

# Annual Review 2011



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Professor David Phillips

CBE CSci CChem FRSC

“ We championed the cause of chemical sciences with pride and conviction throughout the International Year of Chemistry.

# Welcome from the President

When the United Nations announced that 2011 would be designated the “International Year of Chemistry” (IYC), we knew immediately that the year would bring countless opportunities to promote, expand and evolve both the RSC and the chemical sciences more broadly. We needed to make it a year to remember.

I’m delighted to say we rose to the challenge. In a year marked with natural disasters, economic uncertainty and adverse conditions affecting the chemical sciences in ways never seen before, we still led the UK in being perhaps the most active country in the world throughout IYC. Our members did us proud, arranging hundreds of IYC events across the globe.

Perhaps most visible was the Global Water Experiment, an international effort to map global water quality using data collected by school pupils. A national media campaign, including an outing on BBC TV’s One Show, led to widespread awareness of the experiment. Dedicated and enthusiastic UK teachers then inspired a sensational number of their pupils to take part, and as a country we contributed more data to the experiment than any other.

The celebrations sometimes had poignant contrast with current events. 2011 was chosen as IYC partly to honour the centenary of Marie Curie’s Nobel prize in chemistry, for her discovery of radium and polonium. Yet the issue of radioactivity was brought sharply into a different focus when a ferocious tsunami caused the Japanese nuclear facility at Fukushima to become unstable, engendering global uncertainty about the future of nuclear power. We responded with reasoned policy and evidence, quelling some of the tabloid scaremongering and helping to bring sense to the issue, notably through an impassioned debate at the Chemistry Centre watched by thousands online.

But the Marie Curie connection held a more positive purpose: to celebrate the role of women in science throughout history. A series of breakfast events held by women scientists extended a ‘chemical handshake’ around the globe, from Australia through Europe to Brazil, with those in the Chemistry Centre in London watching messages from scientists in China and India. And we were absolutely delighted to see Professor Lesley Yellowlees elected to become the next president of the RSC – the first woman to ever hold the position. Supporting the diversity of the chemical sciences is a strategic goal of the RSC, and this aspect of IYC allowed us to further drive towards it.

Above all it was a year to inspire young people to study chemistry. The chemical sciences, and therefore the country’s prosperity, will fail without students of today continuing to become the chemists, materials scientists, scientifically-literate policymakers and members of the public of tomorrow. With over a fifth of the UK’s GDP supported by the chemical sciences, it is simply vital that we invest in chemistry for our schools, our teachers and our young people.

2011 was a challenging and rewarding year to be president. It was a year when the chemical sciences were under the spotlight and tested, and we championed their cause with pride and conviction. It was definitely a year to remember.



Dr Robert Parker

CSci CChem FRSC



The RSC has in 2011 made a bold statement about its critical international role in disseminating chemical science.

## A message from the Chief Executive

It's extremely gratifying to lead an organisation that is truly exceptional at all levels, and 2011 has been a wonderful year for the RSC. Our staff, members and partners have worked together to achieve some incredible things towards our shared goal of advancing the chemical sciences. With our highest-ever membership total – 47,538 – we support more chemistry than ever before through our interest groups, divisions and local sections. Each individual member adds to the respect and trust we have gained from other societies, academic institutions, policymakers and beyond.

MyRSC, our professional online network for chemical scientists, enabled in 2011 a much broader range of engagement with our members and the wider chemistry community. Its user base more than doubled from 2010, with nearly 19,000 members now registered. Existing RSC programmes, such as ChemNet for 16- to 18-year-olds and careers fair ChemCareers, have reached even bigger audiences through their online extensions on MyRSC. And new communities, such as the burgeoning Talk Chemistry forum for teachers, are finding it easier than ever to share information, experiences and best practice advice.

With over 50% growth in our journals publishing output, and a corresponding increase in the quality of work submitted, the RSC in 2011 made a bold statement about its critical international role in disseminating chemical science. Our newest flagship journal *Chemical Science* won a prestigious industry award for best new journal, and our innovative e-journal *RSC Advances* published over 550 articles in a few months. With huge improvements to our technical infrastructure, an ever-expanding books portfolio and hundreds of top-class international scientists on our editorial and advisory boards, RSC Publishing celebrated its 170th anniversary as a world-leading science publisher.

Our strong international presence has become even more inclusive, with a new staff member and office in Japan adding to the existing presences in India, China and the US. We've helped international scientists to collaborate through high-profile conferences attended by hundreds of senior policymakers and academics, such as the Dalian clean energy conference in China, our Pan Africa Chemistry Network's congress on agricultural productivity, and our launch of the *Developing Talent* report across India. All of these efforts directly support the aims of the RSC's roadmap *Chemistry for Tomorrow's World*, created to outline how chemistry can help tackle major global challenges.

And of course, 2011 was the International Year of Chemistry. I'm proud of the way the whole organisation – staff and members – pulled together to champion the chemical sciences and the themes of the celebrations.

None of these amazing achievements would have happened without our talented and dedicated staff, members and partners across the world. I'd like to take this opportunity to thank them for their effort and commitment to the RSC and the chemical sciences, and to say that I anticipate the forthcoming year with excitement, when I am sure we will together achieve even more.

# Supporting

a strong membership

Our members, whether in the UK or abroad, are at the core of our activities to advance the chemical sciences and we are continually improving the support that we provide for them.



Four years ago we set out a bold new strategy document. The aim of this high-level summary was to set ambitious targets for the RSC across six strategic priorities. Broadly speaking, these priorities were: international influence, growth, publishing, qualifications, policy, and the promotion of chemistry to schoolchildren and the public.

