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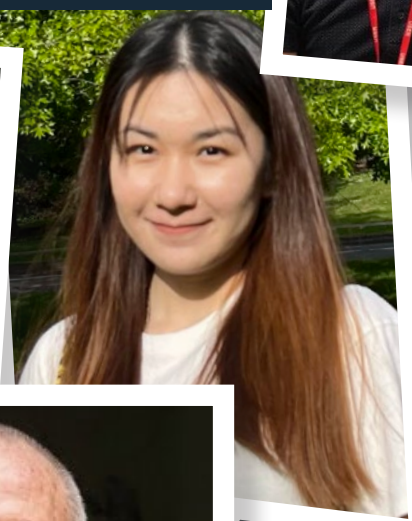
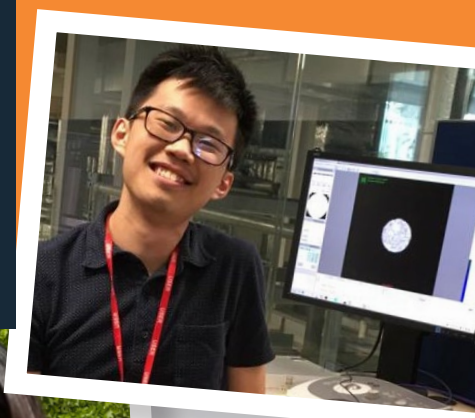
UNIVERSITY of York

ChemYork

HIGHLIGHTS FROM A LEADING UK CHEMISTRY DEPARTMENT








Twenty Years of Wild Scholars



Time Never Stands Still

HEAD OF DEPARTMENT, **DR DEREK WANN** WRITES: I'M SITTING IN MY OFFICE WRITING THIS INTRODUCTION WITH THE SUN SHINING AND JUST AFTER WE'VE FINISHED TWO CONSECUTIVE OPEN DAYS FOR PROSPECTIVE UNDERGRADUATE STUDENTS AND THEIR GUESTS.

Open Days are a real highlight of the summer – an opportunity to show off the Department in its best possible light and to enthuse the next generation of chemistry students (and their equally interested parents). I'm enormously grateful to all the student ambassadors and staff who give their time for these events, ensuring that the pipeline of talent is maintained for another year.

In preparation for these most recent events, we've been adding some additional seating in the chemistry quad and now have four picnic benches situated outside our F-block teaching labs. These were well used at the weekend as the temperatures climbed. We're also making some changes to improve the wildlife and biodiversity of the area, asking our Estates team to leave the grass to grow for longer in the spring and introducing more planters.

This is also the week when assessment results are released and students progress to the next year of study or on to graduation. The Chemistry Graduation Ceremony is the highlight of the summer and it is with immense joy and much pride that we see our students walk across the stage to receive their degree to the backdrop of the enthusiastic applause of family, friends and staff who are there to support them.

During the past six months, there has been a lot of work around transnational education in the University. Chemistry is actively exploring the possibilities of cooperation on undergraduate, taught postgraduate and PhD programmes with Soochow University in China. In May, I was lucky to visit the beautiful city of Suzhou, a couple of hours outside of Shanghai and where Soochow University is situated, to explore the practicalities of how joint education programmes might work. I suspect we'll hear more about this in future editions of ChemYork.

Recently, we celebrated fifty years since Structural Biology Research at York began with the arrival to the Chemistry Department of **Guy and Eleanor Dodson** in June 1976, a fuller account of which will feature in the next edition. The group grew rapidly during the 1980s and 1990s, becoming the York Structural Biology Laboratory (YSBL). The research in the lab has made major developments in the methods that enable the determination and analysis of protein structures used by many thousands of scientists around the world. These methods have been applied at York to transform our understanding of the molecular basis of various areas of biology and also how to exploit protein structure in drug discovery and industrial biotechnology. Hundreds of former staff and students gathered for a packed twenty-four hours of talks, with long-established staff reflecting on lab history and some of its landmark earlier work, while an impressive team of early career staff described some of their ground-breaking work and showed that the future of YSBL is in very good hands. A fantastic dinner at the National Railway Museum then gave the many attendees time to catch up with one another, renew old friendships and reminisce. My sincere thanks to **Professor Rod Hubbard** who masterminded the event and current YSBL group leader, **Professor Jamie Blaza.** It was a week of celebrations as Jamie also had a grant worth almost £1.5M funded by the UK's Biotechnology and Biological Sciences Research Council in support of research using cryo-electron microscopy.

> "An opportunity to show off the Department in its best possible light, while enthusing the next generation of chemistry students."

Now is a probably a good time to remind any alumni and former staff that the Chemistry Department has been working with the Borthwick Archive in the University Library to start archiving and cataloguing the vast amounts of information we have about the 61 years of Chemistry at York. If you have anything that might be of interest to future generations, please drop an email to chem-hod@york.ac.uk and PA Kate Roberts will respond to start a conversation with archivist Charles Fonge to see if we can accommodate your offerings.

