Chemistry Update

ISSUE 358 • SEPTEMBER 2023

Calendar of Events

Coffee and Conversation with... Dr Julia Sarju
Date: Wednesday 5 October
Time: 1pm-2pm
Location: C/A/122

Research Seminar
Speaker: Dr David LeBoeuf, Université de Strasbourg
Date: Thursday 5 October
Time: 1pm-2pm
Location: C/B/101

Official Opening of Eleanor and Guy Dodson Building & Public Lecture
Date: Thursday 5 October
Time: 6.15pm -8.15pm
Location: Room SLB/118, Spring Lane Building

Research Seminar
Speaker: Prof Joe Francisco, University of Pennsylvania
Date: Tuesday 10 October
Time: 12pm-1pm
Location: C/B/101

Professor Brian Sutcliffe Memorial Symposium
Date: Wednesday 11 October
Time: 1pm-5.30pm
3:15pm Inaugural Lecture Prof Peter Karadakov
Location: C/A/101

Research Seminar
Speaker: Bill Hawkins, Otago University, NZ, Easterfield Prize Lecture
Date: Monday 16 October
Time: 1pm-2pm
Location: C/B/101

EDI Lunchtime Forum: Parental Leave & Caring Responsibilities
Date: Tuesday 17 October
Time: 12pm-1pm
Location: C/A/128

Merck Table Top Exhibition
Date: Wednesday 18 October
Time: 10am-4pm
Location: C/A Foyer

KMS Winners Seminar
Date: Wednesday 18 October
Time: 3pm
Location: C/A/101

Research Seminar
Speaker: Mark Crimmin, Imperial College, London
Date: Wednesday 25 October
Time: 1pm-2pm
Location: C/A/101

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Kharkiv-York partnership to tackle the environmental impact of the Ulkraine conflict

In a new partnership the Department of Chemistry, working with colleagues from the Department of Environment and Geography, recently hosted a Ukrainian PhD student as part of an exchange programme between their universities in Kharkiv and the University of York.

The project is a collaboration between the University of York and Karazin Kharkiv National University in Ukraine and stems from a UK-wide twinning initiative to offer support to academics, students and university leaders during the conflict.

Academics, PhD students and post-doctoral researchers from the Ukraine have spent eight weeks with research teams in York, to gain hands-on experience of different research methods in ecotoxicology, environmental fate assessment and green chemistry. During their time in the department, they were able to access cutting edge facilities and expertise.

A 9-week online course led up to the exchange, sharing background information from multiple disciplines – including Green Chemistry. The GCCE then hosted a Chemistry PhD student from Kharkiv, who undertook a project considering the nature of pollutants likely to be present after the war and looking at bioderived sorbents for pollution remediation.

The project aims to equip the Ukrainian researchers with the skills and knowledge needed to tackle the inevitable clean up of the country's natural environment.

Professor Helen Sneddon, from the Department of Chemistry said: "The chemical industry in Ukraine accounted for ~ 9% of Ukraine's exports before the war, screening compounds made in Ukraine have historically helped underpin global drug discovery efforts. We were keen to help in any way we could in the hope of a tangible benefit to Ukraine and in the hope that it would facilitate future projects helping monitor the damage, facilitate the clean-up, and ultimately "build back better". We are keen to learn from our Ukrainian colleagues – and see how best we can collaborate in future."

Joy Parvin awarded the SCI Science for Society Award

The Society of Chemical Industry Yorkshire and Humber Division has awarded its 'Science for Society Award 2023' to Joy Parvin from the University of York's Centre for Industry Education Collaboration (CIEC).

The award is in recognition of Joy's work, over many years, to combat science stereotypes and to help children from a wide range of backgrounds understand that a career in science is possible.

A background in chemical engineering and primary teaching convinced Joy that many children were being disadvantaged due to fixed ideas about who could, and could not, study science, with many children feeling that it wasn't a career open to 'people like me'. She also realised that science-based industries were missing out on a large pool of talent as many potential scientists opted out at an early age by choosing non-STEM subjects at secondary school.

Since joining CIEC in 1992 Joy has worked with scientists in industry to help them to explain their science to young people and to develop activities that make credible links between the science that happens on industrial sites and the primary science curriculum. She has also supported primary teachers to deliver engaging and relevant science lessons that capture the interest of young scientists and open their eyes to a wide range of STEM careers.