As the RSC membership is so integral to absolutely everything we do, it became an overarching priority to be embedded in all our activities. In 2011 the RSC's total membership continued to rise, reaching 47,538. These members are the lifeblood of what the RSC stands for. Many are chemists of the highest academic calibre; all demonstrate the highest professional standards; and many are the most devoted promoters of chemistry to schoolchildren and the public.

At the end of 2011, 37% of our total membership were chartered chemists – that's 83% of RSC Fellows (FRSCs) and 51% of RSC Members (MRSCs).

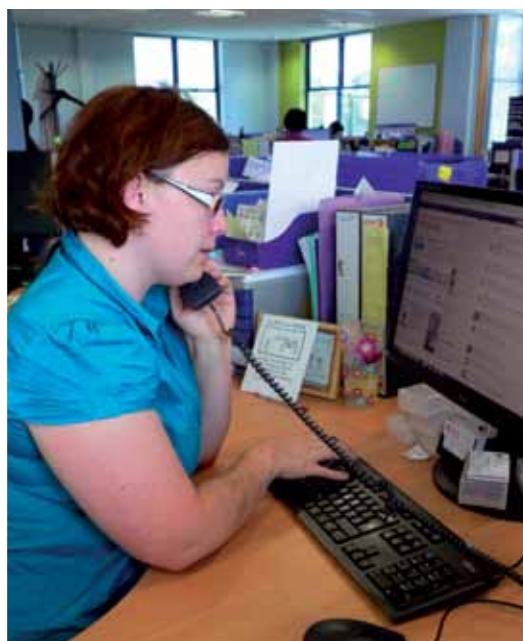
Our members also represent the breadth of the chemical sciences, with approximately 20% in the university sector, just under 20% retired, and the remainder in industry or the public sector. These chemistry industries include food and drink, pharmaceuticals, biotechnology, manufacturing, environmental and energy. By supporting our membership in these areas and beyond, we can ensure the chemical sciences are well-positioned to confront the societal and economic challenges we face.

The RSC encourages its members to network and collaborate in all capacities – through our scientific divisions, our 73 interest groups, the local sections, and national and international meetings. Throughout IYC these groups organised hundreds of amazing events, some of which can be seen in the accompanying IYC booklet.

**RSC Local Sections** are vital for international networking and collaboration with scientific community. Here, RSC International Development Manager David Clark is at a West India Local Section meeting with an Indian chemist.

**ChemCareers**, the RSC's online careers fair, saw 2,936 unique visitors in 2011. Here, careers advisor Charlotte Ashley-Roberts is giving an online consultation to members.

**The RSC General Assembly** is attended by national and international RSC members, such as Professor Oluwole Familoni, a Nigerian representative of the RSC.



The RSC membership is so integral to absolutely everything we do that it became an overarching priority, to be embedded in all our activities.

47,538

members by the end of 2011

18,900

users on MyRSC

37%

total members are CChem

In summer 2011 the RSC launched e-membership. This allows people with an interest in the chemical sciences to connect with the RSC and its members through MyRSC, where they can also read a digital copy of *Chemistry World*. People most interested in becoming e-members might be those who are members of another national chemical society outside the UK, or of another professional body in another science, to whom keeping in touch with the RSC's activities and resources is valuable. The e-membership package is being developed through 2012.

MyRSC – our online professional network for chemical scientists – grew significantly throughout 2011: from 8,000 members registered in 2010 to 18,900 by the end of 2011. The network is being actively used by RSC networks, teachers, students and the RSC for online consultations.

Arguably MyRSC's most successful venture is ChemCareers, the RSC's online careers fair. 2011 was its second year and it saw a 16% increase in unique visitors, which reached a total of 2,936, and increased

engagement with those visitors. ChemCareers 2011 also featured an online poster presentation for postgraduates, providing the opportunity for students to demonstrate their work to potential employers.

In 2011 the RSC careers service supported our members through a range of other activities. Over 110 members attended workshops, 124 were seen through in-house appointments, and 388 received online support through emails and MyRSC. In total 846 individuals received our support. The RSC reacts to situations as they arise; when redundancies were announced at Aptuit and Pfizer, we quickly responded to offer members support.

We also support members with advice and guidance through the RSC Benevolent Fund. In 2011 the Fund received 95 new enquiries on a wide range of issues including debt, housing and care support. The Benevolent Fund is lucky to have a network of members who are Volunteer Visitors; these volunteers provide local support and friendship to members in need.



Professor Graham  
Cooks  
Centenary Prize Winner  
RSC



RSC Prize Winners from around the world gathered at the General Assembly for the Annual Prize Ceremony. Here, David Phillips congratulates Professor Graham Cooks of Purdue University, winner of the Centenary Prize for his pioneering contributions to mass spectroscopy.





Sally Bateman

RSC member

When unexpected illness cut short her PhD, Sally Bateman turned to the RSC for help. Here she explains how, as a member, she was eligible for personal and financial support from the Benevolent Fund, and careers guidance after her recovery.



I realised that the Benevolent Fund wasn't just a service – the people involved genuinely cared about us.

At first, I was reluctant to write this piece. I didn't really want to share with the prestigious membership of the RSC how I lost the third year of my PhD, and consequently my income, to unexpected illness.

