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## Events point the way to a strong future

October proved to be a busy, successful and critically important month for the Academy. Two major events, the Hinton and the International Lecture, took place in the same week as the Academy moved to new premises at 3 Carlton House Terrace. This level of activity and the highly significant move are all part of the Academy's continuing goal to move engineering to the centre of society.

The 2007 International Lecture was a marked success. The speaker, Dr R K Pachuari, Chairman of the Intergovernmental Panel on Climate Change (whose award of this year's Nobel Prize, shared with Al Gore, was announced the following week), spoke at the event on 3 October at the Royal Institute of British Architects. Climate change is such a key issue that it was no surprise that over 400 people attended to hear Dr Pachuari. Prior to taking questions from the audience, he spoke on the pressing need for sustainable energy technologies to be found and for work to mitigate climate change. He asked what engineers, in particular, could do to prevent the types of natural catastrophes that are likely to occur if climate change is not addressed.

Little more than one week after the International Lecture, the Academy welcomed over 300 guests to the annual Hinton Lecture. Academy Fellow David Waboso, Director of Engineering at London Underground Ltd, delivered his lecture on *Building a World Class Tube for a World Class City*. As with Dr Pachuari at the International Lecture, Mr Waboso's superbly delivered lecture was extremely well received and it was followed by a first-class question and answer session.

Both the International and Hinton Lectures are hugely important dates in the Academy calendar. This year they took place either side of the move to 3 Carlton House Terrace, ensuring that the Academy immediately established itself on 'Academy row', delivering the kinds of topical events that are essential if it is to succeed in its mission to drive engineering to the centre of society. Our ambition to raise the Academy's profile can only have been enhanced by the successful move to the splendid new premises.

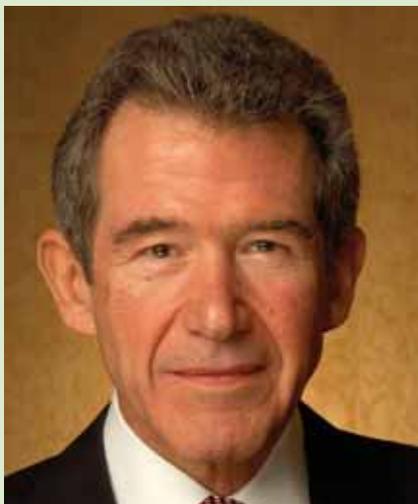
The International and Hinton Lectures were recorded live. To view them online, visit the Academy website and follow the relevant links.

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*David Waboso FREng  
delivering his speech  
at the Hinton  
Lecture in  
October.*



## The President's Column



Lord Browne

I recently opened the Academy's annual Research Forum, an occasion when Academy-sponsored researchers, sponsoring companies, research councils and Government meet and share views. It was a very encouraging reminder of the value to society of engineering research.

Engineers use their knowledge, experience and ingenuity to find solutions to problems and solving problems is a fundamental feature of progress. Engineering research is therefore primarily about progress – human progress in the effort to make a better world. I believe that engineering research must serve to address the key issues and great problems confronting the world today – problems such as the challenges posed by climate change and energy, poverty reduction, and health and welfare.

Confronting the changing global climate is the outstanding issue of the 21st century. The Academy should be at the forefront of this concern, leading debate, promoting policy and undertaking essential research. Virtually everything that uses energy to function or to generate power is an engineered product and similarly, products that reduce energy demand. The engineering profession is in a unique position to advise on the actions required to improve sustainability and energy efficiency and to accelerate the development of new energy efficient products. Professor Dennis Loveday,

the RAEng/E.ON Research Chair of Low Carbon Energy Technology is developing technology to reduce the carbon footprint of buildings, which account for more than one quarter of total carbon emissions. His work is featured in this newsletter.

The Academy promotes engineering research at a variety of levels and today we fund more incumbents than ever before. Our Research Chairs scheme operates at the highest level of academic research; here the aim is to attract the very best of internationally recognised research leaders into high profile and prestigious professorships. Industry helps to develop and co-fund each Research Chair and this scheme is one key method to draw more industry money into academic research.

A further and vital area of investment is in the next generation of engineers. The Academy's Research Fellowship scheme (co-funded with EPSRC) is our principal means to encourage the very best of young engineers to stay in academic research.

The scheme provides full funding for five years to give these young engineers the opportunity to pursue their own individual research projects, unhindered by other responsibilities. These Research Fellows are the engineering leaders of tomorrow and much of their work is already recognised as world class.

In today's globalised world, international cooperation and collaboration are vital to ensuring the continued prosperity of the UK. Here again I am happy to say that the Academy provides the opportunities through its research schemes to permit engineers to do research at leading international centres. Through the Global Research Awards scheme we have sponsored engineers from across the UK to work on key collaborations across the world, from Europe and the USA, to Australia, China, Russia and Japan. These collaborations have provided the opportunity to establish lasting research alliances between leading international institutions which will continue to bear fruit long after an individual secondment is completed. The Academy is further taking the initiative to encourage new research collaborations with India and China.

These two countries will undoubtedly be the powerhouses of the 21st century economy. The Academy's new scheme of researcher exchange will help maintain existing links and create new opportunities to work with these two great nations.

Underlying all these schemes and activities is my prime objective as President of The Royal Academy of Engineering – to move engineering from the periphery to the very centre of society. Engineering research has a key role to play in this. The adventure of research and the excitement of bringing new technology to bear on the global challenges of the day is one of the most satisfying aspects in an engineer's life.

### Meetings and Visitors

The President has recently met:

**Sir Anthony Bamford DL**  
Managing Director and Chairman,  
JCB Group

**Sir Anthony Cleaver Kt**  
President, The Engineering  
Technology Board

**Dr R K Pachauri**  
Chair, Intergovernmental Panel  
on Climate Change (IPCC)

## New Fellows' Dinner

On 5 November, the New Fellows' Dinner was held at the Drapers' Hall, London. The evening was attended by the President and the Senior Fellow, HRH The Prince Philip Duke of Edinburgh KG KT.

