

Mission: Starlight

Global experiment heads for the stars

Newton Fund Indonesia p10

Our honorary fellows p12

> ROYAL SOCIETY OF **CHEMISTRY**





As part of a delegation to northern India, our president Dominic Tildesley, spoke at the 10th symposium in collaboration with the Chemical Research Society of India, in Chandigarh.

As part of the event, speakers from the symposium, including Professor Dave Smith, from the University of York, joined academics and students from the Mohali institute of nanoscience and technology in taking their science to the streets of Chandigarh (right).

Dave Smith also visited Amritsar to speak at Guru Nanak Dev University. He took this beautiful image of the Golden Temple at Amritsar (below), and says of his experience: "The future of chemistry is global, and this was an invaluable opportunity to interact with esteemed Indian academics, talented PhD students and also, through my special schools' outreach lecture, to meet the enthusiastic next generation of potential Indian scientists".

Read more about the RSC-CRSI partnership on p4 of this month's Snapshot.









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Cover: British ast

British astronaut Tim Peake, who has launched our 2016 global experiment.





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Snapshot

A look at the latest news from around the world

INBRIEF

Are you the first chemistry BSA media fellow?

The British Science Association's (BSA) annual media fellowship scheme provides a unique opportunity for practising scientists, clinicians and engineers to spend between two and six weeks working at the heart of a major media outlet, such as the *Guardian*, BBC Breakfast or *New Scientist*. For the first time we have sponsored a chemistry placement on the scheme, with the aim of placing a chemistry media fellow within a broadcast media organisation this summer.

The well-established media fellow scheme will enable us to work with the media to communicate about chemistry, supporting the findings of our public attitudes to chemistry research.

If you are interested in taking a look behind the scenes of a paper, television programme or magazine, and in sharing chemical science stories through the media, head to **www. britishscienceassociation.org/mediafellows** to apply. Applicants should be post-docs or work at any level in an academic or research institution.

After the media placement, the media fellows attend the British Science Festival in September, which provides an opportunity to gain valuable experience working alongside a range of media organisations in the BSA's press centre.

Newton-Bhabha Fund workshops in India

In association with the British Council in India (which is part of the UK Government) we will deliver six Newton-Bhabha Fund Researcher Links Workshops over the next 12 months. The aim of the Newton-Bhabha Fund workshops is to facilitate cohesive and collaborative research partnerships and establish mentoring relationships between UK and Indian researchers.

Speaking at the RSC-CRSI symposium in Chandigarh, India, in February (see across page), our president, Dominic Tildesley, said: "I am pleased to announce our programme of six Newton-Bhabha Fundworkshops, co-funded with the British Council, which will bring UK and Indian scientists together to tackle major global challenges like antimicrobial resistance."

Building UK-India partnerships in science



A delegation including our president, Professor Dominic Tildesley, and our deputy chief executive, Stephen Hawthorne, visited Chandigarh, in northern India in February to re-sign a memorandum of understanding with the Chemical Research Society of India (CRSI) and to celebrate the tenth RSC-CRSI symposium.

Commenting at the event, Dominic Tildesley, said: "India is an increasingly influential centre of chemistry and a vital partner for UK science more widely. We're committed to supporting the continued development of the chemical sciences in India and to fostering collaboration between our two countries."

This was echoed by Professor C N R Rao, one of India's most influential chemical scientists. After attending a panel discussion at the meeting, he commented very positively on our activities in India and the opportunity for much closer collaboration between these two societies and the two nations.

Professor Sourav Pal, CRSI President, added: "This is a very special year, marking the tenth RSC-CRSI joint symposium and a decade of partnership. This has been one of the most successful and visible partnerships in the global context, promoting the chemical sciences in India and bringing India and UK chemistry closer together than ever. I wish this partnership even greater success and hope that it grows stronger in the years to come". See the inside front cover for more images from our delegation to northern India.

The aim of the symposium is to bring together researchers from India and abroad to discuss a variety of topics in the chemical sciences, including areas of applications such as energy and healthcare. At this latest event, Dr Alison Hulme from Edinburgh University, Professor Richard Layfield from the University of Manchester and Cambridge University's Dr Erwin Reisner, who were all part of the Royal Society of Chemistry delegation, shared some of their research. In addition, York University's Professor David Smith presented an outreach lecture on chemistry fighting disease to a packed auditorium.

Describing the impact of events like this, Stephen Hawthorne said: "Many Royal Society of Chemistry members in India are also members of the Chemical Research Society of India, which highlights that there are shared values between our societies.

"Our relationship with the CRSI helps us to connect with the chemical sciences research community in India, many of whom we also know as authors and referees in our journals. The annual joint symposium is an opportunity to introduce leading UK scientists to their counterparts in India, with the aim of generating long-term collaborative relationships to benefit research in both countries."

Charging up a UK-Korea partnership at our battery symposium

Between 18 and 20 January, we hosted ten professors and 23 students from Korea at the UK-Korea Symposium on Lithium and Sodium Batteries at Burlington House, London. We teamed up with Professor Jaephil Cho, from Ulsan National Institute of Science and Technology (UNIST) and Professor Peter Bruce from the University of Oxford to organise the event.

Our chief executive, Robert Parker, commented on the importance of energy storage in tackling our need for sustainable energy systems during his opening remarks: "The need for more sustainable energy systems, is one of the biggest challenges that we face. And better energy storage is an essential part of the solution."

The symposium included presentations from 17 experts in the field, including seven speakers from the UK. In addition, delegates had the opportunity to attend a posters session that included 43 posters from students in the UK, Korea, France, Italy and Poland.

"All the invited speakers communicated with passion and an open mind. Especially, the poster-session was a really interactive event, with all poster presenters eager to deliver to their experimental results to the delegates," said co-organiser Professor Jaephil Cho.

The positive feeling was echoed by many of the delegates, who felt that the event

enabled them to establish new contacts in industry and academia, and to explore potential scientific collaborations.

Dr Qiong Cai from the University of Surrey said: "I enjoyed the meeting very much and indeed have made several useful contacts, particularly with UK industry and Korean delegates. There are plans to develop collaborations with them."

This was echoed by Dr Yoon Seok Jung, UNIST, Korea, who commented: "This conference was fantastic. We have talked about many interesting technical issues and possible collaborations. We've also formed a good friendship."

Dr Ainara Aguadero, Imperial College London, specifically highlighted the benefit in connecting with researchers from Korea, saying: "I have made some Korean contacts and I am planning to visit them next May, when I am going to Korea for another conference."

The two-day symposium was followed by a site visit to energy-research laboratories at the University of Oxford, which was arranged by Professor Peter Bruce and his colleagues. Dr Seok Ju Kang, UNIST, felt that "the meetings at Oxford were very fruitful. There are so many things to learn... it would be great to have some chance to collaborate with UK professors."



Korean delegation visit University of Oxford



Symposium poster session



Poster prize winners at Burlington House



One to one

Take advantage of a wide range of member services

Use your 175 minutes for chemistry to boost your career

In April 2015, we successfully launched our mentoring scheme and now have 36 active mentoring relationships across the UK. This year we would like to continue to provide this support to more members and establish a further 35 relationships.

With this in mind, we are planning further training sessions, across parts of the UK that we didn't cover in 2015 or areas where we have a need to train more mentors. The dates and locations are:

- Newcastle, 9 March
- Cardiff, 6 April
- Cambridge, 28 June
- London, 21 September

If you are based in those areas, you will receive an email inviting you to sign up for the training a couple of months beforehand. But if you already know that you are interested and available, then please do get in touch by emailing us at **careers@rsc.org** and we will add you to the list. We do still have availability for our Cardiff event. As part of the Royal Society of Chemistry's 175th anniversary celebrations, we are encouraging our members to give 175 minutes to chemistry, and participating in the mentoring scheme could be the perfect way to do that.

The training sessions we run provide lots of opportunity to practice the skills that will be used in a mentoring relationship. Our careers management team are happy to answer any questions you might have and establish whether having a mentor is the right step for you.

Who is mentoring for?

There are many reasons why someone might choose to have a mentor. Mentees in our scheme include those who are just starting out in their career, those who want to make a transition, and those who want support developing in their current role. We expect the relationships to last around 12–18 months, so commitment is expected on both sides. The relationship allows focused discussion, on topics that are important and relevant to you. The scheme is there to support you with your career, but what that support might look like is very much up to the mentee and mentor.

As part of the process, we ask both mentors and mentees to complete a questionnaire which we use to match each participant to the best partner for them and, where possible, we try to take into account any specific requests, such as the desire for someone with a specific industry background. However, we find that most people benefit from simply having the opportunity to discuss their career with anyone who has more general experience in the world of work, or a different type of work to them.

Feedback

After a couple of months on the scheme, one of our members told us: "It's just nice to know you have someone in the field – who you do not directly work with – to query about careers and work-related issues". Another said: "The service is very useful – helps me develop a more conscious, selfreflective attitude towards my professional career. I have a couple of big questions, and it's good to discuss them with someone who is interested but not involved directly."

Another said: "It is an excellent service and I feel I have been well matched with someone who has been through my current experience (post-doctoral research) relatively recently and so is able to offer good advice."