As director of CIEC since 2008 Joy has led a growing team of advisory teachers in Yorkshire, Humber and beyond to continue the work which, evidence shows, continues to have a lasting impact on the lives of the young people it touches. Every year hundreds of children take part in CIEC's innovative Children Challenging Industry (CCI) programme. They experience science lessons delivered by a specialist CIEC advisory teacher as well as lessons from their class teacher after they have received training from CIEC. They then visit a linked industry site where they are able to see the science that they have done in school taking place on a much larger scale. These visits are led by STEM professionals who have been supported by CIEC to develop the skills needed to share their knowledge appropriately with young people.

The Society of Chemical Industry 'Science for Society Award' aims to recognise influential contributions to science education which provide a major benefit to society in the Yorkshire and the Humber region as well as beyond. As a result of Joy's work many children who would not traditionally have considered studying STEM subjects have gone on to have a career in science.

Joy received her award at the School of Chemical and Process Engineering at the University of Leeds at 3pm on 22 September 2023 where she delivered her award lecture "Sparking curiosity: Igniting a passion for science careers in young minds".

Deprived communities in England experience higher emissions of air pollution

Air quality scientists have demonstrated that the most deprived areas in England experience the highest levels of air pollution emissions.

A team of scientists, from the University of York and the National Centre for Atmospheric Science, compared emissions of nitrogen oxides, also known as NOx, in England with data from the Index of Multiple Deprivation (IMD).

NOx are a class of air pollutants known to be harmful to human health, and the IMD is an index used by the UK Government to quantify deprivation across England.

A combination of factors such as income, employment, education, health, crime, barriers to housing and services, and living environment all contribute to the level of deprivation that a person or a place faces. While at a national level air pollution continues to reduce, poor air quality is still the greatest environmental risk to human health, and relates closely to where people live, study and work.

New research has revealed that, across England, people in the most deprived groups of society typically live in locations with the highest emissions of air pollution.

Dr Sarah Moller, from the University of York's Department of Chemistry and National Centre for Atmospheric Science, said: "The inequalities in the distribution of emissions are particularly significant for nitrogen oxides. People experiencing the highest levels of deprivation often live closest to major roads, and in areas of high housing density. Densely populated areas expose residents to pollutants created by combustion from heating."

Deprivation-based inequality was found across all major NOx emission sources, such as transport, domestic and commercial heating, factories and power plants. This shows that sources of NOx, beyond road transport, are also important drivers of air pollution inequality.

Nathan Gray, the PhD researcher at the Wolfson Atmospheric Chemistry Laboratories at the University of York who carried out this research, said: "It is often assumed that people living in cities will be exposed to the highest levels of air pollution.

"Our research shows that while the difference in air pollution between the city and the countryside does drive inequalities, those in more deprived areas will likely have worse air quality regardless of whether they live in the city or more rural areas."

The UK's air pollution in the coming few decades will be different to the recent or distant past – and it will change as energy supplies and transport systems are decarbonised, lifestyles and working practices evolve, and as new materials, products and processes are adopted.

Researchers hope that better understanding of NOx emissions across England will have important implications for future UK Government policies aimed at reducing inequalities in air pollution.

Dr Moller said: "Inequalities will persist in the future. Location plays such a large part in determining what emissions people are exposed to, and it is not yet clear how future policy will impact the level of inequality."

Region-specific emissions reduction strategies will be important in determining future emissions inequality

NOx emissions from road transport, the current largest single source of NOx emissions in most areas, are likely to reduce over time as the use of electric vehicles increases. However, this new research shows that inequalities in air pollution will continue despite a reduction in road transport emissions.

As inequalities are driven by the uneven distribution of emissions from a number of sources, future policies should recognise that reducing national vehicle emissions is not the only solution to reducing overall inequalities in air pollution.

Dr Moller said: “Some changes should be beneficial, such as reducing nitrogen dioxide concentrations from road vehicles. The future impact of other measures is less certain, for example choices around decarbonisation of domestic heating. Decarbonisation of domestic heating will impact inequalities in exposure – but whether this improves the situation or makes it worse will depend on which technology is chosen, and whether any emissions from alternative fuels are managed effectively.”