The dinner was preceded by the New Fellows' Briefing which, for the first time, took place in the Academy's new premises at 3 Carlton House Terrace. From here the new Fellows made their way to the Drapers' Hall where they were welcomed into the Academy by the President.

This year, the Academy invited 33 new Fellows to join the Academy. This includes two Honorary Fellows, Lord Rees of Ludlow, 2007 Honorary Fellow; Professor Calestous Juma, 2007 Honorary Fellow; and the Senior Fellow, HRH The Prince Philip Duke of Edinburgh KG KT.

HRH The Prince Philip Duke of Edinburgh KG KT delivered a speech welcoming the new Fellows to the Academy. He urged the Academy's new Fellows to undertake new challenges, make new achievements and to give their commitment to the Academy.

Rear Admiral Nigel Guild CB FREng, Chief Naval Engineer Officer and new Fellow gave a response on behalf of all the new Fellows. Picking up on The Duke of Edinburgh's theme, Rear Admiral Guild encouraged the new Fellows to consider how they could play a full part in the Academy's life. Paraphrasing JF Kennedy, the former American President, he said that new Fellows should, "Ask not what the Academy can do for you, but what you can do the Academy."

Rear Admiral Guild highlighted the importance of engineering in the Royal Navy, pointing out that about a third of its personnel are engineers. However, he noted that despite the centrality of engineering to the operational effectiveness of the Royal Navy, to the outside world engineers were largely invisible – a problem that can be seen in the engineering profession more generally.

Rear Admiral Guild suggested that engineers, "are not good at selling our point". The situation was not helped by the plethora of so many engineering institutions. He said that it was crucial for all of the engineering community to "pull



*Left to right: The President, Lord Browne of Madingley; Lord Rees of Ludlow, 2007 Honorary Fellow; Professor Calestous Juma, 2007 Honorary Fellow; and the Senior Fellow, HRH The Prince Philip Duke of Edinburgh KG KT.*

on the same rope". He added that the key to success was finding the "rope" on which everyone wanted to pull.

Rear Admiral Guild ended by saying that all new Fellows were honoured to have been asked to join the Academy, because the Fellowship was "the best of the best".

To view photographs taken on the night, visit the Academy website and go to the photo gallery section.

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## Academy Challenge

Four brave engineers will represent the Academy in early 2008 in *University Challenge: The Professionals* – the well known BBC2 television programme which is presented by Jeremy Paxman.

Our team captain is Dr Geoff Robinson CBE FREng, better known in the Academy as Chairman of the MacRobert Award Evaluation Panel. Joining him are Dr Eleanor Stride, RAEng/EPSRC Postdoctoral Research Fellow at University College London, Professor John McDermid FREng of the University of York, co-author of the Academy's report with BCS on Complex IT Projects, and Dr Ray Oliver FREng who was a member of the joint Royal Academy of Engineering/Royal Society working group on nanotechnology and nanoscience.

An added bonus of taking part in the programme is the welcome opportunity to

talk about engineering and the Academy's work as part of the introduction to the show.

The shows were recorded over the first weekend of December. The team is sworn to secrecy, but the result will be revealed when the show airs in Spring 2008!

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## Fellows' Welcome Event at 3CHT

On 26 November, the Academy welcomed over 200 Fellows to its new home. The Fellows were given guided tours and shown visualisations of the proposed Master Plan and displays from each Academy Department.

The event provided an excellent opportunity for Fellows to catch up with each other and speak with Academy staff about their work. The President warmly welcomed and thanked the Fellows for their generous support in achieving the move to 3CHT. He highlighted how we are now superbly placed to promote and present the huge contribution engineering makes to society and for 3CHT to be a forum for engineering excellence.

John Turnbull FREng congratulated the Academy on "a well organised and enjoyable event" while Professor Bill O'Riordan FREng echoed the views of many others by saying that the new building is "an impressive and proper home" for the Academy.

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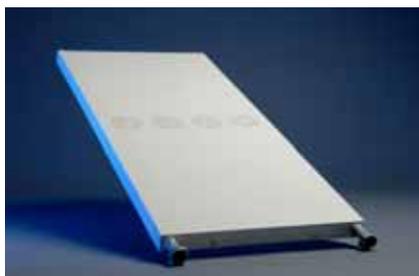
## Research News

### Professor helping to build a low carbon future

Professor Dennis Loveday is The Royal Academy of Engineering/E.ON Research Chair in Low Carbon Energy Technology at Loughborough University. Working in collaboration with Dr Harry Salt, and with assistance from Weatherite Manufacturing Ltd, the team has advanced the development of a prototype hybrid air-conditioning system comprising special ceiling tiles that incorporate evaporative cooling technology and can save up to 50% of the energy required by a conventional central air-conditioning system.

Loughborough University has developed the first prototype of this innovative space cooling technology. The approach is based on a false ceiling made up of individual cooling tiles. Within each tile is a wick surface that is maintained moist via a liquid distribution network. Air from the room is drawn through the tiles, passes over the wick, and cools the tile surface facing the room. This, in turn, removes heat from the room by radiation and convection.

Liquid is maintained below atmospheric pressure within the network, meaning that the system cannot leak or drip. There is no risk of legionella infection because there is no production of aerosolised water droplets – the evaporation process produces water vapour only – and the liquid is dosed with a biociding agent to eliminate the growth of any mould. The system is silent, odourless and has the potential to be installed, either as a retrofitted refurbishment, or new as part of a central air-conditioning system.



*The prototype hybrid air-conditioning system which Professor Loveday has been involved with.*

The system can operate as a hybrid with conventional air-conditioning, or in a stand-alone mode, for even greater energy savings. Patents have been awarded in Europe and the USA for the innovation, and the concept achieved finalist status in the Carbon Trust/*Sunday Telegraph* Innovation Awards of 2003.