It's also important to recognise that the mentor often gets as much out of the relationship as the mentee does and we've received fantastic feedback from those who've already completed their relationships. One of our mentors told us: "It has been a privilege to become involved with a person's emerging career and to be able to offer goals and advice. I feel that we have both learnt much from one another."

People choose to mentor for a number of reasons. Often it stems from a desire to give something back, to share their own experiences and help people develop their own careers. Being a mentor can also help you develop desirable skills. For example, it could be a way of building on your skills as a manager, or it might help you to gain those skills if you are looking to move into a role where you will have more responsibility.

Find out more

If you've been inspired to use 175 minutes to get involved in our mentoring scheme then get in touch with our careers team, **careers@rsc.org**, or if you already know you want to get involved then register for one of the training sessions above.

For more information on how else you can get involved with our 175th anniversary activities go to **rsc.li/175**. We'd love to hear what you're doing and how you are taking part either by email or tweeting us **@RoySocChem** using **#Time4Chem**



Profile

A closer look at our members and their interests



Sir Venki Ramakrishnan is the President of the Royal Society.

"We need to make sure that science is taught in an exciting and interesting way, that we're not turning off pupils at school"

Sir Venki Ramakrishnan Making the case for science as the newly appointed president of the Royal Society

Q What are some of your earliest memories of science?

A I grew up in a scientific family. Both my parents were scientists, my father, a biochemist, and my mother, a psychologist. Together, they combined their skills to look at the effects of malnutrition on learning and brain development.

I originally didn't want to be a scientist, thinking I might be an engineer or doctor. I was fortunate to have a few key teachers at the right time in my life, both at high school in Vadodara (previously known as Baroda), the town I grew up in back in India, and at the Maharaja Sayajirao University of Baroda, where I completed a degree in physics.

I started off as a physicist, finishing off a PhD in theoretical physics at Ohio University in the US. By the mid-1970s, I had already felt that biology was at a very exciting stage where dramatic discoveries were constantly being made, so I made the transition.

Q How much importance do you place on public engagement and the communication of science to a lay audience?

A Public engagement means engaging the general population with science, not just its practical benefits, but science as part of our culture, and human endeavour. That in turn, builds up support for science. There is a great desire among the public to know what's going on in the scientific community. I like to say we all start off as scientists. When we are children we are always curious about all kinds of natural phenomena, why is it like this, or how does this work? We lose this as we become adults and stop asking questions. I think we should be encouraged to continue to be scientists all our lives in some sense, and continue to ask questions.

It's also important because the public is supporting a lot of science, through paying their taxes, and it is only right that they know what it is they are supporting. I think scientists partly have a duty, especially ones who are publicly funded, to engage with the public.

Q Was the Royal Society appointment a surprise?

A I would say it was a bit of a surprise. I've only been in Britain for about 16 years and was sort of parachuted into the laboratory for molecular biology, so I don't have the extensive network of contacts I would have had if I'd grown up and went to university here. To some extent it reflects the openness of British science. Take a guy like Michael Faraday, who never finished high school, became apprentice to Humphry Davy, and eventually rose, to the top of UK science. It shows Britain has always been meritocratic in that way about science. The other reason for my selection could be because of my international background. I grew up in India, but spent most of my life in the US, before I came to Cambridge. So in that sense I have some geographical breadth and also broad experiences in various sciences as a physicist and structural biologist.

Q What are you most excited about in your new role at the Royal Society?

A I think science education both at school and university level is really something we need to look very hard at. We need to make sure that science is taught in an exciting and interesting way, that we're not turning off pupils at school. As well as this, we must ensure the curriculum is taught in a rigorous enough way to prepare the students for the science of the future.

Another issue is international relations, as science becomes an increasingly global enterprise. Just look at how well the RSC is represented in India, and how fond many Indian chemists are of belonging to the RSC, and I think the Royal Society likewise is a society for the commonwealth. I'd like to strengthen those relationships.

Q What are the biggest challenges and opportunities for UK science in 2016?

A We need to constantly engage with governments and industry to make sure the notion that science is going to be of long-term benefit to society is not forgotten. Without a knowledge-based society, we are not going to be able to compete in the future. You can look at countries that are resource rich and knowledge poor, and you will find that they are not doing very well, even though they have lots of resources. It is the opposite for countries that are knowledge rich and resource poor. It is very clear that if you have a knowledge-based economy it will have an impact on economic and general wellbeing, and so I think that's something we certainly need to foster.

Our global experiments past, present and future

A long time ago in a galaxy far, far away.... Well, not quite, but the global experiment series does have some amazing stories to share, and this year's experiment, Mission: Starlight, is taking thousands of pupils into space

What are the aims of the global experiments?

Our global experiments support science teachers at Key Stage 2 and 3, by providing inspiring, collaborative practical activities with curriculum links, using everyday materials.

The experiments are designed to have clear aims or questions which students answer by investigation. After the experiment, teachers or students are able to share results via our website which teachers tell us "really adds impact to classroom discussions and makes students feel more involved with the experiment".

What is Mission: Starlight?

Introduced by British astronaut Tim Peake, our new experiment is inspired by Tim's mission to the International Space Station, partnering with the UK Space Agency and the European Space Agency. Mission: Starlight links the perils of spaceflight to practical science and asks students to investigate materials that block or limit UV light. Using affordable and widely available UV colourchanging beads, students test different materials for their ability to block UV light.

When to take part?

Our global experiments remain permanently open, allowing people to take part whenever it suits them and the topics they're covering. Each year we typically get 30–40,000 participants from all around the world, recording data on our website. This year however, we want more. We are always looking to add to our series of experiments, which currently includes testing the levels of vitamin C in fruit and vegetables, growing crystals, testing hydrogels or investigating materials which can block UV light.

Data from existing experiments

To further increase engagement in the experiment, our website holds all participants' posted results. Students, perhaps for the first time, get to publish data like real scientists and either celebrate their school appearing on the map or interrogate the data for trends. With older groups, teachers can also discuss experimental design and investigate these changes.

Looking back over recent experiments, there are lots of interesting results. From our experiment, launched in 2013 to test levels of vitamin C in fruit and vegetables, participants ran a quick test by counting the number of iodine drops needed to change the colour of a Vitamin C solution (containing starch).







While this was not a completely accurate measure, the results from the mass participation experiment stack up well with red peppers, oranges and kiwi fruits shown to contain higher levels of vitamin C in comparison with other fruits and vegetables. Students around the world discovered that red peppers, perhaps surprisingly, have the most Vitamin C per gram.

A closer look at last year's project – Water: A Global Experiment With Hydrogels – suggests that the nappies purchased in the United Arab Emirates may contain less hydrogel than those from the UK.

Going global

The global experiments are flexible, use easily sourced materials, are simple to perform and are adaptable for schools, science clubs and Scouts / Guides groups, across a wide age range.

A great example of how far the experiments have reached, comes from two school students from Lossiemouth High School in Moray. Rhiannon Cleghorn and Rebecca Brown recently completed a visit to Bokomoso School in Botswana to develop a link between the schools. The link involved senior pupils from Lossiemouth delivering lessons to the pupils in Botswana. Rhiannon and Rebecca ran the hydrogels global experiment due to its ease of transport, affordability and adaptability. The global experiment last year reached 14 different countries and the crystals experiment before that had participants from 22, so the reach is consistently international.

Adapting the global experiment to meet your needs

Each of these experiments includes a number of different investigations, catering for the wide variety of ages involved. Teachers can choose to take part in one small, focused activity or run a variety. Our website can accommodate results from only a few variables, in one experiment, if needed.

We link our global experiments to the British Science Association's CREST awards. To earn one of these awards, participants would typically need to run a certain number of hours of project work (which depends on the age group) using the global experiment. We provide a guide and in Mission: Starlight, challenge students to make their own experimental UV-blocking material.

Our experiments can also inspire all sorts of spin-off projects. Jason O'Grady, a chemistry teacher from Brighton, Hove and Sussex Sixth Form College, recently shared a student project with us. Jason's pupils investigated the effect of the amount of ionic charge in a solution on the volume of water absorbed by a hydrogel. They found that increasing the ionic charge using different salts reduced the amount of water absorbed. Jason also shared that by expanding the context of the global experiment, his group "found it a very interesting and a stimulating project to complete. I believe it has massive sixth form chemistry potential."

At the time of going to press, the Northern Ireland Science Festival (18-28 February) will be hosting a global experiment day (23 February), where hundreds of schools have signed up to run our new Mission: Starlight experiment and post their data. Look out for more in the next edition of *RSC News*.

It will also shortly be British Science Week (11–20 March), Over this time and beyond, our regional education coordinators and I will be running demos or visiting schools to deliver the experiment. You can help by sharing links to Mission: Starlight with teachers in your network as part of that event.

WORDS LEE PAGE

Newton Fund collaboration in Indonesia

WORDS LIZZY RATCLIFFE

A year ago we launched our partnership with the British Council to support the Newton Fund, an initiative begun in 2013 by the UK government department for Business, Innovation and Skills (BIS), with the aim of promoting economic development and welfare in scientifically developing countries

A key initiative of the fund is a series of Researcher Links workshops, which bring together UK researchers with their counterparts in developing countries, to collaborate and exchange ideas. As part of the Royal Society of Chemistry's international strategy, we are match-funding at 50%, a selection of chemistry applications that would not otherwise receive funding. As well as supporting chemists overseas, the workshops provide an opportunity for UK researchers to network on a global scale, and benefit from the knowledge and insight of other scientists.

