years, explaining that they have combined the design of effective practical programmes with research and evaluation of

impact. I did some further research and realised that there was nothing like this elsewhere in the world.

I have always been impressed with the outreach work done in the UK, which has the longest history in the world, going back to the Michael Faraday Christmas lecture of 1825! In recent years, the Chinese government has begun to recognize the importance of outreach both for primary and secondary school students and for the general public.

In 2015, my home university in Beijing set up an outreach centre, both to promote the development of science outreach and to collaborate with other organisations. Working with my Beijing supervisor, Professor David G Evans, over the past 3 years, we have taken part in many national and local science festivals, and organised demonstrations and hands-on experiments for students. Our activities are very popular, but the problem is that we don't know how to evaluate the activities. That's why I decided to come to UK and spend a year with CIEC, where I am being co-supervised by John Holman and CIEC's Director, Joy Parvin.

Can you tell us a little about the 'Flagship' Children Challenging Industry (CCI) programme you have observed?

In the first few months of my visit, I became familiar with the resources that have been developed for the CCI programme, and observed different aspects, including the delivery of lessons in primary schools, science staff meetings for teachers and the training of scientists and engineers in industry to work effectively with primary school children. I also accompanied some classes on their site visits to science-related companies, which is clearly the highlight of the programme for many children. I realised that all of these sessions are based on careful research over many years, which is why they are so effective.

What do you think are the benefits for the children who take part in Children Challenging Industry?

In the CCI programme, children learn science in a real-life context, improving their motivation and enjoyment of science. When I took part in the classroom sessions and site visits I could see the excitement on their faces. However, I think what's more important and will have a long lasting influence on children, is that the programme helps develop their awareness of what they can do in the future and why they need to learn science; great career guidance for children of this age.

I have also noticed that teachers benefit from the programme. They receive training from CIEC specialist teachers at staff meetings and work alongside them delivering two lessons linking science from industry to the primary science curriculum. Teachers also accompany their class on the site visit and interact with a variety of STEM ambassadors trained by CIEC.

All of this leads to teachers being a lot more confident in their own ability to deliver effective and relevant science lessons – this continues to benefit the children even after the CCI programme is finished.

How do these Children Challenging Industry programmes get developed?

I was delighted to be able to observe the development of a new primary science resource, based on 'sustainability', which was coordinated by one of the CIEC team, Nicky Waller. The process began with a workshop, with members of the CIEC team, the Department's Green Chemistry Centre of Excellence, and chemists and engineers working for Thomas Swan, Johnson Matthey, Quorn, Croda and Ineos, all giving input. Nicky used all of the contributions at this event to draft an exciting new resource combining information about sustainability with engaging practical activities and links with the primary school curriculum. The resource is being piloted in schools in the summer term and I am looking forward to finding out how it will be received.

How does the work of CIEC interface with other educational initiatives?

John and Joy have offered me a lot of opportunities to learn about other organisations and projects in the UK, which collaborate closely with CIEC. For example, I met the Primary Science Quality Mark (PSQM) Director, Jane Turner. CIEC has been involved with the PSQM since its inception. Indeed, CIEC is currently running a pilot project with PSQM schools, funded by the Royal Society of Chemistry. This project aims to use the expertise developed through CCI to support PSQM schools to have greater impact on the aspirations of primary children. It will achieve this by brokering links between STEM ambassadors and teachers and training them to make the most of the collaboration. Early indications are that this is having an impact on the children involved in the pilot.

What has impressed you most about CIEC?

People working in CIEC are really enthusiastic and passionate about what they are doing – they are very effective and collaborate with each other very well. The CCI programme has been running for over 20 years and has fostered many connections with primary schools and industries to benefit large numbers of children and teachers. Each session of the programme is designed very carefully and every detail considered to a very

high standard. CIEC evaluate their programmes using questionnaires and interviews with children and teachers.

This makes CCI very systematic, both practically and theoretically – this cannot be done without determination and persistence. That's the most impressive part about CIEC.

What are you hoping to take back to China based on your experience with the team?

I would like to take the CCI programme back to China. It might not be exactly the same because of differences in the culture and education systems. However, we will start with one primary school on a small scale to conduct the four CCI sessions (two class lessons, a staff meeting and a site visit).