Tile performance achieved in a laboratory-scale test room has been impressive, with energy savings of up to 50% having been measured for room-cooling loads typical of those found in modern commercial offices equipped with computing and IT facilities. The R&D team are now looking for companies prepared to trial a prototype system in a realistic setting, and to allow monitoring and testing of its performance.

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### Global Research Awards

The Global Research Award provides an opportunity for UK-based engineering researchers in industry or academia to travel on a research secondment overseas for up to one year.

Dr Paola Amaldi-Trillo of the University of Middlesex is seconded to the Eurocontrol Experimental Centre near Paris, France, to work on a research project, *An Investigation into system safety defences: The Case of Air Traffic Management in the European Air Space*. This is work to improve safe practice in air traffic management and the design of critical alarm systems for air traffic controllers.

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### Industrial Secondment Scheme

The Industrial Secondment Scheme provides funding to the UK Higher Education institutions to enable engineering teaching staff who have never had industrial experience or those whose industrial experience was some time ago, to gain first-hand exposure to current industrial and commercial practice with a view to improving the quality and industrial relevance of their teaching. Eight awards have been made since September

2007. The award holders and their host organisations are as follows:

- **Dr Kevin Stone** from the University of Brighton was seconded to High Point Rendel Ltd;
- **Dr Alberto Saiani** from the University of Manchester was seconded to Astra Zeneca UK Ltd;
- **Dr Mark Ryan** from the University of Birmingham was seconded to HP Laboratories;
- **Dr John Staggs** from the University of Leeds was seconded to International Paint Ltd;
- **Dr Patrick Naylor** from Imperial College London was seconded to SpinVox Ltd;
- **Dr Robert Ian Campbell** from Loughborough University was seconded to Charnwood Dynamics Ltd;
- **Dr Alton Horsfall** from Newcastle University was seconded to BAE Systems Submarine Solutions;
- and **Dr Ivana Kockar** from University of Strathclyde was seconded to TNEI Services Ltd.

There is no closing date and applications are accepted throughout the year. For more information visit [www.raeng.org.uk/research/univ/secondment/](http://www.raeng.org.uk/research/univ/secondment/)

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### Distinguished Visiting Fellowship scheme

The Distinguished Visiting Fellowship scheme aims to initiate and strengthen international relations and networking in engineering Higher Education. It provides funding to UK universities to enable academic engineering departments to be hosts for up to a month to Distinguished Visiting Fellows from overseas academic centres of excellence.

The deadline for the second round of applications was 31 October 2007. There were 11 awards made at this round. Forty five percent of the Distinguished Visitors were from the USA, the remaining were from Germany, Denmark, Belgium, Russia, Taiwan and Australia.

The award holders and their host organisations are as follows:

**Professor Janice Barton**  
The University of Southampton

**Professor Marios K Chryssanthopoulos**  
University of Surrey

**Dr Slobodan Djordjevic**  
University of Exeter

**Dr R W Field**  
University of Oxford

**Professor David Graham**  
Newcastle University

**Professor Bernard Hon**  
University of Liverpool

**Dr Julian R Jones**  
Imperial College London

**Professor Haroun Mahgerefteh**  
University College London

**Professor Stephen Marshall**  
University of Strathclyde

**Dr Max Migliorato**  
University of Manchester

**Dr Pagona Papakonstantinou**  
University of Ulster at Jordanstown

For more information on the awards visit  
[www.raeng.org.uk/research/researcher/dvfs/award\\_holders.htm](http://www.raeng.org.uk/research/researcher/dvfs/award_holders.htm)

For more information about the scheme visit  
[www.raeng.org.uk/research/researcher/dvfs/](http://www.raeng.org.uk/research/researcher/dvfs/)

The deadline for the first round of applications in 2008-2009 is 30 June 2008.

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## International News

### CAETS Convocation

In late October, an Academy delegation led by Peter Saraga FREng, Honorary International Secretary, attended the 17th Convocation of the International Council of Academies of Engineering and Technological Sciences (CAETS) in Tokyo. The Convocation is a biennial event which provides a valuable opportunity for engineering academies from around the world to strengthen ties and discuss topics of mutual concern. This year's theme, 'Environment and Sustainable Growth', attracted considerable interest and more than 270 delegates from 22 countries participated in the meeting.

The Academy was well represented, with Dr John Roberts CBE FREng and Professor



*Peter Saraga FREng (centre) with Keith Davis (second from left) and Hayaatun Sillem (fourth from left) and colleagues from The Engineering Academy of Japan at CAETS in Tokyo.*

Roland Clift CBE FREng delivering excellent presentations on the outlook for energy resources and sustainable consumption and equitable supply chains, respectively. A wide range of topics were addressed by speakers from other countries, including climate change projections, environmental protection in China, sustainable development in North America, the status of nuclear energy in India, and noise as a constraining factor in 21st century urbanisation.

The Convocation was followed by a CAETS Council meeting at which a statement on Environment and Sustainable Growth was agreed by all member academies. The statement can be found at [www.caets.org](http://www.caets.org)

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### Launch of RCUK China office

On 29 and 30 October, the Secretary of State for Innovation, Universities and Skills, John Denham MP, officially opened the Research Councils UK office in China, the first of its kind outside Europe. The President, Lord Browne, was one of the guests of honour at the opening ceremony and gave a short address welcoming the establishment of the office and underlining the need for engineers and scientists from around the world to work together to tackle major global challenges such as climate change. Philip Greenish also participated in a panel discussion at the launch event, during which he emphasised the importance

of interdisciplinarity and the role of engineers in knowledge transfer and wealth creation.

