



## Addressing Global Grand Challenges

In July, the third biennial Global Grand Challenges Summit took place in Washington DC. It focused on inspiring the next generation of engineers, policymakers and the public to address the big issues facing current and future generations, as outlined in the UN's Sustainable Development Goals (SDGs).

The event was jointly hosted by the US National Academy of Engineering, the Chinese Academy of Engineering and the Royal Academy of Engineering and focused on the grand challenges facing the world that engineers can help address, including sustainability, health, public engagement and education.

The summit's first session included a keynote address from Dr Rajiv Shah, President of the Rockefeller Foundation and former Head of USAID, who called on engineers to be proud of their expertise and to speak out on policy issues. Dr Deng Zhonghan, CEO of Vimicro, discussed sustainable digital business models in cities, and how bicycles are making China smarter.

Past President Lord Alec Broers FREng FRS, a member of the original Global Grand Challenges committee, stated that while the programme was founded almost 10 years ago, the challenges map directly onto the SDGs and remain as relevant today as they were then.

At the Academy-led workshop on healthcare, the UK's Chief Medical Officer, Professor Dame Sally Davies DBE FRS, urged engineers to engage with the complex challenge presented by antimicrobial resistance. Professor Molly Stevens FREng, Head of the Stevens Group at Imperial College London, discussed how biomaterials are fundamentally changing healthcare, with collaboration across disciplines enabling new materials to replicate tissue.

Professor Ding, Senior Advisor to the China Meteorological Administration, opened a workshop on sustainability by presenting graphics that showed Shanghai underwater after a two- and four-degree temperature rise. Professor Wu, Vice President of Tongji University, focused on the grand challenge of urbanisation, stating that by 2050, 80% of Chinese people will live in cities.

Baroness Martha Lane Fox CBE, founder of lastminute.com and the youngest female member of the House of Lords when she joined in 2013, discussed digital inclusion and her fears that the internet is not the open space it always promised to be.

The final session featured panel discussions on education and public engagement, and participants debated the importance of equipping the next generation of engineers with not just technical skills, but with the engineering habits of mind. Senator Tim Kaine, Deanne Bell, engineer and presenter of TV show *Make Me a Millionaire Inventor*, and Dean Kamen, inventor and founder of FIRST Global, favoured engineers entering politics but emphasised the importance of keeping their engineering identity.

The speakers were joined at the summit by over 500 student leaders, some of whom took part in a Student Business Competition to pitch design solutions to tackle one of the grand challenges for engineering (see page 11).

Dr John Lazar CBE FREng, Royal Academy of Engineering lead on the Summit Advisory Committee, said: "It is impossible for a society to make progress without sufficient investment and innovation in the technology and infrastructure we rely on so heavily. In short, lack of engineering capacity hinders economic and social development. The good news is that there is a will, the world over, to change this and invest in engineering to achieve sustainable development.

"A decade ago, the US National Academy of Engineering set us on a new path to thinking about how engineering can help us make progress towards those goals. The grand challenges that were drawn up now drive engineering students across the world to focus research, innovation and collaboration on these themes, and the discussions had at the summit were a real demonstration of the headway we have made so far."

The Academy will host the first Global Grand Challenges Summit of a new series in London in 2019.

▲ Summit moderator Ali Velshi in discussion with keynote speaker Baroness Matha Lane Fox CBE

# President's column



September has once again been a busy month for the Academy. On 5 September, we held our Annual General Meeting (AGM) and announced the election of 52 new Fellows and one Honorary Fellow. All of this year's new Fellows have made incredible contributions to society through their work, from groundbreaking developments in artificial intelligence to high-profile transport and infrastructure projects. I look forward to seeing them at the new Fellows' briefing and dinner next month and involving them in the work of the Academy.

As well as looking ahead to our new cohort and the newly elected Trustees, the AGM provided us with the opportunity to reflect on the contribution the Academy has made over the past year, which has seen it harness the collective voice of the engineering profession to provide policy advice to government on critical issues, as well as starting to build the capacity needed for our next phase of development.

At the AGM, I announced that our chief executive, Philip Greenish, had decided to retire from the Academy. Philip joined the Academy in June 2003 and has been a superb chief executive. He has seen us through a long period of sustained growth and development with a particularly sharp increase in funding in recent years. He will be greatly missed. There will be an occasion before Philip retires to come together and celebrate his achievements, and to thank him for all he has done for the Academy. The search is now on for his successor and we have retained the executive search agency, Odgers Berndtson, to support us. The candidate brief and application details are available on our website at [www.raeng.org.uk/ceovacancy](http://www.raeng.org.uk/ceovacancy). Please give careful thought to anyone who you think may be suitable for this important role and encourage them to apply.

Following the official business of the AGM, we heard from Professor Sarah Hainsworth FREng, whose expertise in forensic

engineering science helped establish how Richard III was killed on the battlefield, and Professor Constantin Coussios, winner of an Academy 2017 Silver Medal, whose biomedical engineering research is delivering breakthrough methods for treating tumours.

The Academy's support of such groundbreaking research is something I am particularly proud of. Our continued contribution to engineering research in the UK supports outstanding researchers at all stages in their career and invests in connecting them with industry. This support often enables them to build broader funding portfolios for their research programmes, multiplying our impact; for instance, for every pound that the Academy invested in Research Chairs last year, other funders and businesses invested £18. The Research Fellowships programme is similarly successful, collectively raising over £7 million in third-party income.

These successes were showcased the day before the AGM at the annual Research Forum (page 5), where researchers supported by the Academy presented their work in areas including biomedical engineering, digital technologies, advanced materials, and smart and clean technology, to an audience of Fellows, industry partners and interested media, among others.

Engineering's role in enabling and accelerating growth, including through engineering research and innovation, has long been recognised by the government. In his 2016 Autumn Statement, Chancellor Philip Hammond announced a £4.7 billion increase in science and innovation spending, and in a speech at the beginning of this year, Prime Minister Theresa May placed heavy emphasis on science and innovation in her vision for the UK's future. As part of the government's plans to develop a pipeline of highly skilled research talent, a £210 million National Productivity Investment Fund has been created, as announced in the 2017 Spring Budget. I am pleased to say that the Academy will receive additional funding as a result of this, which will allow us to increase a number of our programmes, including Research Fellowships and Chairs.

I am also pleased to have been involved in shaping how some of the £4.7 billion commitment, through the Industrial Strategy Challenge Fund, will be spent. Over the summer, I have had several meetings with officials from the Department for Business, Energy and

Industrial Strategy (BEIS), the Research Councils and Innovate UK, who have been working hard to shape how the fund will be used. Its ambition is to bring together the UK's world-leading research with business to tackle specific industrial and societal challenges where the UK can take a lead and drive economic impact. Such a partnership approach, bringing together government, industry and academia, bodes well for the engineering profession's role in the industrial strategy.