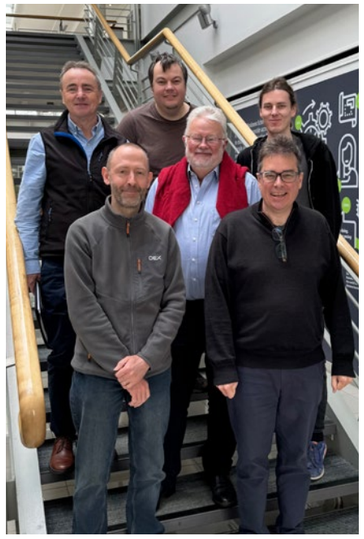
Finally, since the last edition of ChemYork, we've seen retirements of a number of colleagues who between them have a total of well over 100 years' service to our Department. Academics **Professors Peter Karadakov** and **Marek Brzozowski** have both had Emeritus status conferred, while **Dr Jim Brannigan** has retired as a very long-standing Research Associate in YSBL and been awarded Honorary Fellow status. **Karl Heaton** has retired from the technical team, where he has looked after the walk-up mass spectrometry for many years. **Joy Parvin** has also retired as the Director of CIEC, the group that offers opportunities for primary school children to visit the chemical industry as well as upskilling teachers, producing teaching resources and developing science education policy. More about this on page 10 of this edition.

Front cover image: *Tony Wild and some of the many Wild Scholars*
Compiled by *Duncan Bruce*
Designed by *Cookie Graphic Design*
With grateful thanks to *Rachel Crooks and Alice Duckett for their background work on the Wild Scholars article.*

Support for Ionic Liquid Phases

YORK CHEMISTS HAVE WON A £2M COLLABORATIVE GRANT TO USE SUPPORTED IONIC LIQUIDS IN CATALYSIS

Teams from the Department (**Dr John Slattery** and **Professor Duncan Bruce**) and from Heriot-Watt University (**Professors Matt Costen** and **Ken McKendrick** and **Dr Paul Lane**) have won £2M from the EPSRC in funding for an exciting new project. This is the latest in a series of successful projects that form part of a long-running collaboration between the two teams that has generated >£4.5M in grant income. Since 2008, they have used a range of techniques including reactive atom scattering, small-angle X-ray and neutron scattering (winning some forty days of neutron beam time) and surface tension to provide crucial insights into the way that mixtures of ionic liquids – molten salts with low melting temperatures – behave and how this can be controlled for applications such as catalysis. This latest project will provide crucial insights into mechanisms in supported ionic liquid phase catalyst systems, a novel technology for the production of key chemical feedstocks, allowing development of the next generation of more selective, efficient and sustainable catalysts.



The Heriot Watt and York teams at the grant kick-off meeting. L-R: back: Ken McKenrick, Paul Lane and Matthew Gill; middle: Duncan Bruce; front: John Slattery and Matt Costen.

National Honour for Professor Avtar Matharu

PROFESSOR AVTAR MATHARU, DEPUTY HEAD OF DEPARTMENT FOR STAFFING AND A MEMBER OF THE GREEN CHEMISTRY CENTRE OF EXCELLENCE (GCCE), WAS AWARDED AN MBE IN THE KING'S NEW YEAR HONOURS IN JANUARY THIS YEAR.

Avtar joined the Department in 2005 from Nottingham Trent University with a background in liquid crystal research, but inspired by a collaborative project to investigate the possible recycling of the components of liquid crystal displays, he secured a research sabbatical through a University Anniversary Lectureship and made the transition to Green Chemistry.

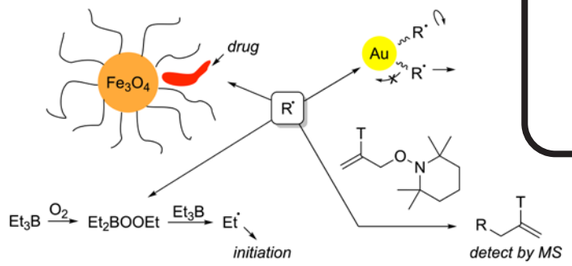
In research, he has undertaken a large amount of work on valorisation where he has shown how useful, valuable chemicals can be obtained from waste materials. This work has often featured waste relevant to the home countries of the many international postgraduate students who have passed through the GCCE over the years, both as MSc and PhD candidates. Indeed, more recently, this international dimension has prompted Avtar to champion the 'Matharu Plot', a one-page infographic showing the geographical distribution of cited research, highlighting any potential biases that may be inherent in the literature. This is part of a wider departmental effort on decolonising chemistry featured on page 12 of this edition.

However, Avtar's commitment to equality goes beyond the University and into the community of York, where he is Chair of the York Interfaith Group. This organisation successfully connects different faiths and addresses racial inequalities, galvanising them to tackle critical issues such as hate crime and discrimination. Much of their work is carried out together with the City of York Council, York and North Yorkshire Combined Authority, and North Yorkshire Police.

On learning of the award, Avtar said, "The real reward is seeing communities strengthen through dialogue and mutual respect. Building bridges requires consistent effort and presence, especially when addressing complex issues like discrimination and inequality."

In my element: the electron!

IN A DEPARTURE FROM THE DEFINITION OF AN ELEMENT, **PROFESSOR VICTOR CHECHIK** MAKES THE CASE FOR THE ELECTRON.



While it is quite a stretch to label an electron an element, its addition or removal from any element/compound changes its chemical properties dramatically and indeed the bulk of my independent career has focused on non-metals with an unpaired electron, *i.e.* free radicals.