I think the link with industry is really important and special. I have seen that companies in the UK become very involved in organising the children's visit. These companies take their social responsibilities. In China, some industries are also keen to help improve education. I hope to start by working with them and I hope this experience will also provide insight and guidance for other outreach programmes in China.

I feel very lucky to have the experience of working with CIEC. I hope we will establish more collaborations on science outreach in the future, which will benefit a lot more children, especially in China.



Superstar students

Nova Prize nominee

Final year MChem undergraduate student Melissa Davie was nominated for the inaugural Nova Prize in Chemistry. The Nova Prize recognises female students who have made outstanding early-career contributions to STEM, with awards being made in the six categories of Chemistry, Physics, Biology, Maths, Technology and Engineering. From hundreds of entries, five exceptional women were nominated in each category.

Early in her undergraduate career, Melissa was awarded funding from The Wellcome Trust to help support a summer project in the research lab of Dr Martin Fascione, in which she focussed on the addition of unnatural reactive groups to enable the modification of a range of biomolecules. She then went on

to carry out her final year MChem project as an industrial placement at the John Innes Centre in Norwich, where she worked on natural product biosynthesis, aiming to unlock the potential of naturally-occurring antibiotics.

During her degree, Melissa was heavily involved in science outreach and communication. She helped present the 'Antibiotic Hunters' stand at the Norwich Science Festival, talking to members of the public about the vital need for new antibiotics, and the key role of chemistry in discovering them. She also led a 'Women in STEM' stand at an event in Norwich for Year 11 pupils, to help inspire the next generation of female scientists.

Commenting on Melissa's contributions, Dr Caroline Dessent,



Chair of the Equality and Diversity Group said: "As an Athena SWAN Gold department, we are delighted to see our undergraduates getting involved in diversity-led initiatives and were very proud Melissa was nominated for the Nova Prize."

Undergraduate outreach pioneer

Third year Chemistry undergraduate, Alex Bytheway, was one of the judges for a communicating chemistry competition for #RealTimeChem week on Twitter. Alex has a longstanding passion for communicating chemistry and in response to a call for ideas from Jason Woolford (@Doctor_Galactic), suggested the innovative idea for a communicating chemistry competition.



#RealTimeChem week is a seven-day event where chemists across the world tweet about their chemistry as they are doing it, using the #RealTimeChem hashtag and connecting with other chemists in the process. The best tweets in various categories, such as #ChemSelfie, #ChemVideo, #ReactionPic are published in C&EN Magazine and also receive an award.

Explaining how his involvement in this year's event came about, Alex said: "I pointed out that the #RealTimeChem community at the moment just concerns chemists, but obviously there's a much wider audience on Twitter, so why not use hashtags to get chemistry out there a bit more? Jason liked the idea and went to Hindawi, an open access publisher, who offered to donate a tablet as the prize."

Alex has communicated chemistry on social media since his early teens when he had his own

chemistry YouTube channel. His talent was spotted early on when his videos were featured on the RSC's ChemNet website for 14-18 yr-olds, and he was later given an administrator's role, facilitating users' questions and answering them, for which he received an award. Alex also visits schools on the STEM Ambassador Programme, volunteers at RSC events, and has contributed articles to the magazine Chemistry Review.

Commenting on Alex's contributions, Admissions Tutor Professor Andrew Parsons, also heavily engaged in student outreach, said: "It is brilliant to see undergraduate students contributing so much to communicating chemistry - they often have much better ideas about how to inspire, motivate and engage the next generation of scientists than more senior academic staff like myself."

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.

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.

The Gold Award submission was primarily prepared by Dr Leonie Jones, Dr Caroline Dessent, Dr Helen Coombs and Dr Derek Wann, and contains a fascinating overview of the department, and the progress

made. For example, recently the department has begun to close the 'leaky pipeline' for female academics, and has worked very hard to mitigate unconscious bias in the recruitment of both students and staff, as well as providing training for 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 offer.

The Department submitted an action plan for the next four years. In particular, the department will focus on improving the recruitment processes used for senior academic positions, and enhance support



for mid-career academics through promotion to Professor, as well as up through the Professorial bands. The Department also considered the career progression of professional and support staff and identified areas where career development will be further supported, for example through the Technician Commitment (see page 12 of this issue).