In the same week as the AGM and Research Forum, the Academy's annual Diversity and Inclusion (D&I) Programme event took place (page 3). The publication of *Creating cultures where all engineers thrive* and the Academy's call for workplace culture change are part of its wider programme of activity to increase D&I across the engineering profession. Our hope is that an increasing number of companies and organisations will join us in our efforts.

What has been clear throughout September's flurry of events is how important our networks - whether of Fellows, research funders, professional engineering institutions or industry partners - are in multiplying our impact and ensuring we can lead the profession in advancing innovation and improving the recruitment and retention of engineers. As the Academy calendar fills up once again following summer, I look forward to working with many more Fellows, partners and supporters.

## Meetings and visitors

**In her capacity as President, Dame Ann has met with:**

Yvonne Baker, Director of the National Science Learning Centre in York, and Baroness Brown DBE FREng FRS  
Dr Ruth McKernan CBE, Chief Executive of Innovate UK  
Philip Duffy and Jon Sell, HM Treasury  
Charles Woodburn, BAE Systems  
Richard Threlfall and Chris Croft, KPMG  
Professor Sir David Cannadine, President of the British Academy

**She attended the following events and meetings:**

Industrial Strategy Challenge Fund Energy Seminar  
BEIS Departmental Board  
Nominations Committee  
Royal Society Advisory Board and Dinner  
Brexit High Level Stakeholder Group with Jo Johnson MP  
British Academy reception with its President

## Creating cultures where all engineers thrive

On 6 September 2017 at its annual Diversity and Inclusion (D&I) Programme event in London, the Academy released the results of a unique study of culture and inclusion across the engineering profession.

Every year, the annual D&I Programme event provides an excellent opportunity for people across engineering to network and share best practice in supporting the programme's vision of a diverse and inclusive profession. More than 100 Academy D&I Programme stakeholders, Fellows and industry leaders gathered at the Academy for this year's meeting.

The Academy launched the report, *Creating cultures where all engineers thrive* at the event. Based on survey responses from 7,000 UK engineers, the report provides insight into how engineers perceive the culture of engineering and the extent to which it is inclusive, and provides recommendations on what would make it more inclusive.

The research confirms that there is a strong business case for inclusion across the profession. Respondents to the survey who said they felt included reported increased motivation (80%), increased performance (68%) and increased commitment to their organisation (52%). The responses showed that the more included engineers feel in an organisation, the more likely they are to understand business priorities, see a future for themselves in the profession and be confident about speaking up about improvements, mistakes or safety concerns. These benefits were not only reported by women and ethnic minority engineers, but also by white male engineers who make up the majority of the profession.

In order for the profession to create a more inclusive future, engineers identify the factors that lead to feelings of inclusion as openness, respect, relationships, career development support, flexibility, leadership and diversity. To make progress, the report highlights the need for action by engineering leaders, managers, and human resources and communications staff, as well as individual engineers. This is needed in areas such as: prioritising inclusion; better articulating the benefits

of inclusion; increasing awareness of how different groups perceive workplace culture; and monitoring data on the delivery of career support and talent management.

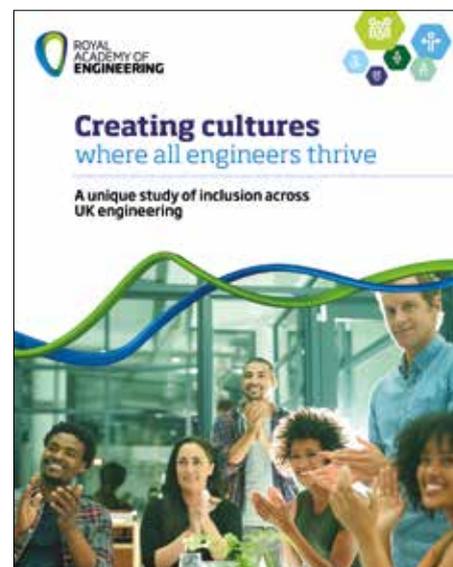
In addition, underlying barriers identified throughout the study need to be addressed. These include: 'inclusion privilege', which suggests that those who already feel included are least likely to take action; the perception that there is no 'crisis of inclusion' to drive action, but a consistent pattern of lower levels of inclusion for ethnic minority and women engineers; and a perceived need to deliver progress on intangible outcomes related to perception and experience that



may be at odds with engineering culture. There is no reason why the engineering profession cannot rise to the challenge of developing a more inclusive future and reap the benefits of inclusion.

As well as discussing the report, delegates at the annual D&I Programme event gained insight into the Academy's D&I Programme strategy. The event provided attendees with the opportunity to learn about the Academy's efforts to increase D&I across engineering employer organisations and professional engineering institutions.

Professor Dame Ann Dowling OM DBE FREng FRS opened the event, and this year's speakers featured senior leaders from across engineering and beyond, including: Dervilla Mitchell CBE FREng, Director, Arup and Chair of the D&I Committee; Rosemary Cook CBE, Chief Executive, Institute of Physics and Engineering in Medicine; David Jenkins, Practice Director, Civils and Structures, Transportation, Atkins; John McCollum,



Head of Engineering, BAE Systems; Dr Nelson Ogunshakin OBE, Chief Executive, Association for Consultancy and Engineering; Peter Price FREng, Director Engineering and Technology, Rolls-Royce; Paul Oatham, Infrastructure Global Recruitment Manager, Bechtel; and Andy Woodfield, Partner, PwC.

Feedback from the event was very positive. Attendees made suggestions on the implementation of recommendations to increase inclusion, and found out about opportunities to engage with the programme in future.

To read the full report on the survey responses, and to watch an animation on the findings, please visit [www.raeng.org.uk/inclusivecultures](http://www.raeng.org.uk/inclusivecultures)

▲ Top: The *Creating cultures where all engineers thrive* report was launched on 6 September

▲ Above: The D&I Programme event panel: Henry Bonsu, broadcaster; Dervilla Mitchell; Bola Fatimilehin, Head of Diversity and Inclusion at the Academy; Sarah Bond, Director, for business sake; David Jenkins; and Andy Woodfield

## Awards presented at AGM

On 5 September, the 41st AGM took place at Prince Philip House.

The President presented her review of the Academy's year. Highlights included the response to the industrial strategy Green Paper by the professional

bodies, the opening of the home of the Enterprise Hub, the Taylor Centre, the CAETS *Engineering a Better World* conference, the announcement of the winners of the 2017 Queen Elizabeth Prize for Engineering, and the annual Awards Dinner.

The Financial Report and Accounts for the year ending 31 March 2017 were presented by former Vice President, Allan Cook CBE FREng.

Attendees celebrated the election of 50 new Fellows, two International Fellows and one Honorary Fellow. The full list of new Fellows can be found on the website at [www.raeng.org.uk/about-us/the-fellowship/new-fellows-2017](http://www.raeng.org.uk/about-us/the-fellowship/new-fellows-2017)

After the formal proceedings of the AGM, Professor Sarah Hainsworth FREng gave a presentation on how forensic engineering helped to discover how Richard III died on the battlefield in 1485, after his remains had been found under a Leicester car park in September 2012. Her talk was followed by 2017 Silver Medal winner Professor Constantin Coussios' presentation of his research, which included his groundbreaking innovations in delivering and distributing anti-cancer drugs in tumours.

