

President's column **2** News of Fellows **3** International **4** Research **6** Events and Awards **7**  
Policy and Public Affairs **8** Education **10** Public Engagement **11** Obituaries **12**

## Cross-party support for Queen Elizabeth Prize

The Queen Elizabeth Prize for Engineering was launched to great media interest at London's Science Museum on 17 November, with the leaders of all three main political parties present to lend their support.

The £1 million prize is a new global award to celebrate outstanding advances in engineering that have created significant benefit to humanity and will be awarded biennially to an individual or team of up to three people, of any nationality, directly responsible for advancing the application of engineering knowledge. The prize will be awarded by a charitable trust, chaired by Lord Browne, which has tasked the Academy with delivery.

Lord Browne of Madingley said: "This new prize aims to illuminate, on an international scale, the sheer excitement of engineering and is an unparalleled opportunity to demonstrate how engineers and engineering are making a real difference to humanity."

A number of major companies have donated to an endowment fund: BAE Systems, BG Group, BP, GlaxoSmithKline, Jaguar Land Rover, National Grid, Shell, Siemens, Sony, Tata Consultancy Services and Tata Steel.

Speaking at the launch, the Prime Minister, Rt Hon David Cameron MP, said: "I am delighted that the Queen has put her name to this prestigious prize. I want to thank The Royal Academy of Engineering and the prize sponsors for making this happen. For too long, Britain's economy has been over-reliant on consumer debt and financial services. We want to rebalance the economy so that Britain makes things again – high-skilled, high-value manufacturing and engineering should be a central part of our long term future."

The Deputy Prime Minister, Rt Hon Nick Clegg MP, said: "It's true that we have a proud record – a nation historically at the forefront of scientific breakthroughs and the vanguard of design. But engineering is just as much a part of our future – at the heart of a new economy driven by invention and innovation."

The Leader of the Opposition, Rt Hon Ed Miliband MP, said: "We now face huge global challenges in the future ranging from climate change and famine to an ageing population in the west. It will be engineering that helps us meet these new challenges."

An international judging panel of experts is being assembled and names will be announced at the same time as the call for nominations, in February 2012. The first winner will be announced in December 2012 and the first award ceremony will be held in Spring 2013.

For more information: [www.raeng.org.uk/QEprize](http://www.raeng.org.uk/QEprize)

*Sir John Parker (left) with the party leaders at the launch of the Queen Elizabeth Prize*



## PRESIDENT'S COLUMN



*The President at the New Fellows' Dinner with Senior Fellow HRH The Duke of Edinburgh and new International Fellows Anne Lauvergeon and Professor Antonio Gens*

The highlight of my first period as the Academy's President has been the launch of the Queen Elizabeth Prize for Engineering, which took place on 17 November to considerable media coverage. This enormously important milestone offers the opportunity of a generation to raise the profile of engineering, to make engineering an aspirational career choice for our young people and create a source of inspiration for everyone. Your Academy will take it forward with great enthusiasm.

My predecessor as President, Lord Browne, is the first chairman of the independent foundation that has been established for the Prize, of which I am a trustee. He remains on the Academy's Council as the Immediate Past President and I look forward to continuing to work with him in both capacities. I would like to record my thanks to him for all he has done for the Academy as President during his five-year term.

As your new President, I aim to engage as widely as I can with our Fellows and the Academy's partners. In July, I hosted a reception for colleagues across the engineering profession before our building closed for major refurbishment. To keep our profile high, we are delivering a busy programme of events and activities outside the building until it reopens with greatly improved public spaces next May. I remain immensely grateful to our Fellows who gave so generously towards the building work and the future of the Academy.

I have met my counterparts at the Royal Society, the British Academy and the Academy of Medical Sciences. We are of one mind that government could deploy the national academies much more effectively as a highly valuable resource for

national policy. We agreed to work closely together in pursuit of this goal.

At the end of September, I met some of our Fellows who are active in Scotland as they celebrated the terrific heritage of Scottish engineers. I returned to Scotland in November to meet the engineering apprentices at Babcock Marine in Rosyth who are building a unique curved walkway to the front entrance of our refurbished building. I was so impressed by the skill and enthusiasm of these young people and am hugely grateful to Babcock for this inspiring gift in kind.

I want to create more opportunities to meet as many of our Fellows as possible where they live and work in the English regions and in Scotland, Northern Ireland and Wales. I am also organising a series of lunch meetings with groups of Fellows who are active in leadership roles in business, industry, government and universities to hear from them what they believe matters.

The Senior Fellow, Prince Philip, remains as strong a supporter of the Academy as ever since he helped establish it 35 years ago. In November, he addressed our new Fellows at their inaugural dinner. I was delighted to welcome 59 new Fellows to the Academy, nine of whom are women. Earlier in the day, a number of our new Fellows spoke about their work in a fascinating session that reinforced the breadth of skills and experience within the Academy's Fellowship.

I recently gave a talk at a girls' school in South London. I was impressed by the intelligence and interest in engineering that I encountered there. It underlined to me the importance of the work that the Academy and its partners in the profession

are undertaking to open up engineering as a career to all young people, especially girls, from a much greater range of backgrounds.

As President, I shall give a great deal of my time and energy to the Academy. As Fellows, we all feel passionate and proud of what our organisation is achieving. Our new strategic plan sets out big, important priorities for the coming years. There is much to do and it can only be achieved with the leadership and participation of our Fellows. Our task is nothing less than to put engineering at the heart of society and, with all my heart, I encourage you to play an active part in the life of the Academy.

