



**New Fellows' Dinner 3 Obituaries 3 International News 4 2008 International Lecture 4 The Big Bang 5  
Research News 6 Fellows' visit: ss Great Britain 7 2008 Hinton Lecture 7 Policy News 8 Council News 9  
News of Fellows 9 Education Programmes 10 Education News 11 Staff News 12 Publications received 12**

## The Royal Academy of Engineering hosts first Euro-CASE conference

In January 2008, the European Commission put forward renewables targets for all EU member states, with the overall goal of meeting 20% of Europe's primary energy consumption from renewable sources by 2020. Meeting these targets will require a concerted effort by all stakeholders to tackle the barriers to the development and deployment of renewable energy technologies across the continent. On 3 November, the Academy brought together 100 of Europe's leading engineers and policy-makers in an attempt to start addressing the engineering elements of that challenge.

The event, entitled *How can Europe meet its 2020 Renewables Targets?*, was the first annual conference of the European Council of Applied Sciences, Technologies and Engineering (Euro-CASE), an organisation bringing together 21 European engineering academies. EU Energy Commissioner Andris Piebalgs delivered the keynote speech.

Opening the conference, Lord Browne welcomed the EU targets as a good example of "clear, stable and predictable policy" and warned that dismantling the targets that had been announced could "damage the investing environment in renewables in Europe for a generation".

In the course of the day, speakers from 12 countries addressed a range of renewable technologies. The overwhelming message from the conference was that the targets could be delivered, providing that the right policy support was put in place. Speakers called for greater investment in engineering education and greater engineering input into policy development. Renewable companies needed fair access to grids and energy markets and planning regimes across the continent needed to be simplified. Moreover, the Commission's renewables proposals needed to be complemented by an equally ambitious suite of demand-side reduction policies and technologies.

In a poll of conference participants, conducted using interactive voting technology, two-thirds of those present thought that the 2020 renewables targets could be delivered. When asked to name the greatest obstacle to achieving the targets, half of the attendees said that it was a lack of political will, 19% nominated public perceptions and consumer behaviour, and 12% thought that the greatest stumbling block was a lack of appropriate incentives.

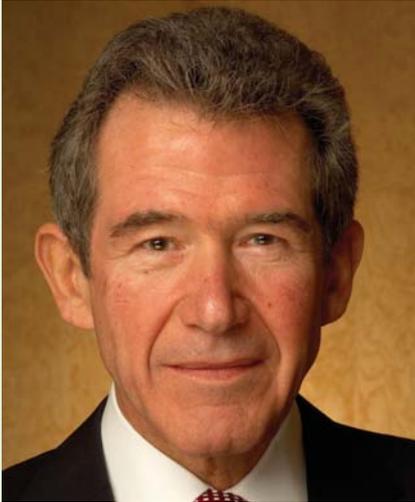
The conference was well received by the delegates and attracted favourable media coverage, including an article in the *Guardian* and an interview with Lord Browne in the *Financial Times*.

Videos of the keynote speeches and copies of all presentations are available to view in the Past Events section of [www.raeng.org.uk](http://www.raeng.org.uk). A published account of proceedings will be made available on the website in the coming months.

*EU Energy Commissioner, Andris Piebalgs, delivering his keynote speech on the European Commission's vision for the development of renewables in the EU*



## The President's Column



Lord Browne

The Innovation, Universities, Science and Skills select committee has continued its in-depth inquiry into engineering in the UK with two new case studies: *Geo-Engineering* and *Engineering in Government*. In November, five Academy Fellows were among those called to give oral evidence to the committee on both studies: Professor Nick Jenkins FREng, Professor Wendy Hall CBE FREng, Professor David Fisk CB FREng, Professor Michael Kelly FREng FRS, and Professor Christopher Snowden FREng FRS. This was an important contribution to our strategy to raise the profession's profile with policy-makers.

The first case study concerned potential engineering strategies to mitigate the effects of climate change by deliberately affecting a change in the global climate. This includes schemes such as releasing sulphate aerosols into the stratosphere or inducing plankton blooms in the ocean. The committee was interested to learn about the place of engineers in developing geo-engineering solutions to climate change, and the role of engineers in advising the government and the public about the potential effects of such solutions.

A further case study, on *Engineering in Government*, was timely and gave the engineering community an important opportunity to highlight concerns about the profession's relationship with Government policy-making. The committee heard evidence of the

way that Government procures and uses engineering advice, the status of engineers in the civil service and the roles of professional organisations such as the Academy in providing engineering advice to Government.

The Academy had approached this case study somewhat differently than from previous Government reports. In the evidence sessions following the opening of this inquiry, the IUSS committee had grilled representatives of the professional engineering organisations on the multiplicity of engineering institutions. It had suggested that this proliferation of voices was a reason why the message from engineering is often not listened to and why Government often fails to engage with the engineering community.

To a great extent, I agree with this analysis, but there are other factors at work here too. The Academy has been measuring public perception of engineering, which is, unsurprisingly, low on awareness and understanding. We have now developed a strategy to improve our presence with the public and with Parliament and Government, which we are rolling out by means of a programme of policy and communications work.

An important part of this will involve working, wherever possible, with colleagues across the engineering community to create a louder, more coherent voice for engineering. The *Engineering in Government* case study was a perfect example: what better issue on which to provide a unified view? The Academy worked with the larger engineering institutions to develop a response to the case study and invited support from all of the engineering institutions under the Engineering Council UK (ECUK). With 26 institutions, the ECUK and the Engineering Technology Board as signatories, there was certainly a resounding unity in the message.