The President presented two Academy awards. The Sir Frank Whittle Medal, awarded to an engineer whose sustained achievements have had a profound impact upon their engineering discipline, was awarded to Professor Andrew Schofield FREng FRS, an engineer who has been responsible for transformational research in soil mechanics and geotechnical engineering and has been a leading voice in the field since the 1960s.

The 2017 Royal Academy of Engineering Armourers and Brasiers Company Prize, an award established with support from the Worshipful Company of Armourers and Brasiers for excellence in materials engineering, was presented to Professor Mohan Edirisinghe FREng. Professor Edirisinghe has spent over 25 years developing new methods of manufacturing advanced materials in response to industry requirements, particularly healthcare.

The evening concluded with a networking reception.



▲ **Top:** The President presents Professor Andrew Schofield FREng FRS with the Sir Frank Whittle Medal  
◀ **Left:** Professor Mohan Edirisinghe FREng is awarded the 2017 Royal Academy of Engineering Armourers and Brasiers Company Prize



On 4 September, the annual Research Forum took place at Prince Philip House, showcasing the world-class engineering research that is funded through the Academy's wide range of programmes.

Awardees from across the Academy's research programmes presented and displayed their research in a set of displays with the themes of smart and clean technology; biomedical engineering and quantum technologies; digital technologies and space; and manufacturing and advanced materials.

Attendees were welcomed by the Academy's President, Alex Chisholm, Permanent Secretary at the Department for Business, Energy and Industrial Strategy, gave an address on the importance of the industrial strategy. Professor Sir Jim McDonald FEng FRSE, Chair of the Academy's Research Committee and Principal of the University of Strathclyde, presented an overview of the research programmes, highlighting the role that the Academy plays in supporting future engineering leaders and enabling academia-industry partnerships.

The event provided guests with an opportunity to meet Academy-funded researchers and hear about how the funding has supported their careers and the impact that their research has made on wider society. Guests included Fellows, current and past awardees of the schemes, sponsors, businesses and other partners.

The day ended with the presentation of the Colin Campbell Mitchell Award, given to a small team of engineers who have made an outstanding contribution to the advancement of any field of UK engineering. Sir Jim McDonald presented the award to a team from Oxehealth: Dr Oliver Gibson, Dr Simon Jones and Nick Dunkley. Oxehealth is a world leader in non-contact health monitoring technology, which delivers continuous, medical-grade contact-free vital signs monitoring through low-cost digital video camera sensors.



▲ Above: The Oxehealth team were presented with the Colin Campbell Mitchell Award

◀ Left: Academy awardees discussed their research at the event

## Future of Engineering Awards

Three early-career innovators have won a Future of Engineering Award, prizes that celebrate engineering excellence in the UK while closing the skills and mindset gap required to turn engineers with high potential into future tech leaders.

The overall award was won by Florence Gschwend, Co-founder and Director of Operations at Chrysalix Technologies. Florence is a biochemistry PhD graduate from Imperial College London, and co-founded Chrysalix Technologies, which explores ways to make clean fuel and chemicals from waste wood material that would otherwise go to landfill.

The two runners-up were Clementine Chambon, CTO and Co-founder of Oorja, which is aiming to supply one million people in developing countries with

renewable energy by 2022 through combined biogas and solar power microgrids; and Imran Ahmed, an information engineering student at the University of Cambridge, who has developed an astronaut tracking system for NASA and secured a \$5,000 grant from MIT to develop an advanced sensor analytics venture.

All three will share £20,000 prize money. The prize is designed to help students and early-career engineers to develop their skills and approach so that they can bring their ideas to fruition.

The judging panel was led by Suranga Chandratillake FEng, one of the Enterprise Hub's mentors. Entrepreneur First and the Enterprise Hub based their decision on nine criteria, including resourcefulness, organisation of submissions, ambition and drive to deliver growth.



The Enterprise Hub is grateful to Dr Tony Trapp FEng MBE DL for his donation to the Future of Engineering Award.

▲ Florence Gschwend, winner of the Future of Engineering Award with judge Suranga Chandratillake FEng

## Innovation in haptics



On 4 July, the Academy hosted *Innovation in haptics* as part of UK Robotics Week. Haptic technologies create the sense of touch that enables computer applications to give users feedback.

The event was chaired by Dr David Braben OBE FREng, Founder and CEO of Frontier Developments, and showcased a selection of the latest virtual reality applications and haptic technologies across a variety of sectors including healthcare, transport and entertainment.

Tom Carter, CTO and Co-Founder of Ultrahaptics, opened the event with an insight into haptic feedback and explained how engineering innovation has allowed the sense of touch to be simulated to allow greater interaction with digital worlds,

bringing virtual reality to life. This was followed by a series of presentations, ranging from haptic surgical training applications and autonomous vehicle testing in virtual reality, to the use of haptic technologies in the music industry. The event closed with a panel debate that explored the future of haptics and the wider social and ethical implications of emerging technologies.

Throughout the day, there were exhibitions and live demonstrations from Ultrahaptics, Generic Robotics, Fundamental VR, Haptic Wave, the Bartlett School of Architecture, Touch & Discover Systems, as well as Enterprise Hub members TangiO and NeuroCONCISE.

▲ Generic Robotics demonstrating its SimuTeach® Dental Simulator to attendees at the *Innovation in haptics* event

## Engineering for Development Research Fellowships

Two Engineering for Development Research Fellowships have been awarded to Dr Maria Chernysheva at Aston University and Dr Ton van den Bremer at the University of Edinburgh.

The Fellowships are an Academy scheme funded by the Global Challenges Research Fund (GCRF).

Dr Chernysheva will be studying novel mid-infrared ultrafast fibre lasers for molecular vibrational sensing technologies.

Dr van den Bremer's research is focused on cleaning the ocean and understanding the transport of plastic pollution by waves.

GCRF forms part of the Official Development Assistance commitment from the government, and is administered through delivery partners including other

National Academies and the Research Councils.

The Engineering for Development Research Fellowships offer the same benefits as the Academy's Research Fellowships, but come with an additional ring-fenced £25,000 per year to support international collaborations. The aim of the research must positively impact or contribute to the sustainable economic or social development or welfare of a developing country.

## New Research Chairs

The Academy has announced five new Research Chairs, who will hold the positions for five years from September 2017. The Research Chairs will each be mentored by an Academy Fellow during this time.

The programme strengthens the links between industry and academia by supporting exceptional academics in UK universities to undertake use-inspired research that meets the needs of the industrial partners.