The workshops are aimed at early careers researchers but senior researchers also attend as mentors, to facilitate sessions and share their expertise.

In April and July 2016, the British Council will be calling for applications for funding for further researcher links workshops. Find further information at **www.britishcouncil.org/education/ science/newton**. And if you are an early careers researcher, have a look at the website and keep an eye out for upcoming workshops to attend. Sarah Thomas, Royal Society of Chemistry senior international development manager, attended the second of the workshops we co-funded, which took place between 26–29 January, in Bogor, Indonesia. She says: "This workshop was a great success with the potential for some significant outcomes between Indonesia and the UK. The involvement of the Royal Society of Chemistry with the British Council in the Newton Fund Researcher Links workshop scheme is very important for enabling UK chemists to develop international collaborations."

Professor Russell Howe, of the University of Aberdeen, and Dr Yuni Krisnandi, of Universitas Indonesia (pictured below left), co-organised the event and, in the months running up to the workshop, documented their challenges and successes for *RSC News*....

Below from left to right: workshop co-ordinators Professor Russell Howe and Dr Yuni Krisnandi; Sarah Thomas and workshop mentors discuss; researcher's breakout sessions to build new collaborations; final day photograph.





Diary entry: November 2015 Three months to go...

PROFESSOR RUSSELL HOWE, UNIVERSITY OF ABERDEEN

The original application for this workshop began a year and a half ago, after a discussion with a former student of mine, Yuni Krisnandi. She is now based in her home country of Indonesia, and we put in a bid to the British Council to hold a workshop there. Unfortunately our bid was not funded but when the Royal Society of Chemistry got involved in the Newton Fund, they were able to fund it.

We advertised the workshop via a webpage, and we've been pleased at the number and quality of applicants. It's been a tough job to select the 15 from each country to go.

We now have most of the arrangements in place. To overcome any initial shyness, we're getting photos of everyone in advance, to help in putting faces to names, and we've organised a sort of speed-dating session to introduce everyone to each other on the first day.

DR YUNI KRISNANDI, UNIVERSITAS INDONESIA

I have been to several workshops that tried to connect scientists from Indonesia with scientists from other countries. It's a brilliant idea but it can be difficult to achieve in practice. So I want to collaborate with my UK counterpart to organise the kind of workshop that could help scientists maintain a real connection after they return to their places of work.

There will be some cultural barriers to overcome. We Indonesian scientists need to stop feeling inferior and explore our own potential and capability, especially in the area of indigenous studies. The other participants will need to be open minded and willing to look for opportunities to work together with others. Perhaps we could start by writing some joint publications, or working together to characterise some new materials.

I'm expecting the workshop to have a good academic atmosphere and I hope the participants really use this rare event to discuss and create opportunities for collaboration. The funding is available: it's not the main issue any more. What we really need now are serious scientists to collaborate on good research.

Diary entry: January 2016 Less than one month to go...

PROFESSOR RUSSELL HOWE, UNIVERSITY OF ABERDEEN

Despite the challenges of organising an event in a country with a seven hour time difference with the UK, and the sometimes unreliable Skype connections, everything is ready to go. Travel plans are in place, and the programme book is almost ready. We'll be distributing an electronic version to the participants in advance.

I think the UK researchers will be able to learn from their Indonesian counterparts, how to apply their research to real problems in the developing world, in the areas of energy and the environment.

In return, the UK researchers will be able to share their experience of the more advanced research techniques that they have access to.

DR YUNI KRISNANDI, UNIVERSITAS INDONESIA

We're picking up most of the participants at the airport, so I'm checking and rechecking the arrival schedule! I've also invited two senior lecturers, Dr Jarnuzi Gunlazuardi and Dr Ivandini Tribidasari, from Universitas Indonesia, to join us as mentors and speak about their work.

The workshop will take place in Bogor, a small city about 60 km from Jakarta, the capital city of Indonesia. It is surrounded by three active volcanoes that have been calmly sleeping for a long time. It has a beautiful botanical garden, built in 1817 by Dutch colonials. The weather here is much cooler than Jakarta, so the city is famous as a place for holidays and relaxation. Its nickname is Rain City because it can easily rain every day. The venue is located away from the crowded public places and I believe it's the perfect location for an intensive workshop like this.

Diary entry: February 2016 After the workshop

PROFESSOR RUSSELL HOWE, ABERDEEN, AND DR YUNI KRISNANDI, UNIVERSITAS INDONESIA

The workshop is over, and we are very pleased with how it went. It turned out very successfully, and the participants were very active and enthusiastic towards the programme.

Everyone learned a great deal from both the talks and informal discussions, and participants from both countries saw how their research could be mutually beneficial. For example, particular environmental and energy related problems in Indonesia could benefit from UK expertise, while Indonesian research utilising natural resources to produce catalysts and other useful materials is directly relevant to UK research. The workshop exposed Indonesian researchers to a wide range of UK activities on synthesis, characterisation and properties of materials relevant to energy and the environment, and UK researchers to the energy and environmental problems that Indonesian researchers are addressing, particularly through the use of natural resources.

The best parts of the experience were the breakout sessions, where the participants guided by the mentors could identify potential collaboration partners and express interest. They also discussed possible funding options for developing these collaborations.

Our experience has shown that Researcher Links workshops are highly beneficial to participants from both countries involved, and we will be applying to the Newton Institutional Links programme (another Newton Fund programme that provides grants for the development of research and innovation collaborations) to further develop the collaborations initiated by the workshop.





Our 2015 honorary fellows

WORDS ALEX JACKSON

Each year we recognise substantial contributions that individuals make to the chemical science community, by awarding them honorary fellowship to the Royal Society of Chemistry. This year, we welcome five new honorary fellows, including two Nobel Laureates, who will receive their awards at our events throughout the year. If you'd like to find out how to nominate someone or read a list of all Royal Society of Chemistry honorary fellows, visit **www.rsc.org/honfrsc**

Mapping how cells repair damaged DNA and safeguard genetic information





Tomas Lindahl HonFRSC FRS

Francis Crick Institute and Clare Hall Laboratory, Hertfordshire UK

Paul Modrich HonFRSC

Howard Hughes Medical Institute and Duke University School of Medicine, Durham, NC, USA IMAGE © HOWARD HUGHES MEDICAL INSTITUTE

The Royal Swedish Academy of Sciences awarded the Nobel Prize in Chemistry for 2015 to Tomas Lindahl, Paul Modrich and Aziz Sancar, 'for having mapped, at molecular level, how cells repair damaged DNA and safeguard the genetic information. Their work has provided fundamental knowledge of how a living cell functions and is, for instance, used for the development of new cancer treatments.

Each day our DNA is damaged by UV radiation, free radicals and other carcinogenic substances, but even without such external attacks, a DNA molecule is inherently unstable. Thousands of spontaneous changes to a cell's genome occur on a daily basis. Furthermore, defects can also arise when DNA is copied during cell division, a process that occurs several million times every day in the human body.

The reason our genetic material does not disintegrate into complete chemical chaos is that a host of molecular systems continuously monitor and repair DNA. The Nobel Prize in Chemistry 2015 awards three pioneering scientists who have mapped how several of these repair systems function at a detailed molecular level.

In the early 1970s, scientists believed that DNA was an extremely stable molecule, but Tomas Lindahl demonstrated that DNA decays at a rate that ought to have made the development of life on Earth impossible. This insight led him to discover a molecular machinery, base excision repair, which constantly counteracts the collapse of our DNA.

Paul Modrich has demonstrated how the cell corrects errors that occur when DNA is replicated during cell division. This mechanism, mismatch repair, reduces the error frequency during DNA replication by about a thousandfold. Congenital defects in mismatch repair are known, for example, to cause a hereditary variant of colon cancer.

The Nobel Laureates in Chemistry 2015 have provided fundamental insights into how cells function, knowledge that can be used, for instance, in the development of new cancer treatments.



Andrew Hamilton HonFRSC

Current President of New York University, USA

Professor Andrew David Hamilton is a distinguished chemist and recently took up the president's role at New York University. Prior to that, he was Vice Chancellor at the University of Oxford.

Professor's Hamilton's academic achievements have been widely recognised internationally. In 1999, he received the Arthur C Cope Scholar Award from the American Chemical Society, and in 2004 he was elected a Fellow of the Royal Society and a Fellow of the American Association for the Advancement of Science.

His research interests lie at the interface of organic and biological chemistry, with particular focus on the use of synthetic design for the understanding, mimicry and potential disruption of biological processes.

He read chemistry at the University of Exeter before studying for a master's degree at the University of British Columbia. In 1980, he received his PhD from Cambridge University and then spent a post-doctoral period at the Université Louis Pasteur in Strasbourg.

Professor Hamilton was appointed Assistant Professor of Chemistry at Princeton University in 1981 before serving as a department chair and Professor of Chemistry at the University of Pittsburgh. He joined Yale in 1997 and was Provost of Yale from 2004 until October 2008 where he combined a wide-range of administrative duties with teaching and research.