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### DFID's Research Strategy

In September, the Academy submitted a response to the Department for International Development's (DFID's) consultation on its Research Strategy for 2008-2013. This Strategy will guide the Department's future spending on research, which is forecast to reach £220 million by 2010.

This is the first time that the Academy has responded to a consultation by DFID and reflects the growing interest within the Academy in the contribution that engineers can make to reducing global poverty. In its response, the Academy highlighted the breadth of this contribution and the relevance of engineering and technology to each of DFID's priority research areas: killer diseases and healthcare; governance; climate and environmental change; and sustainable agriculture.

The Academy also urged DFID to undertake research to address new topics such as the impending depletion of natural resources and the opportunities presented by the increasing availability of more powerful, cheaper computers, as well as calling for a more holistic approach to building research and technical capacity in the developing world.

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## Policy News

### Systems Biology and Medicine

The third annual lecture of the UK Focus for Biomedical Engineering, *Systems Biology and Medicine: from reactive to predictive, personalised, preventative and participatory (P4) medicine*, was given by Dr Leroy Hood on 13 November.

Dr Hood is President of the Institute for Systems Biology in Seattle and is considered a pioneer in promoting an engineering approach in biology and medicine. He spoke of his experiences in challenging traditional research centres to become multi-disciplinary and of the problems he faced in commercialising his research. His group is currently working on identifying protein markers in the body that can be attributed to the presence of a certain disease. The research focuses particularly on prion disease, which causes BSE and CJD in animals and humans.

Dr Hood predicted that the systems approach will lead to a revolution in medicine, where we can predict an individual's predisposition to particular diseases and personalise their healthcare. In addition, systems medicine and its digitalisation will reverse the trend of ever-increasing healthcare costs so that P4 technology can be exported to the developing world.

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### From Engineering Research to Practical Healthcare

The Academy has long recognised the potential for wealth creation and healthcare improvements arising from engineering research. On 29 October the Academy hosted an event with the Wellcome Trust highlighting a range of issues concerning the translation of research to commercial applications.

Lord Darzi HonFREng, Parliamentary Under Secretary of State to the Department of Health, gave the keynote address on innovation in clinical practice. Sir Alfred

Cuschieri identified the opportunities and challenges of disruptive biotechnologies, emphasising the need for new interfaces between medical science and engineering research. Professor Christofer Toumazou gave an animated presentation on the use of non-medical technologies for healthcare applications, particularly for novel disposable devices. Professor Tony Unsworth provided a personal experience of the road to commercialisation, highlighting problems caused by patents, clinical trials and regulations. Professor Chris Taylor talked about imaging informatics (obtaining clinical information from medical imaging) and its applications. Dr Glenn Wells gave an overview of funding available from the Wellcome Trust.

The event showed that the challenges in translating engineering research into commercial healthcare can be partly overcome through innovation and better access to funding sources.

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### Philosophy of Engineering

The contrasting disciplines of Engineering and Metaphysics met in an interesting meeting on 5 September. Professor Peter Simons from the University of Leeds, spoke about how ontology, the study of the basic categories of existence, yields conceptual clarity and rigour that can be of benefit to engineering, especially the engineering of complex artifacts. Dr Hasok Chang of University College London, spoke on the notion of the boiling point of water – noting that engineers and physicists have different attitudes on whether this point is constant. He attributed this to their different methodological concerns. Finally, Dr Luciano Floridi of the University of Oxford argued that the maker of an artifact can have greater and deeper knowledge of it than the theorist who merely describes it.

The philosophy of engineering is a growing discipline. The first international workshop was held in Delft from 29 to 31 October. Dr Natasha McCarthy, Policy Advisor at the Academy, gave the opening talk. It is hoped that this will be the first in a series of workshops and that the Academy will continue to be involved in them.

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### Carbon Capture and Storage

The Academy, in conjunction with the Royal Society and the International Energy Agency's Coal Industry Advisory Board, hosted a two day workshop on carbon capture and storage. It was held at the IEA's central offices in Paris on 7 and 8 November.

This was an international event with speakers from Europe, the US, Canada, Australia, China, India and Japan. It was attended by over 100 delegates representing industry, academia and government. All aspects of CCS were covered from the general context of climate change and security of energy supplies to current global activities.

The main conclusions drawn from the workshop were that, given the abundance of coal reserves, particularly in China and India, CCS represents one of few options for tackling global warming while maintaining secure electricity supply and economic growth in developing countries. The urgency of the situation was highlighted – with no full scale demonstration plant likely to be in operation until at least 2012 there is need for a globally co-ordinated raft of pilot schemes to test the viability of the technologies at a commercial scale. It was also made clear that other issues would need to be addressed in parallel, such as the policy, legal and regulatory frameworks, matching of potential storage sites with the infrastructure, and of public engagement.

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### Industry and Academia

The Academy, in association with Cardiff University, held its sixth Industry Academia Interactions Regional Seminar in Wales on 16 November. With the generous support of the Welsh Assembly Government, through the Knowledge Exploitation Fund, it was possible to conduct the seminar simultaneously in Cardiff and St Asaph in North Wales with a video link. Around 150 delegates in Cardiff and 50 in St Asaph engaged in presentations and discussion on how to improve universities' interactions with SMEs.



The sixth Industry Academia Interactions Regional Seminar in Cardiff, complete with video link to St Asaph in North Wales.

Cogent Power, a producer of electrical steels, used academia to keep abreast of developments in materials science. This demonstrated a traditional industry in Wales taking the technology route to maintain market competitiveness. Vision Support is the trading arm of a charity providing transcription services for blind people. It worked with Bangor University which provided IT solutions to reduce labour-intensive copy typing in transcribing documents into Braille and other media, winning the top prize at the Knowledge Transfer Partnerships 2007 Awards. RUMM Ltd produce remote energy management solutions and started as a spin-out from Glamorgan University. RUMM benefits greatly from the incubator space the University makes available to them.