The awardees are:

- Professor Rebecca Lunn, BAM Nuttall / Royal Academy of Engineering Research Chair in Biomineral

Technologies for Ground Engineering, University of Strathclyde

- Professor Nic Petrinic, Rolls-Royce / Royal Academy of Engineering Research Chair in Impact Engineering with Digital Materials for Paradigm Shift in Design, University of Oxford
- Professor Philip Prangnell, Airbus / Royal Academy of Engineering Research Chair in Metallurgical Excellence, University of Manchester
- Professor Pedro Rivera-Diaz-del-Castillo, LPW Technology/ Royal Academy of Engineering Research Chair in Alloy and Microstructure Design for Additive Layer Manufacturing, Lancaster University

- Professor Ashutosh Tiwari, Airbus / Royal Academy of Engineering Research Chair in Digitisation for Zero-setup and Zero-measurement Manufacturing (Di-Zero), University of Sheffield

The Research Chair posts are professorial appointments, so applicants should already be a Reader or Senior Lecturer level or equivalent.

The next round of applications is due to close in March 2018.

For more information, please visit [www.raeng.org.uk/researchchairs](http://www.raeng.org.uk/researchchairs) or contact [lucy.wheeler@raeng.org.uk](mailto:lucy.wheeler@raeng.org.uk)

## APEX Awards

Six researchers have been awarded funding under the Academy's new APEX Awards (Academies Partnership in supporting Excellence in cross-disciplinary (X) research) scheme, which was launched earlier this year in partnership with the Royal Society and the British Academy with support from the Leverhulme Trust.

The researchers began work on their interdisciplinary proposals in September 2017, with the award of up to £100,000 primarily funding staff costs. The awardees and their research projects are:

- Dr Kate Robson Brown, University of Bristol – the ontogeny of bone microstructure as a model of programmed transformation in 4D materials
- Dr Marilina Cesario, Queen's University of Belfast – before and after Halley: medieval visions of modern science
- Professor Rama Cont, Imperial College London – systemic risk: mathematical modelling and interdisciplinary approaches
- Professor Robert Field, University of Oxford – exploring water re-use:

the nexus of politics, technology and economics

- Professor Dave Goulson, University of Sussex – people, pollinators and pesticides in peri-urban farming
- Professor Stuart Murray, University of Leeds – engineering the imagination: disability, prostheses and the body

APEX Awards aim to demonstrate how researchers from different disciplines sharing a common vision can come together to generate creative and innovative solutions that will benefit wider society.

## Education and skills

### Education conferences, events and workshops

The Academy has recently hosted a number of education workshops, conferences and events that have covered a variety of issues, including digital and entrepreneurial skills, evaluating teaching and developing degree apprenticeships in higher education.

In June, the Academy held a digital skills workshop as part of the engineering community's partnership with government in reviewing industrial digitalisation, which

is being led by Juergen Maier FREng, Chief Executive of Siemens UK.

The Academy also hosted a joint workshop with the other national academies on entrepreneurship education for STEM graduates. The workshop was held in response to recommendations from the Prime Minister's Council for Science and Technology, and was chaired by Professor Alison Noble OBE FREng FRS. The event hosted a range of speakers including Professor Fiona Murray, Associate Dean for Innovation at MIT and Co-Director of the MIT Innovation initiative.

Another workshop was held to provide an opportunity to share and discuss the Academy's findings from the first phase of a joint research project with the Edge

Foundation to evaluate the University Technical College model.

The Academy hosted a high-level forum for academics and employers developing and delivering degree apprenticeships in engineering. There were a number of speakers including Peter Lauener, Chief Executive of the Institute for Apprenticeships.

A workshop also held following the creation of the Academy framework for evaluating teaching achievement in universities. The project is working with 16 university partners from across 12 countries, and leaders from these partner universities attended the workshop to discuss experiences of changing institutional promotion processes and to share lessons learned.

## Connecting STEM Teachers celebration event



On 6 July, teacher coordinators, sponsors and invited guests from professional engineering institutions and the STEM community attended an annual celebration event for the Academy's Connecting STEM Teachers programme.

The event at Prince Philip House was an opportunity to learn about some of the inspirational STEM learning taking place within the Academy's 45 teacher networks across the UK. Teacher coordinators used the event to share their experiences and to highlight the positive

impact of improving STEM education in primary and secondary schools.

Attendees also heard from speakers from industry and the STEM education community, who covered a variety of topics including how virtual reality can engage pupils in STEM learning. The teachers also discussed creating an affordable classroom robotics project using the BBC micro:bit and 3D printing, and promoting primary STEM learning through a Top Trumps Tournament and TES resources. The curriculum lead

at AQA also provided an update on an engineering and STEM qualification.

The Connecting STEM Teachers programme launched in 2011 and aims to create a national network of support for STEM teachers, ensuring that they have the knowledge and confidence to engage a greater number of students with STEM. The 45 teacher coordinators connected with 1,053 network teachers in 757 schools in the 2016/2017 academic year.

▲ Attendees at the event try out virtual reality as part of a discussion on engaging pupils in STEM

## Visiting Professors' annual conference

At the end of September, the Academy hosted the Visiting Professors' conference in Birmingham, bringing together representatives from the Industry-Academia Partnership Programme (IAPP), the Higher Education Partnership in sub-Saharan Africa programme, and the Visiting Professors' programme in the UK to discuss innovative approaches to engineering education.

The theme of the conference was *What is excellence in engineering teaching?* It built on the experiences of both UK

and international partners, addressing how engineering education and the skills gap can be improved in the UK and internationally.

The first day of the conference consisted of three panel discussions, with the speakers focusing on the different ways to promote employability, scalability and entrepreneurship through engineering. Jane Butler FREng chaired the conference, and Professor John Perkins CBE FREng, Honorary Professor at the University of Manchester, gave the keynote presentation on the essential skills needed for modern-day engineering.

New UK Visiting Professors and their academic champions joined the

conference on the afternoon of the first day for an induction to the scheme.

This was followed by a networking drinks reception in the evening and a speech from Professor Janusz Kozinski, from the New Model in Technology and Engineering (NMiTE), titled *Humanist engineer: excellent teaching and effective learning*.

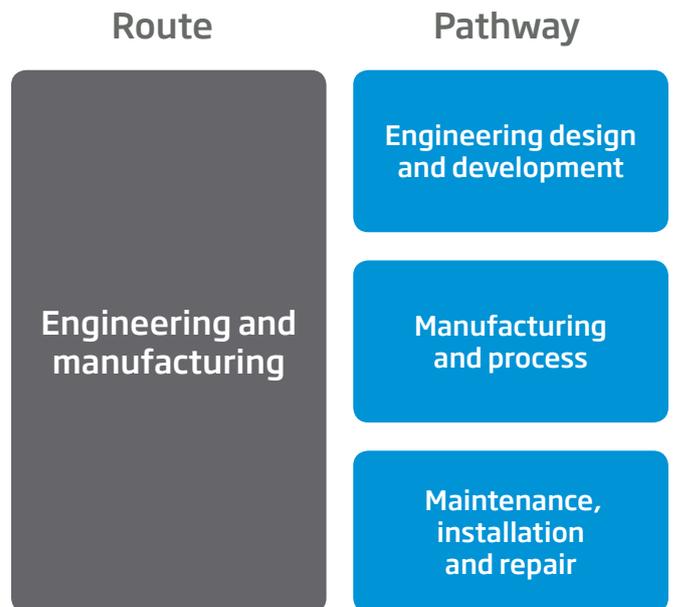
The international and UK guests came together on the second day, chaired by Professor Peter Goodhew CBE FREng, for a series of talks and Q&A sessions, and a discussion on excellence in engineering education. This was followed by breakout sessions and group discussions.