Our view, as the engineering community, is that the Government does not ask advice from the engineering profession frequently enough, nor does it use engineering expertise enough in the development of policy. We believe that the engineering dimensions of policy should be considered at the beginning of the policy-making process, not the end. There is also a strong

sense that there are too few engineers within the civil service, meaning that Government is not an informed customer when it procures or evaluates engineering advice. There is also agreement that professional engineers should continue to be appointed as Chief Scientific Advisors and that some Government departments actually need a Chief Engineering Advisor.

The clarity and unity of our messages on this issue are what is needed if the engineering community is to get its message across, on this and other crucial issues. We also have to make it easy for Government to access the right expertise on such pressing issues as climate change, sustainable energy and the security of food and water supplies. The Academy and other institutions are working to align ourselves to make our engineering expertise available and accessible to policy-makers, as well as developing new ways of raising the profession's profile, impact and influence.

A handwritten signature in black ink, appearing to read 'J. Browne', written in a cursive style.

### Meetings and Visitors

The President has recently met:

#### Viscount Linley

#### His Highness Sheikh Dr Sultan Bin Mohammad Al Qassimi

Member of the Supreme Council of the UAE and Ruler of Sharjah

#### Sir Alan Rudge CBE FREng FRS

Chairman, ERA Foundation

#### Sir Evelyn de Rothschild

Chairman, Concordia BV

#### Dr Armen Sarkissian

Former Prime Minister of Armenia, founding President and Chairman of Eurasia House International

#### Sir David Tang OBE

Chairman, DWC Tang Development Ltd.

## New Fellows' Dinner



*The six International Fellows of 2008, with the Duke of Edinburgh and Lord Browne (front row)*

The Academy welcomed a new group of Fellows for 2008 at the annual New Fellows' Dinner, held at Drapers' Hall in London on 29 October.

The dinner was attended by the President, Lord Browne, Senior Fellow, HRH The Prince Philip Duke of Edinburgh KG KT, and over 50 new Fellows to join The Royal Academy of Engineering, along with four Honorary Fellows and six International Fellows.

Those invited to sign the Academy's roll book at the event in 18th century Drapers' Hall included Lord Robert Winston HonFREng, Emeritus Professor of Fertility Studies at Imperial College, Professor Sir Gordon Conway HonFREng FRS, Chief Scientific Adviser at the Department for

International Development, and Stephen Payne OBE FREng, Chief Naval Architect of Carnival Corporate Shipbuilding.

Following a welcoming speech by the Duke of Edinburgh, Stephen Payne OBE gave a response on behalf of all the new Fellows.

Stephen Payne called for new Fellows to ceaselessly work to attain recognition for engineering as a "cornerstone to the advancement of society". He ended the evening by encouraging all Fellows, new and existing, to "rise up and empower this celebrated Academy" by promoting engineering through all means at their disposal.

## Academy continues to meet the standard

In its first review since being recognised as an Investor in People in November 2005, the Academy successfully demonstrated that it continues to meet the standard's exacting requirements. The evaluation process involved a two-day evidence gathering exercise based on the interviews of 17 members of staff and two members of the Academy's Council (Dr David Grant CBE FREng and Dr Christopher Elliott FREng).

The final report on the assessment exercise identified three areas of effective practice at the Academy: clarity of vision and business planning; meeting the different needs of people and providing equality of opportunity; and achieving on-going improvement in organisational performance through investment in people. None of this could have been achieved without the efforts of all the Academy's staff, who have embraced the Investor in People concept since the Academy's first involvement.



## Obituaries

**Mr Norman Edward Goddard FREng** died on 25 November 2008. Prior to retirement, he was Director of Philips Research Laboratories.

**Dr Robert Paul CBE FREng** died on 23 September 2008. Before his retirement he was Chief Executive, Albright & Wilson plc.

## Contact

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## Ruler of Sharjah visits Academy

His Highness Sheikh Dr Sultan bin Mohammed Al Qasimi, Ruler of Sharjah, visited the Academy on 7 November 2008. The visit was facilitated by Lord Broers FREng, Past President, who has been a long-standing member of the American University of Sharjah's Board of Trustees. His Highness was welcomed by the President, Lord Browne of Madingley and a Memorandum of Understanding was signed.

The American University of Sharjah is known for its unique approach to engineering education, based around hands-on laboratory work and group-based learning.



Lord Browne and the Ruler of Sharjah

His Highness, who studied at the universities of Durham and Exeter and has been a generous donor to both bodies, is a strong believer in the importance of cultural and communications skills in engineering education.

Over the next few months, proposals will be developed to support the further development of engineering research capabilities in Sharjah and the development of the Academy's facilities at 3 Carlton House Terrace.

## International News

### Mission to Japan

In November, Peter Saraga OBE FREng, the Academy's Honorary International Secretary, led a delegation to Tokyo to participate in a symposium on *Privacy and Security in the Information Society*, held jointly with the Engineering Academy of Japan and hosted by the British Embassy. The symposium provided an opportunity to bring the Academy's highly successful report *Dilemmas of Privacy and Surveillance*, published in 2007, to an international audience, and to explore the commonalities and differences in the British and Japanese treatments of the subject.

The first day of the meeting was devoted to policy and perceptions and explored issues such as the concept of privacy in cyberspace, UK and Japanese attitudes to privacy and surveillance, and Japanese plans for developments in e-government. The second day focused on technology and included presentations on software engineering and system dependability,



Peter Saraga and Hayaatun Sillem with members of the Engineering Academy of Japan

next-generation data security architectures, and biometric authentication.