Achievements during his time as Provost of Yale included the acquisition of the West Campus, the re-establishment of the Yale School of Engineering and Applied Science after a 40-year hiatus, a reform of the tenure process and the significant enhancement of the Yale undergraduate curriculum.

In addition to serving as Provost he was Benjamin Silliman Professor of Chemistry and Professor of Molecular Biophysics and Biochemistry. He was elected a Member of the American Academy of Arts and Sciences in 2010 and received the International Izatt Christiansen Award in Macrocyclic Chemistry in 2011.

Dame Carol Robinson DBE HonFRSC FRS



Dame Carol Robinson is the first female Professor of Chemistry at the University of Oxford and was previously the first female Professor of Chemistry at the University of Cambridge. She is renowned for pioneering the use of mass spectrometry as an analytical tool and for her ground-breaking research into the 3D structure of proteins.

Professor Robinson was a graduate student at Churchill College from 1980–1982, completing her PhD in two years. Following an eight-year career break to begin raising her three children, she returned to research at Oxford, later becoming a titular professor in 1999.

In 2001, she returned to Cambridge to continue her research into mass spectrometry and was elected a Professorial Fellow at Churchill College, a Fellow of the Royal Society in 2004, and a Royal Society Research Professor in 2006. In 2009, she was elected Doctor Lee's Professor of Chemistry at the University of Oxford and in 2013 was awarded the title of Dame Commander of the Order of the British Empire.

Her awards list is extensive and ranges from the Royal Society of Chemistry's Silver Medal for Mass Spectrometry in 2002, the Rosalind Franklin Award from the Royal Society in 2004, to being awarded the L'Oréal – UNESCO For Women In Science European Laureate last year.



University of Edinburgh, UK

Professor Lesley Yellowlees is the Vice-Principle and Head of the College of Science and Engineering at the University of Edinburgh. Professor Yellowlees has worked extensively with the Royal Society of Chemistry over the years, chairing our Science and Technology Board, sitting on the Publishing Board, and working with the Scottish Education section. In July 2012, she became our first woman President.

Professor Yellowlees's current research interests are in inorganic electrochemistry and spectroelectrochemistry, epr spectroscopy, synthesis and characterisation of potential solar energy dyes, utilisation of CO₂, public engagement of science and promoting women in science.

She completed both her BSc in Chemical Physics and her PhD in Inorganic Electrochemistry at the University of Edinburgh. After completing research positions in Brisbane, Australia and Glasgow she returned to an academic position in Edinburgh in 1986 and gained a personal chair in Inorganic Electrochemistry in 2005.

Professor Yellowlees was a highly effective Head of Chemistry in Edinburgh and Head of EaStChem, the joint research school for chemistry in Edinburgh and St Andrews.

She was awarded an MBE in 2005 for services to science, a CBE in 2014 for services to chemistry, and was admitted as a Fellow of the Royal Society of Edinburgh in 2012. She was one of the first people to be elected a Distinguished Woman in Chemistry by IUPAC.

She currently chairs our Diversity Committee, following a theme that she developed very effectively during her presidency.

IMAGE © ROYAL SOCIETY OF CHEMISTRY



Epigenetics – from under the radar to over the top?

Does epigenetics represent a new frontier in drug discovery? Nessa Carey looks at the explosion in our understanding



Nessa Carey is an author and popular science writer.

"Epigenetics does represent a new frontier in drug discovery, potentially opening up opportunities in cancer and a range of chronic diseases."

Until about 10 years ago, epigenetics was a bit of a niche discipline in biology, something of a problem child – clearly very clever, but difficult to pin down. To hardcore geneticists it was too fuzzy, with an uncomfortably large gap between outcomes and mechanisms. In the last decade however, there's been an explosion in our understanding of epigenetics – now recognised as a vital player in cellular function and human health, as well as a source for the development of new drugs.

What is epigenetics?

How long do you have? There's a lot of subtly different definitions, and some of the nuances are only of interest to the obsessives. A useful working definition, at a mechanistic level, is that epigenetics refers to heritable modifications to chromatin. These modifications can be present on DNA itself or on the histone proteins with which it associates. They are passed on when cells divide, through mechanisms that in many cases are opaque. The modifications don't alter the sequence of genes, but they do influence how and when a gene is expressed. The modifications vary hugely in their stability and the length of time for which they influence expression of a specific gene. At one extreme they can mediate a transient response to an environmental stimulus, of thirty minutes or less. At the other, they define and maintain cellular fate for an entire lifetime. In the past decade the techniques for identifying and analysing these patterns of modifications have improved by orders of magnitude, driving some of the increased interest in this field.

Not too subtle?

These hundreds of epigenetic proteins generate a horrendously complex landscape of interacting epigenetic modifications across the entire genome, which varies with cell type, age and just about every environmental influence you can imagine, with a high degree of stochastic variation thrown in for luck. So what makes us think that interfering with just one Writer, Eraser or Reader will really have any biological impact? Well, nature itself suggests that abnormal expression of a single epigenetic protein can influence cellular outcomes dramatically. This is clear from the overt phenotypes seen in children with germline mutations in genes that encode epigenetic proteins. Similarly, somatic mutations in specific epigenetic genes have been shown to be strong drivers of certain cancers.

The future

There are already drugs licensed for clinical use that target epigenetic enzymes. Often referred to as first generation epigenetic drugs, these are effective at treating (although not necessarily curing) certain haematological cancers. They target epigenetic enzymes that mediate very wide-ranging modifications and were discovered more or less accidentally – the starting compounds were shown to be anti-tumour before they were shown to be working epigenetically. Epigenetics does represent a new frontier in drug discovery, potentially opening up opportunities in cancer and a range of chronic diseases. But frontiers are hazardous places and we will need new approaches to target identification, patient monitoring,

Epigenetic literacy

Epigenetic modifications and their effects on gene expression are mediated by proteins that fall into three linguistic categories. 'Writer' enzymes deposit epigenetic modifications on chromatin, whereas 'Eraser' enzymes remove them. The consequences of these events are translated by nonenzymatic 'Reader' proteins which bind to the different modifications and attract protein complexes, driving the ultimate outcome in terms of gene expression. Together they are encoded by several hundred different genes. representing in turn, hundreds of new potential drug targets. These new targets even include the non-enzymatic Reader proteins, at least some of which have been shown to be exquisitely druggable.



dosing and toxicology, to maximise the benefits of this field.

To support this improvement, the Royal Society of Chemistry has recently published *Epigenetics* for Drug Discovery, written by the leading researchers in this field. It is intended as a guide for medicinal chemists or scientists in other fields wishing to know more. *Epigenetics for Drug Discovery* is part of the *RSC Drug Discovery* series of books (http:// rsc.li/drug-discovery) that has now reached its 50th volume in five years.

You can access the ebook for *Epigenetics for Drug Discovery* at http://dx.doi. org/10.1039/9781782628484. The first chapter is free.

Diary

Your guide to all important events

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Our latest global experiment starts in Northern Ireland – read more on p20.

Further information

To find out more about any event on this page, see www.rsc.org/events

Call +44 (0) 1223 43 2254/2380

Or email events@rsc.org

RSC conferences

Faraday Discussion Single Entity Electrochemistry

31 August–2 September 2016 York. UK

Full paper submission deadline - 11 April 2016

Single entity electrochemistry studies provide a new way of viewing electrochemical processes at the nanoscale and a bottom-up approach for understanding electrochemical processes in complex systems. This Faraday Discussion will bring together leading scientists to discuss key challenges in the design, execution, analysis, theory and interpretation of single entity electrochemistry experiments, and to assess the implications of such measurements for electrochemistry and broader interfacial science.

Submit your paper now for the chance to showcase your research in one of four key themes:

- nanoparticles (NPs), nanotubes (NTs) and nanowires (NWs);
- nanopores;
- complex surfaces and reactions at the nanoscale; and
- molecular electroanalysis: from single molecules to single cells.

Join us in York, 2016. Register now.

Spaces are limited: secure your place by registering online now. rsc.li/electrochemistry-fd2016

Faraday Discussion

Aggregation Induced Emission

18–20 November 2016 Guangzhou, China

Poster abstract submission deadline – 5 September 2016

Aggregation-induced emission (AIE) offers a new platform for exploration of practically useful luminescent materials. This meeting will focus on the issues associated with development of new fluorescent and phosphorescent AIE-active luminogens (AIEgens) – particularly advanced functional AIEgens with stimuli-responses – and exploration of their high-tech applications, especially in the area of biomedical research.

Submit your paper now for the chance to showcase your research in one of four key themes:

- new and efficient fluorescent and phosphorescent luminogens;
- advanced functional luminogens in the solid-state;
- biomedical applications of luminogens; and
- optoelectronic devices of high efficient luminogens in the solid state.