As a divorced single parent with two dependant teenage sons, I didn't need my chemical science degree to realise the simple equation: no income = potential mortgage arrears + threat of repossession. At the time, my eldest son was taking his GCSEs and my youngest was just a year behind. I was very worried about how their education would be affected at such a critical time, with the security of our home being threatened by financial difficulties.

Thankfully, help was available through my RSC membership. I contacted the RSC and received one-to-one financial advice before I applied to the Benevolent Fund for financial assistance. The charitable status of Benevolent Fund grant payments meant that they don't affect State benefits payment. So, I didn't have to worry about accidentally falling foul of the law by accepting them as income.

My first contact was made with the Benevolent Fund in the October of the first year I was unwell. At Christmas we received a lovely handwritten card, and since then I have been visited by one of their pastoral volunteers several times. I realised that this wasn't just a service – the people involved genuinely cared about us. Because of their help, my immediate financial worries were eased, and I was able to concentrate on my recovery.

Fast forward a few years, and my eldest son is now a first year chemistry undergraduate at Nottingham University. He's having a great time and is student rep for his year. How wonderful that both mother and son are now chemists and members of the RSC! My youngest son is completing his final A-level year. He's a whizz with the spoken and written word, having already won a prestigious poetry competition and can draw fantastic cartoon stories that have me in gales of laughter. I am overjoyed for them both.

I recently had an interview with a RSC careers advisor, Charlotte Ashley-Roberts, which is another useful service that is available to members. She helped me to update my CV and advised me on how to get back into a scientific career. As I love writing, and have always enjoyed "translating" technical scientific jargon into everyday language so that everyone can understand current scientific affairs, I'm considering pursuing science writing as a career. I'm also thinking of becoming a RSC Benevolent Fund volunteer visitor to give something back in recognition of their support.

Of course, I would have preferred to tell you that I managed to complete my PhD and design a dressing for treating ulcerated wounds, but life is inevitably unpredictable. I'm glad now that I found the courage to share this story with fellow RSC members, to tell of the exceptional help and support available if it's ever needed.

# Leading

the global chemistry community

The RSC brings scientists together from academia and industry to support collaboration, share new ideas, and encourage best practice.



In 2011 the RSC built even further upon its reputation as a truly international organisation, helping to connect chemists around the world and lead the community in coming together to tackle global challenges.

To help us achieve this, we opened a new RSC office in Tokyo, adding to our existing international offices in Beijing, Shanghai, Philadelphia and Bangalore. Our growing permanent presences in other countries give us cultural insights and experience, and help us better understand how to support chemical sciences around the world.

Our international activities continued to support collaborations through our cooperation agreements with many national chemical societies in countries where the chemical sciences are growing rapidly. We intend to renew our cooperation agreements with the national chemical societies of Brazil, India and South Africa in 2012.

We further disseminated chemical knowledge around the world with our high-profile conferences and symposia. The series of International Symposia on Advancing the Chemical Sciences (ISACS), launched to support our new flagship journal *Chemical Science*, attracts exceptional chemists from around the globe. In 2011 ISACS4 in Boston covered renewable energy; ISACS5 in Manchester covered chemical biology; and ISACS6 in Beijing covered organic materials and supramolecular chemistry. We held our 5th *ChemComm* international symposium on organic chemistry and catalysis at Kyoto University in Japan, Lanzhou University and Nankai University in China.

Our Divisions reflect global chemical science in their events, too. RSC Faraday Discussions are set up to debate different aspects of physical chemistry, and the Faraday Division held their 150th Discussion in Basel, Switzerland on *Frontiers in Spectroscopy*. Other international events included a medicinal chemistry conference in Hyderabad, India and we also held the 5th Chemical Research Society of India (CRSI) - RSC joint symposium in chemistry in Bhubaneswar, India.

African scientists are supported by the PACN such as through workshops to train them to use and maintain state-of-the-art research equipment.

Chemistry research excellence is recognised by the RSC. Here, past RSC president Professor David Garner congratulates Professor Allen Bard for becoming a Honorary Fellow of the RSC at ISACS4 in Boston.

The RSC opened the Japan Office in Tokyo and appointed Dr Hirofumi Seiki (middle) as the RSC representative.



Our growing permanent presences in other countries – such as Japan this year – help us better understand how to support chemical sciences around the world.

100

African ministers at *Wealth Not Waste* report launch

320

delegates from 23 countries at Clean Energy Conference in Dalian

100

influential delegates at each *Developing Talent* report launch

We further strengthened our growing relationship with the Indian chemistry community as we introduced *Developing Talent in the Chemical Sciences: Driving Growth in India and the UK*, at three launch events in Delhi, Pune and Kolkata. This report, developed with leading Indian and UK chemists, highlights the potential benefits of collaboration between India's growing and highly-skilled workforce with British experience in research and innovation, and identifies opportunities to fulfil this potential. The events each attracted over 100 influential delegates, including leading scientists from academia and industry, and representatives of the British and Indian governments.

The Pan Africa Chemistry Network (PACN) remains a powerful way to bring together Africa's top scientists and in 2011 that collaboration, facilitated by the RSC, saw the continent's top minds focus on global challenges that particularly affect Africa. At a UN meeting in Nairobi we launched a report titled *Wealth Not Waste: Green science and engineering for sustainable growth in Africa* – based on the major 2010 PACN conference – to over 100 African ministers of science,

education and higher education. And later in the year 140 delegates from 21 countries attended the 1st PACN Congress on Agricultural Productivity in Accra, Ghana, which led to discussions and recommendations to be published in a forthcoming report for policymakers.