Wales is keen to develop as a knowledge-driven economy and the Welsh Assembly Government sees universities as key to this.

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## Response to Responsible Nano Code

The emergence of nanotechnologies is often perceived as posing new threats, with their benefits potentially representing future problems. To manage these unknowns, the Royal Society, Insight Investment, the Nanotechnology Industries Association and the

Nanotechnology Knowledge Transfer Network drafted a voluntary code for businesses using nanotechnologies.

The Academy welcomed the code's aspirational, voluntary nature – organisations should be encouraged to commit to responsible practice, rather than simply being punished for bad practice. However, the key message of the Academy response was that there is no need for a novel approach to managing nanotechnology risks. Good risk management processes are designed to deal with all unknown risks – the uncertainty surrounding nanomaterials is not an unusual form of uncertainty. Likewise, where the code requires stakeholder dialogue, the response was that there should always be debate with stakeholders when there are risks. Singling out nanotechnology could have the effect of encouraging alarm instead of debate.

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## Response to Planning for a Sustainable Future

A response was submitted to the Department of Communities and Local Government's consultation following their White Paper, *Planning for a Sustainable Future*. The White Paper sets out proposals for reform of the planning system designed to improve speed, responsiveness and efficiency in land

use planning. Central to the proposals is the intention to produce national policy statements for significant infrastructure projects, particularly in the energy, waste and transport sectors.

In response, the Academy agreed that the overall package of reforms should achieve the objectives of clarifying the decision making process, streamlining the procedures, improving public participation and, most importantly, providing greater certainty for promoters and hence investors in major infrastructure projects.

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## Response to the Future of Nuclear Power

The Government's public consultation process on the future of nuclear power continued with a consultation by the Department for Business, Enterprise and Regulatory Reform, *The Role of Nuclear Power in a Low Carbon UK Economy*. The consultation sought views on the information and arguments set out on whether the private sector should be allowed to build new nuclear power stations.

The Academy's response was drafted by Fellows with particular expertise in the nuclear industry and then widely circulated amongst the Fellows for their comments. All those who responded agreed with the Academy's position of supporting a programme of new nuclear power plants in the UK. Overall, the Academy concluded that nuclear power has a crucial role to play in the UK's electricity generating capacity if the UK is to maintain a secure and affordable electricity supply, while simultaneously reducing emissions of carbon dioxide in line with the Government's aspirations.

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## Correction

In the Autumn 2007 issue of this Newsletter, the date of death of Mr David Shore OBE FRAEng was incorrect. He in fact passed away on 7 July 2007. We would like to offer our most sincere apologies for this mistake.

## Education News

### New Visiting Professors appointed

The Academy has recently sponsored two new Visiting Professors as part of its hugely successful link scheme between participating universities and industry. Several more are in the pipeline.

Professor David Horsley will act as Visiting Professor in Integrated System Design at Newcastle University, introducing the subject area into the undergraduate and postgraduate curricula. Recently retired from BNFL, Professor Horsley is currently an independent consultant.

At Newcastle, he will develop two new modules for inclusion into stages II and IV of the undergraduate degree programmes in the Engineering Schools of the Faculty of Science, Agriculture and Engineering. The new modules will also be available for incorporation into selected existing and new MSc programmes.

Professor Horsley, who will be working out of the Newcastle Engineering Design Centre, has received enthusiastic support from Peter Norman, Director of the Engineering Design Centre at Newcastle University, and Professor Oliver Hinton, the Provost of the Faculty of Science, Agriculture and Engineering at Newcastle.

At the University of Bristol, the Academy has sponsored the appointment of Professor Peter Bull from Arup to lead the creation and delivery of two teaching units known as Engineering the Built Environment 3 and 4 which are optional for third or fourth Year undergraduate students.

Systems Engineering, founded on the Academy's publication *Creating Systems that Work*, provides an academic grounding for the process integration required and an introduction to an area of practice, research and enterprise that is developing rapidly across a wide range of industries.

Patrick Godfrey, Professor of Systems Engineering and Director for the EngD Centre in Systems at the University of Bristol and the University of Bath says,

"These Built Environment courses are founded on the success of our Design Degree, our Civil Engineering Systems units and our new EngD in Systems which already has 25 Research Engineers. Academy, Industry and EPSRC sponsorship and support combined with substantial practitioner experience in the teaching and research are essential to these innovations. They are entirely consistent with the Faculty's purpose which is Engineering for a Sustainable Society."

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## Council News

Council held its fourth meeting of the year on 15 October, this was the first meeting to be held in the Academy's new premises at 3 Carlton House Terrace. Council approved a number of actions to implement the recommendations of the Membership Study Group. These included: a number of changes made to the Academy's regulations in order to define Council's responsibilities for the membership process more closely; revised terms of reference for the Membership Committee were adopted; Dr Ian Nussey OBE FEng was appointed to be the first Chair of the Proactive Membership Committee; and targets were agreed for the Proactive Membership Committee to aim to achieve.

Sir Peter Gershon CBE FEng, Chair of the Membership Study Group, attended Council to present the plans for implementing recommendations in regard to International Fellows. These included the rationale for appointing International Fellows, the requirements for election, the process of election, the establishment of a Proactive International Fellowship Group and the need to increase the number of International Fellows. Council approved the recommendations and called for an implementation plan to be prepared.

Council discussed the joint Academy and Engineering and Technology Board report entitled *Public Attitudes to and Perceptions of Engineering and Engineers 2007*. The view of Council was that the report would be used to inform activities in terms of ways to engage the interest of young people, and would provide an excellent baseline from which to measure future progress.

Philip Greenish reported on the move to 3 Carlton House Terrace. The move had been accomplished very smoothly and staff are settling happily into their new home. The cost of the move was substantially less than had first been estimated, this was largely due to the ease with which the former premises had been disposed of. The Master Plan for the new building is being developed and it will be vitally important for the Academy to maintain firm control of costs in order to stay within its fundraising targets.