Join us in Guangzhou, November 2016

Spaces are limited: secure your place by registering online now. **rsc.li/emission-fd2016**



Reaction Rate Theory: Faraday Discussion

19–21 September 2016 Cambridge, United Kingdom rsc.li/reaction-fd2016

DATES AND DEADLINES

Designing New Heterogeneous Catalysts: Faraday Discussion

4–6 April 2016 London, United Kingdom Final registration deadline: 7 March 2016

rsc.li/catalysis-fd2016

Chemistry in the Urban Atmosphere: Faraday Discussion

6–8 April 2016 London, United Kingdom Final registration deadline: 7 March 2016

rsc.li/atmosphere-fd2016

Liquid Salts for Energy and Materials: Faraday Discussion

11–13 May 2016 Ningbo, China

Early bird registration deadline: 21 March 2016 Bursary application deadline: 21 March 2016

rsc.li/liquidsalts-2016

Nanoparticles with Morphological and Functional Anisotropy: Faraday Discussion

4–6 July 2016 Glasgow, United Kingdom Poster abstract deadline: 25 April 2016

rsc.li/anisotropy-fd2016

Carbon Capture and

Storage: Faraday Discussion 18–20 July 2016 Sheffield, United Kingdom Poster abstract deadline: 9 May 2016 rsc.li/ccs-fd2016



Events

Further information

The RSC News Diary this month lists Royal Society of Chemistry events from March to April 2016 that are held on our conference database. Further details on any of these meetings can be obtained from the named contact or from our conference website at www.rsc.org/events

You can search events by name, date or keywords and have the option to browse by location, subject area and event type.

EASTERN

EAST ANGLIA SECTION

Retired Members Lunch -Suffolk

The chance to catch up with friends and colleagues over lunch. • 15 April

- The Randolph Hotel, Southwold Contact John Beckett
- +44 (0)1502 675705 beckett.jv@btinternet.com

ESSEX SECTION

Annual General Meeting

- 16 March
- Brentwood School
- Contact Colin Ward

+44 (0)1375 407361 colinmward@blueyonder.co.uk

OTHER EVENTS

5th RSC / SCI Symposium on Ion Channels as **Therapeutic Targets**

The conference will be organised around series of plenary lectures and seminars delivered by international leaders in ion channels science and drug discovery from academia and industry. In addition there will be a poster session, an exhibition and opportunities for informal networking.

- 14–15 March
- The Wellcome Trust, Hinxton, Cambridge
- Contact Maggi Churchouse

+44 (0)1359 221004

maggi@maggichurchouseevents. co.uk

SCI/RSC Continuous Flow Technology III

This meeting will be of interest to synthetic chemists, process development chemists, chemical engineers and plant managers operating in pharmaceutical, agrochemicals and the fine and speciality chemicals industries. To reflect the mix of interests and applications across the chemistry community, the symposium is structured as two back to back events with options for attending two consecutive days or all three. • 14–16 March

- Robinson College, Cambridge Contact Patricia Cornell
- +44 (0)20 7598 1561 patricia.cornell@soci.org

Terahertz Spectroscopy

This two day meeting will cover many aspects of Terahertz spectroscopy and includes research presentations from both International and UK research groups.

- 17–18 March
- Gonville and Caius College, Cambridge University Contact Alex Zeitler iaz22@cam ac uk

Faraday Division Advanced Vibrational Spectroscopy for **Biomedical Applications: Faraday Discussion**

This meeting aims to bring together scientists involved at the cutting edge of vibrational spectroscopy and development of clinically relevant diagnostic tools to discuss the current challenges and emerging opportunities.

- 21-23 March
- St Catharine's College, Cambridge
- Contact RSC Events Team +44 (0)1223 434048
- events@rsc.org

RSC Organic Division South Eastern Regional

Meeting

Half-day symposium with organic chemistry talks from members of the South East Region, a keynote lecture from the 2015 recipient of the RSC Harrison-Meldola Memorial Prize: Dr Robert Paton (Oxford), and poster presentations. 23 March

- University of East Anglia, Norwich
- Contact Maria Paz Munoz
- +44 (0)1603 597157
- m.munoz-herranz@uea.ac.uk

Teacher Training Scholarships

Inspire the next generation Find out if you qualify

Biological and Medicinal Chemistry Sector

Medicinal Chemistry in

The symposium will comprise

presentations covering various

including medicinal chemistry case

studies and SBDD, as well as more

general topics related to medicinal chemistry and drug discovery. The

meeting is applicable to all those working in medicinal chemistry

and drug discovery and will offer

networking opportunities.

+44 (0)1359 221004

• The Fielder Centre, Hatfield

Contact Maggi Churchouse

INTERNATIONAL

1st Materials Horizons

International Conference

Overseas (Yingije) Exchange

Contact RSC China Events Team

UK-Singapore Symposium

This symposium focuses on the

latest research on nanomaterials

and biomedical devices. One of the

major outcomes of this symposium

and their applications in energy

will be opportunities for UK and

network and exchange ideas.

Contact RSC Events Team

ISACS19: Challenges in

The conference will bring together

of organic chemistry and synthesis

world leading experts in the field

and will provide an outstanding

programme, complimented by

extensive poster sessions forming

a key part of the symposia. There

will be questions after each talk

and delegates will be exposed to

Organic Chemistry

+44 (0)1223 432509

events@rsc.org

19 April

USA

Singapore scientists to meet and

National University of Singapore

on Nanomaterials and

their Applications

Center, Peking University

00 86 105982 2317

SINGAPORE

ChinaEvents@rsc.org

maggi@maggichurchouseevents.

• 21 April

CO UK

(MH1)

• 8-10 April

aspects of drug discovery,

27th Symposium on

Eastern England

http://rsc.li/scholarships-teach



new areas of research which will encourage the cross fertilization of ideas.

- 20–23 March
- University of California, Irvine, USA
- Contact RSC Events Team +44 (0)1223 434048
- events@rsc.org

NORTHERN IRELAND

OTHER EVENTS

Analytical Division -Northern Ireland

Crystals and Intellectual Property

This seminar will discuss the background and importance of crystalline forms and present how intellectual property is tied to these forms

- 20 April
- Queen's University Belfast
- Contact Panagiotis Manesiotis
- +442890974515
- p.manesiotis@gub.ac.uk

MIDLANDS

BIRMINGHAM AND WEST MIDLANDS SECTION

Annual General Meeting

AGM followed by a talk entitled 'The Chemistry of Curry' by Professor Nazira Karodia, Wolverhampton University.

 3 March Novotel Birmingham Centre

- Contact Les Cheriton
- +44 (0)7713 590952
- les.cheriton@blueyonder.co.uk

EAST MIDLANDS SECTION

Annual General Meeting

Members are invited to a tour of British Geological Survey laboratory facilities, followed by the AGM, Undergraduate Practical Prize Presentations and a lecture by Dr Michael Watts, Head of Inorganic Geochemistry in the Centre for Environmental Geochemistry. 10 March

- British Geological Survey,
- Keyworth Contact Sarah Hill
- +44 (0)7718 191115 rscemsecretary@gmail.com

OTHER EVENTS

Education Division – Midlands Chemical Engineering of Chocolate Creme Eggs

The secrets of the creme egg revealed. A lecture for Sixth Form pupils. Tickets for the event are free of charge but registration is required.

- 15 March
- University of Birmingham
- Contact N Briggs +44 (0)1827 311205

briggswmctc@btinternet.com

Past and Future Role of Organic Synthesis in Drug Discovery

This talk will take an informative look back on past successes and failures and speculate upon future challenges to provide some thought provoking ideas to anyone considering a career as a drug designer. Event is suitable for 16–18 year-olds.

17 March

University of Nottingham

Contact Samantha Tang

+44 (0)115 846 7229 samantha.tang@nottingham.ac.uk

Dalton 2016

A meeting bringing together researchers from the breadth of inorganic chemistry to this conference organised by the Dalton Division and associated Interest Groups. With a number of UK and internationally based plenary lecturers and RSC Prize Winners.

- 29–31 March
- University of Warwick
 Contact Richard Walker RSC
- +44 (0)1223 432234 walkerr@rsc.org

Organic Division

Midlands Regional Meeting The programme will consist of speakers from across the Universities in the region alongside plenary RSC award lectures from the recipients of 2015 Organic

- the recipients of 2015 Organic Industrial Chemistry Award and the 2015 Merck Award. • 11 April
- University of Birmingham
- Contact Iain Wilkinson
- +44 (0)121 414 2275 i.d.wilkinson@bham.ac.uk

Education Division – Midlands Magic Molecules: The Magic of Oxygen

A lecture for Year 6 pupils. Tickets for the event are free of charge but registration is required.

- 20 April
- University of BirminghamContact N Briggs
- +44 (0)1827 311205
- briggswmctc@btinternet.com

NORTH EAST

SHEFFIELD AND DISTRICT SECTION

Annual Pub Quiz

The quiz is based on various topics. Each team should have no more than six people. Food will be provided. • 14 April • Bloo 88, Sheffield

- Contact Jackie Morton
- jackie.morton@hsl.gsi.gov.uk

Retired Members' Springtime Social

A tour of the unique eighteenth century industrial works.

26 April
Abbeydale Industrial Hamlet, Sheffield

Contact Peter Jackson
 peterjhvr515@talktalk.net

TEESSIDE SECTION

Annual General Meeting and Lecture

The lecture will be presented by Professor Andrew Beeby (Department of Chemistry, Durham University) entitled 'Shedding Light on Medieval Manuscripts'. • 11 March

- 11 March
- Parkmore Hotel, Yarm-on-Tees
- Contact Dr Adrian Adamson +44 (0)7830 985926
- teesside_rsc@hotmail.co.uk

Root Cause Analysis at the Materials Processing Institute

The tour will include fluid/particle flow modelling and imaging facility, metallurgy, refractories, ceramics, glasses, analytical laboratories, electronic sensors, stress/strain measurements and an operational steel/alloys plant, piloting / upscaling area.