## Academy involvement in T-levels

The Academy has recently been involved in agreeing content for the new engineering T-levels.

The T-levels are being launched as a result of recommendations in the *Post-16 Skills Plan*, which was published in June 2016, with the aim of creating a simplified technical progression route for 16 year olds. The T-levels cover 15 areas that are defined by a set of occupations that were mapped so that students taking the qualifications can readily find employment in the corresponding professions. One of the areas is engineering and manufacturing, which has three main pathways (see diagram).

The Academy has worked with the Department for Education and the Gatsby Charitable Foundation to ensure that there is agreed common content for the engineering and manufacturing route and its pathways, which will be presented to the Department for Education and the Institute for Apprenticeships later in the year.



## Hidden Figures

In June, almost 400 people attended a screening of *Hidden Figures* at the Science Museum's IMAX cinema to mark International Women in Engineering Day and to celebrate the release of the film on DVD.

The President gave an inspiring speech about the importance of encouraging young people into engineering and before the film, a panel discussion took place, chaired by Dr Maggie Aderin-Pocock MBE, space scientist and broadcaster.

*Hidden Figures* tells the story of Katherine Johnson, Dorothy Vaughan and Mary Jackson, three African American women who worked at NASA during the 1950s and early 1960s as part of a team of 'human computers'. Their job was to calculate the launch and landing coordinates for the experimental rockets being built at the dawn of the space race.

The importance of their achievements is still relevant today, as at present, only

## Public engagement

9% of the UK's engineering workforce are women and only 6% are from a black, Asian or minority ethnic background.

The event was held in partnership with the Academy, the Queen Elizabeth Prize for Engineering, Twentieth Century Fox Home Entertainment and EDF Energy's *Pretty Curious* campaign.



▲ Members of the panel at the *Hidden Figures* screening: (l-r) Dr Nelson Ogunshakin OBE, President and Chief Executive of the Association for Consultancy and Engineering; Dr Maggie Aderin-Pocock MBE, Space Scientist; Anita Bernie, Director of Spacecraft Platform and Demonstration Missions at Surrey Satellite Technology; Roma Agrawal, Associate Director of AECOM; and Abbie Hutty, Lead Structures Engineer on the ExoMars Rover Project, Airbus Defence and Space

## Daniel Zeichner MP visits MacRobert Award winner and finalist

On 27 July, Daniel Zeichner MP visited two engineering companies based in his Cambridge constituency: Raspberry Pi, the winner of the MacRobert Award 2017, and finalist Darktrace.

At the Raspberry Pi Foundation, the MP learned how the microcomputer is designed to teach people how to code. Since the first Raspberry Pi was launched in 2012, the organisation has sold 14 million microcomputers. Zeichner also discussed the foundation's community initiatives, such as its after-school Code Clubs that have reached 85,000 UK children in 5,750 weekly clubs. There are also 4,500 Raspberry Pi Code Clubs outside of the UK, teaching computing skills in 27 languages.



Daniel Zeichner's visit to Darktrace included a presentation about the company and a demonstration of its product. Founded only four years ago and already active in over 64 countries, the Enterprise Immune System behaves similarly to the human immune system, self-learning to identify and neutralise abnormal activity in computer systems. It

is the first piece of unsupervised machine learning software that is designed to detect and defend against cyber security threats from within computer networks.

▲ Cambridge MP Daniel Zeichner (second from right) with the Darktrace team, a MacRobert award finalist that is based in his constituency

## QEPrize Ambassadors' workshop



▲ QEPrize Global Engineering Ambassador Nikita Hari from the University of Cambridge discusses perceptions of engineering and the barriers to engaging with the public

On 19 September, a group of Queen Elizabeth Prize for Engineering (QEPrize) Global Engineering Ambassadors came

together at Prince Philip House to take part in a one-day workshop on the public perceptions of engineering.

The Ambassadors are part of an international network of young engineers from both business and academic institutions. They are the future leaders of engineering, who share a passion for their profession and frequently engage in activities to promote STEM.

The workshop was the first annual event exclusively for the QEPrize Global Engineering Ambassador network. The participants were invited to share knowledge and ideas, and encouraged to collaborate to form an influential voice in the engineering engagement community. They were also challenged to develop realistic recommendations aimed at different sectors (education, business, professional engineering institutions and individuals) to maximise the efforts and activities currently taking place in STEM communication. These recommendations will form a 'call to action' document and will be circulated to engineering organisations to be used as a guideline when devising future outreach activities.

## Parliamentary Links Day

In June, Malcolm Brinded CBE FREng, Chair of the Academy's Africa Prize for Engineering Innovation, represented the Academy at Parliamentary Links Day, an event that brings together scientists, learned societies and MPs.

This year's theme was *UK Science and Global Opportunities* and the event comprised two panels: *Science and Europe* and *Science and the world*. Malcolm participated in the second

panel and discussed the critical role that engineering plays in providing societal benefits to developing countries.

Opening remarks were given by the Speaker of the House of Commons, the Rt Hon. John Bercow and Jo Johnson, Minister of State for Universities, Science, Research and Innovation. Sir John Kingman, Chair of UK Research and Innovation, also spoke at the event.

## Engineering a Better World student competition

In July, 15 teams of university students took part in a student business competition that took place before the start of the Global Grand Challenges Summit in Washington DC.

Teams of students from the UK, US and China pitched their innovations to solve global challenges in a *Dragons' Den* style competition. Five teams from UK universities took part, from Bournemouth University, Heriot-Watt University, and the universities of Bristol, Hull and Sheffield.

Dr John Lazar CBE FREng was one of seven judges tasked with quizzing the students on their business proposals. The winning team was the WorldCare Technologies team from the University of California, whose innovation was a low-cost device for monitoring HIV levels in blood. The students from Bournemouth University were awarded the second prize of \$15,000 for their innovation MoreWater, a modular water-filter system.

University College London's Department of Science, Technology, Engineering and Public Policy also ran a *How to Change the World* challenge, which 150 students



participated in. Multi-country teams were tasked with producing a podcast that explained how solving the Global Grand Challenges could have an impact on the lives of people around the world. Bethany Gordon from the University of Virginia took top prize for her podcast on how virtual reality could enable engineers to tackle humanitarian problems.

The Summit also featured a poster competition, with a student team from Newcastle University winning in the undergraduate impact category.

▲ Members of the Bournemouth University student team pitch their innovation

## Fellows' visit to the National Physical Laboratory

On 14 September, a number of Academy Fellows visited the National Physical Laboratory (NPL) in Teddington, London.