Mr Greenish also reported the outcome of the Comprehensive Spending Review 2007 (CSR2007). Council concluded that, under the circumstances of tight spending restrictions, the settlement for the Academy was very good. Further details on CSR2007 are contained on the opposite page.

Council approved a change in the definition for the awarding of the Silver Medal in order to aim the award at a younger age group of engineers.

Council considered the report *Implementing Diversity Policies: Guiding Principles* which had been published jointly by the Academy, Equalitec and Roehampton University. The report identifies the need to attract more women into engineering and the need for exemplar companies to be identified to illustrate career paths for women in engineering. The Academy intends to be active in this area and will be looking for volunteers in the Fellowship to take the work forward.

Sir Duncan Michael FEng attended Council to present ideas on the possibility of organising a great exhibition of *Engineering in the 21st Century*. He explained that such an exhibition needed to capture the public's interest and imagination, should cover the whole field of engineering and that exhibits should be sourced globally. The Arup Group had generously agreed to fund a feasibility study and the preparation of a proposal. Council formed the view that this was an excellent idea that should be pursued and gave Sir Duncan its wholehearted support.

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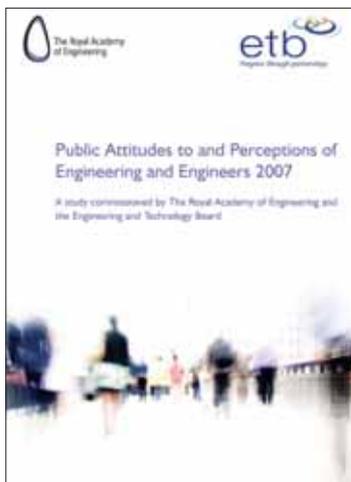
## Public Engagement

### The Public Face of Engineering

The Academy and the ETB recently published a report entitled *Public Perceptions of and Attitudes to Engineering and Engineers*. The findings provide a UK-representative picture of public knowledge and views of engineering and engineers as well as establishing a solid baseline measurement against which to track changes and measure impact. In addition, a series of focus groups explored why such perceptions existed. Together the results will help to inform the Academy's communication action plans.

The research outcomes verify that there is very limited public awareness of the nature and scope of engineering and its impact on society. Evidence suggests that this is due to the common use of the term 'engineering' to describe repair and maintenance work, coupled with a lack of exposure to the creative, problem-solving and innovative side of the profession. Young people in particular have a limited understanding, with six out of ten 16 to 19 year-olds stating that they know 'very little' or 'not very much' about engineering.

This climate of misunderstanding and misperception creates barriers for the UK engineering sector to flourish. However, the report shows that people do feel positive towards the profession, and consider engineering to make a good contribution to society.



Re-imaging engineering is achievable, especially given that there is general indifference in society towards engineering rather than hostility. Furthermore, the focus group research reveals that increasing awareness of contemporary engineering positively impacts on perceptions and attitudes.

The Academy is currently exploring how to complement existing educational programmes with activities that focus on sparking a much wider awareness and interest in people of all ages and walks of life, and to begin to change the public face of engineering.

Researched by the British Market Research Bureau (BMRB), the report can be downloaded from: [www.raeng.org.uk/pa](http://www.raeng.org.uk/pa)

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### Comprehensive Spending Review 2007 (CSR2007)

The long process of the Comprehensive Spending Review, which had lasted well over a year, ended on 9 October 2007 when the Secretary of State for Innovation, Universities and Skills announced the allocation. The amount of Grant-in-Aid allocated to the Academy will increase from £9.752 million in 2007/08 to £10.279 million in 2008/09, £12.138 million in 2009/10 and £12.826 million in 2010/11.

All existing programmes will continue with an overall increase in Grant-in-Aid of 5% per annum. There will be above average increases in expenditure on Research Chairs and Research Fellowships, mostly to cover the higher per-capita cost under the new Full Economic Cost regime. This has the effect that several other programmes will have to be managed on a flat cash, or reduced cash, basis.

The Academy was pleased that its bid for funding for the Engineering Leadership Scheme was accepted. The scheme will make about 300 Leadership Awards and 30 Advanced Leadership Awards each year. These are targeted at high quality engineering undergraduates with the aim of 30% being awarded to women engineers by 2011.

### APEG update

Some 2,300 years ago, Aristotle, the Greek philosopher and tutor of Alexander the Great, remarked that, "the fate of empires depends on the education of youth." Education and skills remain important drivers of prosperity today.

It was apposite, therefore, that APEG's first event of the autumn focused on education and skills. Barry McGregor, the National Specialism Coordinator, Engineering Colleges, Specialist Schools and Academies Trust, gave a lively presentation on engineering specialist schools. He showed how engineering was incorporated into all aspects of the curriculum and how children in engineering specialist schools and colleges were inspired by the approach.

Lyn Tomkins, Director of Policy at the Sector Skills Council for Science, Engineering and Manufacturing Technologies (SEMTE), highlighted the problems of skill shortages and skill gaps in the engineering sector. However, she argued that the increase in apprenticeships, the development of the engineering diploma and the increasing commitment of employers to training were encouraging signs.

APEG has a full programme of events lined up for 2008, for further details on this and more about APEG, please see: [www.apeg.org.uk](http://www.apeg.org.uk)

In addition, funding for a new programme called UK International Fellowships was accepted. This scheme was proposed jointly by the Academy, the Royal Society, the British Academy and Research Councils UK. The Fellowships will allow researchers to carry out research in the UK for up to two years. The scheme will start in 2009/10 with funding of £1.305 million going to the Academy which will increase to £1.408 million in 2010/11.