Free radicals played a critical role in the history of this Department. Dick Norman, our founding HoD, studied free radical reactions using EPR spectroscopy and, when he came to York, he brought with him Bruce Gilbert, his ex-PhD student, who continued this type of work and was the HoD when I was appointed.

When I started at York, I knew virtually nothing about free radicals or EPR but was compelled to try this technique by Agneta Caragheorgheopol, a Romanian visitor to Bruce's lab. Most of what we have done since has involved unpaired electrons! We started by using stable radicals to probe organic layers on the surface of Au nanoparticles. EPR made it possible to 'watch' how surface-bound molecules wiggle (*Faraday Disc.*, 2004, **125** 279) and hop from one particle to another (*Angew. Chem. Int. Ed.*, 2007, **46**, 3304) - but unfortunately, they could not 'walk' on the surface (*Anal. Chem.*, 2008, **80**, 95). We then became interested in short-lived radical intermediates and started using radical trapping techniques to decipher reaction mechanisms. For instance, while not a radical process itself, we used these methods to detect an elusive gold hydride (Au–H) intermediate (*J. Am. Chem. Soc.*, 2009, **131**, 7189) formed in Au nanoparticle-catalysed oxidation of alcohols.

Then while experimenting with these trapping agents, I learned of their deficiencies, and we worked hard to develop a different methodology, so that EPR spectroscopy was replaced by mass spectrometry (*J. Am. Chem. Soc.*, 2022, **144**, 15969), which helped us solve some mechanistic problems. For instance, we clarified the mechanism of Et_3B/O_2 radical initiation and showed that most initiating radicals in this system come from a molecule-assisted homolysis of the peroxo species Et_2BOOEt (*Chem. Eur. J.*, 2025, **31**, e02339).

Apart from exciting chemistry, unpaired electrons can interact with each other leading in some cases to magnetic materials and we have developed magnetic nanoparticles for the targeted delivery of drugs (*Nanoscale*, 2024, **24**, 2466). An element it may not be, but when alone and unpaired it can give rise to a large family of materials with very diverse properties.

Three-minute Thesis Success

CHEMISTRY POSTGRADUATES RISE TO THE CHALLENGE OF EXPLAINING THEIR RESEARCH - IN JUST THREE MINUTES...

Designed as an academic competition to improve participants' presentation and communication skills and raise awareness of their research area, the Three-minute Thesis competition brings together postgraduate researchers from across the University to explain their work with the aid of a single, static slide.

Chemistry was very well represented in the 2026 final by **Lucy Anderson** (*The Key to Cancer: Unlocking New Medicines*) who works with Drs Chris Spicer and Martin Fascione, **Gabriella Holland** (*No Place Like Home: Improving Cell Models for Better Medicines*) who is supervised by Dr Chris Spicer and Professor Dave Smith and **Dean McGettigan** (*MRI on Steroids: Optimising the Metals We Can't Live Without*) from Professor Simon Duckett's research group.

ChemYork offers its congratulations to all three finalists and, in particular, to Gabriella who was the overall winner (also winning the People's Choice prize), and Dean who came second overall. A Chemistry 1-2!

Gabriella writes about her work: 'Currently, hydrogels fail to mimic the complex extracellular matrix they represent accurately during tissue culture. To address this, I am using dynamic covalent chemistry to develop self-healing hydrogels that allow cells to physically remodel their local environment as they grow and multiply. Ultimately, these dynamic hydrogels should create more biologically relevant models for tissue engineering.'

L to R: Gabriella, Lucy and Dean at the finals (photo courtesy of Simon Duckett)

Reflecting afterwards, she said, "Condensing my entire PhD into just a three-minute speech was definitely a challenge. It took loads of thinking, many revisions and, of course, lots of practice. Overall it was an enjoyable process and definitely helped build my confidence".

The team of (left-to-right): Lee Duff, Richard Gammons, Hannah Briers, Megan Goss and Will Heamen.

Water-saving Initiative

A TEAM OF TECHNICAL STAFF AND STUDENTS SHOWS HOW TO SAVE ON WATER USE

The Department uses significant quantities of water across the whole range of its activities and so anything that reduces use of this valuable and indeed costly resource is to be welcomed. A few years ago and supported by investment from the University, traditional water-cooled condensers in the research laboratories were replaced with air condensers to great effect. However, recognising that there was still more that could be achieved, a team of technical staff composed of **Hannah Briers, Lee Duff** and **Richard Gammons** took the initiative to see what might be possible.

Based on their audit of water-fed equipment and the potential impact of chillers on the department's ecological footprint, they constructed a proposal that won grant support from the Royal Society of Chemistry's Sustainable Laboratories initiative.

With water condensers a thing of the past, it turned out that rotary evaporators were easily the biggest consumers of water. Using the grant they were able to fund two student technicians – **Megan Goss** and **Will Heamen** – who carried out an in-depth analysis of how they are used and how improvements could be made. Having established the level of baseline use, Goss calculated the carbon footprint of cooling *via* running water versus recirculating chiller across the teaching and research labs, while Heamen optimised the capacity and running conditions of different chiller setups. Their analysis revealed that the introduction of chillers into research labs for synthetic chemistry would have by far the most significant impact as the research labs operate year-round. The team were then able to use some of the remaining grant money to purchase several chiller units for these labs, subsequently augmented by more underwritten by the Department and the University, leading to an anticipated saving of some 15,000 m^3 of water use each year.