The UK fielded a very strong team of speakers consisting of Professor Nigel Gilbert FREng, from the University of Surrey and chair of the group that produced the Academy's *Dilemmas* report; Professor Andy Hopper CBE FREng FRS, University of Cambridge; Professor Cliff Jones FREng, University of

Newcastle; Dr Martyn Thomas CBE FREng, Martyn Thomas Associates Ltd; Dr Maire O'Neill, Queen's University Belfast and former Academy Research Fellow; and Dr Andrew Adams, University of Reading and former holder of an Academy Global Research Award.

A symposium summary will be available shortly on the Academy's website, including a research agenda for future UK-Japan co-operation in this area.

### Africa Works

On 5 November, guests of the Academy were treated to an inspiring and thought-provoking address by Dr Mo Ibrahim, founder of Celtel International and the Mo Ibrahim Foundation. The occasion was the the Academy's flagship 2008 International Lecture, enabled by a donation from the ERA Foundation, which aims to bring to a UK audience an international perspective from a world-leading individual with an engineering connection.

Dr Ibrahim gave a highly personal account in which he narrated the story of Celtel International – both a successful African telecoms business and a global exemplar

of good governance. The company was sold to MTC Kuwait in 2005 for US\$3.4 billion, making it one of Africa's most profitable commercial ventures.

Dr Ibrahim then spoke about his Foundation, which he established using the proceeds of this sale to support and celebrate great African leadership. It awards the world's largest monetary prize (US\$5 million) to a departing African leader who has governed well and stood down peacefully.

Dr Ibrahim's speech was entertaining, informative, and provocative in equal measure and was greatly appreciated by the diverse audience, which included engineers of various disciplines, students,

business leaders, senior government officials, and African diplomats.

At a time when the Academy is increasingly focusing on Africa, it was a welcome opportunity to hear from an influential advocate of the region.



Dr Mo Ibrahim at the Africa Works lecture

### Engineering Change

The Academy has published a collection of essays entitled *Engineering Change: Towards a Sustainable Future in the Developing World*, launched at a reception following the Academy's briefing on engineering and global food security. The collection has been written by engineers and development experts and explores the many ways in which engineers around

the world contribute to improving the quality of life for those in poverty, with a particular focus on Africa. The topics range from water and waste, to computing for sustainability, to disaster risk-reduction, and adaptation to climate change.

*Engineering Change*, edited by Professors Peter Guthrie OBE FREng and Calestous Juma HonFREng FRS, and Dr Hayaatun Sillem, seeks to stimulate a reconsideration

of the role that contemporary engineering can play in enabling sustainable growth.

It is a key contribution towards the Academy's work on poverty reduction as part of the *Engineering for Society* programme and, as such, is part of a process that should enhance the contribution that engineers make to improving conditions for the world's poorest people.

## Engineering and Global Food Security

Although the subject of food security has featured highly in policy and media debate in recent months, the role of engineers in tackling the problem has attracted little attention.

To address this, the Academy convened a briefing on engineering and global food security in partnership with the Institution of Civil Engineers and Institution of Agricultural Engineers.

The event, held on 21 October 2008, was chaired by Professor Sir Gordon Conway KCMG HonFREng FRS, Chief Scientific Adviser to the Department for International Development, and featured speakers from academia and industry.

Professor Dick Godwin FREng, from Cranfield University, gave an overview of the contributions that engineers make to production agriculture, also touching on their critical role in post-harvest technology.

Lawrence Clarke, former Head of the Agricultural Engineering branch of the Food and Agriculture Organisation, brought a developing country perspective, focusing on the significance of farm power and mechanisation.

Work is now underway to produce an Academy position paper on global food security and consider possible future activities relating to the subject.

## Newton International Fellowships Scheme

The Newton International Fellowships were launched in June 2008 to bring the best post-doctoral researchers from around the world to the UK for a period of two years. There is further follow-on funding available to enable Fellows to maintain their links with the UK. The first round of applications closed in August 2008.

Over 700 applications were received, covering the full range of disciplines under the remit of the British Academy, The Royal Academy of Engineering, and the Royal Society; of these, 140 applications were from engineers. Professor Ann Dowling CBE FREng FRS and Professor Steve Furber CBE FREng FRS chaired the two engineering panels and oversaw the difficult task of selecting the successful candidates. Thirteen engineering Fellowships were ultimately made, covering countries including China, the USA, and Japan, and a number of subjects, such as the development of hearing aids, terahertz radiation for imaging, and power electronics for wind turbines. The full list of awards will be available at [www.raeng.org.uk/international](http://www.raeng.org.uk/international).

The next round of the scheme is currently open and applications are welcomed. The deadline for applications is 12 January 2009. Further information is available at: [www.newtonfellowships.org](http://www.newtonfellowships.org).

### Engineering with a bang

The Royal Academy of Engineering is part of a consortium of science and engineering organisations supporting the UK's inaugural Young Scientists and Engineers Fair.

Called The Big Bang, the three-day landmark event is being coordinated by the BA with the support of the Engineering and Technology Board. Targeted at people aged 11 to 19 and their teachers, the fair aims to highlight the role of science and engineering in society, and the exciting career opportunities available in the industry.

The Academy's Chief Executive Philip Greenish is currently leading The Big Bang activities group, which provides strategic direction and advice regarding the fair's events programme. The Big Bang takes place from 4 to 6 March 2009.



## Headline hits

The Academy's media team has been making an impact in the last few months, achieving national media coverage nearly every week. Our target is to continue to build exposure at this level across all our activities through promotional stories, announcements, interviews, letters and rapid reaction.

We are working with both *The Independent* and *The Daily Telegraph* on their twice-yearly engineering careers supplements.