- 12 April
- Materials Processing Institute, Middlesbrough
 Contact Dr Adrian Adamson
- +44 (0)7830 985926 teesside_rsc@hotmail.co.uk

OTHER EVENTS

North East Regional Meeting

The meeting is open to all those involved in our Boards, Committees and our Representatives and members. The meetings are chaired by a member of council, and start with presentations from the RSC, on our strategy and events and activities happening in your region. The presentations are then followed by an opportunity to network with other members and staff over a buffet and drinks. • 3 March Mercure Hull Royal Hotel, Hull
 Contact RSC Member Networks
Team

+44 (0)1223 432274 networks@rsc.org

The BMCS Mastering MedChem II

In the main there are two types of drug discovery programmes: those that hit serious problems and those that are going to hit serious problems. The difference between success and failure is how we, as medicinal chemists, tackle and resolve the problems. • 9 March

• 3M Buckley Innovation Centre, Huddersfield

 Contact Maggi Churchouse +44 (0)1359 221004 maggi@maggichurchouseevents. co.uk

NMR Discussion Group Spring Meeting – In Situ Monitoring by NMR: What is it all About?

This one-day meeting will be of interest to NMR spectroscopists who are actively involved in either the development or application of NMR based in situ monitoring, but also the meeting will be of particular value to spectroscopists who would like to learn more about the potential of the technique in this discipline. process chemists / engineers or molecular biologists may find the programme to be of interest.

- 17 March
- The University of York
- Contact Stephen Byard

+44 (0)1665 608544 stephen.byard@covance.com

Organic Division North East Regional Meeting

A one-day symposium showcasing a broad range of organic chemistry research from universities in the Northeast. The meeting will include RSC prize plenary talks from Professor Michael Krische, University of Texas at Austin (2015 Pedler Award) and Professor David O'Hagan University of St Andrews (2015 Organic Stereochemistry Award) alongside invited presentations from established and early career researchers. The programme will also include a poster session, lunch and a drinks mixer. Registration is free. 6 April

- 6 April
 Newcastle University
- Contact Michael Hall

Michael.Hall@newcastle.ac.uk

NORTH WEST

CUMBRIA SECTION

Annual General Meeting

Review of the Section's activities over the previous year and an opportunity to become more involved. Followed by AGM. • 24 March

- The Chase Hotel, Whitehaven
- Contact Kevin Webb
- +44 (0)19467 79264

kevin.j.webb@nnl.co.uk

Workington Dock Tour and Lecture

- A tour of Workington Dock with a lecture given by Colin Sharpe, Business Development Manager. • 28 April
- Workington Port
- Contact Kevin Webb
- +44 (0)19467 79264
- kevin.j.webb@nnl.co.uk

LANCASTER AND DISTRICT SECTION

Wine Tasting followed by a Buffet Supper

- 8 March
- Preston's College, Preston
- Contact Harry Clarke
- +44 (0)1995 640003
- hclarke906@btinternet.com

Annual Quiz Night with a Buffet

- 5 April
- Preston`s College, Preston

LIVERPOOL SECTION

Retired Members' Lunch

A presentation on the Mersey

Catalyst Science Discovery

Gateway Project followed by a

Contact Harry Clarke

buffet lunch.

Centre, Widnes

• Contact Dr Bob Lee

+44 (0)151 334 7875

drboblee@msn.com

OTHER EVENTS

Analytical Biosciences Group

3rd Analytical Biosciences

Early Career Researcher

Delegates will obtain a broad

overview of the current state of

the art for analytical techniques,

with detailed examples of their

highlight and demonstrate the

techniques to encourage their

MARCH 2016 RSC NEWS 17

applications. It is intended to

breadth and depth of these

translation into new areas.

• 23 March

Meeting

+44 (0)1995 640003 hclarke906@btinternet.com

EVENTS

• 16–17 March

University of Liverpool
 Contact Professor John Hunt
 +44 (0)151 794 9013
 huntja@liverpool.ac.uk

Education Division – North West NW A-level Chemistry TeachMeet

Discussions include practical work in the new specifications, Level 2 mathematics requirements topics new to the specifications and hard to teach.

• 17 March

Bolton School Boys' Division
 Contact Kristy Turner
 KLT@boltonschool.org

SCOTLAND

MID-SCOTLAND SECTION

Annual General Meeting and Dinner

AGM followed by dinner and a talk by Mr Douglas Murray Master Distiller and Blender for Diageo PLC on 'The Science behind traditional Scotch Whisky production'.

• 22 April

Best Western Park Hotel, Falkirk
Contact Mark Dennis

+44 (0)1324 494554

mark1_dennis@hotmail.com

OTHER EVENTS

Analytical Division – Scottish Schools Analyst Competition 2016 (South Scotland Heat)

The Scottish Analytical Division of the RSC extends an invitation to schools to apply for a place in the 2016 contest. The competition is open to teams each made up of three pupils studying Higher Chemistry (normally in year 12 / S5 or equivalent) and is designed to stimulate interest in analytical chemistry and to give school pupils a brief glimpse of university life. • 7 March

- Edinburgh Conference Centre,
- Heriot–Watt University
- Contact Gillian MacKinnon +44 (0)1355 270142

+44 (0)1355 270142 Gillian.MacKinnon@glasgow.ac.uk

Food Safety – Analytical, Toxicological and Regulatory Aspects

• 8 March

The University of Strathclyde,

Technology and Innovation Centre

Contact Kate Jones

+44 (0)1298 218435

kate.jones@hsl.gsi.gov.uk

Analytical Division – Scottish Schools Analyst Competition 2016 (North Scotland Heat)

The competition is open to teams of three pupils studying Higher Chemistry and is designed to stimulate interest in analytical chemistry and to give school pupils a brief glimpse of university life. The competitors work as a team (each school may only field one team) to complete and report on three practical analytical chemistry experiments. The winners will be invited to participate in the UK final in June 2016.

- 10 March
- Robert Gordon University,
 Aberdeen
- Contact Eva Krupp +44 (0)1224 272901
- e.krupp@abdn.ac.uk

Scotland Regional Meeting

The meeting is open to all those involved in our Boards, Committees and our Representatives and members. The meetings are chaired by a member of council, and start with presentations from the RSC, on our strategy and events and activities happening in your region. The presentations are then followed by an opportunity to network with other members and staff over a buffet and drinks.

- 17 March
- The Merchant's Hall, Edinburgh
 Contact RSC Member Networks
 Team

+44 (0)1223 432274 networks@rsc.org

Electrochemistry Group Scotland and North of England Electrochemistry Symposium (Butler Meeting)

A symposium at which PhD students and PDRAs from across Scotland and the North of England can meet with their peers and present the results of their research in any field related to electrochemistry. Both oral and poster presentation slots will be available. There will also be a keynote lecture given by Professor John Irvine of the University of St Andrews. The symposium is free to attend. • 20 April

School of Chemistry, University of Glasgow
Contact Mark Symes
+44 (0)141 330 4416 mark.symes@glasgow.ac.uk

SOUTH EAST

CHILTERNS AND MIDDLESEX SECTION

Retirees Pub Lunch

14 March
The Cock Inn, Sarratt
Contact Tom Keaveny
44 (0)7785 997828
keaventj@hotmail.co.uk

KENT SECTION

Ron Lancaster's the Chemistry of Fireworks

Revd Ronald Lancaster, founder of one of the UKs leading fireworks companies Kimbolton Fireworks, will be giving a demonstration lecture on general explosive chemistry, in particular the influence on burning of particle size, types of tubes, temperature and pressure. Various firework effects are demonstrated, such as whistles, colours, crackers. Also included will be firework types and the broad scope of pyrotechnics. • 1 March

• Canterbury Christ Church University

Contact Alex Vujakovic
 a.vujakovic78@canterbury.ac.uk

OTHER EVENTS

The 3rd Organic Chemistry Frontiers International Symposium

The symposium will feature lectures from Organic Chemistry Frontiers Editorial Board members and invited local speakers, who are leading researchers in the field of organic chemistry. The symposium this year is co-organized by the RSC and Professor Stuart Conway from the University of Oxford. The event is free to attend.

- 1 MarchSt. Hugh's College, University
- of Oxford • Contact Dr Wenjun Liu RSC

orgchemfrontiersed@rsc.org

Applied Catalysis Group Perspectives on Applied Catalyst Characterization

The symposium will bring together academic and industrial speakers to share exciting developments and examples of applying catalyst characterization tools to real world catalysts as well as their perspectives on the future of this stimulating field. The event will include eight perspective talks from a mix of industrial and academic invited speakers, as well as the opportunity to network and for students or younger members to present posters.

8 March

 The Royal Society of Chemistry, Burlington House, London
 Contact Simon Beaumont +44 (0)191 334 2598 ACG.Event@durham.ac.uk

Marketing Group Pollutants, Human Health and the Environment: A Risk Based Approach

Dr Nikolaos Voulvoulis, an international expert in water and environmental management and Reader in Environmental Technology at Imperial College London, will provide an up-todate overview of environmental pollutants that are of current concern to human health. The talk will also include insight into the various risk assessment frameworks and regulations covering the main pollutants.