## Meetings and visitors

The President recently met:

**The Rt Hon David Cameron MP**  
Prime Minister

**The Rt Hon Nick Clegg MP**  
Deputy Prime Minister

**The Rt Hon Ed Miliband**  
Labour Party Leader

**Sir Paul Nurse PRS**  
President, The Royal Society

**Sir Adrian Smith FRS**  
Director General, Knowledge and Innovation,  
Department for Business, Innovation  
and Skills

**HRH The Duke of Edinburgh KG KT OM GBE**  
Senior Fellow

## The Academy welcomes the new Fellows for 2011



*HRH The Duke of Edinburgh and Sir John Parker surrounded by new Fellows who attended the Drapers' Hall reception*

The Academy welcomed a new group of Fellows at the annual New Fellows' Dinner held at Drapers' Hall, London, on 7 November.

This year, 59 eminent engineers joined the Academy: 50 new Fellows, three new Honorary fellows, and six new International Fellows. Included

in the list were nine women, more than in any previous election.

Before dinner, the President and senior staff introduced themselves before new Fellows had the opportunity to give presentations explaining their areas of expertise. Later in the evening, new Fellows were invited to sign

the Academy roll book, and were then presented with their scrolls of Fellowship by the Senior Fellow, HRH The Duke of Edinburgh.

Following the dinner, the new Fellows were addressed by HRH The Duke of Edinburgh and new Fellow Tristram Carfrae, a group board director at Arup.

## Council meeting

The Council held its fourth meeting of the year on 17 October. The President welcomed the new members of the Council: Professor Gehan Amaratunga, Professor Helen Atkinson, Dervilla Mitchell, Professor Richard Parry-Jones CBE, Dr John Roberts CBE, Dr Jean Venables CBE and Nigel Whitehead. Professor Sir William Wakeham was also welcomed as Senior Vice President.

Professor Dame Wendy Hall presented her annual report on the Academy's Diversity Campaign. She reported that funding from the Department of Business, Innovation and Skills supported the Academy as the diversity lead for the engineering community and consequently the Academy's diversity campaign had developed a more external focus.

Philip Greenish reported on the Academy's support for the Queen Elizabeth Prize for Engineering. He added that the refurbishment of the Academy's building had started, and to date was both to budget

and on schedule. Rear Admiral Nigel Guild presented the annual report of the Proactive Membership Committee.

### News of Fellows

**Sir David Brown** has been appointed Deputy Chairman and Chairman Designate of the BSI.

**Christos Christopoulos** has received the Ambrose Fleming Medal for Achievement in Information and Communications and been appointed Guest Professor at the Nanjing University of Science and Technology, China.

**Dr John Dunkley** received a doctorate from Cambridge University for his work on metal powders and atomisation.

**Professor Richard Godwin** received the BCPC medal for contributions to British agriculture.

**Judith Hackitt CBE** has been awarded an honorary doctorate by Leeds Metropolitan University.

**Professor Julia King CBE** was awarded the Lunar Society Medal.

**John Loughhead OBE** has been elected Foreign Fellow of the Australian Academy of Technological Sciences and Engineering.

**Dr Mike Lynch OBE** has been awarded the Outstanding Contribution to UK IT Award by BCS, the Chartered Institute for IT.

**Professor Robert Mair** has received an honorary degree from Nottingham University.

**Dr Adam Neville** was awarded an honorary degree from the Politecnico di Torino (Italy) and the Robert Philleo award from the Concrete Research Council of America..

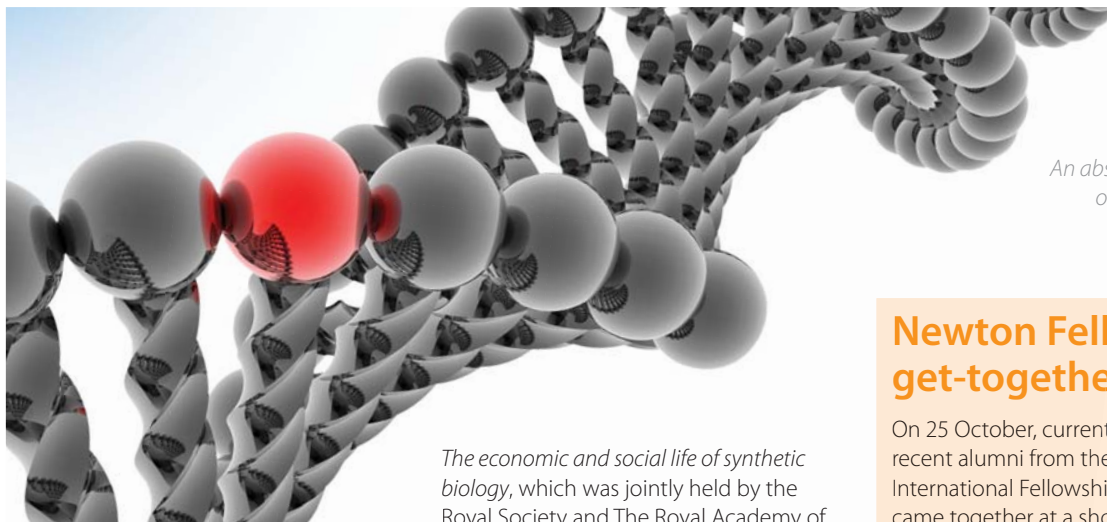
Pacific National has named a locomotive after **Sir John Parker**.

**Lord Sainsbury** has been elected Chancellor of Cambridge University.

**Ian Shott CBE** and **Mike Carr** have been appointed to the Technology Strategy Board.

## INTERNATIONAL

### Symposium on synthetic biology



An abstract representation of a DNA double helix

From 12 to 14 October, the second in the series of international symposia on synthetic biology took place in Shanghai, China. This series of events brings together the six national science and engineering academies from the UK, China and the USA to discuss this fast-moving, global area of research.