In China we deepened our commitment to further collaboration by signing a memorandum of understanding with the Chinese Pharmaceutical Association at the third China/UK Medicinal Chemistry Symposium in Guangzhou. The International RSC Conference on Clean Energy Science in Dalian – organised by the RSC, the Dalian Institute of Chemical Physics and the Chinese Academy of Sciences – attracted 320 scientific and industrial delegates from 23 countries.

We also held the 3rd annual Chemical Sciences and Society Summit (CS3) in Beijing in September 2011. The CS3 international network of chemical societies and funding organisations came together to discuss "Chemistry for Better Health", and recommendations from the symposium will be released in report in 2012.



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The RSC is one of five international chemical societies that work in partnership to provide innovative solutions to address the world challenges in the areas of health, food, energy and the environment.

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## Krishna Ganesh

Director, Indian Institute of Science, Education & Research

The Local Sections of the RSC are fundamental to our growing relationship with the international scientific community. Professor Krishna Ganesh, First Director and Professor of Chemistry at the Indian Institute of Science, Education and Research (IISER) describes his role as chairman of the West India Local Section.



I take pride in telling people about the active role of the RSC in India in bringing industry and academia together.

I have been involved with RSC activities for the last five or six years now. The RSC West India section covers Mumbai to Pune and is very active. Through collaborations with IISER Pune, National Chemical Laboratory (NCL), Indian Institute of Technology (IIT), Piramal Life Sciences Ltd (PLSL), and others we hold an intense range of activities that focus on bringing together academia and industry. I am highly indebted to Gopalan Ramaswamy, the secretary of the Section who has been the exciting force behind all the activities.

The Section showcases chemistry to all ages. We promote chemistry to schoolchildren such as through the Experimental Science Quest competition at St. John's School, Mumbai in August engaging over 80 pupils. We held a workshop for 45 university teachers in collaboration with IISER Pune and University of Glasgow: *Innovative Approaches to Teaching Chemistry*. Since many teachers are not researchers, they became up-to-date with current research topics and relevance in industry as well as new teaching methods.

We hold many postgraduate lectures at local universities covering all areas of chemistry, given to excite the students and demonstrate real-life applications. The PhD students annually organise a two-day programme of workshops and presentations for their peers, gaining skills like conference management. In 2011 it was held at the University of Goa for 120 delegates.

Of course, 2011 was IYC where we started with the first RSC West India section Women Scientists Symposium at Sophia College for Women, Mumbai for over 160 delegates. The speakers were some of the brightest young women scientists in the world, coming from IISER, NCL, PLSL and Tata Institute of Fundamental Research. The student community in attendance could not have asked for greater or more inspirational role models.

In September 2011 the RSC, NCL, IISER and British Deputy High Commission launched the *Developing Talent in the Chemical Sciences: Driving Growth in India and the UK* report to approximately 300 influential delegates across academia, industry and government. This report incorporated recommendations from a high-level workshop of how academia and industry could work together to address fundamental issues of developing talent in the chemical sciences. The report has been publicised to all 800 members of the Chemical Research Society of India (CRSI), and events are being organised by the RSC/CRSI to support the recommendations.

As direct impact of the report, there is now good interaction between Shell R&D Bangalore with IISER Pune where 5 student internships have led to full-time employment. There are also RSC-GSK workshops for over 100 students, which allow manufacturers to demonstrate innovative prototype designs.

I refer to the *Developing Talent* report a lot. It is important to take joint activities forward to bring teachers, students, researchers and industrialists together in order to drive chemistry growth in India and the UK.

# Engaging

people with chemistry

We help teachers to inspire the next generation of chemical scientists and we engage the public to demonstrate the vital role that chemistry plays in our society.



Inspiring young people to study chemistry and raising the public's awareness of the importance of chemistry were two key goals of the International Year of Chemistry (IYC). Already at the heart of what we do, these themes came across even more strongly through our engagement activities in 2011.

As the largest non-governmental supporter of chemistry education in the UK, we have hundreds of trusted, well-researched resources for learning and teaching chemistry. These are now easier to search for and use than ever before with *Learn Chemistry*, a brand new online portal that went live at the end of 2011. It brings together all of our respected education resources, and a host of new content as well.

The *Faces of Chemistry* resource is a set of short, curriculum-led videos of personable chemists explaining how they use in their jobs the chemistry they learned at school, and how that has an impact on the real world. By partnering with companies like Proctor & Gamble, Johnson Matthey and Syngenta, we are able to give students an insider's view of real chemists working on hair dyes, catalytic converters and crop protection products.

One of our most popular and iconic resources, the Visual Elements Periodic Table, has been brought to the fore with a new design and updated information, with an astounding 39,101 unique visitors in its first month after the relaunch. The attractive and functional table shows trends and data with a single click, and the properties, history and even global scarcity of each element can be explored, lending a modern viewpoint on sustainability.

We also launched our Global Frameworks for Chemistry Education - a comprehensive, international set of guidelines, based on the challenges laid out in our roadmap for the chemical sciences, *Chemistry for Tomorrow's World*. The Frameworks set out the key chemistry principles and information that all pupils should learn in a modern chemistry curriculum, for both the 11-14 and 14-16 age ranges.

**Great success for the UK team** in the 43rd International Olympiad competition 2011. David Edey of Alcester Grammar School was awarded gold, with a score of 94.8% he ranked third in the world.

**Students across the globe** took part in a drawing competition *Our Children on Water*. Here, children from Kenya drew what water represented for them.