Given the circumstances and general expectation of a very tight financial regime surrounding the spending review, the Academy considers that the settlement was very good

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## Education Programmes

### Diploma in Engineering

Mark Yelland, recently Deputy Head at the London Nautical School, has joined the Academy education staff as Project Director for the new 14-19 Diploma in Engineering.

Mark's role is one of leadership. He is tasked with the successful launch of the Diploma in Engineering in Southwark and Lambeth, one of the highest profile pilots for this new engineering qualification that is designed to be delivered by partnerships of schools, FE colleges and universities.

There are numerous steps necessary for a successful launch. Chief amongst them are the choice of exam board, the development of learning materials, recruiting students to the programme, the training of teachers, the organisation of joint timetabling between schools and the tracking of student progress and attainment.

This is a big challenge and an exciting one. Mark is well supported by Gatsby Charitable Foundation funding as well as significant resources from the Learning and Skills Council.

### Best Programme

The Academy's settlement under the 2007 Comprehensive Spending Review is discussed elsewhere, but it brought particularly welcome news for the Best Programme. The Academy has been awarded nearly £1m over three years to enhance its provision of support to engineering undergraduates in the form of an Engineering Leadership scheme.

Building on the success of both the Engineering Leadership Awards scheme and the Undergraduate Programme, the new provision will make up to 30 advanced awards and up to 300 standard awards per year. The advanced awards will be used to identify a cadre of very high ability engineering undergraduates, both men and women, and to raise them as the role models and leaders of their generation. The aim is to retain these very best engineers in the profession

and to use them to influence the future prosperity of engineering in the UK.

The basis of an advanced award is to provide rich support to engineering undergraduates over three years. This support takes the form of:

- help in constructing a personal development plan;
- one-to-one mentoring (provided by Sainsbury Management Fellows);
- a £5000 development fund to be spent in accordance with the personal development plan (and with the approval of staff at The Royal Academy of Engineering);
- and an annual training weekend.

A standard award will give engineering undergraduates access to training and development courses to ensure that they receive aspects of the rounded engineering education that might not be available to them through their university course.

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### London Engineers roll up to be role models

EDF Energy's Director of HR and Communications, Patrick Clarke, has spearheaded a campaign for the LEP that asked London scientists and engineers from black and minority ethnic backgrounds to give up a day each year to encourage the next generation to get involved in the profession.

The LEP teamed up with specialist PR company, Communitas, and the call-to-action has resulted in some 50 professional engineers signing up as LEP role models. The volunteers will all undergo training by science, technology, engineering and maths network, STEMNET, and then take their expertise into LEP schools to pass on their vast knowledge and experiences.

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### LEP schools go green

In October, students from LEP Young Engineers clubs at St-Martin-in-the-Fields High School for Girls, St Saviour's and St Olave's School, Bacon's College and Bow Boys School attended the Greenpower National Final at the world-famous Goodwood Motor Circuit.

Greenpower is a company dedicated to promoting engineering and technology careers to pupils during their school life. They do this through an exciting hands-on project to design, build and race an electric racing car.

All of the students got the opportunity to go around the pit lanes and paddocks and to meet other Greenpower teams, LEP schools and Young Engineers Clubs to share their experiences and watch the spectacular races.

When Bacon's College and Bow Boys School register with Greenpower, this will bring the total number of LEP schools entering to nine. The LEP therefore hopes to hold its own LEP Grand Prix next summer for the nine schools to race prior to the regional Greenpower events. Phillip Watson of St Martin-in-the-Fields Girls School said of the event, "The day was excellent – it really gave us a boost and the students are now totally committed!" Similarly, Rukia Begum from Bow Boys High School said, "The students definitely enjoyed the Greenpower final on Sunday... the boys have been bugging me about when they can start building their car!"

One of the other activities on the day, organised by Young Engineers, was a competition to build the tallest tower possible from K'Nex in 25 minutes. Along with this, the tower also had to be able to hold a can of cola for 10 seconds.



Going Green – electric car racing at Goodwood.

After several attempts by lots of different schools, the winners were two girls from St Saviour's and St Olave's School who managed to build their tower to a height of 3.2 metres.

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## Treb-tastic!

To celebrate Enterprise Week (12-18 November), The Smallpeice Trust held a week of fun and innovative workshops for teenagers from LEP schools. The workshops took place in the vaults at the Tower of London and were hosted by the Royal Armouries.

Coordinated by the LEP's Smallpeice Trust fieldworker, Ahmed Kotb, 250 students were invited for the week to devise and make a trebuchet (a medieval catapult of surprisingly cunning design) and develop a marketing strategy to then sell their creations.

Judging criteria for the competition focused on the technical accuracy of the trebuchet and how far a fired projectile would travel. At the end of each day, the winning students were presented with a trophy for their school and medals for each team.

Among the schools taking part were Central Foundation Girls School, Little Ilford School, St Martin-in-the-Fields High School for Girls, Mulberry School for Girls and Harris Academy Bermondsey.

On Women's Enterprise Day (14 November), the Trebuchet Challenge was won by St Martin-in-the-Fields High School for Girls and was watched by many prominent members of the engineering industry. Among the guests were Deborah Lazarus, Chairman, IStructE Educational TRust; Paul Lehmann, Tubelines; Val



The winners of the Trebuchet Challenge on Women's Enterprise Day.

Simmonds, The Learning Grid; and Dave Rowley from The Royal Academy of Engineering who has been pivotal in the national *Shape the Future* campaign.

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## LEP Young Engineers club among best in the country

In September, St Saviour's and St Olave's School for Girls were selected to represent London in the Club Challenge and Club Showcase at the Young Engineers Annual Celebration of Engineering held at the Old Royal Naval College in Greenwich.

The club at St Saviour's School has only been running for a few months, so to represent London at such an early stage is a great achievement in itself.

Only 12 clubs from around the country were selected to represent their region, making the St Saviour's School club the top club in London. Four girls were chosen to represent the club, showing off the engineering activities in which they had taken part.