- 10 March
- The Royal Society of Chemistry,
- Burlington House, London
- Contact Tilele Stevens
- tilele.ts@gmail.com

Management Group Innovation in a Fast Paced Industry – The Evolution of Medical Gloves

Dr Robin Harrison (Synthomer) will review the evolution of synthetic latex used in the manufacture of medical gloves over the past few decades. This will connect how a number of significant high level drivers have helped shape the industry and have led to a number of technology advances both in polymer technology and the production process for disposable gloves.

- 10 March
- The Royal Society of Chemistry, Burlington House, London
 Contact Mario Moustras moustrasm@outlook.com

Joint Pharmaceutical Analysis Group The Use of in Silico Modelling in Drug Development

This symposium brings leading experts to give solutions to the big issues, advice, best practice and current developments.

- 17 March
- The Royal Society of Chemistry, Burlington House, London
 Contact events@jpag.org

Chemistry World Science Communication Competition Live Final

Come and hear the finalists of the 'Chemistry World' science communication competition give their presentations to a live audience and panel of expert judges. An opening talk will be given by author Bill Bryson, who will lead the judging panel. • 21 March

The Royal Institution, London
 Contact Philippa Matthews RSC
 +44 (0)1223 432203
 matthewsp@rsc.org

Environmental Chemistry Group

Geoengineering the Climate

The 2016 ECG Distinguished Guest lecture will be provided by Professor Alan Robock (Rutgers University).

- 22 March
- The Royal Society of Chemistry,
- Burlington House, London

• Contact Rowena Fletcher-Wood +44 (0)7708 824013

ecg.dgl@gmail.com

Analytical Division Advances in Microcolumm and Related Separation Technologies

• 22 March

 The Institute of Engineering and Technology, London
 Contact Alan Handley +44 (0)7917 416529 alan.handley@lgcgroup.com

Historical Group

The Atom and the Molecule: A Symposium Celebrating Gilbert N Lewis

• 23 March

 The Royal Society of Chemistry, Burlington House, London
 Contact Professor John Nicholson
 +44 (0)20 8979 8379
 jwnicholosn01@gmail.com

ESR Spectroscopy Group 49th Annual International Meeting of the ESR Group

There will be an international programme of speakers, including the award of the annual Bruker Prize lecture by Professor R David Britt (University of California, Davis). • 3–7 April

University of Essex, ColchesterContact Dima Svistunenko

+44 (0)1206 873149 svist@essex.ac.uk

Faraday Division Designing New Heterogeneous Catalysts: Faraday Discussion

At this discussion, we will bring the catalysis community together to discuss the theme of designing new heterogeneous catalysts. We will explore the modern methods used to design new catalysts and how the approaches can bridge across the disciplines of physical sciences and chemical engineering. • 4–6 April

• The Royal Society of Chemistry, Burlington House, London • Contact RSC Events Team +44 (0)1223 432509

+44 (0)1223 43 events@rsc.org

Faraday Division Chemistry in the Urban Atmosphere: Faraday Discussion

Much of the recent research on urban air pollution has focused upon cities as a source of air pollutants to the regional and global atmosphere. This ignores the huge importance of urban air pollution in the context of human health, and the associated policy and scientific relevance of urban atmospheric chemistry studies to compliance with limit values for secondary pollutants (e.g. NO2 and particulate matter) and quantifying personal exposure to air pollution. With the increasing urbanisation of human populations, this topic is of ever-greater importance.

• 6–8 April

- The Royal Society of Chemistry, Burlington House
- Contact RSC Events Department + 44 (0)1223 434048 events@rsc.org

RSC Faraday Division Sponsored Meeting on Self-Assembling Materials for Biomedicine

This meeting will bring together researchers using (bio)polymers and related biomaterials in several applications relevant to healthcare – specifically in the fields of

- specificatly in the fields of tissue engineering, regenerative medicine and drug delivery. Different approaches relying on self-assembly of polymers, peptides and other biomaterials to create novel nanostructures with biomedical activity will be discussed by prominent researchers in the field presenting their state-of-the-art findings. Registration is free.

- 14 April
- Shinfield Grange, Reading
- Contact Barbara Parr
- + 44 (0)118 378 8454
- b.l.parr@reading.ac.uk

Synthesis in the Agrisciences

The objective of the meeting is to promote scientific interactions between researchers in the field and to showcase the key role that synthesis plays in the development of new agrochemicals. • 14 April

• The Royal Society of Chemistry, Burlington House, London • Contact Maggi Churchouse +44 (0)1359 221004 maggi@maggichurchouseevents. co.uk

Biotechnology Group Chemical and Biological Therapeutic Approaches to Neurological Disorders III

The conference is focused on solving the mechanisms involved in neurological disorders that will facilitate the discovery of disease – modifying treatments and brings together the top influential academic and industrial researchers in the field and will be of interest to all scientific disciplines involved in neuroscience.

18 April

The Royal Society of Chemistry, Burlington House, London
Contact Dr Irene Francois +44(0)1483 469599 irene.francois@ntlworld.com

Chemical Biology Symposium

The programme will explore all aspects of chemical biology and highlight the wider scope and impact of the field. This event will include a poster session, providing an opportunity for early career researchers to share and discuss their recent research advances and to network with others delegates. • 27 April

 The Royal Society of Chemistry, Burlington House, London
 Contact RSC Events Team
 +44 (0)1223 434048
 events@rsc.org

RSC Separation Science and Food Group

Advances in the Chemical Analysis of Food

The meeting is of value to scientists working in the food and / or analytical science industry, whether academic or industrial, from graduate to Professor. It will provide excellent networking opportunities.

- 29 April
- The Royal Society of Chemistry, Burlington House, London
 Contact Lewis Jones +44 (0)1664 4155222 lewis.jones@effem.com

SOUTH WEST

OTHER EVENTS

Inspire to Teach Bristol

Teaching is a rewarding and exciting career so whether you're an undergrad, postgrad or a professional looking for a career change, come along and find out more about it. The event will include presentations from training course providers, the National College for Teaching and Leadership, a recently qualified teacher and a representative from the RSC. You will get to find out how to apply for teaching training. what teacher training involves, what it is really like, how you are supported and scholarships and bursaries available.

- 17 March
- University of Bristol.
- Contact Beth Anderson
- beth. and erson @bristol.ac.uk

WALES

SOUTH EAST WALES SECTION

Norman Heatley Award Lecture

The Lecture will be given by Prof Mark Wallace. No booking required.

- 14 March
- Cardiff University, School of Chemistry
- Contact James Redman
- +44 (0)2920 876273
- redmanje@cardiff.ac.uk
- reumanje@carum.ac.u

OTHER EVENTS

Wales Regional Meeting

The meeting is open to all those involved in our Boards, Committees and our Representatives and members. The meetings are chaired by a member of council, and start with presentations from the RSC, on our strategy and events and activities happening in your region. The presentations are then followed by an opportunity to network with other members and staff over a buffet and drinks.

- 10 March
- Ramada Plaza, Wrexham
- Contact RSC Member Networks
 Team

+44 (0)1223 432274 networks@rsc.org

Notices

Sharing our Global Experiment at the BT Young Scientist & Technology exhibition in Ireland

In January, the RSC Ireland Local Section was involved with John O'Donoghue, Stephanie Nelson and Angela McKeown from the Royal Society of Chemistry regions team, as well as Jonathan Wells from the outreach team, to support this year's BT Young Scientist & Technology exhibition.

John O'Donoghue explains: "Our Royal Society of Chemistry stand was hosted in the RDS in Dublin from 7 to 9 January, and was represented by a hugely enthusiastic bunch of 25 volunteers. RSC members from all walks of life delivered hands-on experiments to children of all ages and uploaded the results to our website to create an interactive global map of the results. There was a great atmosphere and fantastic crowds formed around the experiments.

"We're massively proud to say that Ireland now has the most uploads for the Global Experiment and our volunteers were the first RSC members to engage in the 175 minutes for chemistry campaign running throughout 2016. Thank you to all our team and we look forward to more events like this in the near future."

See p8 for more information on this year's Royal Society of Chemistry Global Experiment – Mission: Starlight or on the Learn Chemistry pages of our website at **rsc.li/mission-starlight**





NOTICES

Regional Meetings 2016

We are over half way through the 2016 series of regional meetings which take place in the nine regions in the UK and Ireland. The leadership team gave an overview of our 2015 activities and introduced our priorities for 2016.

A presentation on our Public Attitudes to Chemistry research led to ideas on how we as chemists can put this into practice. The meetings offered an opportunity for members to meet each other and RSC staff, and to find out more about activities in their local section.

This year, we have also been presenting chartered chemist certificates to those who have recently achieved chartered chemist status, raising awareness of the award and its relevance to our community. Take a look in our diary section to find out when and where the meetings are being held.

Helen Pain, Dr Maira Hernandez Guzman and Professor Sabine Flitschthe visit Queen's University Belfast.



Breakthrough in fight against antimicrobial resistance – from breast milk

A paper published in our journal *Chemical Science* has made headlines around the world. Researchers from the National Physical Laboratory and University College London have described a conceptual design for creating artificial antimicrobial viruses from a breast milk protein.