**The Bill Bryson science communication prize winners** received their certificates at the Speaker's House in the Palace of Westminster.

**RSC School Teacher Fellows** Declan Fleming, Penny Bradshaw and Tim Harrison held demonstrations to inspire other teachers at the ASE conference at the University of Reading.



Inspiring young people to study chemistry and raising the public's awareness of the importance of chemistry were two key goals of the International Year of Chemistry.

400

international entrants for the Bill Bryson science communication competition

21

public lectures at the Chemistry Centre in 2011

39,101

unique visitors to the Visual Elements Periodic Table site after the relaunch

2011 was the first year of the *Reach and Teach* education programme, funded by the Wolfson Foundation. The programme allows inspired students to explore the chemical sciences through masterclasses, practical activities and online resources to challenge and push their abilities. These activities have been designed to span age ranges across the curriculum - from primary school level, such as the *Chemistry at Work* events across the UK, right through to *Spectroscopy in a Suitcase* demonstrations for students in further education. We have also developed a fun online resource for learning chemistry facts called *Gridlocks*.

*Reach and Teach* includes a new course as part of the Young Applicants in School Science (YASS) scheme, which has been developed by the RSC and the Open University. This gives students in further education a taste of university study, helping to bridge the gap between tertiary and higher education. We also train ChemNet ambassadors to carry out ChemNet visits, which are events for 16-18 year olds that are studying chemistry and want to take their interest further.

Many of our existing activities have grown in both scope and number. In 2011 we held 21 public lectures on a range of topical chemistry areas at the Chemistry Centre in Burlington House to engage with the general public. And as part of IYC, we established a series of lectures with GlaxoSmithKline on topics that included the life of Marie Curie, age-related illness, and a debate on drugs and doping in sport.

As one mark of IYC, we marketed the annual Bill Bryson science communication competition internationally, and attracted a record number of almost 400 entrants. Winners were invited to a prize ceremony at the Speaker's House in the Palace of Westminster.

The International Year of Chemistry offered so many diverse and exciting opportunities to engage with the public that we share them with you as we did with our members in January 2012: in an accompanying booklet showing a month-by-month, colourful tour of a fraction of the hundreds of events hosted by us, our members and the wider chemistry community.



Children from across the world took part in the Global Experiment 2011 measuring the acidity of their local water. Here school children measured the pH of the water outside Buckingham Palace.





## Jacquie Robson

RSC School Teacher Fellow at Durham University

The RSC has thousands of student and teacher resources that complement any school curriculum. Dr Jacquie Robson explains how she has used these resources as a school teacher to inspire pupils before she became a RSC School Teacher Fellow at Durham University to work on projects aimed at easing the school to higher education transition.



It's fantastic to see that the educational resources produced by the RSC cover a range of academic levels.

I've been involved with the RSC since reading chemistry for my undergraduate degree and being a member of the student Chemistry Society at Durham University. After my postgraduate, also at Durham, I went into teaching for 10 years. Many teachers routinely use RSC educational resources to support the school curriculum. But there are thousands to choose from so it's difficult for teachers to sift through them apart from during the summer holidays. It's great that the RSC are working on a new education platform to allow teachers and students to search for relevant material more easily in the future.

One of the RSC resources that I found really useful at my secondary school was *The Chemistry of Art* resource pack. This led to some cross-departmental activities, collaborating with the art department. Coincidentally, the Bowes Art Museum next door to the school was undergoing restoration. The restoration expert was a chemist that really engaged with our school, giving students and teachers private tours and an insight into art restoration. As a UCAS advisor and Sixth form tutor, I felt this was an important experience for students, showing them that there are more career prospects for chemists than the stereotypical white lab coat researcher. We had a group of 12 sign up to the Chemistry of Art sixth form science club and almost all were female – almost unheard of in school science clubs! Curriculum links between chemistry and art were forged as a result of this resource, and set to continue in the future.

I stayed in close contact with Durham University during my teaching career such as being a teacher consultant for Chemistry Outreach staff. We noticed that students seem to find the transition from school to university really quite difficult, especially for the first year. Students really struggled to carry out practicals in university teaching labs yet did not experience the same problems during sixth form. We wanted to find out why, and what we could do at both school and university level to make this transition easier. School Teacher Fellowships were then introduced to address this.

I was appointed as the RSC School Teacher Fellow at Durham University from September 2010 – August 2011 as part of the National HE STEM Programme, and have stayed on at the University in a similar role. One aim was to improve the practical skills for undergraduates by providing supporting resources and course material for students and teaching lab co-ordinators. The first change was the induction to the first year undergraduate chemistry course, which was revised to take into account changes in the school curriculum. Another large scale curriculum development was producing a new research-led laboratory course for the autumn 2011 first years, and had some great positive feedback from the students. These resources, and those arising from other Teacher Fellows, will be made available next year for all universities to help all chemistry students with the school to HE transition.

Collectively, it's fantastic to see that the educational resources produced by the RSC cover a range of academic levels, from schools and teachers through to university level and beyond.

# Influencing

## the future of chemistry

The RSC's experience, knowledge and insights into the benefits to society of chemistry are sought and trusted by senior policymakers, both nationally and internationally.



As governments around the world attempted to balance their budgets after a global economic crisis, it became essential for us to demonstrate to policymakers the value and benefit of chemistry to society.

By launching the International Year of Chemistry in the UK at the heart of government, in the Houses of Parliament, we made our mark early in the year. Dozens of parliamentarians were dazzled by a spectacular chemistry show performed by Professor Hal Sosabowski, which saw Minister of State for Universities and Science Rt Hon David Willetts MP, Science & Technology Select Committee chair Andrew Miller MP and scientist Julian Huppert MP getting hands-on with exciting, memorable chemistry.