The Department will continue its sector-leading 'Beacon Activities', which aim to spread some of the best practice nationally and internationally. More information about these activities will be provided in future editions of ChemYork.

Professor Lucy Carpenter elected Fellow of The Royal Society

PROFESSOR LUCY CARPENTER HAS BEEN ELECTED AS A FELLOW OF THE ROYAL SOCIETY IN RECOGNITION OF HER CONTRIBUTION TO SCIENCE. SHE CONDUCTS WORLD-LEADING RESEARCH ON THE EMISSIONS, CHEMISTRY AND IMPACT OF PROCESSES OCCURRING IN THE ATMOSPHERE ABOVE THE WORLD'S OCEANS.

More specifically, her group's research encompasses gas phase tropospheric chemistry, heterogeneous chemistry on ocean surfaces, long-term atmospheric observations, and ocean emissions of halogenated compounds.

The Royal Society is the oldest scientific academy in continuous existence. The award of Fellowship recognises individuals who have made a substantial contribution to the improvement of natural knowledge. Professor Carpenter becomes the 6th FRS in the Department of Chemistry,

joining Professors Eleanor Dodson, John Goodby, Robin Perutz, Gideon Davies and Pratibha Gai.

On receiving the news of the award, Lucy commented, "I'm hugely honoured and happy to be elected FRS, as well as surprised. A successful research career relies as much or more on collaboration, support and friendship from colleagues as it does on the individual, and I'm lucky to have experienced a lot of that in my life as an academic. I'd like to thank those who proposed me for the fellowship, and the students and



colleagues who have worked with me over the last 20 years or so."

Professor Deborah Smith, Pro-Vice-Chancellor for Research, said: "Lucy Carpenter is an exemplary scientist who has carried out excellent work of the highest international standing and with real impact in the world. Lucy is a genuine role model of the highest calibre."

You can find out more about Professor Carpenter in the Feature Article in Issue 3 of ChemYork.

Doctoral training programmes funded

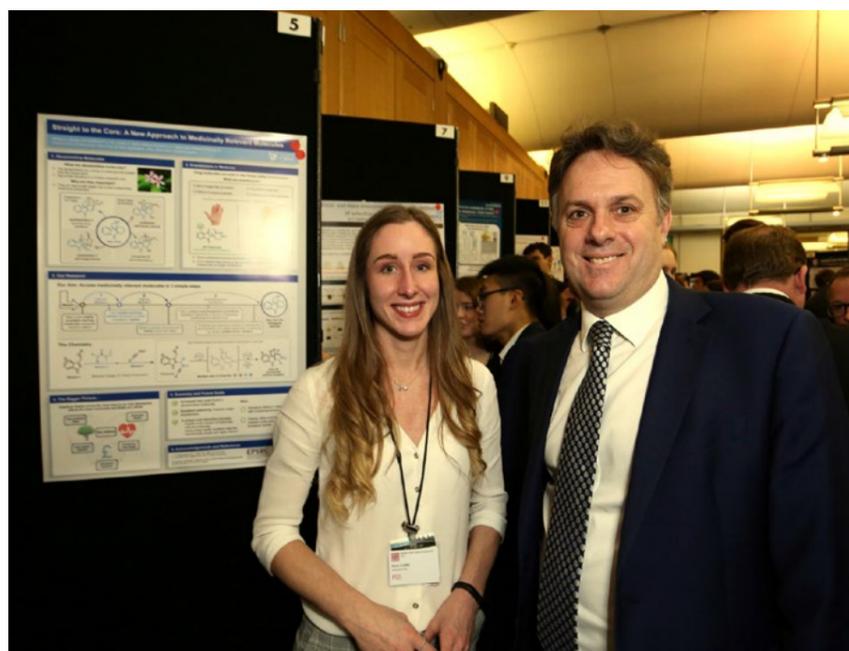
The Department of Chemistry received a share of £100M to train the next generation of environmental scientists, being involved in two of the successfully funded Doctoral Training Programmes (DTPs) supported by the Natural Environment Research Council (NERC).

These programmes aim to develop confident and multi-skilled PhD students capable of undertaking cutting-edge research and tackling questions of global significance.

The Adapting to the Challenges of a Changing Environment (ACCE) programme will support 14 new PhD students a year for the next five years in ecology, evolution and conservation.