The team now hopes to be able to implement further changes as new funding becomes available and are aiming to eliminate water cooling from the entire department by 2027.

Inside the CAF – York's New Chemistry Analytical Facility

IN SHOWCASING THE AVAILABILITY OF ITS EXCELLENT ANALYTICAL FACILITIES, THE DEPARTMENT IS PROVIDING SUPPORT TO BUSINESSES AND BETTER SUPPORTING ITS OWN RESEARCHERS. **PROFESSOR RICHARD DOUTHWAITE** WRITES.

The Department has established the Chemistry Analytical Facility (CAF), a virtual entity to support internal and external researchers solve their problems in chemical analysis. The CAF comprises NMR spectroscopy, mass spectrometry, various X-ray experiments, chromatography, elemental analysis, and additional, specialised techniques supported by expert technicians. Day-to-day operations are headed by **Dr Hannah Briers** and external business is managed by **Dr Suranjana Bose**. As academic lead, I provide support and advise on non-routine enquiries.

The instruments are operated and maintained by our team of dedicated technical staff, and the CAF is working to ensure they are properly recognised for their contribution, including full paper co-authorship when this is appropriate.

The new website is a one-stop-shop for business, also providing links to internal booking and training. While internal researchers remain the major users, external business has doubled in the first year of the CAF, as the excellent skills and facilities available are recognised. Requests for help cover an eclectic mix of subjects ranging from X-ray fluorescence of archaeological artefacts and weathered caravan cladding to state-of-the-art NMR analysis of precious metal catalysts. Thus, the CAF helps many local and national companies provide answers to questions important to them, with significant consequences for their business and employees' futures.

Underpinning all of this has been a significant rationalisation of instrument booking and accounting undertaken by members of the technical team. Invisible to the users, this critical work will improve cost recovery both to maintain existing instrumentation and to improve and future proof the CAF as developments in instrumentation emerge.

The initiative is supported in part by a Partnership Acceleration and Commercial Engagement (PACE) grant, which helps with marketing, conference participation and continuing professional development. Look out for the glossy new brochure!

The Family of Wild Scholars at 20

TWENTY YEARS ON, WE REFLECT ON THE IMPACT OF THE GENEROUS DONATIONS THAT HAVE SUPPORTED SO MANY WILD SCHOLARS

It started over dinner in New York in the early 2000s, when former HoD Robin Perutz met with alumnus Dr Anthony (Tony) Wild. Tony was one of the very first cohort of undergraduates when York Chemistry opened in 1965 and, following graduation, he moved to Cambridge to undertake a PhD in gas-phase spectroscopy after which followed a highly successful career in the pharma industry. Robin invited Tony back to York to see how it had changed, which he did a year or so later, meeting with the new HoD, Paul Walton. Tony was keen to help his *alma mater* in some way and the two of them hatched a plan that would help defray the high costs of overseas students wishing to undertake postgraduate research in Chemistry; this was the first incarnation of the Wild Scholars scheme.

Tony was very keen to help attract talented students to York from wherever they came and this also meshed perfectly with the Department's view of the powerful benefits of a diverse community of individuals working together. Tony kindly donated some money and the first cohort of Wild Scholars were supported. The first to graduate was Jianhui Huang in 2006 and so this year marks the **Twentieth Anniversary** of the first Wild Scholar graduating! Jianhui worked with Professor Peter O'Brien for his PhD and is now a Professor in the School of Pharmaceutical Science and Technology at Tianjin University in China: he reflects back on his time in York as part of this article.

Tony visited the Department again and was able to meet some of the scholars whom he had supported. Delighted to meet the individual who had made their dreams a reality, the students rose to the occasion and the very special bond that exists between Tony and the Wild Scholars was forged. This inspired Tony to support more students through further generous donations and the rest, as they say, is history.

Through Tony's continued generosity, more than a hundred research students have been supervised. They have originated from more than twenty different countries and have gone on to forge successful careers across the globe in academia, industry and a wide range of other professions, too. The Department and its Wild Scholars are so very fortunate to benefit from such unique support.

Tony has continued to visit the Department over the years and his generosity has enabled many other projects that have transformed the Department, but the highlight of each visit for all concerned is the informal lunch when Tony and his Scholars sit round the table talking science, culture and so much else. The support afforded to the Scholars has presented individuals with opportunities that would otherwise not have been possible, has allowed research to happen that would not otherwise have been conducted and has enriched the community that is the Department, the University and the wider city. More than that, it has allowed people to meet who would not have done so and has created an international family that will endure well into the future.

Happy Anniversary to all the Wild Scholars!

Jianhui Huang

As the very first recipient of the Tony Wild Scholarship, I still vividly recall my time in York where I was a PhD student with **Professor Peter O'Brien**. Most importantly, I was fortunate enough to meet and communicate with Dr Tony Wild himself, whose vision for nurturing young chemical scientists laid the foundation for this transformative scholarship programme.