Our engagement with UK parliaments continued throughout the year, with our high-profile annual events at the Welsh and Scottish parliaments attracting over 300 guests and 30 scientific exhibitors, and allowing high-level networking between scientists and policymakers in Wales and Scotland.

At Parliamentary Links Day 2011 – the largest scientific event of the parliamentary calendar – David Willetts and Andrew Miller were joined in engaging with the science community by Chi Onwurah MP, Shadow Minister for Innovation and Science; Lord Willis of Knaresborough; and Professor David Clary, Chief Scientific Advisor to the Foreign and Commonwealth Office.

And as laid out in our Royal Charter, we act as trustworthy advisors to the government. In 2011 experts from the RSC gave evidence to select committee hearings on the pharmaceutical industry, strategically important metals, and open access publications.

**Ambassador Ahmet Üzümcü**, director-general of the Organization for the Prohibition of Chemical Weapons talks to Professor David Clary, Chief Scientific Officer to the FCO, at the Chemistry Centre.

**Science Question Time, Scotland** was attended by influential MSPs and Scottish scientists. This RSC organised event engaged the scientific community in the live audience and viewers at home.

**The UK's nuclear power strategy debate** was led by influential public figures such as George Minbiot and Douglas Parr.

**The first PACN congress in West Africa** was held in Ghana, and was supported by the Ghanaian government with the welcome from science and technology minister H.E. Sherry Ayithey.



Lobbying has led to an impressive number of one-to-one meetings with parliamentarians across all parties.

4,000

people watched the Chemistry Centre debate on nuclear power

300

guests attended our annual events at the Welsh and Scottish parliaments

75

top-level stakeholders came together to discuss the future of UK chemistry

At the political level we developed new relationships and opportunities by attending the three major UK political party conferences, contributing to sessions and conveying the need to invest in the UK chemical sciences to rebalance the economy and support technology-led growth. This lobbying has led to an impressive number of one-to-one meetings with parliamentarians across all parties.

To overcome the challenges facing UK chemistry teaching and research, innovation and talent supply, the whole chemical science community will need to work in harmony. We brought together 75 top-level stakeholders from industry, academia and education to collaborate to find solutions to these problems and to define a single clear vision for the chemical sciences. Throughout 2012 we will continue to develop these ideas and to provide policymakers with the key action points required for growth.

Insights drawn from the chemistry community as a whole allowed us to engage positively with research councils in their restructuring of research funding.

We were asked by the Engineering & Physical Sciences Research Council (EPSRC) to provide expert counsel and evidence, including meetings with members of RSC's science divisions, which influenced their *Shaping Capability* funding plan and encouraged further engagement with the chemical sciences community.

Guided by our roadmap for the chemical sciences, *Chemistry for Tomorrow's World*, we have staged international scientific conferences and public events that encourage debate on global issues such as energy and health. The Roadmap had its international influence further increased when it became the basis of the EuCheMS Roadmap, launched and presented to senior European civil servants in 2011.

Our Healthcare Innovation Action Plan, created with members of the pharmaceutical industry, outlines a strategy for the sustainable growth of a new business model for UK medicines research. Throughout 2012, we will continue to work with our partners to champion chemistry's vital role in society.



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At the RSC's Parliamentary Links day in June, Shadow Minister for Innovation, Science and Digital Infrastructure Chi Onwurah addresses influential delegates from government, academia and industry.

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Jim Iley

Director of Science & Education, RSC

The EPSRC released its *Shaping Capability* report in July 2011, outlining funding priorities up to 2014. As RSC Director of Science & Education, Professor Jim Iley describes how the RSC responded to the announcement and is committed to working with EPSRC to ensure a vibrant community.



Today's postgraduate students and postdoctoral fellows are tomorrow's research leaders and innovators; we must ensure that we develop a coherent funding system that nurtures that talent.

Before the 2010 Comprehensive Spending Review (CSR), the RSC worked with the Engineering & Physical Sciences Research Council (EPSRC) to produce *The economic benefits of chemistry research*, a policy report that demonstrated how chemical research supports £258bn of UK gross domestic product. In his CSR speech the Chancellor revealed the overall research budget would be frozen up to 2014 – a result better than for many areas of government spending, which science minister David Willetts attributed to the work done by the RSC and other scientific organisations. But a frozen budget equates to a 12-15% funding reduction in real terms, signalling a negative impact for some areas.

In early 2011 EPSRC initiated an implementation plan for their strategic priorities for 2011-2015. Andrew Bourne, Head of Physical Sciences at EPSRC, shared their approach in general terms with the RSC's Science, Education and Industry Board in March.

In July EPSRC released its report *Shaping Capability: EPSRC's Research Portfolio 2011*, outlining the first tranche of funding priorities up to 2014. This announcement caused real concern within the chemical sciences community by addressing the funding for only two areas of chemistry and without providing an overall picture of chemistry funding. While the area of catalysis would receive increased funding, for synthetic organic chemistry – an area of international strength for the UK – the proposed outcome was decreased funding.