This programme brings together the academic strengths of the Universities of Liverpool, Sheffield and York, and also benefits from the unique scientific expertise and resources of the Centre for Ecology and Hydrology and the Natural History Museum.

The PANORAMA DTP will support 13 studentships a year for the next five years in multidisciplinary studies of the science of the Earth's Atmosphere, Geosphere and Biosphere. The programme is a collaboration between the Universities of Leeds, Hull and York.



Presenting research to MPs

DR AIMEE CLARKE, A POSTDOCTORAL RESEARCHER WORKING WITH DR WILLIAM UNSWORTH AND PROFESSOR RICHARD TAYLOR, PRESENTED HER RESEARCH TO MPS IN THE HOUSES OF PARLIAMENT AT THE STEM FOR BRITAIN EVENT. SHE WAS ONE OF ONLY 30 CHEMISTS NATIONWIDE, SELECTED TO PRESENT RESEARCH AT THE EVENT.

Leading early career researchers from across the STEM (Science, technology, engineering, and mathematics) subjects discussed "ground-breaking and frontier UK research" with Members of Parliament - a unique opportunity for researchers to meet and engage with politicians.

Aimee presented a poster entitled "Straight to the Core: A New Approach to Medicinally Relevant Molecules" which communicated her complex work on developing a new synthetic approach to access medicinally relevant scaffolds. After the judging, Aimee was able to present her work to her MP Julian Sturdy who was very enthusiastic and excited to hear about her research.

catalysts for use in important industrial chemical processes.

With the Fellowship award Parul visited the University of Melbourne, Australia, where she collaborated with Professor Amanda Ellis.

Reflecting on her fellowship success, Parul said: "I am honoured to be one of the recipients of the ACU Blue Charter Fellowship. My research project will cover the broad areas of sustainable design, plastics waste management and Green Chemistry".

health of our oceans and marine life.

Parul is carrying out a PhD under the supervision of Professor James Clark, Dr Avtar Matharu and Dr Rob McElroy, using plants with the ability to capture metals as feedstocks for making metal-based

ACU Blue Charter Fellowship Award

FIRST YEAR GREEN CHEMISTRY PHD STUDENT PARUL JOHAR WAS AWARDED A BLUE CHARTER FELLOWSHIP FROM THE ASSOCIATION OF COMMONWEALTH UNIVERSITIES (ACU).

The programme provides funding for talented researchers to travel from an ACU member university to a host institution in another country, for research work themed around addressing the critical global issue of marine plastics, which are drastically affecting the

York chemistry in the spotlight

IN THE LAST YEAR, YOU MAY HAVE STUMBLED ACROSS YORK CHEMISTS IN A VARIETY OF UNUSUAL SETTINGS - FROM RADIO 4'S TODAY PROGRAMME TO THE ONE SHOW. HERE WE TAKE A LIGHT-HEARTED LOOK AT SOME OF THESE APPEARANCES.



Biggest Audience Award

Professor Simon Duckett's appearance on BBC's The One Show reached the largest audience. As part of a feature discussing the original invention of magnetic resonance imaging (MRI), Professor Duckett explained the possible future of the technique, being investigated in the Centre for Hyperpolarisation in Magnetic Resonance (CHyM). This included the possibility of next-generation MRI that can be performed without the need for large magnets, a breakthrough which would enable MRI to become routine in a wide range of healthcare settings.



Action Hero Award

High above the Lancashire moors, Professor James Lee and his research team from the Wolfson Atmospheric Chemistry Laboratory (WACL), were interviewed by BBC News on their flying laboratory - a converted passenger plane run by the Natural Environment Research Council (NERC) for atmospheric analysis. Professor Lee explained how they were analysing air pollution generated by moorland fires in the North West of England to gain insight into the impact of such events on the wider environment.



Best Newcomer Award

Early one morning, Dr Rachel Smith, from the research team of Professor Jane Thomas-Oates did a brilliant job of explaining to the listeners of BBC's flagship 'Today' programme on Radio 4 about their research to detect traces of opiates in an ancient vessel from the British Museum. You can read more about this work on page 4.