My doctoral research centred on fundamental synthetic chemistry, which sparked my enduring passion for translational pharmaceutical research. The Wild Scholarship was far more than financial support, opening doors to world-class academic resources, cross-border academic exchanges and mentorship from leading chemists in the UK. This precious opportunity shaped my research mindset, teaching me to combine rigorous basic chemistry with practical biomedical applications.

I am now a Professor at the School of Pharmaceutical Science and Technology at Tianjin University in China. My research focuses on new small-molecule drug development and AI-aided pharmaceutical chemistry and we are dedicated to translating cutting-edge chemical discoveries into safe, effective drug candidates for clinical use.

The Wild Scholarship remains a pivotal milestone in my academic journey. I am deeply grateful to all who established and now sustain this brilliant scheme. It warms my heart to see successive cohorts of young scholars benefit from the same chance I received all those years ago. I hope future Wild Scholars will cherish this extraordinary platform, embrace international academic collaboration and keep pushing the boundaries of chemistry.

Neda Jeddi

I am Neda, a former Wild Scholar and I completed my PhD under the supervision of **Professor Ian Fairlamb** in the field of palladium chemistry. Looking back on my time at York, I see it as an unparalleled opportunity, providing extensive access to world-class expertise and facilities, and inspirational supervision.

I am originally from Iran, where I completed my undergraduate and master's education at one of the country's well-regarded universities for science. However, the scientific environment in Iran unfortunately lacked access to advanced technologies, international research networks, and, most importantly, a well-established laboratory infrastructure.

York provided me with a scientific platform to turn my ambitions into reality and gain a clear vision of my future career. I am now a Postdoctoral Research Fellow at the University of Bristol, working in catalysis and collaborating closely with industry partners.

I would not have got this far without the Wild Fund Scholarship, nor without the opportunity to experience the state-of-the-art research environment in York and I hope this scholarship scheme will continue to support talented scientists from around the world.

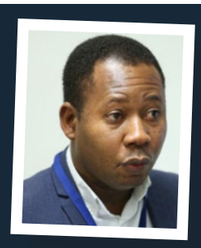
Anastasiia Herman

I come from the beautiful city of Kyiv in Ukraine, the city of blooming lilac in May and brave people under constant attack since February 2022. My story starts in March 2022 when my mum, younger sister and I escaped the Kyiv region.

Once in a safe place, my plan was to support my family, but my heart still belonged to science, so I looked for ways to combine both. I found support under a Wild Fund Scholarship supervised by **Dr Pavol Bardy** and **Professor Fred Antson** and moved to the UK to join YSBL – an amazing place to do high-quality science. I studied important viral proteins using cryo-electron microscopy and cryo-electron tomography, leading to the understanding of the genome delivery and assembly mechanisms of two distinct and interesting groups of viruses.

The Scholarship gave me so much: science, an amazing community of people who became my friends, an opportunity to explore the UK and to live in the lovely city of York. I've recently completed my PhD and with all the techniques I learned thanks to the Wild Fund, I have secured a postdoctoral position in Belgium to pursue my passion for science and structural biology.

Babatunde Okesola



I moved from Nigeria to pursue my PhD in York working with **Professor Dave Smith**, focusing on the development of supramolecular hydrogels for water purification, which I termed supramolecular envirogels. They introduced me to the fascinating fields of supramolecular chemistry and gel science, which have since formed the cornerstone of my scientific career.

My PhD was intellectually demanding and personally challenging, and Dave's supportive supervision was pivotal to my success and his belief in me and the intellectual freedom he afforded were truly transformative. More than that, he understood my need to balance fatherhood with the rigours of study, enabling both my family and academic lives to thrive. I am equally grateful for the Department's exceptional research environment fostering creativity, collaboration and excellence.

A special debt of gratitude is owed to Dr Tony Wild, whose generous support through the Scholarship was a lifeline at a moment when there appeared little prospect of funding. His philanthropy enabled me to achieve my goals and I am now Assistant Professor at the University of Nottingham, leading interdisciplinary research spanning supramolecular chemistry to immunoengineering.

Zongyuan Zhu

I completed my PhD in Green Chemistry in 2015 supported by a Wild Fund Scholarship for which I am deeply grateful, as it enabled me to focus on my research and take full advantage of the academic and collaborative opportunities.

During my PhD, I worked with **Dr Duncan Macquarrie** on *Microwave-assisted Pretreatment of C4 plants in Biorefinery*, focusing on the use of microwaves to convert biomass into value-added products. This project was a collaboration with colleagues from Biology and partners from the Netherlands and Brazil, providing valuable experience of a diverse, international scientific team.

Following my PhD, I remained in academia, contributing to several research projects funded by the Chinese government and by the EU, expanding my research expertise to include heterogeneous catalysis, biofuels, biochar, energy storage and life-cycle assessment, leading to strong research outputs.