The RSC wrote to the EPSRC chief executive David Delpy in September to express our concerns, stressing the need for open dialogue about the future of *Shaping Capability* and asking what additional evidence they needed from us. We also wrote a joint letter to EPSRC with the Royal Society, Institute of Physics, Royal Academy of Engineering, and Council for Mathematical Sciences. Through the RSC Divisions, we asked members to submit evidence and put questions forward at EPSRC's Physical Sciences Town Hall meeting on 26 September. Here, we stressed the importance of greater engagement with the chemistry community and recommended EPSRC provide much clearer transparency on their decision-making processes – in particular for any further funding decisions of the various chemistry portfolios to be announced simultaneously.

Subsequently, we brought together RSC's Divisional Councils representatives with EPSRC representatives for an open discussion of the community's concerns. As a result, EPSRC approached the RSC for additional inputs into the *Shaping Capability* process. After consulting with the community through *Grapevine*, we provided 17 information sources. Also through consultation with the RSC's Divisional Councils and more widely, we compiled a list of 50 individuals – covering all chemistry areas – that could assist EPSRC in gathering evidence.

There remain significant concerns about EPSRC's programme, not least the impact of changes to funding mechanisms for postgraduates and postdoctoral fellows. Nevertheless, the RSC will work with the community and EPSRC to ensure that the UK continues to develop a vibrant chemical sciences research and skills pipeline.

# Enhancing knowledge

We are at the forefront of science publishing, continually developing new products to promote understanding of emerging areas of the chemical sciences and launching new services so that scientists everywhere can access this knowledge.



Publishing isn't 'the business arm' of the RSC. It's part of the fabric of the organisation, addressing our fundamental responsibilities under our Royal Charter: to disseminate chemical information to the scientific community and the public around the world.

Already recognised as a world-leading publisher of scientific information, RSC Publishing had a spectacular 2011 with even greater achievements than the successful previous year. Citations and Impact Factors rose alongside article output and breadth of portfolio, demonstrating impressive growth in both the quality and quantity of our publishing.

In 2011 – RSC Publishing's 170th anniversary – we published well over 20,000 journal articles: an amazing 52% increase over 2010. Our journal portfolio grew to include even more facets of chemical science as three new titles were successfully launched.

*Catalysis Science & Technology* is a multidisciplinary journal focusing on all fundamental science and technological aspects of catalysis. *Toxicology Research* covers both the fundamental and applied physiological aspects of toxicology, and is published in collaboration with the British Toxicology Society and the Chinese Society of Toxicology. And the innovative online journal *RSC Advances*, which in a year has already published more than 550 articles, allows us to publish even more high-quality research.

The International Symposia for Advancing the Chemical Sciences (ISACS) series, launched in 2010 to support the launch of *Chemical Science*, continued through 2011 with events in Boston, Manchester and Beijing, bringing together exceptional researchers in renewable energy, chemical biology, and organic materials and supramolecular chemistry from around the world.

RSC Publishing celebrated 170 years of being an international scientific publisher in 2011. Here, Council member Professor Graham Richards unveils the Chemical Landmark plaque to mark the occasion.

Three new journals were launched in 2011. *Catalysis Science & Technology*, *Toxicology Research* and *RSC Advances* add to our portfolio of quality research journals to cover all areas of the chemical sciences.

Mobile apps for the RSC and *Chemistry World* make it even easier to access and track cutting-edge chemistry on the go.



Investing in cutting-edge technology means our online journal performance beats rival publishers across the world.

Our flagship journal *Chemical Science* was launched in 2010 and has already established a reputation for excellence, winning the Award for Best New Journal 2011 from the Association of Learned and Professional Society Publishers.

Impact Factors (IFs) are a measure of how often a journal's articles are cited, and our portfolio's average IF now stands at 5.4 – over twice the average for a chemistry journal (2.54) – and over 80% of our journals have an IF greater than 3.

Investing in cutting-edge technology means our online journal performance beats rival publishers across the world. Innovative improvements to our Publishing Platform decreased delivery time by 50%, and we saw significant usage growth. And our new RSC iPad app means users can download, read and track articles of interest wherever they are.

We saw our book collection expand to include 92 new titles, on topics as diverse as solar fuels, carbohydrates and *The Case of the Poisonous Socks*,

a collection of tales of chemists and their studies throughout the last two hundred years. As of 2011 we now publish new titles as ebooks before print, and offer over 1,000 ebooks online.

*Chemistry World* remains a highly popular member service, now delivering its incisive chemistry news, features and opinion through a wealth of new digital options alongside the successful podcasts and e-magazine. These include mobile apps for iPhone, iPad and Android devices, and social media offerings such as Twitter, where the @ChemistryWorld account has more than 130,000 followers.

ChemSpider, our online molecular database, has grown to contain over 26 million chemical structures. The chemistry community clearly appreciates such a valuable resource being made available free of charge for the benefit of the chemical sciences; we have seen usage more than double over the past year.

20,419

articles published in RSC journals in 2011

92

new book titles

26 million

records in ChemSpider



By investing in cutting-edge technology, the RSC have made its content more accessible than ever before, and supported on mobile devices and tablets.





## Sean Ekins

Senior Consultant at Collaborations in Chemistry

As an exponent of using technology to advance the chemical sciences, Sean Ekins tells how he has found the RSC's free structure database, ChemSpider, a source of trustworthy information – and inspiration.



When you start something in science you never quite know down what path it will take you. My involvement with ChemSpider over the last five years exemplifies how that path can meander in interesting ways.