The symposium included sessions on topics ranging from the creation of synthetic genomes and cells to the use of synthetic biology in industry, as well as the ethical, legal and social implications of these technologies. It followed on from the first symposium, entitled

*The economic and social life of synthetic biology*, which was jointly held by the Royal Society and The Royal Academy of Engineering on 13 and 14 April.

The symposium was chaired by Professor Guo-ping Zhao of the Shanghai Institutes for Biological Sciences at the Chinese Academy of Sciences. Professor Richard Kitney OBE FEng, Co-Director of the EPSRC Imperial College Centre for Synthetic Biology and Innovation, and presented a talk entitled *The application of systematic design to synthetic biology*.

The third symposium, looking ahead to the next generation of technologies and the research infrastructure needed to cope with them, will be held in Washington DC, from 12-14 June 2012.

### Frontiers of Engineering

Sixty of the best engineers under the age of 45 from the US and Europe met at the Beckman Center in southern California for the second annual EU-US *Frontiers of Engineering symposium*, which took place from 3 to 5 November.

Participants presented cutting-edge research and explored potential future collaborations in fast-moving areas at the intersection of traditional disciplines. Topics under discussion included sustainable cities, networks in biology, smart grids, medical devices and renewable energy generation.

The three-day symposium was jointly organised by the US National Academy

of Engineering and The Royal Academy of Engineering on behalf of Euro-CASE, the umbrella group for European national engineering academies. It follows a successful event hosted by the Academy in August 2010 at Jesus College, Cambridge.

Professor Richard Williams OBE FEng, Pro-Vice Chancellor of Birmingham University, co-chaired both EU-US Frontiers of Engineering events.

The next EU-US Frontiers of Engineering symposium will be held in France in 2013. Presentations from the 2011 event are viewable at the following link: <http://tinyurl.com/c5wyu9n>

### Newton Fellowship get-together

On 25 October, current Fellows and recent alumni from the Newton International Fellowship scheme came together at a showcase event at the British Academy to share their experiences of the scheme and discuss ways of maintaining their links with the UK in the years ahead.

The Newton International Fellowship scheme attracts some of the best researchers from around the world to work in the UK for a period of two years. The scheme offers additional funding of up to £6,000 annually for up to 10 years after the Fellowship comes to an end, enabling Newton Fellows to forge long-term relationships between the UK and centres of excellence worldwide. While The Royal Academy of Engineering no longer funds new engineering Newton Fellowships, it continues to offer follow-on funding to former Newton Fellows who have received Academy support.

The first session for the engineering Newton Fellows included a briefing about the Academy and a selection of presentations from current and past Fellows. Dr Thao Nguyen, originally from Vietnam, gave a striking account of how her Newton Fellowship at Royal Holloway College, London gave her the opportunity to develop ICT solutions for women-run micro-enterprises in the developing world. Later at the event, Hugh Philpott, Head of the Science and Innovation Network at the Foreign and Commonwealth Office, led a discussion on how the network could help Newton alumni maintain their links to the UK research community.

## Zimbabwe workshop



Dr Sanzan Diarra

From 16 to 17 November, the Academy, as part of the Africa-UK Engineering for Development Partnership, helped facilitate a two-day engineering education workshop with the Zimbabwean Institution of Engineers in Harare. The workshop brought together 40 leading academics and policy makers from 11 sub-Saharan African countries to explore how engineering education could be improved and better aligned with international development goals. The workshop also allowed the Africa-UK Partnership to gather informed opinions and recommendations on the future work of the partnership in the field of tertiary education.

Delegates were welcomed by Dr Sanzan Diarra, CEO of the Zimbabwean Institution of Engineers, and the keynote speech was delivered by Eng Samuel Kundishora, Permanent Secretary at the Zimbabwean Ministry of ICT. Other speakers included Professor Luc Rukingma, Director of the UNESCO office in Harare; Eng Wilson Nyemba, Dean of the Faculty of Engineering at the University of Zimbabwe; and Professor Duncan Fraser, from the University of Cape Town, as well as senior academics from Swaziland, Malawi and Uganda.

Attendees discussed the need for improved engineering education across sub-Saharan Africa to boost the economy, build infrastructure and deliver the Millennium Development Goals. Key needs included the updating and localisation of teaching approaches and curricula, the inclusion of advanced technologies such as ICTs, the development of soft skills and a better roll-out of quality assurance and accreditation of degrees.

There were particular challenges facing the higher education sector in the continent which could be tackled in cooperation with international partners. This included lack of suitably qualified staff and up-to-date equipment, as well as difficulties in finding industrial placements for students and identifying opportunities for knowledge transfer. Across sub-Saharan Africa, there was a pressing need to demonstrate to public and politicians the attraction of engineering as a career and the vital role engineers could play in driving economic and human development.

The Academy was represented at the workshop by Holly Wright, International Policy Advisor, who gave a presentation on the forthcoming report on engineering needs in sub-Saharan Africa.

For more information of the Academy's capacity-building work in Africa, please contact Holly Wright at [holly.wright@raeng.org.uk](mailto:holly.wright@raeng.org.uk)

## Publications received

*Reflections on the Last One Hundred Years of Lighting in Great Britain* - centenary celebration publication by The Society of Light and Lighting.

*Making the World Work Better: The Ideas that Shaped a Century and a Company*, by Kevin Maney, Steve Hamm, and Jeffrey M O'Brien. A publication commemorating IBM's innovations over the past century.

## Debate on strategic minerals

On 1 November, the Academy held the second of its current series of debates on *Natural Resources in the Global Economy*. The motion under discussion was 'This House believes that there is no need for concern about the future global supply of strategic minerals'. Professor Sir William Wakeham FREng, the Academy's Senior Vice-President and Honorary International Secretary, chaired the debate.