The research team suggests that region-specific emissions reduction strategies will be important in determining future emissions inequality, and that policies that focus on a range of emissions sources - not just road transport - need to consider their impact on that inequality.

Chemistry at York ranks 7th in The Times and Sunday Times Good University Guide 2024

The Department of Chemistry has placed 7th in The Times and Sunday Times Good University Guide 2024 for the subject of Chemistry. The ranking recognises the quality of our courses, and the experiences and opportunities they provide to our students.

Our Deputy Head of Department said: “I'm delighted that the Department of Chemistry has been ranked 7th nationally in the new Times and Sunday Times Good University Guide rankings. This reflects the excellent quality of teaching and research achieved by our Department, which makes it an outstanding environment for students to pursue an undergraduate degree, with access to the very best research opportunities. We are proud to be a Department which strives for excellence in everything we do, alongside our long-standing commitment to equality and inclusion”

The Times and Sunday Times Good University Guide uses data on entry standards, student-staff ratios, completion rates, first-class and 2:1 degrees, and graduate prospects. It combines these with measures of research quality, student satisfaction and social inclusion to award each university an overall score, broken down by subject.

New colleague for the Centre for Industry Education Collaboration

Having said goodbye to Clare Docking last month CIEC is delighted to be welcoming Clare Draper to the team. Coincidentally, Clare is the fourth Clare to work as an advisory teacher in the East of England over the past 9 years!

She told us,
“I am absolutely delighted to be the new Primary Science Advisory Teacher in the East of England continuing Clare Docking’s excellent work. I will be delivering the Children Challenging Industry (CCI) programme, building visible links between science education and its application in industry and related careers. Joining CIEC is a fantastic opportunity, and I am very much looking forward to working with STEM industries, schools and the CIEC team to inspire and enlighten the next generation of children, through raising their science capital”.

Clare will be working for CIEC two days per week delivering tailored training for industries and primary school staff, delivering lessons in schools, and organising interactive site visits for primary schools to industry. On the other three days, she will continue in her role as a teacher and science lead at Marleigh Primary Academy, a STEM school in Cambridge. As well as spending time with family and friends, Clare enjoys arts and crafts and cycling and running in her beautiful home city of Cambridge.

5th RSC-CRSI Joint Symposium in Chemical Sciences

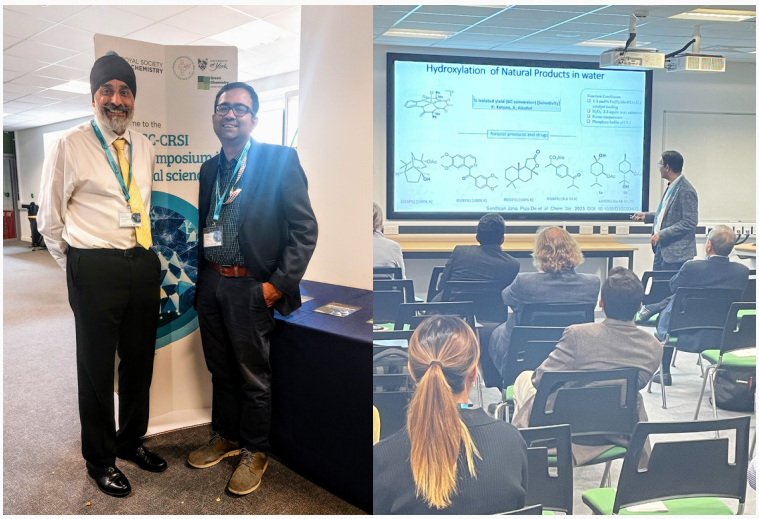
The Green Chemistry Centre of Excellence were proud to host the 5th RSC-CRSI Joint Symposium in Chemical Sciences on Tuesday 12th September.

The Royal Society of Chemistry and Chemical Research Society of India (CRSI), have been jointly promoting the exchange of ideas and knowledge in chemical sciences research and enabling networking opportunities for researchers for several years.