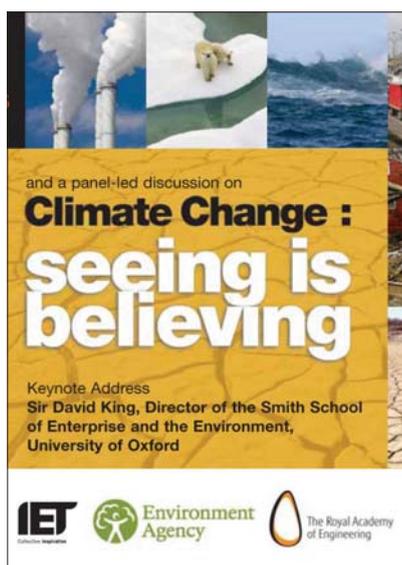
Recent highlights include articles in both *The Times* and *Daily Mail* on research by Professor Lionel Tarassenko FREng using mobile phones to monitor patients remotely, as presented at the UK Focus for Biomedical Engineering conference in November. *Time* magazine also named

MacRobert Award winner Touch Bionics' i-LIMB hand one of its top innovations of 2008.

Lord Browne gave an interview to the *Financial Times* discussing European renewables targets to coincide with the EuroCASE conference on this subject hosted by the Academy in November.

*The Independent* launched the Technology Horizons essay competition, supported by the Academy and Bosch, with a full page article on this year's theme of green solutions.

The Academy supported the PAWS Drama Awards held at the IET. This year the theme was climate change and Vice President Dr Scott Steedman took part in a debate on the issues with writers and film producers.



Flyer for the PAWS Awards Evening at the IET

## Research News

### New Chair: Emerging Technologies

Following intense competition, the Academy has awarded Professor Anne Neville of the University of Leeds its prestigious new Research Chair in Emerging Technologies. This is the first and possibly only award of its kind to be made by the Academy for the foreseeable future and, unlike the Research Chairs co-funded by industry, this position is funded solely by the Academy. Over the 10-year lifetime of the Chair, £1.3 million has been earmarked, which should see the research area through to be fully established, with continued funding for the position secured from other sources.

Professor Neville will focus on examining engineering problems relating to her core research areas of corrosion and lubrication and will focus on 'bioinspiration' in the area of interface and surface engineering where she has built a considerable reputation.

She has noted how the technology transfer from biology into engineering has enormous potential and that there is currently a great deal of work being done



*Professor Anne Neville, the Academy's new Research Chair in Emerging Technologies*

in the mimicking of natural surfaces for engineering applications.

Much of this work has been towards replicating surface topographies across the different length scales and also combining different length scales on one surface. The most well-documented are the lotus leaf as a self-cleaning surface, the gecko to achieve effective adhesion, moth eye for anti-reflection and shark skin for low drag.

This proposal will specifically address the ability of surfaces to regenerate, self-heal or respond to the environment – surface activity is at the core of the research.

Professor Neville feels that bioinspiration as a research field can capture the minds of budding engineers and intends to use this Chair to learn about how nature solves problems of repairing damage, adapting to extreme environments and defending against predators is fascinating and we can use this to design engineering systems for a range of application areas including motorsport, oil and gas recovery, and medical devices.

She also plans to spend some of her time as an ambassador for engineering, encouraging youngsters to consider the subject as a career.

## Research and Secondment News

### Industrial Secondment Scheme: motion capture design

The Industrial Secondment Scheme is a gateway to knowledge transfer between industry and academia.



*Dr Ian Campbell*

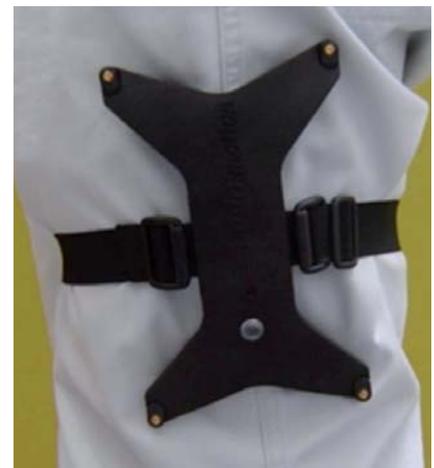
The scheme provides funding for the UK Higher Education institutions to enable engineering teaching staff to gain industrial experience with a view to improving the quality and industrial relevance of the teaching of engineering.

A secondment has numerous benefits to the host company as it enables the host to gain access to the expertise of highly qualified academic staff as well as access to his/her university's staff, students, graduates and facilities. Five awards were made in October 2008, making 14 total awards made since April 2008.

An Industrial Secondment award enabled Dr Ian Campbell (left) from Loughborough University to spend nine months on a part-time basis at Charnwood Dynamics Ltd. The main objective of the secondment project was to design, build, test and manufacture an innovative range of motion capture equipment used in a number of areas, including for example, clinical movement analysis, sports performance analysis, and ergonomic evaluation of products.

The outcomes of the secondment included the re-design of existing products to enable the use of rapid prototyping methods in their manufacture, the design, beta-testing and optimisation of a new product line of motion capture equipment (called 'clusters'), the development of new teaching material for a number of modules and the development of an in-house Computer Aided Design (CAD) capability.

The work carried out during Dr Campbell's secondment at Charnwood Dynamics was also presented at a number of international conferences.



*An assembled motion-capture cluster box*

## Distinguished Visiting Fellowship Scheme 2008 Hinton Lecture

The Distinguished Visiting Fellowship Scheme aims to enable and promote international relations and networking at a senior level within the academic engineering community. Funding is provided to enable an academic engineering department at a UK university to be a host for up to a month to a Distinguished Visiting Fellow from an overseas academic centre of excellence.