The two proposers of the motion, Andrew Bloodworth, Head of Science for Minerals and Waste at the British Geological Survey, and Jan Lewis, Director at Wardell Armstrong and President of the Institute of Materials, Minerals and Mining, argued that reserves



Jan Cilliers FREng argues against the motion

of strategic minerals were plentiful, if at present hard to access. They also pointed out that false scares over shortages of various minerals and commodities had been rife for at least two centuries.

In opposition to the motion, Edward Bickham, former Vice President for External Affairs at Anglo American and Professor Jan Cilliers FREng, Head of Department of Earth Sciences and Engineering, Imperial College London, argued that there was always a risk to the uninterrupted supply of minerals, through national frictions or conflicts. There are also skills imbalances within the mining sector, with the US and Australia producing just 40 mineral engineering graduates each a year while China produces upwards of 3,000.

Following a lively and informative audience discussion, the house voted against the motion.

The third and final debate in the series will take place at the British Academy on 17 January 2012 and will be on the theme of water. All three debates will form the basis of a report that will inform the Academy's future activities in this area.

The series follows last year's successful programme of Academy debates on the topic, *Competing in the global economy*. The report from that series can be seen at [www.raeng.org.uk/globaldebates](http://www.raeng.org.uk/globaldebates)

## RESEARCH

### Researcher showcase

The annual Engineering Research Forum is a showcase event that brings together UK researchers being sponsored by the Academy as well as industry partners, government and research council representatives. The Forum, which was held on 22 September at the Royal College of Physicians, spotlights the leading-edge engineering research that is being conducted in the UK and provides a welcome opportunity for networking with similarly engaged and interested parties.

The guest speaker this year was the Rt Hon David Willetts MP, Minister of State for Universities and Science, the Department for Business, Innovation and Skills (BIS). Speaking on engineering in the UK today, the minister gave a presentation explaining why engineering and manufacturing are essential to rebalancing the economy. He highlighted the obligation of engineers to future generations to build a long-lasting infrastructure.

The Academy provides numerous funding opportunities for researchers.

On this occasion, eight Academy-funded researchers presented their work and demonstrated the significant impact they were having on the international engineering community.

Professor Phil Mawby holds a Research Chair sponsored by Converteam. He is investigating silicon carbide power devices which will deliver significant savings in electricity generation.

The Academy's prestigious Research Fellowship scheme promotes excellence in engineering by fostering the development of high-quality, independent post-doctoral researchers and was represented by engaging presentations from Dr Silvia Schievano, Dr Maria Ana Cataluna, Dr Simon Cotton and Dr Darren Cosker.

Strong links with industry are established and maintained through the Research Chair and Senior Research Fellowship schemes. The Nuclear Decommissioning Authority jointly sponsors the Research Chair of Professor Neil Hyatt whose research



*The Rt Hon David Willetts MP speaking at the Research Forum*

addresses the design, processing and performance of glass and ceramic materials for the immobilisation of nuclear wastes.

Network Rail and Royal Academy of Engineering Research Chair Roderick Smith and Dr Andrew McCalister, Global Research Awardee to the USA, also gave presentations.

There were 18 poster presentations which can be found on the Academy's website [www.raeng.org.uk/research](http://www.raeng.org.uk/research)

The Research programmes team would like to thank again all those involved for making the 2011 Forum such a great success.

### New Research Chair

Professor Ian Hunter has been appointed to the Radio Design Ltd/ Royal Academy of Engineering Research Chair in Microwave Signal Processing at The University of Leeds. Microwave technology has a variety of uses ranging from the radar systems necessary for air traffic control, to mobile phones and televisions.

With mobile phone data traffic set to greatly increase over the next few years, adapting and improving the software and hardware behind communications systems will be essential to meet demand. Professor Hunter will develop a broad portfolio of research into advanced microwaves and millimetre-wave devices with an aim to ensure that future wireless communication

systems will be software reconfigurable, enabling hardware to adapt to rapidly changing system requirements.

As a leading supplier of mobile communications equipment Radio Design Ltd, a leading supplier of mobile communications, will collaborate with Professor Hunter and implement the results of the research.

## DEVELOPMENT

### In-kind donations

In its selection criteria for key suppliers for the Forum for Engineering project, the Academy included assessment of how well products would meet its sustainability and energy efficiency objectives.

Several of the chosen suppliers offered to make discounted cost/ in-kind donations. These include: Schindler (lifts); Zumtobel (lighting); ADT (alarms, security and fire detection systems); London Wall (roll down wall); and Air Diffusion (air ventilation grilles). The William Hare Group has offered to deliver and install the sinuous entrance bridge on Carlton House Terrace, which will form a major architectural feature of the project. As previously reported, the bridge is being built by engineering apprentices at Babcock International's Rosyth shipyard.

The Academy thanks all these companies and the Fellows who helped secure these valuable contributions to the project.

### Promoting engineering in schools

John Hornibrook OBE FREng has kindly donated £10,000 (plus Gift Aid) to support the Engineering Engagement Programme (EEP). This will help expand the EEP's work to promote engineering in schools and upskill teachers to deliver an inspiring and relevant STEM curriculum. These are crucial components of the Academy's educational work and donations of this kind can be well leveraged.

The Academy's *making things better* fundraising campaign aims to raise £10 million to build the capacity and reach of the Academy's education and engagement programmes; £4.5 million has already been secured and the support of Fellows in reaching this target is very much appreciated.