This year, the theme of the York event was, fittingly enough "Sustainability", and the Indian and British researchers presented a wide range of related research. Highlights included:

- Water as a reactant in Organometallic Research (Jitendra K Bera)
- New approaches to the polymers society needs (Steve Howdle)
- Carbon Recycling for Sustainable Energy: A Journey from Fundamental Chemistry to Green Technologies (Sebastian Peter) Catalyst development for Sustainable Oxidation Reactions (Sayam Sen Gupta)
- Flower Waste biorefinery (Parimala Shivaprasad)
- Cost-Effective Liquid Junction Solar Cells and their Application to Dual Function Devices (Melepurath Deepa)
- Enabling nucleophilic fluorination in water, (Krishna Sharma)

Poster prizes were won by Hannah Chapman, Callum Gater and Natthamon Inthala.



Enhancing Research Culture in the Chemical Sciences through Mentorship Event

The Department hosted a very successful event focussed on mentorship and its role in addressing inequalities and promoting a positive research culture in chemistry and related physical sciences on Wednesday 13 th September. The meeting ran in hybrid format with over 70 registrations from across the Department, the wider University, other universities and from industry.

The meeting started with introductions from Professor Caroline Dessent (Chemistry's Head of Department) and Professor Sarah Thompson (Associate Pro-Vice Chancellor Research). Laura Woodward (Royal Society of Chemistry, RSC) then gave an excellent overview of the range of mentoring schemes running at the RSC, with a particular focus on the Broadening Horizons and Destination STEMM programmes that are part of the RSC's actions aiming to address racial and ethnic inequalities in chemistry. The second speaker in the morning session was Dr Karen Clegg (Head of the Building Research and Innovation Capacity Team, University of York) who told the audience about recent mentoring schemes at York and her plans for the RSVP project, led by York, which aims to transform the culture of doctoral supervision through training and mentoring.

After the lunch break and networking opportunity Professor Robin Perutz (University of York) opened the second session with a talk reflecting on his personal experiences as a mentor, both in formal and informal mentoring relationships, and gave some invaluable advice for others in mentorship roles. The second speaker was Professor Jen Heemstra from Washington University in St. Louis who gave an inspiring and thought-provoking overview of her activities around mentorship, predominantly of early career researchers, as a research group leader.

The day closed with a panel discussion, chaired by Professor Avtar Matharu. The panel included Laura Woodward, alongside early career researchers Dr Kelechi Uleanya, Jerry Tam, Dr Abigail Frith, Aidan Carr. The discussion focussed on current challenges and future actions around mentorship in chemistry and the physical sciences. The panel gave insightful and often personal reflections that brought together some key ideas from the earlier talks and highlighted some challenges for the chemical community in the future.

All sessions were recorded and if you'd like access to any of the recordings please email John Slattery for a link to these.

EPSRC Mobility DTP: York joins other pilot projects at Link Day symposium

In September 2023, York joined the three other universities participating in the EPSRC Mobility pilot to meet in person for the first time at Queen Mary, University of London (QMUL) for a Link Day - a one-day symposium dedicated to the project.

This was the second Link Day event, the first was hosted by York in 2022 as a virtual event. This time the management teams and DTP candidates from QMUL, Brunel, the University of Southampton and the University of York gathered at QMUL's Mile End campus for the first in-person Link Day. They were joined by representatives from industry partners, funding bodies and other invited guests for a day of knowledge-sharing and networking.

The EPSRC-funded project is designed to pilot new routes into academia for candidates from an industry background. The Doctoral Training Programme (DTP) has been running as a pilot at York since 2020. Since then, candidates from a non-standard academic background - specifically, those with experience working in industry - have joined the programme to work towards either a PhD in Chemistry or a PhD in Biology.

Unusually, for those candidates already employed in industry, this pilot programme means they can remain in employment alongside being enrolled in their course. They're not required to leave their job in order to take up their place at university - they can do both. This has been made possible with the help of funding from EPSRC and with the support and cooperation of a range of industry partners who are keen to enable employees to undertake advanced and innovative research with the guidance of leading academic experts.

Bringing together all four institutions at the Link Day was an opportunity to hear about the range of innovative research these candidates are undertaking which they showcased through presentations, posters and discussion. Candidates also spent time on a dedicated skills session with an expert facilitator. Additionally, the university staff teams joined industry partners, EPSRC representatives and other guests for a roundtable discussion on the topic of mobility enabled by university-industry partnerships.

Feedback from attendees indicated that the Link Day was a useful and interesting experience. The institutions are now working together to plan the next Link Day in 2024.