I first started using ChemSpider in 2007 at the recommendation of a colleague, to source high quality structures for the quantitative structure-activity relationship modelling that I was doing with academic collaborators. I found datasets that were unique and would publish them in ChemSpider; for example, a set of scents. Over time, I built a stronger relationship with ChemSpider by linking a software tool of one of my clients, Collaborative Drug Discovery, Inc., in 2009 and then forging two-way links in 2011. I now use ChemSpider several times a week as my main source for finding structures and molecular information. One of the things that always impressed me was the rapid evolution of the database, yet at the same time it did not compromise its quality.

ChemSpider becoming part of the RSC was my first exposure to the Society as an organisation. I was pleasantly surprised to find the breadth of topics covered by RSC Publishing and considered submitting my first papers on tuberculosis research. By 2011, I had articles in *Molecular BioSystems*, *MedChemComm* and *Lab on a Chip* – it's now certainly on my radar to publish my research with the RSC.

Back in 2010, I became very interested in the evolution to make ChemSpider mobile. I was inspired to think about our mobile future for the pharmaceutical R&D space – how could it transform who we work with, where we do it and why we do research, and at the same time potentially improve collaborations? I envisage that we'd be using Twitter to share molecules and doing our R&D this way pretty soon.

By early 2011, ChemSpider was one of the first mobile apps I used. While at a green chemistry conference in Washington DC I realised that there was data on solvent selection that could be "applified". Sharing this live through Twitter, Antony Williams from the RSC and Alex Clark from Molecular Materials Informatics (developer of the ChemSpider mobile app) resolved that a free Green Solvents app would be a great idea, all while I was still in the session. A week later, the app was developed and available free on iTunes.

The idea of communicating chemistry and science by using apps is certainly becoming more common. For example, Pistoia Alliance wanted ideas for a "Dragons' Den" type competition for a technology to transform the pharmaceutical industry by 2014, a competition that would be held at the RSC in early 2012. This inspired me to work with the ChemSpider team again, to use apps and social media as a means to communicate scientific research.

Five years ago, I would never have imagined that a database called ChemSpider would have inspired me to co-develop mobile apps. What it has inspired others to do, I can only imagine. Perhaps I should also say that I am excited by where it will take me in the future – thank you ChemSpider!

# Summary of financial information

Thanks to sterling efforts by RSC's staff and members, in 2011 we were able to devote resources of £39.7 million to our charitable activities. Furthermore, an operating surplus of £5.0 million was achieved. RSC Publishing revenues increased, returning a surplus of £8.4 million. Membership revenues were £3.8 million, and investment income £3.6 million.

## Income (£000)

Voluntary Income	490
Investment Income	3,623
Membership	3,755
House Journal	516
Conferences	1,367
Qualifications and Education	774
Publishing	31,771
Library	173
Scientific Affairs	2,457
International Development	21
Other	155

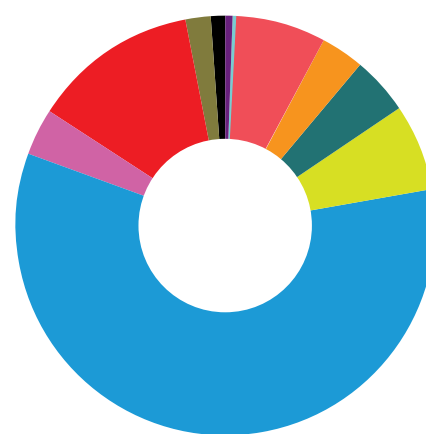
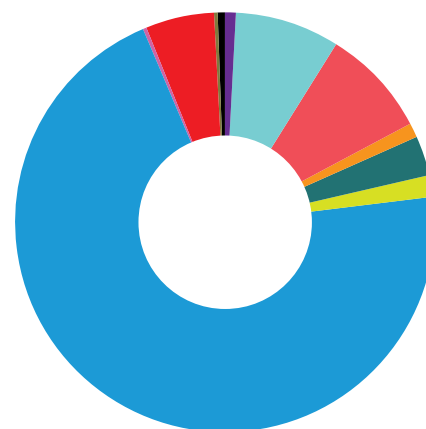
**Total Income 45,102**

## Expenditure (£000)

Voluntary Income	319
Investment Management Costs	70
Membership	2,839
House Journal	1,319
Conferences	1,733
Qualifications and Education	2,662
Publishing	23,390
Library	1,449
Scientific Affairs	5,118
International Development	760
Governance Costs	440

**Total Expenditure 40,099**

**Consolidated Net Assets 73,599**



The Defined Pension Scheme liability has reduced to £8.3 million from £15.3 million, this is a result of changes in actuarial assumptions relating to the Scheme liabilities, the closure of the Scheme to future accrual and additional contributions from the Society. In order to reduce risk, £4 million was taken from investments and placed within a twelve month term deposit; during 2012 the value of the remaining portfolio reduced by £1.6 million to £66.3 million. Overall, The RSC's reserves increased from £66.4 million to £73.6 million. I am confident that the RSC will continue to have the financial resources to play a major charitable role in advancing the chemical sciences.

Dr P J Machin, Honorary Treasurer

### Trustees' statement

This financial information is taken from the audited and published statements for 2011 which were approved on 3 May 2012. The full financial statements contain an unqualified audit report and will be submitted to the Charity Commission after the RSC's AGM. This summary information may not contain sufficient information to allow a full understanding of the financial affairs of the group and parent charity, RSC. The 2011 Trustees' Report is available for download from [www.rsc.org/aboutus/corppubs](http://www.rsc.org/aboutus/corppubs)

Members who require a print copy or who have any questions regarding the financial statements should contact the RSC Finance Department in Cambridge on 01223 432230 or by emailing [finance@rsc.org](mailto:finance@rsc.org).

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