## EVENTS AND AWARDS

### Global energy challenges



Malcolm Brinded FREng

As part of the *View from the top* lecture series, Malcolm Brinded FREng, Executive Director of Upstream International at

Shell, and Hilary Mercer, one of the company's most senior project directors, described how Shell develops solutions for some of the energy industry's most demanding challenges.

In the first half of this century, global energy demand is likely to double, on the back of a rapidly expanding global population and sharp growth in the emerging economies. Over the same period, the world must limit its CO<sub>2</sub> emissions to avoid the worst effects of climate change. Malcolm Brinded outlined how engineers are critical to developing and delivering the energy resources needed to meet this dual challenge.

View the talk on [www.RAEng.TV](http://www.RAEng.TV)

### International Medal



Dr Andrew Viterbi (right) with Professor Sir William Wakeham FREng

Dr Andrew Viterbi, mobile communications pioneer and co-founder of Qualcomm, visited the Academy on 13 October to receive one of its highest accolades, the International Medal, from the Senior Vice President, Professor Sir William Wakeham.

That evening, Dr Viterbi gave a talk on the history of computing, followed by an informal interview with engineer and broadcaster Dr Mark Miodownik.

Dr Viterbi's talk encompassed the evolution of computing from Charles Babbage's 'difference engine' over a century and a half ago, to the early electrical computing machines of World War II and later developments in solid state physics, PCs, and personal two-way communication via the internet, both wired and wireless.

The lecture can be viewed on [www.RAEng.TV](http://www.RAEng.TV)

### MacRobert Award 2012



The MacRobert Award is the UK's premier prize for innovation in engineering.

Applications are now being invited for the 2012 prize with the closing date of 31 January 2012.

The award, first presented in 1969, honours the winning organisation with a gold medal and the team members with a prize of £50,000. The presentation of the award recognises the successful development of innovative ideas in engineering. It seeks to demonstrate the importance of engineering and the role of engineers and scientists in contributing to national prosperity and international prestige.

For further information please visit [www.raeng.org.uk/prizes/macrobot](http://www.raeng.org.uk/prizes/macrobot) or email [macrobert@raeng.org.uk](mailto:macrobert@raeng.org.uk)

### Forthcoming events

Wednesday 11 January 2012

#### Innovation in Construction event

**Hosts:** Sir John Parker FREng and Peter Hansford FICE

**Venue:** Institution of Civil Engineers (ICE)

**Contact:** [amy.abbott@raeng.org.uk](mailto:amy.abbott@raeng.org.uk)

Monday 16 January 2012

#### New Year Reception

#### *Intervention and Stabilisation Operations: the role of the military engineer*

**Speaker:** General Sir Peter Wall KCB CBE ADC Gen

**Chair:** Sir John Parker FREng

**Venue:** Royal Society

**Contact:** [helen.berrington@raeng.org.uk](mailto:helen.berrington@raeng.org.uk)

Tuesday 17 January 2012

#### *Natural Resources in the Global Economy lecture series*

**Venue:** British Academy

**Contact:** [holly.wright@raeng.org.uk](mailto:holly.wright@raeng.org.uk)

Tuesday 7 February 2012

#### Manufacturing event with BAE Systems

**Host:** Sir John Parker FREng

**Venue:** IET

**Contact:** [amy.abbott@raeng.org.uk](mailto:amy.abbott@raeng.org.uk)

Monday 27 February 2012

#### Vodafone Lecture series

#### *How mobile phones promote economic development*

**Speaker:** Tom Standage, Digital Editor, The Economist

**Venue:** Royal Society

**Contact:** [helen.berrington@raeng.org.uk](mailto:helen.berrington@raeng.org.uk)

Wednesday 22 February 2012

#### *Technology Visionaries lecture series*

**Speaker:** Professor Nigel Shadbolt FREng

**Venue:** Royal Society

**Contact:** [helen.berrington@raeng.org.uk](mailto:helen.berrington@raeng.org.uk)

5 March 2012

#### North West Regional Lecture

#### *Nature and nano – it's all going on at engineering surfaces*

**Speaker:** Professor Anne Neville FREng

**Venue:** University of Leeds

**For further details contact:**

Dr John Bramley FREng

[jvbsheff@googlemail.com](mailto:jvbsheff@googlemail.com)

For full list of Academy events visit:

[www.raeng.org.uk/events](http://www.raeng.org.uk/events)

## POLICY

### Three meetings on the future of water



Panellists at the second event (l-r) Professor Roger Falconer FREng; Yvette de Garis, Head of Environment and Quality Strategy, Thames Water; John Lawson FREng

The *Engineering the Future* alliance ran a series of three events over the autumn on the issue of water security. These events were a follow-up to the publication of the *Global Water Security – an engineering perspective* study which was undertaken on behalf of the Government Office for Science in 2010.

At the first meeting, chaired by Michael Norton, speakers from academia, industry and agriculture looked into public attitudes to

local water recycling, presenting examples of water use in the UK and globally. The meeting discussed a deep rooted reluctance in the UK to use reused or recycled 'grey' water in homes and businesses caused by factors such as health concerns and the perception that there is a surplus of water in the UK.

The theme of the second meeting was water transfer and the engineering, environmental and economic impact of moving water around the country from areas of plenty to places where supply is under greater stress. Representatives from regulators, industry and leading experts discussed this challenging issue. Professor Roger Falconer FREng, in the chair, said: "It is clear that while water transfer may not be everyone's preferred solution to water demand in coming years, it is an option which needs to be seriously considered."

At the final meeting, chaired by Dr Jean Venables FREng, leading professionals looked at approaches to behaviour change and demand management. Engineers were challenged to be innovative and imaginative in proposing solutions rather than focusing on changing behaviour through educational campaigns. The paradox of water was also considered - it is everywhere in the home but never in our minds - because water infrastructure is less visible than others. Technology alone would not change consumer behaviour, but exploiting technological trends could 'activate the customer' into thinking more about water use.