The protein Lactoferrin – which provides antimicrobial protection to infants – tears bacterial membranes apart and makes it impossible for them to evolve defences quickly enough to fight back.

Articles based on the paper have been published in the *Times* (requires subscription), the *Daily Mail*, *Telegraph* and *Guardian*, as well as being syndicated by the Press Association internationally.

Anne Horan, our life sciences programme manager, says: "Research in the chemical sciences is helping to understand antimicrobial mechanisms, leading to better prevention, diagnosis and treatment of microbial infections. This represents an exciting research direction to deliver new therapeutics, paving the way for interesting applications."

In an interview with the *Times*, Professor Dame Sally Davies, chief medical officer for England, said more needs to be done by governments and experts to tackle the antibiotics issue.

She said: "We need on average 10 new antibiotics every decade. If others do not work with us, it's not something we can sort on our own. This is a global problem. I am optimistic about this. The science is crackable. It's doable."

Biju wins Bristol section award

Our Bristol & District local section recognised the outstanding performance of Gloucestershire University student, Biju Williams, by awarding him a prize of a certificate, a £150 cheque and a £50 book token at the University's annual awards ceremony in Gloucester Cathedral.

In his dissertation, Biju validated a Near Infra-red Spectroscopy unit for assessments of haemoglobin, oxyhaemoglobin and deoxyhaemoglobin in several different water temperatures. This device can now be used for assessment of blood volume change and microvascular function during contrast water therapy and other water-based techniques.

This excellent piece of work will have lasting impact in the sports science and physiology work undertaken at the university and elsewhere.

Committee vacancies

As we told you in the last issue of *RSC News*, the working name of our benevolent fund is now the Chemists' Community Fund.

This summer we will have new vacancies on the committee, which assesses applications for financial support and sets the strategy for the fund.

If you are interested in finding out more, please email **benfund@rsc.org**

National Apprenticeship Week on the way

It is National Apprenticeship Week from 14–18 March. The week is designed to celebrate apprenticeships and the positive impact they have upon both individuals and businesses.

In order to mark the occasion we are offering apprentices, for one week only, a reduced membership fee of £10 when they sign up to our membership during the week.

Apprentices should write to **registers@rsc. org.uk** and quote 'Apprenticeship Week' to take advantage of this fantastic offer.



NOTICES

Everest Lab: The Science of High Altitude Survival

What happens to your body when you push it to somewhere it's not built to go – to the top of the world? With summit kit, interactive experiments and stunning videos from his trek to the highest lab in the world at Everest Base Camp, join TV and YouTube Science Presenter Greg Foot to find out.

Greg is presenting this month's sold-out public lecture at Burlington House, on 3 March, to tell the story of a team of scientists, doctors and children who pushed themselves to extremes to uncover cutting-edge medical treatments and save lives back home. This is not only a story of ground-breaking research, it's a story of how modern medicine can lead you on a scientific adventure.

Greg Foot is a Science Presenter on TV, on YouTube and on stage. He's the Science Guy on Blue Peter, hosts series for BBC Worldwide, has racked up more than 5,000,000 hits on his YouTube films, and writes and presents sell-out spectacular live science shows around the world. He's also been given the prestigious title of 'Engagement Fellow' for The Wellcome Trust. Greg has been frozen, shot and buried alive, built a jet-powered go-kart and a real levitating hoverboard, answered people's questions from 'What causes a beer belly?' to 'Why do we have pubic hair?', unleashed giant flamethrowers on stage, and sat inside a bowling ball loop the loop... all for science!

For anyone not lucky enough to be in the audience, a video of Greg's presentation will be available to watch on our Youtube channel afterwards. Look for our Public Lectures playlist on the channel – that's at **http://bit.ly/106ta5S** – and a video will be available within a week of Greg's lecture.



NOTICES / DEATHS

Supporting primary education

Our education team are continuing work to support teachers of chemistry at all stages of education – including primary. At primary, topics such as solids, liquids and gases and properties of materials lay the foundations of chemistry for pupils and start to develop their understanding of the chemical world. However, only a small percentage of primary science leaders have a science-related degree, and, with most teachers having to teach multiple subjects – many of which are not their speciality – we think it's vital to support primary teachers and enable them to develop their chemistry knowledge and teaching.

We have recently reviewed our offering of resources, suitable for primary chemistry and pooled them into a set of primary resource collections on Learn Chemistry. The collections are focused on subject knowledge topics that are relevant to primary teachers throughout the UK and Ireland.

A 'teacher support' collection has also been created, which contains resources that help develop teaching practice for primary science. These resources include planning tools for embedding science in cross-curricular topics, and videos that look at demonstrations and teaching techniques.

Since the creation of the primary resource collections, there has been a 300% increase in views of our primary content compared with this time last year. What's more, we have seen a high number of visitors returning to the site and spending more time looking at these resources.

While we plan to continue adding to the number of primary resources in our collections, our main focus is to make our resources as useful and relevant as possible. We will do this by providing improved supporting information around the resources, including suggestions as to how to get the most out of them and drawing attention to possible misconceptions students may have.

Reconnecting with chemistry in Belfast

Following our General Assembly in Manchester in November last year, Pakistan Local Section Chair Dr Ashraf Chaudhry took the opportunity to visit his Alma Mater, Queen's University Belfast (QUB), 45 years after graduating with his PhD. He shared with *RSC News* the details of his visit and how it enabled him to connect with researchers across the university.

During his visit, Ashraf met with researchers at the School of Chemistry & Chemical Engineering, Queen's University Ionic Liquid Laboratories (QUILL) and the Centre for the Theory and Application of Catalysis (CenTACat) to find out more about their research. For example, Dr Gary Sheldrake, Senior Lecturer demonstrated some of the spectroscopic techniques and instruments he uses for his research. In addition, Ashraf visited the Institute of Electronics and Communication and Information Technology (ECIT), where Professor Danny Crookes, Director of Research, Speech & Vision Systems Cluster shared insight into multi-directional approaches to innovation and commercial applications.

"The university setup has really assumed a new shape, which is quite different from 1971," says Ashraf. "It was a rewarding visit that is likely going to facilitate our professional cooperation."

aged 88

Deaths

Mr Leonard Ralph Ainsworth CChem FRSC Retired senior scientific officer, British Nuclear Fuels. Died 7 December 2015, aged 83

Mr James Alexander CChem FRSC Retired. Died 19 December 2015, aged 83

Mr Royston Allen CChem MRSC Retired analytical manager, Lanstar Ltd. Died 7 October 2015, aged 77

Mr David Arnold Bailey CChem FRSC Retired self-employed consultant. Died 11 November 2015, aged 78

Mr Peter Alan Barker CChem FRSC Retired. Died 7 January 2016, aged 82

Miss Lily Baxendale CChem FRSC Retired managing director, Biorex Laboratories Ltd. Died 16 October 2015, aged 91

Dr Frank Bellamy CChem FRSC Retired European representative, IDL International. Died 29 December 2015, aged 85

Mr W Sullivan Boomer CChem MRSC Retired. Died 13 April 2015, aged 68

Mr James Brisbane Cameron

CChem FRSC Retired technical director, Permali Ltd. Date of death not supplied

Mr Ernest David Dennis CChem MRSC Retired.

Died 13 December 2015, aged 85

Mr Terence Dickinson CChem MRSC Retired. Died 8 December 2015, aged 75

Dr Martin George Glaister CChem MRSC Senior application analyst, Tata Consultancy Services. Date of death not supplied

Mr Wilfred Douglas Bailie Hamilton CChem FRSC Retired director, Kellogg Co. Died 17 December 2015,

aged 88 Dr Michael Anthony Hughes CChem FRSC Honorary reader, University of Bradford. Died 31 December 2015, aged 82

Dr John William McKenzie Jamieson CChem MRSC Retired self-employed. Died 21 June 2015, aged 82

Mr Desmond King MRSC

Retired head of chemistry, Nugent High School. Died 22 December 2015, aged 86

Professor Masaharu Kojima MRSC Emeritus Professor, department of chemistry, Kyushu University. Died 17 December 2015, aged 90

Mr Norman Albert Julius Luff CChem FRSC Retired senior lecturer. Died 12 December 2015, aged 85

Dr Irena Maria McCabe FRSC Honorary Research Fellow,

University College London. Died 23 December 2015, aged 84

Mr David Harry Mitchell CChem FRSC Retired. Died 10 December 2015, aged 88

Dr Nicholas William James Pumphrey MRSC Environmental advisor RAS Ltd. Died 23 December 2015, aged 77

Mr John Jeffrey Reid CChem MRSC Retired chief analyst, Borax Research Ltd. Died 16 December 2015, aged 88 Professor David Marshall Taylor CChem FRSC Retired, Honorary Professor, Cardiff University. Died 5 December 2015.

Mr John Stewart Tunwell MRSC Retired. Died 5 December 2015, aged 64

Mr John Stanley Weir CChem MRSC Retired senior safety officer, Transco. Died 18 October 2015, aged 81

Mr John Vernon Wilkinson CChem MRSC Retired scientific officer, The Boots Co. Plc. Died 6 January 2016, aged 86

To inform us of the death of an RSC member or to submit an obituary, please contact our membership team on 01223 432141 or **membership@rsc.org**. *See **www.rsc.li/obituaries** for obituaries.

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