In 2023, I moved to the chemical industry where I am a Senior Chemist at Johnson Matthey. I work on Oxo technology licensing - rhodium-catalysed hydroformylation and copper-catalysed hydrogenation - encompassing research and development, and collaborating with engineering and commercial teams to support process design, scale-up and plant

Tony Wild with some of his scholars on a recent visit to York

A Note from Tony Wild

When Duncan Bruce asked me to contribute to this review of the Wild Scholarships, I read the five contributions of previous scholars, was moved deeply by them and started thinking back to how it all came about. I arrived in York in 1965, the very first year of Chemistry and of the Heslington campus. I had turned 17 only 3 months earlier, unusually young and immature. I had the good fortune to be assigned to David Waddington as my supervisor who enabled my first life-changing experience with York: he helped me grow. Three years later as I was toying with the idea of doing research, my main passion had become trying to understand what the chemical bond was and how molecules get formed. One of the experiments in the lab, designed by David, was a gaseous flow system producing active nitrogen. This captured my imagination and I suggested to David that I stay to do a PhD in this field. He then shocked me by saying, "Well, you need to go to Cambridge and work for Brian Thrush. The Physical Chemistry department there is the best in the world for this field; indeed, it had won two Nobel Prizes (Norrish and Porter) a couple of years earlier. Thrush had been a postdoctoral researcher in that very group, and I know him quite well"! This selfless act by David in pushing me out was a truly crucial next step.

This leads me to the second key influencer: money. All British undergraduate students in those days were offered full grants by local government. Without this probably I could not have afforded to go. Likewise in Cambridge, Brian Thrush was able to get me a scholarship from the Royal Society. So many students struggle to find the funding needed.

Thirdly and fast-forwarding through the ensuing decades, we come to the people dimension. I grew up in the international pharmaceutical industry surrounded by scientists, engineers, clinical researchers and pharmacists who had a couple of things in common: they were not only talented, but they were also passionate and driven by their missions. These characteristics in turn became my guiding path for recruiting and developing young managers: being smart and well educated was not enough; they had to have passion. Although we obviously also invested heavily in building and equipping good facilities, I realised that without the right people nothing could happen.

Fourthly, I had the fortune to work with people of so many nationalities, indeed I came myself to live and work in six different countries. Talent is global.

My career has been amazing, and, through it, I came into a position to be able to give back and help. When Paul Walton and I first started to look at ideas for my help, we started perhaps more traditionally with support for new building projects and equipment. As fulfilling as this certainly was, we then started thinking more about people: how to bring in the best students, in particular research students? Going back to my own experience, I was keen to look at the international dimension. This way we could attract truly the best, not just from the UK.

These five contributions from Scholars here illustrate so clearly how successful we have become, and my thanks go out to each and every past and present scholar for what they have achieved. However, let me end with an important caveat: this talent would never have blossomed without the incredible academic team in Chemistry, dedicated to teaching, guiding and encouraging this special cohort of research students. My hat therefore goes off to the succession of department heads, from Robin, Paul and Richard on to Duncan, Caroline Dessent and now Derek Wann, indeed to the entire academic staff.

It has been my pleasure and a true honour to help York Chemistry with this scholarship. Without York I would have never been who I am today, and I look forward to many more years of collaboration. Dare I also say I will also look forward to Paul Walton's annual present of a Bettys Christmas cake!

Paul Walton Elected as Member of the Royal Swedish Academy of Sciences

PROFESSOR PAUL WALTON HAS BEEN HONOURED BY THE ROYAL SWEDISH ACADEMY OF SCIENCES

Perhaps best known as the body which awards the Nobel Prizes in Chemistry, Physics and Economic Sciences, the Royal Swedish Academy of Sciences (RSAS) is one of the world's oldest and most prestigious science academies. Paul was elected as a foreign member in its Chemistry Class earlier this year and is the first York academic to be elected to RSAS and one of only eighteen such members worldwide in this discipline.

Paul is a bioinorganic chemist, whose recent work in collaboration with Professor Gideon Davies has shown how copper-based metalloenzymes break down some of the toughest materials on Earth, such as cellulose found in plant fibres and chitin found in crustaceans and fungi. Much of his work pivots on the understanding he developed of the 'histidine brace', part of a protein that binds copper allowing it to activate oxygen from the air. This activated oxygen can in turn break the strong chemical bonds found in these otherwise stubborn materials. These insights are important for the production of sustainable biofuels, in particular cellulosic bioethanol.

Paul enjoys close ties to Sweden and has held visiting professorships at Chalmers University of Technology, Gothenburg and KTH University, Stockholm. He said, "I am honoured to be elected to the Royal Swedish Academy of Sciences. It is also a recognition of the collective efforts of many colleagues and collaborators over the years."

Research Highlights

Teaching Old Dogs New Tricks

The drug *cis*-platin and related compounds such as carboplatin are well-proven anti-cancer drugs used in the clinic. **Dr Angelo Frei's** group in collaboration with teams in Switzerland, Sweden and India have now shown that by keeping the *cis*-$PtCl_2$ unit and incorporating substituted cyclooctadienes, the new complexes are potent and non-toxic antimicrobial agents. Read about Angelo's research here.

New Approach to Tackling 'Flu

The drug Oseltomivir, also known as Tamiflu, can treat and prevent influenzas A and B, and is prescribed for patients judged at high risk of developing complications after 'flu is diagnosed. Oseltomivir works by temporarily blocking an enzyme on the surface of the virus that helps it spread. But work from **Professor Gideon Davies** in collaboration with groups from Leiden, Barcelona and the Francis Crick Institute has developed compounds known as 'sugar aziridines' that lock onto the enzyme permanently, preventing the virus from spreading from one cell to another. Read about Gideon's research here.