### Industrial systems

The Academy is publishing a report on industrial systems and how best to capture value from manufacturing processes. The profile of manufacturing has risen recently, highlighted by a policy focus on 'rebalancing the economy' and there are a number of ongoing initiatives, some with Academy involvement.

In November, the government's Foresight team started work on a study examining how UK manufacturing might develop by 2040. The purpose of the study is to provide rigorous long-term thinking to feed into government policy-making processes. Also ongoing is a study by the Institute of Manufacturing at Cambridge University on behalf of the Technology Strategy Board looking at what technologies might be important to the UK manufacturing sector by 2040.

The government is planning to publish a new Manufacturing Strategy early in 2012.

The third annual Manufacturing Summit, organised by *Engineering the Future*, is on 7 March 2012. *Making UK manufacturing internationally competitive* will discuss issues including wealth creation and export. Registration for the event is via the website

[www.ukmanufacturingsummit.co.uk](http://www.ukmanufacturingsummit.co.uk)

### Public affairs

The Academy organised a roundtable meeting of Fellows for Chi Onwurah MP, Shadow Minister for Science and Innovation, as part of her review of Labour policy on innovation.

Martin Earwicker FREng, Chair of the External Affairs Committee, attended a meeting on capital investment in infrastructure with Chris Leslie MP, Shadow Financial Secretary to the Treasury.

As part of the Academy's growing role as adviser and delivery partner

on policy, Martin Earwicker and Natasha McCarthy, Head of Policy, met Philip Rutnam, Director General, Business and Skills at BIS. Following this, a roundtable meeting was held in September with members of Philip Rutnam's Business and Skills team. Steve Garwood FREng, Mike Short FREng, Simon Howison FREng and Roger Kemp FREng along with members of Academy staff attended the meeting.

Gordon Masterton FREng, along with members of the Institution of Engineers and Shipbuilders in Scotland,

held a meeting with Fergus Ewing MSP, Scottish Minister for Energy, to discuss energy policy in Scotland.

In October, the Parliamentary and Scientific Committee met to discuss challenges facing the UK's infrastructure in Portcullis House in Westminster. The discussion was supported by the *Engineering the Future* alliance and was chaired by Andrew Miller, Chair of the Parliamentary and Scientific Committee. The panellists were Professor Jim Hall FREng, Professor Will Stewart FREng, and Professor Brian Collins CB FREng.

## Engineering ethics in practice



On 8 September the Academy, in conjunction with the University of Leeds applied ethics centre, launched their innovative guide, *Engineering Ethics in*

*Practice*, at a one-day event held at the School of Mechanical Engineering. The report uses a series of case studies to address a number of ethical issues faced by professional engineers and how to respond to these concerns.

The event combined plenary sessions given by ethicists and engineers working in industry and academia with interactive workshop sessions. Talks were given by Lambert Dopping-Hepenstal FREng, Rear Admiral Nigel Guild CB FREng, Professor W Richard Bowen FREng and Professor Jonathan Wolff. It is hoped that the report will provide a valuable ongoing resource for professional development of all levels of engineers.

Download the guide at <http://tinyurl.com/czvbyep>

## Philosophy of engineering

The second volume of essays from the two-day event chaired by Dr Keith Guy FREng considering the philosophy of engineering will be published in January 2012. The essays are grouped into two sections: Engineering, Metaphysics and Mind; and Engineering, Ethics and the

Environment. Essay titles include: *When water does not boil at the boiling point*; *Constructionism, the maker's knowledge tradition and knowledge engineering*; and *Engineering and environmental values*. This publication will be available on the website to download.

## Engineering the Future activities

Following on from the publication of the *Engineering the Future* report, *Nuclear Lessons Learned*, the *Engineering the Future* alliance is developing a series of good practice guides on nuclear safety culture, welding and concrete. These reports aim to be of practical use to the construction industry. The reports were well received at an industry stakeholder meeting held in Wigan in September this year and are in the final stages of editing and approval. They are due to be published before the end of the year.

The *Engineering the Future* alliance has been collaborating on a 'timeline' which aims to map known government policy to the UK's infrastructure needs across the sectors up to 2050.

Details of the debate topics and speakers can be found at:

<http://tinyurl.com/btvz2lw>



## Response roundup

The Academy has submitted a joint response along with the Institution of Engineering and Technology, British Computer Society and the Chartered Institute for IT to the House of Commons Science and Technology Select Committee on malware and cybercrime. Dr Michael Westmacott from the British Computer Society gave follow-up evidence to the Committee on 9 November.

The Academy also submitted a response to the Technology Strategy Board on manufacturing.

*Engineering the Future* submitted a joint response to the Department for Transportation on a sustainable framework for UK aviation.

The alliance has submitted a joint response to the House of Commons Science and Technology Select Committee on Engineering in Government.

Philip Greenish gave oral evidence to the committee on 7 December. The committee also submitted a joint response to the House of Lords Science and Technology Select Committee on the Role and Function of Departmental Chief Scientific Advisors.

Philip Greenish gave follow-up evidence to the Committee on 25 October.

## Professional engineering governance

A report will be launched in the new year that highlights the importance of engineering in the governance of both private companies and the public sector. Following contributions from a number of Fellows with experience in a wide range of engineering sectors a clear message emerged of the important yet often unrecognised role for professional engineers in setting the long-term strategy of companies and government policy.

The report examines the different issues faced by large companies, SMEs and government; the problems that arise from a failure to procure adequate engineering advice; and offers recommendations on how best to source and use the advice. It also identifies the need for professional engineers' education to promote a better understanding of commercial issues so that they are more effective at providing advice.