NPL is leading groundbreaking engineering projects based on decades of metrology experience. The visit showcased the development of four prototypes: the Diabetic Foot Ulcer Prevention Scanner, the Breast Scanning Ultra sound Facility, NPL Time Distribution, and the International System of Units Redefinition.

Tours of the laboratories were conducted by NPL Fellows and staff with extensive knowledge in their individual subject areas. Following the



tours, Fellows and NPL staff members contributed to an in-depth discussion about the laboratories and NPL's future developments.

▲ Academy Fellows at the National Physical Laboratory

# Thought leadership

## Cyber safety and resilience of connected health devices

On 11 July, the Academy held a workshop to explore the subject of cyber safety and resilience in connected health devices, which was co-chaired by Professor Nick Jennings CB FREng and Dr Mike Short CBE FREng.

The event brought together developers and procurers of connected health devices with experts in policy, regulation and cyber security.

The attendees debated the cyber security risks in connected health devices and how regulatory and non-regulatory mechanisms might improve practice. The workshop focused on implantable and non-implantable devices used both in clinical settings and at home.

The topics of discussion included differences in US and EU regulatory approaches, the suitability of standards versus a risk-based approach to cybersecurity, how the cultures of the various stakeholders including software developers and the NHS affect practice, and what might be learned from other sectors and applications, especially industrial control systems.

The workshop was part of the Academy's ongoing work on the cyber safety and resilience of critical infrastructure and the Internet of Things.

## Education programmes alignment review

In partnership with EngineeringUK, the Academy has established a steering group to review engineering engagement activities in schools across the UK.

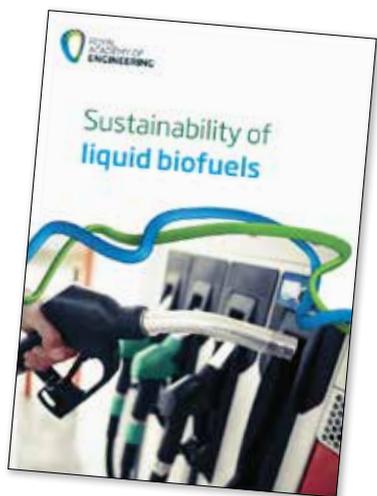
The group was established following feedback from Professor John Uff CBE QC FREng in his independent review

of UK professional engineering that stated that there is a lack of coordination in STEM engagement activities. The steering group is jointly chaired by the President and Malcolm Brinded CBE FREng, Chair of EngineeringUK.

A working group, which was chaired by Philip Greenish CBE, carried out detailed analysis of the scale and geographic coverage of current activity provided by professional engineering institutions, third-sector providers, employers, and further and higher education providers. More than 80 STEM engagement activity providers also attended a workshop on the issue. A final report was submitted to the steering group in early July, which identified a number of options for future models of coordination.

The steering group identified a number of other areas for the Academy and profession to work on, including developing a common, agreed framework for evaluation and coordinating research into young people's attitudes and decision-making behaviours.

## Sustainability of liquid biofuels



On 14 July, the Academy launched its study on liquid biofuels for use in UK transport.

It was produced at the request of the Department for Business, Energy and Industrial Strategy and the Department for Transport. The report presents results from a review of the available literature on the environmental, economic and social issues in relation to biofuel production

and use, with a particular focus on the carbon footprints of different biofuels. The report was produced by a working group of Fellows and experts, supported by Academy staff.

Following its publication, the report featured in news stories in *The Times*, the *Guardian*, and on BBC Radio 2 (see the media roundup on pages 15-16).

A copy of the report can be downloaded at [www.raeng.org.uk/publications/reports/biofuels](http://www.raeng.org.uk/publications/reports/biofuels)

## Collective benchmarking for D&I

In July 2017, professional engineering institutions and members of the Science Council took part in events to kick-start a collective benchmarking exercise, based on the *Diversity and Inclusion (D&I) Progression Framework*, to set a baseline for D&I activity across engineering and science professional bodies.

Launched in December 2016, the *D&I Progression Framework* provides

a tool for science and engineering professional bodies to discuss, plan and progress D&I.

For the collective benchmarking exercise, all professional bodies were invited to submit completed frameworks to a third party to produce aggregated engineering and science benchmarks and reports. Participating organisations will also receive individual reports indicating action that can be taken to progress D&I, and will have the opportunity to benchmark against reports that will be available in late 2018.

The Academy has used the Framework to develop action plans in a number of its own activities: governance and leadership; Fellowship; conferences and events; education and training; prizes, awards and grants; communications, marketing, outreach and engagement; and employment.

Plans have been signed off by Academy directors and will be followed-up with progress reports over the coming weeks and months.

## New Academy Engineering Policy Centre

The Trustee Board has agreed to create a new Engineering Policy Centre to increase the Academy's impact and influence on national, devolved and regional policy. The Engineering Policy Centre will build on the Academy's record as an authoritative, independent source of policy advice and a track record of convening the expertise of the profession.

A working group of Trustees and Operating Committee Chairs is exploring mechanisms and ways of working that will engage the collective expertise of the profession, engineering businesses, academia and the wider engineering network. The Academy is recruiting a new director of policy who will establish the new centre and lead the team.

President Dame Ann Dowling said: "Two major pieces of policy work on Brexit and the Industrial strategy, which harnessed the deep knowledge of the professional engineering institutions and took evidence from right across engineering, have demonstrated that we can create so much more impact when we speak as a whole profession. Governments across the UK need engineering advice on policy as never before and the new centre will make our advice much more accessible and focused."



## Statement of Ethical Principles

On 11 July, the Academy and the Engineering Council launched an updated version of their jointly produced *Statement of Ethical Principles* for the engineering profession.

The statement was first published in October 2005, and was also revised in 2014. It sets out four fundamental principles for ethical behaviour and decision-making for all professional engineers and technicians, tradespeople, students, apprentices and trainees engaged in engineering.

Attendees at the launch were welcomed by the Academy's President before hearing from a range of speakers. Philip Corp CB, chair of the joint review group,

introduced the Statement and the outcomes of the review and update. Dame Judith Hackitt DBE FREng, Chair of EEF, provided a perspective from industry, and Professor Chris Atkin, Chair of the Engineering Council, provided a perspective from academia.

Following the talks, the Academy President took part in a discussion panel with the speakers and Richard Maudslay CBE FREng, Chair of the Academy's Ethics Working Group. This was then followed by a wide-ranging Q&A session.

A copy of the Statement can be downloaded from the Academy's website at [www.raeng.org.uk/publications/reports/statement-of-ethical-principles](http://www.raeng.org.uk/publications/reports/statement-of-ethical-principles)

▲ The discussion panel at the event

## Academy meeting on Grenfell Tower fire

The tragic fire in Grenfell Tower on the night of 13 June has raised many questions for the engineering profession. In August the Academy hosted a roundtable meeting with experts from the Fellowship, professional engineering institutions, and other relevant organisations, to explore these challenges and ascertain how the Academy and engineering profession can usefully contribute to the response over the coming months.