Using Chemistry to Direct Stem Cells

Stem cells extracted from bone marrow have the potential to differentiate into a wide variety of other cell types and so being able to understand and harness them offers great promise in regenerating or replacing damaged tissue and organs. Work by **Professor Dave Smith** in collaboration with **Professor Paul Genever** in Biology, has shown that gels fabricated using a new dibenzylsorbitol-based gelator encourages stem cells to form spread shapes that are usually a precursor to differentiation into bone cells, whereas previous gelators seemed to direct the formation of fat cell precursors. Read about Dave's research here.

Harnessing Enzymes for Enantioselective Chemistry

Enzymes are some of the most effective catalysts known, working away in living organisms and performing and mediating an incredible range of transformations. Inspired by this ability, many chemists have been attracted to the possibility of harnessing their power to perform highly specific chemical transformations in vitro. Thus, an industrially funded collaboration between **Professor Gideon Grogan** and **Dr Will Unsworth** has shown that a peroxidase extracted from fungi can catalyse the enantioselective oxidation of families of sulfur-based compounds to their medicinally important chiral sulfoximines and sulfinimines with an enantiomeric excess of up to 99%. Read about Gideon and Will's research here.

An End and a Beginning

AFTER MORE THAN THIRTY YEARS, DIRECTOR OF CIEC **JOY PARVIN** RETIRES MARKING THE END OF AN ERA

The Centre for Industry Education Collaboration (CIEC) has a long and distinguished history of promoting awareness of STEM careers and industries among both schoolchildren and their teachers, especially with primary-age children. It has done this through creating and distributing resources for schools, and providing CPD activities. In particular, its flagship Children Challenging Industry programme has provided tailored training for industry partners and primary school staff with fully resourced problem-solving classroom activities and interactive site visits to industry.

At the heart of this for some 30 years or more has been Joy Parvin – a primary teacher trained in chemical engineering – who started as an advisory teacher, became Primary Projects Manager, then co-Director with Gayle Pook in 2008 and finally sole Director in 2016 when Gayle retired.

And so it was with mixed emotions that at the end of April people gathered to wish Joy well as it was her turn to retire. Joy had been a real powerhouse during her tenure, leading a team of talented and committed staff bringing the wonders of science to thousands of schoolchildren.

Working closely with her Advisory Board and its Chair, Harry Swan, Joy raised resources from many different organisations, took initiatives, promoted CIEC abroad and expanded its UK regional reach, with both CIEC and members of its team attracting

both national and international recognition for their outstanding work.

As Joy leaves, CIEC is now undergoing a transition from being an autonomous unit housed in Chemistry to being a part of the University's wider Access and Outreach work where it will continue to thrive and deliver its own unique approach to promoting STEM subjects in UK schools.

News

Election to Academia Europaea

Professor Duncan Bruce has been elected as a Member of Academia Europaea – The Academy of Europe is the pan-European and multi-disciplinary Learned Society. Duncan's research is been in the broad area of Molecular Materials, in particular transition metal complexes with liquid crystal properties.

Leverhulme Fellowship

Congratulations to **Professor Caroline Dessent** who has been awarded a one-year Leverhulme Research Fellowship to 'Uncover the Hidden Pathways in Chemistry with Mass Spectrometry'.

Lucy on the Radio

Professor Lucy Carpenter was the guest of Jim Al-Khalili on The Life Scientific in May this year. Listen to the programme here on BBC Sounds.

YSBL@50

Over two days in the middle of June, members past and present got together to mark 50 years since the York Structural Biology Laboratory – YSBL – was established by the arrival in York of Eleanor and Guy Dodson. Featuring lectures with both an historical perspective and a forward look and with a celebratory dinner at The National Railway Museum, it was a wonderful way to mark YSBL's Golden Anniversary. A full account will appear in the next edition.

York Students' Union Excellence Awards

ChemYork offers many congratulations to **Kieran Godfree**, a technician in our Teaching Laboratories who was Highly Commended as an Unsung Hero, in which category the Department's Student Services Manager, **Alison Edmonds**, was also nominated. Congratulations also to **Will Butler** who was shortlisted as GTA of the Year.

2026 Royal Society of Chemistry Prize Winners

ChemYork is delighted to congratulate: **Dr Will Unsworth** on the award of the **Organic Chemistry Robert Robinson Mid-career Prize**. In addition, York chemists were part of three team prizes. **Dr Jackie Mosely** is Vice Chair of the RSC Separation Science Group Committee, recognised in the **Inspirational Committee Award** for establishing the Solutions in Science (SinS) conference. The **Dalton Horizon Prize** is awarded to a team of >30 from eight different institutions dedicated to studying solid-state molecular organometallic chemistry in work initiated by **Professor Andy Weller**. The third team award is the **Chemical Biology Interface Horizon Prize** for a network of >50 people across three continents working on Neglected Tropical Diseases of which **Professor Tony Wilkinson** is part. More about these in the next issue.