## EDUCATION

### National Higher Education STEM Programme

On 13 and 15 September, the National HE STEM Programme engineering team from The Royal Academy of Engineering held two networking events for colleagues engaged in the programme to learn more about each other's work with the aim of creating new partnerships

At Coventry University, colleagues have implemented a scheme as part of their civil engineering programme where part-time students with industry experience act as mentors for full-time first year students. Training and support for the mentors was provided.



Delegates at the networking event at Coventry University

across the programme network. After two years of preparation, the first set of engineering projects under the National HE STEM Programme has now been completed and these are currently being disseminated at various conferences and seminars across the UK.

Colleagues from the University of Bradford created *Transit engineering*: a set of resources to support the transition of engineering students from further to higher education, thereby helping to increase the long-term success of students entering higher education from vocational courses.

[www.transitwestyorkshire.ac.uk](http://www.transitwestyorkshire.ac.uk)

A project team at Loughborough University has been working to develop a new LabVIEW based Control Systems Analysis Toolkit (CSAT) to assist lecturers teaching control engineering. Evaluations indicated positive impact and the resources have been made available to the control systems community.

A second round of projects is due to be completed in the new year and a third round in March 2012. Details of the projects supported by the Academy can be found at [www.thelep.org.uk/national/projects/allprojects](http://www.thelep.org.uk/national/projects/allprojects)

### Skills for university and beyond

Thanks to the generosity of the Motorola Solutions Foundation, the Academy was able to run the *Developing skills for university and beyond* course for a third year, allowing another 16 young women to benefit from 2.5 days of pre-university skills training.

The course, held in early September, was for female students who have previously taken part in a Headstart residential programme and are now about to enrol on an engineering degree course at university. Supported by experienced female mentors, it covered such topics as presentation skills, developing effective negotiation skills and devising personal development plans.

The students also visited the Olympic Park in Stratford where they learnt about the construction of the velodrome from George Oates of Expedition Engineering, and on the last day were addressed by Jayne Bryant FEng, Engineering and Technical Director at BAE Systems.



Participants in the Developing Skills course

### HE White Paper

The Academy made a submission following publication of the government's higher education (HE) White Paper, *Students at the Heart of the System*. The key points made were that the modern, experience-led engineering higher education required by industry to drive economic growth is currently underfunded. This is in spite of the additional support received through the HEFCE higher-cost provision and Strategically Important and Vulnerable Subject (SIVS) mechanisms. The proposals made in the HE White Paper have failed to address this point.

Continued funding input from HEFCE is required to avoid the current underfunding becoming worse and there is ongoing need for cross-subsidy from earnings made from lower-cost courses to cover losses sustained through the provision of engineering. The proposals in the HE White Paper do not offer a stable and sustainable future for engineering courses with attendant risk to economic growth.

There is a high risk that the proposals in the HE White Paper will fail to deliver the engineering and scientific skills necessary if the ambitions of the government

Growth Review are to be realised. This seems to be a worrying disconnect in public policy. Some universities will be disincentivised from providing high cost courses, introducing the real possibility of reducing student numbers in strategically important subjects such as engineering.

### Newsletter contact

For queries or contributions:

**Emily Bick** (Copy Editor)

**Email:** [emily.bick@raeng.org.uk](mailto:emily.bick@raeng.org.uk)

**Tel:** 020 7766 0645

## Visiting Professors move into sustainable wealth creation

In what has been as a particularly busy year, 21 new Industrial Visiting Professors have been appointed by the Academy at universities in the UK. The majority of these practitioners, whose role is to enrich the teaching curriculum with the latest industrial knowledge and practices, will promote effective practice in the creativity-innovation-design cycle. They will also expose student engineering design projects and ideas to the marketplace through activities such as the Academy's Innovation Hothouse.

In addition, the Academy is jointly funding two new Industrial Visiting Professor posts in Building Engineering Physics with the Chartered Institution of Building Services Engineers. This joint venture was a direct result of the Academy's *Engineering a low-carbon built environment* report, published last year, which has focused the profession's thinking in this area and has been referenced in the government's *Low Carbon Construction Innovation and Growth Team report*. The posts will be hosted by Loughborough University and University College London.

In another new development, the Academy has secured funding from the London Chamber of Commerce and Industry for a pilot Visiting Professor post in Sustainable Wealth Creation. This post, which is being hosted by the Nottingham Business School, is a break from past projects. It aims to teach business school students the value to the economy of hi-tech wealth-creating industries and modern manufacturing, and their role in extracting value from engineering and technology. David Falzani, a Sainsbury Management Fellow, has been appointed to this position. His wide-ranging business, operational and technical experience, combined with his MBA and chartered engineer training, make him ideal for this role.

The 2011 biennial Visiting Professor and Teaching Fellows conference was held in late September at Aston Business School. The 60 delegates who attended were tasked with addressing the question 'What can we do educationally to make students more innovation minded?'. Following a series of presentations from guest speakers, Visiting Professors and Teaching Fellows, in addition to reflective syndicate group sessions, delegates put together a 10-point action plan in response. This plan will be incorporated in a forthcoming Academy publication on the teaching of innovation.

## PUBLIC ENGAGEMENT

### Battle of Ideas

The Academy joined forces with the Institute of Ideas to bring together engineers and commentators in two debates, as part of the *Battle of Ideas* festival that took place in London, from 29 to 30 October 2011.

*What's innovation good for?* included Professor William Webb FEng on the debating panel. The discussion explored what we mean by the innovation and whether the term has become overused to describe the latest gadget upgrades, when it should be reserved for advances that have truly transformed society or led to new industries.