The two deadlines for applications in the 2007-2008 fiscal year were 30 June 2008 and 31 October 2008, resulting in 90 applications, with visitors from 24 countries. Of the total number of applicants, almost one-third (27%) were female.

A Distinguished Visiting Fellowship award enabled Professor Sarah Spurgeon (currently at the University of Kent) to invite Professor Yuri B Shtessel from the University of Alabama to undertake collaborative research on Higher-Order Sliding Mode (HOSM) observers for state estimation and input reconstruction in non-linear systems and to apply the theoretical developments to practical aerospace control problems, including launch vehicle and satellite estimation and control. The visit outcomes included two manuscripts submitted for publication in journals, a paper presented at the International Workshop on Variable Structure Systems, and a number of presentations at City University and the University of Sheffield.

The deadline for the next round of applications is 30 June 2009. For more information visit [www.raeng.org.uk/research/researcher/dvfs](http://www.raeng.org.uk/research/researcher/dvfs).



Professor Sarah Spurgeon

The Academy's annual Hinton Lecture took place in October 2008 at the Royal College of Surgeons in Lincoln's Inn Fields. The lecture was entitled *Advances in applying engineering solutions to surgery*.

The Academy's flagship annual lecture featured a keynote speech from Professor the Lord Darzi KBE HonFREng, internationally respected surgeon and recognised pioneer in the field of minimal invasive surgery. Lord Darzi spoke on the use of advanced technology – particularly robotics and laparoscopy – for minimal access surgery and the importance of an interdisciplinary approach to the research and evaluation of healthcare technologies.

In his talk, Professor Darzi explained how a multidisciplinary approach, involving engineers and clinicians in collaboration, has been responsible for the progression

of medical robotics and other healthcare technologies in the UK over the last 20 years and predicted where that collaboration is likely to lead in the future.

Professor Darzi's speech followed a presentation by Lord Browne of the Academy's 2008 Sustained Achievement Award to Dr Adam Neville CBE FREng, for 60 years of research and practice in the field of structural concrete.



Lord Darzi KBE HonFREng

## Fellows' visit: ss Great Britain



Fellows and their guests boarded the world's first ocean-faring iron-hulled ship, Isambard Kingdom Brunel's ss Great Britain, for a special event in September.

A tour of the venerable ship, which now rests in permanent dry dock in Bristol following a lengthy restoration programme, was followed by a drinks reception on the Weather Deck and authentic Victorian banquet in the ss Great Britain's First Class Dining Saloon.

The after dinner speech was by Colin Green CBE FREng, Vice Chairman of the ss Great Britain Trust, with closing remarks from Dr David Grant CBE FREng, a Vice President of the Academy.

## Mobile telecommunications lecture

At the beginning of October, the Academy was host to a lecture on the establishment of the global telecommunications network and where it is likely to develop in the future.

The lecture was given by Dr Linda Doyle, Associate Professor of the Department of Electronic & Electrical Engineering at Trinity College, Dublin.

Dr Doyle spoke on the service-neutrality and adaptive technology of future telecommunications and explored the challenges – technological, political, and economic – that need to be overcome before this dynamic vision of global communications can be realised.

The lecture was chaired by Professor Mike Walker FREng, Research and Development Director at Vodafone Group, and forms part of a series of telecommunications lectures supported by Vodafone.

For further information on the lecture series, visit [www.raeng.org.uk/events](http://www.raeng.org.uk/events)

## Policy News

### Putting engineering at the heart of society

A major objective for the Academy is to get engineering recognised for its crucial role 'at the heart of society'. The Academy is pursuing this in a number of ways, including a new public affairs programme that aims to promote the role and work of the Academy and the contribution of engineers.

A new External Affairs Committee has been established to promote the work of the Academy's three policy standing committees – education, international policy and engineering policy. The new committee will drive a programme spanning public relations, public engagement, and public affairs (relations with Government and Parliament). Initially, the Academy's public affairs programme will concentrate on Westminster and Whitehall but, as it develops, will include the other UK administrations. With much new UK legislation having its origins in the European Union, the Academy is also looking to develop its links with EU institutions.

The Academy's policy work is highly regarded and a set of position papers is being developed to help highlight the key issues and inform policy discussion as part of a programme of briefings with Government ministers, frontbench spokespeople and key backbenchers of all political parties.

The autumn annual party political conferences offered an opportunity to engage in dialogue with politicians, their advisers, and grass-roots party members. This year, for the first time, the Academy, along with partners in the engineering institutions, held a series of fringe meetings at all three main conferences. The theme was Innovation, which gave a broad opportunity to explore how engineering contributes to the economy and the private and public sectors through new products and processes. Panel chairs included Jonathan Guthrie (Enterprise Editor of the *Financial Times*), and *The Times* Chief Leader Writer Daniel Finkelstein. MPs Vince Cable, Eric Joyce and Stephen Timms (the then Work and Pensions Minister), and Julian LeGrand and Will Hutton, who are known for innovative policy ideas, examined the barriers and drivers.

The Academy and other engineering institutions are now considering how to build on the experience, bringing in more institutions and other organisations to create a much bigger engineering presence at next year's conferences.

Meanwhile, the Academy is working on a series of business breakfasts and dinners that will examine some of the themes and issues raised by Fellows as well as at the fringe meetings. These meetings, which will bring together Fellows, specialist editors, business and industry, parliamentarians and think tanks, will highlight issues for further discussion and should point the way towards future policy work.