Prize-winning Dating and Fellowship Successes

WORKING ON TINY TRACES IN TOOTH ENAMEL HAS LED TO SOME VERY BIG MOMENTS OVER THE LAST FEW MONTHS FOR **DR MARC DICKINSON**, WHO HAS RECENTLY BEEN AWARDED BOTH THE LEWIS PENNY MEDAL OF THE QUATERNARY RESEARCH ASSOCIATION AND A NERC INDEPENDENT RESEARCH FELLOWSHIP.

The Lewis Penny Medal was presented by Professor Jane Hart, the QRA president.

The Lewis Penny Medal recognises excellence in Quaternary Science (the study of the last 2.5 million years) and is awarded annually to an early career researcher who has made an outstanding contribution to the field. Marc received the honour for developing a new way to date fossilised mammal remains using the proteins preserved in tooth enamel. He uses the predictable breakdown of proteins and amino acids, the building blocks of life, as a molecular clock to open up new possibilities for dating fossils in geological settings where other techniques struggle. His research focuses on using these improved chronologies to address fundamental questions about the evolution, dispersal and extinction of mammals, including humans, elephants, hippos and rhinos. The method has already been applied to fossil assemblages around the world, providing new insights into the timing of key evolutionary events.

On the basis of these developments, Marc has also been awarded a highly competitive Independent Research Fellowship from the NERC. The funding it provides will support his work over the coming five years, with a project that focuses on the origins of humanity, tracing our ancestry back to the Cradle of Humankind in South Africa. Working at several internationally significant fossil sites, Marc will continue developing methods to more accurately date the remains of early human ancestors.

In particular, the Fellowship will support collaborations with researchers in South Africa to establish advanced analytical techniques locally. This will enable more of the science to be carried out in-country, so strengthening research networks, building local expertise and reducing the need to export valuable samples and heritage material.

PROTEINS FROM SINGLE-CELL ARCHAEA MAY REVEAL A NEW APPROACH TO CANCER TREATMENT

This is the aim of **Dr Nick Yates** who has also secured his own fellowship funding – this time from EPSRC – to develop the project under the mentorship of **Dr Chris Spicer**. Pyrrolysine is an amino acid found in some simpler life forms such as archaea, but the genes responsible for synthesising and encoding pyrrolysine can be transferred to other organisms, such as bacteria. Nick aims to create cancer-selective bacteriophages which have pyrrolysine on their surfaces, and will attach a jacket of human sugars to these pyrrolysine motifs. This will help the bacteriophage evade detection by the immune system, allowing it to attack the cancer more efficiently.

Prize-winning Work on Decolonising Chemistry

A TEAM OF SCIENTISTS FROM THE DEPARTMENT HAVE BEEN RECOGNISED WITH A ROYAL SOCIETY OF CHEMISTRY HORIZON PRIZE FOR THEIR INNOVATIVE WORK TO PROMOTE DECOLONISATION OF THE CHEMISTRY CURRICULUM. **PROFESSOR CAROLINE DESSENT** WRITES:

> "The prize gives us another opportunity to explain what decolonising the curriculum is, and help to make the undergraduate chemistry curriculum relevant to as many global student chemists as possible."
> **Caroline Dessent**

RSC Horizon Prizes in Education are given to teams opening up new directions in chemical education through ground-breaking scientific developments. This Prize then recognises the extensive pioneering work we've conducted in recent years to explain decolonisation of the chemistry curriculum and stimulate chemistry departments both to develop decolonisation strategies and to embrace the benefits of decolonising their curricula. The diverse prize-winning group from the Department includes staff and students who have worked on the project across the last seven years.

The Horizon Award notes that decolonising had previously been largely ignored by the chemistry community and that by acting together from a prominent chemistry department, the team in York were able to provide leadership and legitimacy to a topic which has, and in some quarters continues to be, viewed as highly controversial.

The aim of decolonising a science curriculum is to develop a broad, scientific perspective that better includes global voices and contexts than has been the case traditionally. This has the potential to fulfil an important goal for chemistry, namely to improve the retention and attainment of individuals from ethnic minorities who are currently underrepresented in higher education, especially in the higher levels of the academic pipeline. In 2019, the Department began work to decolonise its undergraduate chemistry curriculum, in parallel with which it took on an internationally leading role in disseminating the importance of decolonisation across UK and international chemistry higher education, as well as the broader STEM community.

One of the major outputs of the project is an article published in the *Journal of Chemical Education*, which provides a useful starting point for anyone who would like to understand more about what decolonising chemistry means. This article has gone on to be hugely influential, having been viewed more than 26,000 times, cited 35 times, with Altimetrics indicating it to be one of the most linked and discussed articles ever published by the journal. The group has subsequently published further articles on practical aspects of decolonising the curriculum, along with YouTube videos. These efforts have snowballed over the last few years and the materials are now included as key resources by many science departments interested in decolonising their own curricula. Members of the team have also been invited to talk about decolonising chemistry at many universities and professional societies across the UK, and overseas, including in Nigeria and Botswana.

Team members: Top row: Professor Caroline Dessent; Professor Avtar Matharu; Dr Leonie Jones. Middle row: Professor Dave Smith; Dr Kelechi Uleanya; Dr Sam Furfari. Bottom row: Dr Ruhee Dawood; Dr Kgato Selwe; Amelia Milner.