Areas of discussion included: the importance of a systems approach for building safety, the regulatory system and enforcement regime; responsibility and accountability in building design, construction and lifetime maintenance; and capacity and competence in the

sector. There are a significant number of ongoing reviews that will address these topics. It was agreed that there is a role for the Academy in supporting these reviews, including by convening expertise and acting as a hub for gathering relevant information or evidence.

## Systems approaches to integrated catchment management

On 29 June, the Academy ran a one-day workshop with the Department for Environment, Farming and Rural Affairs (DEFRA) and the Environment Agency (EA).

The event brought systems engineers together with policymakers and analysts from across DEFRA and the EA to introduce systems approaches within engineering and explore their application

to the challenge of integrated catchment management of river basins.

The workshop was part of a project aimed at exploring, illustrating and raising awareness of systems approaches in engineering and their relevance to complex policy challenges.

The workshop consisted of introductions to systems thinking, analysis and management, and some examples of their application, introductions and exploration of the particular challenges and opportunities in the area of integrated catchment management. There were also sessions of collaborative working that explored how one could inform the other.

The workshop was positively received by attendees and follow-up activities to develop this work are now being undertaken.

# Academy roundup

## Growing transparency and engagement

*Professor Richard Williams OBE FREng FRSE, Vice-President of Fellowship Engagement, provides an update on the Academy's Fellowship activities.*

Over the last four years, the engagement of Fellows in the Academy's activities has grown, especially with newly elected Fellows.

As Vice-President of Fellowship Engagement, it has been a pleasure to receive comments and advice from Fellows in different parts of the UK about the Academy's operations. I know the passion and commitment our Fellows hold for the Academy as the voice of engineering in the UK and beyond. These inputs have been valuable when the Trustee Board meets to consider strategic priorities to serve the Fellowship and mission of the Academy.

In the last two years, I have been keen to 'open up the Academy' to enable Fellows to see more clearly its impact and how it operates - notably through the now annual Fellows Day, enhanced communications from the Trustee Board, and a range of informal regional lunch and dinner meetings. However, more needs to be done to enhance the transparency of information and processes relating to committee membership and Trustee election. Progress on the IT communication systems has also been pending and I am pleased to note that a new online forum for Fellows has now been launched (see page 15).

The Board has been operating under its revised governance for three years and decided that it was timely to assess the effectiveness of the operation. As a result, a group recently completed a review of Board effectiveness. The review set out to examine the governance, technical delivery, effectiveness, agility, transparency and diversity of the Board and its operations, and I presented the findings at the AGM on 5 September. Recommendations included addressing the need for



▲ Professor Richard Williams OBE FREng, Vice-President for Fellowship Engagement

ensuring readily accessible information on the Committee and Trustee Board roles and clear, timely opportunities to discuss and receive full information on these. Opening up of the process should significantly enhance the transparency and opportunity to find the most suitable Fellows for the specialist posts.

I continue to welcome your ideas, observations and advice, and can be contacted at [vicepresident@raeng.org.uk](mailto:vicepresident@raeng.org.uk)

## Academy Fellows' celebrated on stamps



▲ One of Dr Taylor's Isle of Man stamps that features the home of the Enterprise Hub, the Taylor Centre

Two Academy Fellows have recently been included on stamps: Dr John C Taylor OBE FREng FRS is featured on a set of six Isle of Man stamps, and Carlos Ghosn KBE FREng has been honoured on a Lebanese postage stamp.

Dr Taylor's stamps showcase his greatest professional achievements, including his design of Chronophage

clocks, bimetal kettle switches and his support for education. Dr Taylor said "I have lived my life deliberating, inventing, creating, producing and perfecting. Through this unique issue of stamps, the Isle of Man Post Office has captured my life's work."

Carlos Ghosn, chairman and CEO of the Renault-Nissan Alliance, is the first businessman to feature on a Lebanese stamp. He was chosen by the national post office of Lebanon following a tradition of creating stamps that celebrate the successes of the country's citizens, with previous collections featuring political icons and women pioneers.

involves 10 primary schools, five secondary schools and two further education colleges.

The Commercial Education Trust has awarded a grant towards a study of business knowledge, practice and entrepreneurship in the further education engineering learning experience. The study will gauge appetite in the sector for continuing professional development resources for further education STEM practitioners in these areas. The results of the study will be available in mid-2018.

## New funding for education programmes

Two new Academy education projects have been granted funding, and the Sir John Fisher Foundation has confirmed a sixth year of support for the Barrow Engineering Project.

The Barrow Engineering Project was established in 2009, and now

## Annual Reports archive

The Academy is seeking copies of its annual reports and accounts for the years 1980-81 to 1984-85 inclusive for archival purposes. Fellows who have copies (print or digital) - or who know of someone who might have one - are invited to contact Dominic Geyer, Trusts & Research Manager on 0207 766 0647, [dominic.geyer@raeng.org.uk](mailto:dominic.geyer@raeng.org.uk). All help received in locating these publications will be greatly appreciated.

## Fellows' Forum

The Academy has now launched its new Fellows' Forum, an online space where Fellows can log-in to discuss the issues of the day. It has new, accessible software that works equally well on phones, tablets and PCs, and all Fellows are invited to participate.

The forum will contain discussions in the following categories: current issues (such as news, Brexit, responses to government, skills gap, robotics); industry (such as industrial strategy, sectors, international capacity building); skills, research and enterprise (such as research and innovation, universities, education, enterprise); and events and social (such as Academy events, other events, and general conversation). In addition, Fellows can start their own topics of discussion.

The forum can be accessed at [fellowsforum.raeng.org.uk](http://fellowsforum.raeng.org.uk)

## Tell your friends about *Ingenia*

The Academy's quarterly magazine, *Ingenia*, has secured further sponsorship for the coming year from Arup and Rolls-Royce. Both of the companies continue their longstanding support of the magazine alongside BAE Systems.

*Ingenia* publishes stimulating and informative articles about all aspects of engineering and technology. It is aimed at engineering enthusiasts from 10 to 110, including students, engineering undergraduates, engineers at all levels, academics, opinion formers and policymakers. It has a particularly large readership among young people, with almost 4,000 copies going out to schools, colleges and sixth forms.



To add someone or an institution to the mailing list free of charge, please contact the *Ingenia* team at [ingenia@raeng.org.uk](mailto:ingenia@raeng.org.uk)

## Media roundup

The profession's response to Brexit and the government's industrial strategy

continues to provide opportunities for media engagement. In May, the Technopolis report commissioned by the UK national academies warned of the vulnerability of EU-funded research following Brexit, and received coverage on BBC Radio 4, in the *Financial Times*, *The Times* and the *Daily Telegraph*, as well as the *Mail Online* and a number of local publications.