### Theatre explores patient record debate

The Academy has launched a new public engagement project to explore the social, technological, and health impacts of developing a national patient record database. Launched at a workshop in November, this two-year project is supported by the Wellcome Trust and the Research Councils, and is being developed and delivered in partnership with the Y Touring theatre company.

The project will raise public awareness and stimulate debate on the use of a patient record database, specifically for health and medical research, by developing a

thought-provoking play to be delivered as a live production in schools and hospitals across the UK.

The workshop involved eight experts in related fields (including systems and software engineer Martyn Thomas FEng), five playwrights, 20 young people from London schools, and four adult patients.

Feedback from November's workshop session will be available at [www.ytouring.org.uk](http://www.ytouring.org.uk) which will form an invaluable resource for the playwrights, who will each prepare a synopsis of a possible play based on the issue of electronic patient records. The finished play will have its first performance in September 2009.

### Engineering Better Health

In November 2008, the Academy celebrated the 20th anniversary of the UK Focus for Biomedical Engineering at a special one-day event at the Royal Society of Medicine.

The UK Focus for Biomedical Engineering is a forum for organisations to debate and work together to improve the diagnosis and treatment of major medical conditions. The event, entitled *Engineering Better Health*, was a chance to highlight how biomedical engineering has benefited society over the last 20 years, and explore the future of engineering in healthcare.

Presentations included a talk from Professor Christofer Toumazou FEng FRS, from the Institute of Biomedical Engineering, on the development of disposable healthcare devices.

The annual lecture was given by Professor Jon Cooper FEng FRSE, from the University of Glasgow.

### Policy Responses

This quarter, the policy team responded to the following consultations: UK Renewable Energy Strategy for BERR; Role of SMEs in Public Procurement for OGC and BERR; Plutonium Management for the Nuclear Decommissioning Authority; and Geo-Engineering and Engineering in Government for the Innovation, Universities, Science and Skills committee.



Attendees at the Health and Society workshop

## Philosophy of Engineering



*Philosophy workshop break-out session*

How can we define 'engineering' across cultures? Is 'systems thinking' the engineering equivalent of philosophy? Can engineers build devices that will help solve philosophical problems? These were some of the issues explored at the second international Workshop on Philosophy of Engineering (WPE), held at The Royal Academy of Engineering from 10-12 November 2008. This was the second WPE to be held, following a successful meeting at the Technical University of Delft last year.

The workshop was attended by nearly 90 participants from across Europe, the US, China, India, and Brazil. Nearly all of those attending played an active part, with 46 contributed papers, eight posters, four keynote speakers, and a series of tutorials in which topics such as machine consciousness and peace engineering were introduced to participants.

The centrepiece of the conference was a talk from Jerome Ravetz, entitled *Maintenance as Morality*. Dr Ravetz's talk addressed the essential importance to engineering of maintenance, in contrast to the relatively low status of maintenance activity and the people who carry it out. Other keynote speakers at the workshop were Billy V. Koen of the University of Texas, who spoke on *Towards a Philosophy of Engineering: An Engineer's Perspective*; Deborah Johnson, who spoke on *An STS-informed account of Engineering Ethics*; and Carl Mitcham discussed *The Philosophical Weakness of Engineering as a Profession*.

Plans are now being formed for the next workshop to be held in 2010. This year was a success in bringing together philosophers and engineers in academia.

The challenge for the next conference is to include more practising engineers to give their perspective on the reality of engineering methods and to discuss with philosophers those aspects of their work that they find philosophically interesting.

Hardcopy books of abstracts from the workshop are available, or can be read at: [www.raeng.org.uk/policy/philosophy/](http://www.raeng.org.uk/policy/philosophy/)

## News of Fellows

**Professor Vidal Ashkenazi** received the Harold Spencer-Jones Gold Medal from the Royal Institute of Navigation.

**Dr Martin Barnes** is to chair the Independent Dispute Avoidance Panel for London 2012. Other Fellows on the panel are **Dr Richard Harris** and **Professor Tony Ridley CBE**.

**Lord Broers** has been appointed chairman of Diamond Light Source.

**Professor Cliff Burrows OBE** has been awarded the ASME 2008 Robert E. Koski Medal.

**Professor Phil Coates** has been appointed an Honorary Professor of Sichuan University.

**Professor Anthony Kelly CBE** delivered the 2008 Eschbach Public Lecture.

**Professor Pat McKeown OBE** has been awarded the IMechE James Clayton Prize.

**Professor William Milne** received the JJ Thomson Medal for Achievement in Electronics from the IET.

**Professor Alvin W Nienow** has been granted honorary membership of the Czech Society of Chemical Engineering.

**Professor David Payne CBE** won the 2008 Marconi Society Prize.

**Professor Ian Underwood** has been appointed to the Scottish Science Advisory Council.

**Professor Richard Williams** has been elected Fellow of the Australian Academy of Technological Sciences.

**Professor Robert White** has won the 2008 Engineering medal from the Institute of Acoustics.

## Council News

The Council held its fourth meeting of the year on 13 October 2008. The President welcomed new members of the Council: Dr Christopher Elliott, Professor Dame Julia Higgins, Professor Robert Mair, Dr Gordon Masterton, Professor John McCanny, Sir John O'Reilly, and Professor Michael Walker.

The Chief Executive gave a progress report on the key issues. Among these was planning and preparation for the UK Young Scientists and Engineers Fair 2009, with which the Academy is heavily involved.

The Council approved a statement on strategic outcomes and impacts for the period 2008 to 2011. Staff are now preparing delivery plans that will aim to achieve targets set out in the paper.

Council approved new terms of reference for the Communications Committee, which is now to be called the External Affairs Committee. Key reasons for the change are to maximise the impact of the Academy's policy work and to develop a horizon-scanning function in order to inform policy planning.