Best Prop Award

Research data obtained in the team of Professor Alastair Lewis featured on Channel 4's Grand Designs. The programme followed a couple building a home with minimal use of materials that emit volatile organic compounds (VOCs), because their two sons suffer from life-threatening allergies. The results of this scientific analysis were revealed by presenter Kevin McCloud at the end of the show, and indicated that VOC



concentrations were lower than a comparable house, in some cases by as much as 95%.



Best Supporting Actor Award

Appearing on screen with his husband Sam who was suffering from rejection of his lung transplant, Professor David Smith appeared on ITV News. Sam explained the burden of medication he had to take in order to try and prevent organ rejection. Professor Smith then explained how his EPSRC-funded research aims to develop smart materials for tissue engineering, with the long-term goal of growing organs from a patient's own stem cells, avoiding problems associated with rejection. Since filming, Sam has sadly passed away.

Technician commitment

THE UNIVERSITY OF YORK HAS RECENTLY SIGNED UP TO A NEW COMMITMENT TO SUPPORT THE CAREERS OF ITS TECHNICAL STAFF. THE DEPARTMENT OF CHEMISTRY BENEFITS FROM THE COMMITTED SUPPORT OF OVER 50 TECHNICAL STAFF, NEARLY HALF OF THEM FEMALE - HERE WE CAUGHT UP WITH TWO OF THEM, ABBY MORTIMER (GLASSBLOWING WORKSHOP) AND DR. GRAEME McALLISTER (RESEARCH TECHNICIAN), TO FIND OUT MORE.



What roles do technicians carry out in the department?

Abby: Technical work is very varied and includes 20 departmental support technicians (stores, analysis, IT, workshops etc.), 13 research technicians, 6 teaching technicians and 15 technicians who are employed to work on specific projects.

What is the Technician Commitment?

Graeme: The Technician Commitment (TC) is a university and research institution initiative, led by a steering board, including the Gatsby Foundation, with support from the Science Council and Technicians Make It Happen campaign. It was launched in May 2017 to support technicians working in Higher Education and research. There were originally 36 signatories including the University of York, and it now has 75 signatories, including 20 of the 24 Russell Group Universities. The University of York has developed an action plan that aims to build on the key areas of the TC: Visibility, Career Development, Recognition and Sustainability.



That's impressive, but technicians are practical people, so how would you explain what the commitment offers in practical terms?

Abby: I personally feel quite passionate about the 'visibility' aspect of the commitment and am working on ways to share and promote the diverse range of technical roles that we have across the university.

Graeme: I have found that the TC, and the TechYork conferences that have been organised as a result, have definitely improved 'visibility' and given me greater awareness of my own place in the University. I think technicians sometimes fall into the trap of seeing themselves as behind-the-scenes, when in fact, we are crucial to the successful running of our units. We're just not very good at blowing our own trumpets!

Abby: In terms of the 'recognition' part of the TC, I gained professional registration 5 years ago as an RSciTech, however the TC has made me consider whether this is still the right registration standard for the level I am working at, and also how recognition might link to my own career development.

Graeme: The TC has definitely encouraged me to think more to the future. For example, I decided to apply for professional registration (RSci) as I felt it was an excellent way of conveying my skills and experience when I tell people outside chemistry "I'm a Technician". While I wouldn't exactly say I have a 5-year plan (who

knows what will happen?), I do feel I am in a better place to think about it. The TC will give us the tools to help us take more control over our own 'career development' - the University is also helping this by developing defined career pathways and fully updated grade descriptors.

Abby: It is particularly exciting that to help the TC gain sustainability the University will be using the Apprenticeship Levy to encourage technical apprenticeships, and for the first time, really promoting the idea of being a technician as a positive career choice.

Any last thoughts you would like to leave us with?

Abby: On a personal level, being involved in the TC has taken me out of the comfort of my glassblowing workshop and into the world of Steering Groups and meetings (where I was expected to contribute!). This was initially very daunting, and at first I wondered why I was there, but as time went on I realised the value I brought to those meetings as the 'technician voice', have grown more confident in sharing my views and ideas, and am pleased that the university seems to be listening.

Graeme: Also speaking personally, one pleasing thing from TechYork and working on the TC, is that I have met so many more colleagues from across the faculty. I have felt a much greater sense of community across the institute and I know from conversations with others, that I am not alone in that.

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