In June, Academy President Dame Ann Dowling guest edited an edition of BBC Radio 4's *Woman's Hour*, highlighting the excitement of an engineering career and featuring engineers including Professor Eleanor Stride FREng and Naomi Climer FREng. Past President Lord Browne of Madingley FREng FRS was the focus of BBC Radio 4's *The Bottom Line* programme in June, with an interview and questions recorded in front of a live audience at the Academy profiling his time as CEO of BP.

In June and July, Raspberry Pi, winner of the 2017 MacRobert Award, received extensive coverage with appearances in the *Financial Times* and *The Times*, local television and radio news, and engineering trade press. Features on BBC Click and interviews on BBC World News also broadcast the story to a global television audience. Other award winners and finalists continue to generate interest too – including a profile of Silver Medal winner Billy Boyle that appeared in the *Sunday Times* in July.

## News of Fellows

**Professor Helen Atkinson CBE** has been appointed Pro-Vice-Chancellor and Head of School of Aerospace, Transport Systems and Manufacturing at Cranfield University

**Baroness Brown DBE** has been awarded an honorary doctorate from Brunel University

**Ursula Burns** has been appointed a non-executive director at Diageo, starting April 2018, and Chair of the supervisory board of VEON

**Professor Roger Falconer** has been appointed an Honorary Member of the International Association for Hydro-Environment Engineering and Research and has been appointed Vice-President of the International Association for Coastal Reservoir Research

**Professor Iain Gray CBE** has been awarded an honorary degree from the University of the West of England

**Professor Sarah Hainsworth** has been appointed the Pro-Vice-Chancellor and Executive Dean for the School of Engineering and Applied Science at Aston University

**Dr Andrew Herbert OBE** has been appointed Chair of the National Museum of Computing

**Professor Andrew Livingston** has been appointed Interim Academic Lead at the Rosalind Franklin Institute

**Professor Allan Matthews** has been appointed the Director of the BP International Centre for Advanced Materials

**Sir David McMurtry** has been awarded an honorary doctorate from the University of Huddersfield for services to design and innovation

**Professor Mark Miodownik** has been awarded the 2017 Michael Faraday Medal by the Royal Society

**Past President Sir John Parker GBE** has been awarded an honorary degree from the University of Huddersfield

**Dr David Potter CBE** has been appointed Honorary Chairman of Planet Computers Ltd

**Richard Sadler** has been appointed Chief Operating Officer at GasLog Ltd and GasLog Partners LP

**Professor Martyn Thomas CBE** has been awarded an honorary doctorate from the University of Bath

**Professor Liz Tanner OBE** has been awarded an honorary PhD from Lund University's Faculty of Medicine

**Andrew Tyler CBE** has been appointed Chair of Kite Power Systems

In July, the Academy's report on *The sustainability of liquid biofuels* received attention with news stories from *The Times*, the *Guardian*, *New Scientist* and the BBC, in addition to local press, specialist websites, and mentions on national radio news. An article by Professor Raffaella Ocone FREng explained the report at *The Conversation* website following news of the proposed 2040 ban on non-electric vehicles, and the report continues to generate interest on social media.

## 2018 Royal Academy of Engineering MacRobert Award call for applications

Applications for the MacRobert Award 2017 will open in October. The MacRobert Award is the premier prize for UK engineering innovation and is supported by the Worshipful Company of Engineers. It is given annually for an outstanding innovation, commercial success and benefit to the community.

The Award, first presented in 1969, honours the winning organisation with a gold medal and the team members with a prize of £50,000. The presentation of the Award recognises the successful development of innovative ideas in engineering.

For further information, please visit [www.raeng.org.uk/prizes/macrobot](http://www.raeng.org.uk/prizes/macrobot) or email [macrobert@raeng.org.uk](mailto:macrobert@raeng.org.uk)  
Closing date: 31 January 2018

## Forthcoming events

This is a selection of Academy events. For a complete list, visit [www.raeng.org.uk/events](http://www.raeng.org.uk/events)

10 October 2017

**View from the top - David Pitchforth**

**Venue:** Prince Philip House

**Time:** 6.30pm to 9.00pm

18 October 2017

**New Fellows' briefing**

**Venue:** Prince Philip House

**Time:** 12.30pm to 5.00pm

18 October 2017

**New Fellows' dinner**

**Venue:** Drapers' Hall

**Time:** 6.30pm to 10.45pm

14 November 2017

**In Conversation with Raspberry Pi, 2017 MacRobert Award winner**

**Venue:** Prince Philip House

**Time:** 6.30pm to 9.00pm

21 November 2017

**Hinton Lecture - Vincent de Rivaz CBE FREng**

**Venue:** Prince Philip House

**Times:** 6.00pm to 10.00pm

## 2018 prizes and medals - call for nominations

*The following 2018 Royal Academy of Engineering Awards are now open for nominations:*

**Major Project Award** - awarded to a team of engineers, based in the UK, who have delivered a major engineering project that has had a substantial impact on society.

**President's Medal** - awarded to a Fellow who has contributed significantly to the Academy's aims and work.

**Colin Campbell Mitchell Award** - for an engineer or small team of engineers who have made an outstanding contribution to the advancement of any field of UK engineering.

**Prince Philip Medal** - awarded to an engineer for exceptional contributions to engineering through practice, management or education.

*Closing date: Monday 13 November 2017*

To make a nomination, please visit [www.raeng.org.uk/grants-and-prizes/prizes-and-medals](http://www.raeng.org.uk/grants-and-prizes/prizes-and-medals)

For more information, please call the awards team on 020 766 0607 or email [awards@raeng.org.uk](mailto:awards@raeng.org.uk)

## Leave a lasting legacy

Thank you to all Fellows who have generously pledged a bequest to the Academy. Legacy gifts help the Academy to bring together the most successful and talented engineers from across the profession to put engineering at the heart of a sustainable and prosperous society, improving lives and opportunities. For a confidential discussion about legacy giving, please contact Fiona Stewart, Head of Giving, on 020 766 0852 or [fiona.stewart@raeng.org.uk](mailto:fiona.stewart@raeng.org.uk)

## Publications received

*Construction Law* by Professor John Uff CBE QC FREng has been donated by the author and can be found in the Fellows' Library.

*Cambridge Engineering, the first 150 years* by Professor Haroon Ahmed FREng has been donated by the author and can be found in the Fellows' Library.



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## Obituaries

**Mr Anthony Kenneth Allum CBE**

**FREng** died on 1 August 2017, aged 74. He was formerly Chairman of Halcrow Group Ltd.

**Mr Philip Malcolm James Gray**

**FREng** died on 10 April 2017, aged

89. He was formerly Chariman of Zinc Metallurgy Ltd.

**Dr Alan Arthur Shepherd CBE FREng**

died on 7 May 2017, aged 89. He was formerly Deputy Managing Director of Ferranti.

**Professor Geoffrey Donald Sims**

**FREng** died on 5 August 2017, aged 91.

He was formerly Vice-Chancellor of the University of Sheffield.

**Professor Leslie Roger Wootton**

**FREng** died on 5 July 2017, aged 73. He was formerly a Professor of Engineering at City, University of London.