The Chairs of the standing policy committees on Engineering Policy, Education and Training, and International reported on the current major issues for their committees. For example, the Academy has recently collaborated successfully with many engineering institutions on the Industry, Universities, Science and Skills (IUSS) Committee's enquiry into engineering in government; and the Proactive International Fellows Group has been set up to identify a larger pool of eminent overseas engineers who would be suitable for election as International Fellows.

Dr Ian Nussey, Chair of the Proactive Membership Committee, presented the annual report of the Committee. The Council had set targets for the nominations which the Committee should generate, including: gender, age, and industry sector. Dr Nussey stated that he was confident that the Committee would meet these targets.

Keith Davis, Director of Strategy and Planning, gave a comprehensive report on the work of his department over the past 12 months.

## Education Programmes

As the year draws to a close, the Academy is continuing its work as an influencing body in science, engineering, technology and maths (STEM) teaching in schools, colleges and higher education institutions. Here is a report on the Academy's current education programmes and the ways in which we are contributing to the development of a changing STEM agenda in the UK.

### 14-19 Diploma in engineering

One full term into teaching, the Academy has hosted two workshops for those teachers who have been delivering the new curricula, to enable them to share their experiences with each other.

*Working with Others* (University of Brighton) provided an opportunity for teachers leading the delivery of the Diploma in Engineering to meet and exchange experiences and ideas, share good practice, and to enable the Academy to identify what kind of support would be helpful to consortia, teachers, and schools in successfully developing and delivering diplomas in the future.

In addition, a selection of mathematics exemplars are now available for use as teaching aids. The exemplars are intended to motivate mathematics teaching and learning, helping students to gain a fluency in the use of mathematics for practical problem-solving and are available to download from

[www.raeng.org.uk/education/diploma/maths](http://www.raeng.org.uk/education/diploma/maths)

With news that the universities of Oxford and Cambridge will accept the advanced Diploma in Engineering for entry to their undergraduate engineering courses, the Academy can be proud of its involvement in developing the Level 3 Certificate in Mathematics for Engineering.

### DCSF/DIUS STEM programme

Following an OFSTED report this summer into Design and Technology education in schools, the Academy has begun discussions with the Department for Children, Schools and Families (DCSF) about possible means of strengthening

Design and Technology education in primary and secondary schools.

The report, *Education for a technologically advanced nation: Design and Technology in schools 2004-2007*, recommended the creation of a national development plan to coordinate the necessary improvements to develop Design and Technology teaching, including improved training for newly qualified teachers in the use of machinery and computer-aided manufacturing equipment.

The report acknowledged that there is room for improvement, noting that the subject lacks strategic long-term planning and support.

### London Engineering Project

The national roll-out of the London Engineering Project (LEP), the Academy-led scheme which works to widen participation in engineering higher education, continues to gather pace, with the Higher Education Funding Council for England soon to appoint a university to act as a host institution for the national programme. Universities across England were invited to tender and a decision is expected by the end of 2008. Once the host university is appointed, the LEP will work alongside its sister projects in physics, mathematics and chemistry to enhance STEM education nationwide.

### Barrow Engineering Project

The Barrow Engineering Project (BEP) is up and running, and bringing STEM activities to school pupils in the north-west of England. A series of STEM activity days in Barrow schools has received acclaim from local teachers and more are planned for the future. Every school involved in the project has its own co-ordinator who chooses activities ranging from Young Engineers Clubs to home-grown, hands-on activities both in school and elsewhere, including a residential course for 60 students that will be taking place at the University of Lancaster in 2009.

Project leaders recently visited BAE Systems, a supporter of the BEP, and enjoyed a tour of the site after discussions

about how BAE systems can become more involved in the education of local students.

### Education for Engineering

A new partnership has been established, known as Education for Engineering (E4E) and convened by the Academy, which merges the *Shape the Future* programme with the Engineering Education Alliance. E4E will enable the engineering profession to provide a much clearer voice in all matters relating to education for engineering.

The *Shape the Future* programme was initiated in 2005 as a partnership of The Royal Academy of Engineering, the Engineering and Technology Board (ETB), engineering institutions, and a number of other STEM bodies to bring a much greater degree of coordination to the promotion of engineering to young people. One outcome has been the production of the STEM Directories, now published by the Department for Children, Schools, and Families (DCSF) and based on original work by the Academy.

The UK Government and the devolved assemblies now have policies for the promotion of STEM careers (including engineering) as well as policies on STEM teaching in schools and colleges.

With a constantly shifting STEM landscape, it has become increasingly important for the engineering profession to provide clear, consistent, and relevant views on education issues that affect the formation of future engineers and technicians. The science and maths communities are already well-placed through SCORE and ACME respectively and E4E will represent engineering in the same way. In the first instance, the role of Head of Secretariat will be filled on a part-time basis by the Academy's Professor Matthew Harrison.

Seeking opinion across the breadth of the engineering community, E4E will ensure that UK Government and the devolved Assemblies receive the highest quality advice on STEM education (with an emphasis as required on design, engineering and technology education) so the system produces people who are equipped to keep pace with technological changes in society.

## New website for LEP

The London Engineering Project, the Academy-led scheme which works to widen participation in engineering higher education, has launched its brand new website.

The new site, designed by NetXtra, experts in website design for the not-for-profit sector, worked on the project for six months after receiving an initial brief from the LEP team.

LEP outreach activities are featured on pages dedicated to teachers, students, ambassadors and partners. The site also has a useful resources section featuring case studies, the LEP's activities chart and its opportunities menu; a complete guide to the activities offered by the LEP. A section dedicated to the work in higher education institutes (HEIs) features research papers and reports produced by the Project and a constantly updated calendar shows the up and coming LEP activities programme.