Professor William Webb FEng

Former Academy Public Engagement Fellow Dr David James took part in the second event *Drugs and bionics: enhancing sport?* The panelists debated how we can differentiate between a 'fair' enhancement and cheating, and what the future holds for bionic enhancements for both Olympic and Paralympic athletes.

Videos of the debate are available from: [www.battleofideas.org.uk](http://www.battleofideas.org.uk)

## Diversity programme update

The next phase of the Academy's diversity programme got underway in earnest with a stakeholder meeting on 17 October at the Institution of Engineering and Technology. The event was chaired by Professor Dame Wendy Hall FEng, with good representation from several of the professional engineering institutions, the Royal Society and other key organisations. The meeting explored the key areas of diversity data for the profession and the possible subjects for pilot projects within the programme. These themes will be carried forward in smaller collaborative working sessions throughout the winter.

The lively event showed that there is much interest in tackling the issue of diversity within the engineering profession and recognition that there is still a great deal of progress to be made.

The diversity team is mindful that the programme must firstly capitalise on work that has already been undertaken by the Academy and other organisations, including those outside the engineering sector, and secondly that the diversity 'strands' must be treated holistically wherever possible.

The Academy's own assessment using the UKRC's SET Fair Standard for gender equality begins on 14 November. This process will involve all staff and some Fellows, including those currently serving on standing committees, and will provide a valuable benchmark of the Academy's diversity maturity.

For more information about the programme please contact [diversity@raeng.org.uk](mailto:diversity@raeng.org.uk)

## Obituaries

**Dr Sydney Andrew FREng FRS** died on 2 November aged 85. Before his retirement he was Senior Research Associate, Imperial Chemical Industries plc. He was a Founder Fellow.

**Professor Andrew Beeby FREng** died on 28 October aged 72. At the time of his death he was Emeritus Professor of Structural Design, School of Engineering, University of Leeds.

**Mr Alistair Dick FREng** died on 26 October aged 74. Before his retirement he was Director, Group Planning, National Express Group plc.

**Sir William Hawthorne CBE FREng FRS** died on 16 September aged 98. He was Emeritus Professor of Applied

Thermodynamics, University of Cambridge. He was a Founder Fellow.

**Sir Gordon Higginson DL FREng** died on 5 November aged 81. Prior to his retirement he was Vice-Chancellor, University of Southampton.

**Sir Donald McCallum CBE DL FREng FRSE** died on 18 October aged 89. Prior to retirement he was a Director, Ferranti plc.

**Mr Bernard Mills FREng** died on 6 September aged 82. Before retirement he was the Managing Director at Standard Telecommunication Laboratories Ltd.

**Mr Kenneth Taylor OBE FREng** died on 2 October aged 90. Prior to his retirement he was Director, Mechanical and Electrical Engineering, British Rail.

## Building update

The contractors Knight Harwood started refurbishment work at the Academy in July 2011 as part of the transformation of 3 Carlton House Terrace into a national Forum for Engineering. In the past three months, a new lift shaft has been constructed beside the existing lift in the entranceway. The lift manufacturer began the installation of both lifts in December and the new air-handling unit, for the air conditioning, was craned onto the roof in November.

In the new public rooms on both the first and ground floors, the ceiling supports have been installed with service installations such as heating, lighting, power, and audiovisual connections being fitted during the early months of 2012.

The main wall on first floor has now been taken down in order to extend the lecture theatre. A wall partition, a concertinaed divide that can be opened and shut to create a smaller or larger lecture space, will be installed in the coming months.

The new sinuous bridge is scheduled to be lifted into place on 7 February 2012. This will be a stainless steel structure, manufactured by Babcock International

apprentices, that will create a new entrance for visitors to the Academy.

Academy staff have been able to remain in the building thanks to dust-proof partitioning installed between the office space and building work areas. A number of companies, universities and institutions, as well as neighbouring academies, have been generous in providing meeting rooms and the Academy would like to thank them for access to their facilities.



*The new lift shaft viewed from the first floor*

For photos of the works to date please see: [www.raeng.org.uk/3CHTproject](http://www.raeng.org.uk/3CHTproject)

## Staff News

**Chris Dixon** has joined the Academy as Resource and Training Coordinator for the 5-19 Education Team. He was formerly Head of Science at Harris Boys' Academy.

**Caroline Evans** has been appointed Deputy Director of the Queen Elizabeth Prize for Engineering. Since 2005 she has been CEO of the UK Teaching Awards, an independent charity promoting the teaching profession.

**Bola Fatimilehin** has joined the Further and Higher Education Team as Head of Diversity in a job share with Jenny Young. Bola was formerly the Diversity Business Partner for the BBC.

**Anji Hunter** has been appointed to the role of Director, Queen Elizabeth Prize for Engineering. Previously, she has held the posts of Head of Government Relations at Anglo American, Director of Communications at BP, and Head of Government Relations at 10 Downing St.

**Manisha Laloo** has joined the Academy as the Assistant Manager for Public Engagement. She previously worked on a European-wide project called e-ScienceTalk.

**Dr Imren Markes** has left the Academy after five years' service as Manager, Industrial Secondments and Distinguished Visiting Fellowships.

**Natasha McCarthy**, Head of Policy, is on maternity leave. Her son Hector Milton was born on 10 October, weighing 9lb 1oz.

Two Assistant Managers are joining the Research Programmes team. **Katie Melton** gained her first degree from Ohio University in Mechanical Engineering and subsequently an MA from Warwick. **Tapsi Khambra** has a MRes (Master of Research) from Glasgow in Biomedical Sciences, and will start in January 2012.

**Jon O'Neill** has joined as Corporate Development Manager. Previously he was Regional Corporate Manager for the NSPCC.