On the day, they had to display all of their work in their team booth and answer questions from the Young Engineers club judges.

The Young Engineers club of the year title and trophy went to Kingston Grammar School, but the St Saviour's girls said they had thoroughly enjoyed the event and were hoping to return to next year's final.

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## Shape the Future – The Big Draw

This year saw the first focus on engineering on the Big Draw menu with over 20 initiatives that engaged with the *Shape the Future* 'Designing for Sustainability' challenge. Schools, community groups, charities and local attractions all signed up to offer the challenge with the promise of prizes for the most innovative entries. The month of October saw many hundreds of Big Draw events around the UK urging and inspiring

young and old to pick up their paints, pencils and sketching implements and get drawing.

National Trust sites, the sustainable schools network in the midlands, primary schools in Cornwall, the ss Great Britain and the Fleet Air Arm Museum were amongst the variety of hosts that supported the *Shape the Future* Big Draw campaign. The campaign aimed to promote the importance of engineering and technology in society in a different way.

The Academy will be jointly hosting, with the Royal Society, the celebration of the Big Draw awards during National Science and Engineering Week 2008 (7-16 March). On 12 March there will be displays of the winners' projects at the Academy. On the same day at an event next door at the Royal Society, there will be a presentation of the Big Draw awards.

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## Obituaries

**Professor John Stuart Archer CBE FREng FRS** died on 9 December. At the time of his death he was Principal and Vice-Chancellor, Heriot-Watt University.

**Mr Frank Geoffrey Johnson FREng** died on 19 November. Prior to his retirement he was Head of Engineering, North of Scotland Hydro-Electric Board.

**Academician Konstantin V Frolov FREng** died on 18 November. The International Fellow was Vice President, Russian Academy of Sciences.

**Professor Brian May FREng** died on 17 November. He was Development Adviser and Emeritus Professor, Cranfield University.

**Sir John Rix MBE DL FREng** died on 13 October. Prior to his retirement he was Director, Victorian Cruise Lines Ltd.

**Professor Peter Otto Wolf FREng** died on 6 October. Until this time he was Consultant and Emeritus Professor at City University.

**Mr John Edward Wood OBE FREng** died on 27 October. He was formerly Area Director of British Coal.

## Events

A full list of all forthcoming events is now to be found in the new Forward Planner which has been enclosed in this Newsletter. These listings can also be found online at [www.raeng.org.uk/events](http://www.raeng.org.uk/events)

## Publications Received

### Freedom to Innovate - Biotechnology in Africa's Development – Report of the High-Level African Panel on Modern Biotechnology

By Professor Calestous Juma HonFREng FRS and Ismail Serageldin. Donated by Professor Juma.

### Innovation: applying knowledge in development

Lead Authors – Professor Calestous Juma HonFREng FRS and Lee Yee-Cheong. Donated by Professor Juma.

## Staff News

**Antoinette Carey** has become Development Administrator/Researcher. Previously she worked for the exam board Edexcel as a Technical Support Officer, providing technical and statistical support for the exam cycle.

**Bernadette Benati** has joined the Development Department as Head of Donor Relations. Her prior experience is in raising major gifts, which she has achieved at The London School of Economics and more recently at The Zoological Society of London.

**Helen Berrington** has joined the Academy as Assistant Manager, Events. Prior to this appointment she was an Events Coordinator at the Royal Society of Medicine.

**Leval Houghton-James** has joined the London Engineering Project team as the Project Assistant through the TRISSET (Year

in Industry) programme. Leval recently finished his education at an LEP school – Forest Hill School in Lewisham – and after his year out with the LEP, he hopes to continue his studies in engineering.

**Mark Yelland** has joined the Academy as Project Director for the new 14-19 Diploma in Engineering. See page 10 for more details.

## Win whisky and wine at the New Year Reception

The 2008 New Year Reception will once again involve a raffle. This year, two extremely attractive prizes are on offer. Tickets for both are available to Academy Fellows and staff only.

The first of the prizes is a vintage bottle of Chateau Petrus (1950) red wine which was won at last year's raffle by Sir Denis Rooke FREng, but very kindly re-donated for the raffle. This wonderful bottle of Bordeaux red is currently worth over £1,000.

The second prize on offer has been kindly donated to the raffle by Ian Ritchie FREng. It is a bottle of Strathisla 1973 single malt whisky (see picture) from the oldest distillery in Speyside which, according to the Scottish Malt Whisky Society, is 'an outstanding dram'.

Raffle tickets for the wine cost £10, whilst those for the whisky are £5 and all proceeds will go to the Academy's Development



Appeal. Tickets can be purchased at any time before the event or on the day itself.

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## News of Fellows

**Dr Martin Barnes** has been given the Spirit of Telford Award by the Institution of Civil Engineers.

**Lord Browne of Madingley** has been awarded an Honorary Doctorate from Imperial College London.

**Peter Davidson** has been made the Senior Innovation Advisor for the Department for Business, Enterprise and Regulatory Reform.

**Patrick Head**, Technical Director of Williams GrandPrix Engineering Ltd, won the John Bolster award at the Autosports Awards in December.

**Donald Heughan**, Honorary Fellow and initiator of the MacRobert Award, has arranged for Sir Richard Wakeford's 1987 President's Medal to be put on show at the MacRobert Trust's centre at Douneside House.

**Professor Terence Langdon** won the 2007 Albert Sauveur Achievement Award from ASM International.

**Sir Maurice Wilkes** has won the IEEE Computer Society 60th Anniversary award for seminal contributions to the discipline of computing.

**Professor Richard A Williams** received the Thomas Edison Award for Innovation for his work in creating a trans-national innovation in healthcare technologies between the US and UK.

**Professor Olgierd Zienkiewicz CBE** has been given an honorary degree as Doctor of Engineering by the University of Glasgow.

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