The corporate partners, and industrial sponsors such as Transport for London, also feature on the website, outlining and explaining what involvement in the Project means to them.

Visit the new LEP website at:  
[www.thelep.org.uk](http://www.thelep.org.uk)



## Engineering Leadership Awards annual event

The annual event for the Engineering Leadership awardees took place at Robinsons College, University of Cambridge, in October 2008.

The Engineering Leadership Advanced Award Scheme provides financial and mentoring support to some of the most exceptional engineering undergraduates in UK universities and allows ambitious, inspiring engineering undergraduates – those who want to become leadership role models for the next generation of engineers – to undertake an accelerated personal development programme.

Awardees get the opportunity to acquire the skills needed to fulfil their potential, enabling them to move into an engineering leadership position soon after graduation.

Three cohorts of around 75 awardees met at the college for a weekend of talks, workshops, networking and demonstrations and, during dinner, the guests were treated to a talk by Academy Fellow and smart materials expert Professor Raymond Oliver FREng.

## Education News

### Academy launches scheme for hands-on Engineering Design

November 2008 saw the launch of a significant new programme in the field of engineering design education. The Visiting Teaching Fellows in Engineering Design is the Academy's latest offering from its engineering design education initiative.

The scheme involves placing practising industrial engineers, typically at the Chartered Engineer plus four years experience stage, in a teaching role within universities where they are able to complement the curriculum material with examples of the latest industrial engineering practice.

Each Visiting Teaching Fellow is expected to commit up to 10 days a year over a two year period to the host university, with 90% of the time being spent on student contact. This new initiative has been deliberately structured and focused to complement the established and highly successful Visiting Professor schemes which involve more senior industrial engineering design practitioners and currently run in 30 universities throughout the UK.

The 12 universities selected to take part in the pilot programme are: Aston, Cardiff, Durham, Edinburgh, Glasgow, Hertfordshire, Hull, Kent, Loughborough, Newcastle upon Tyne, Plymouth and Strathclyde.

### Executive Engineers Programme

Executive Engineers Programme scheme members convened at the Møller Centre, Cambridge, in October 2008 for their annual weekend event.

Participants in the scheme are graduate engineers and the objective of the programme is to deliver a challenging curriculum for accelerated professional development to chartered engineer status.

Some 51 young graduate engineers attended the event, with sessions on business, managing personal development, the management of technology, and leadership.

Trainers for the sessions were from local industry and the Cambridge Institute of Manufacturing; Academy Fellow, Mr Warren East FREng, spoke about leadership and industry at the after-dinner address.

## Fellows' visit: Bill O'Riordan's flight simulator

Academy Fellows gathered to test their flying skills at the Berkshire home of Professor Bill O'Riordan FEng. Professor O'Riordan has constructed a complex, fully functioning flight simulator, featuring state of the art electronics and cooling systems.

The flight simulator replicates the cockpits of a Beech Baron twin-engine airplane and a Robinson R22 Helicopter. Fellows were invited to become virtual pilots for a day in July. Much flying activity took place over London in the virtual helicopter and many attempts were made to land at London City Airport without demolishing the Millennium Dome or engaging in submariner activity in the river Thames.

One Fellow attempted and succeeded in landing a virtual plane at Lukla Airport in Nepal, which sits precariously on the mountainside near Mount Everest. This is an admirable feat for even the most experienced pilot.

Professor O'Riordan unveiled the latest innovations with his aircraft simulator. He recently designed, tested and fitted two state of the art graphical displays in a high-spec computerised cockpit, as well as fitting a Stormscope lightning detector. The displays operate with regular instrumentation and are unique



*International Fellow Fred Brooks practices his flying skills on the flight simulator*

in that they allow easy transition from analogue to digital. All three technologies were needed as Fellows were forced to fly through severe storms and over treacherous terrain.

Professor O'Riordan also revealed how he had overcome the major challenge of increasing the speeds of processors, memory, and graphics cards without any major financial outlay.

Professor O'Riordan intends to continue his work and arrange another Fellows' visit in 2009.

## Publications received

**The Stripline Circulator – Theory and Practice**, by Professor Joseph Helszajn OBE FEng FRSE; donated by the author.

**An Engineer in Peace and War: a Technical and Social History, Volumes I and II**, by Donald B Welbourn FEng; donated by the author.

**A Well Engineered Company: the Story of The Worshipful Company of Engineers**, by Commander Bryan Gibson MBE Royal Navy; donated by Air Vice-Marshal Graham Skinner.

**The Lives of Great Engineers of Ulster, Volumes II and III**, by Professor Sir Bernard Crossland FEng FRS and John S. Moore; donated by Professor Sir Bernard Crossland.

## Staff News

**Chris Atkinson** has joined the Academy as Assistant Editor, Publications. His previous role was as an in-house writer and editor at Erudine, a software company based in North Yorkshire.

**Pauline Stillman** has been promoted to the role of Senior Administrator, Professional Formation, with responsibility for supporting the Engineering Design Education portfolio.

**Iffat Memon** has joined the Academy to take on the new role of External Communications Manager. Previously, she worked in public affairs for a global PR agency in London.

**Misty Palmer** has joined the Academy as Assistant Manager, Research Programmes. Misty is completing a PhD on chemotherapy resistance mechanisms in childhood leukaemia.

**Dr Chris Coulter** has changed roles to Fellowship Manager, responsible for the Proactive Membership Committee, which seeks to provide nominations for Fellowship from under-represented areas.

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