Addressing global challenges in Brazil

In July, the second Frontiers of Development symposium took place in Rio de Janeiro, Brazil. The event brought together a group of 60 international researchers and practitioners from a diverse range of disciplines for three days of interactive workshops, networking and discussion on the theme of Inclusivity and wellbeing: coastal communities in a 3°C world.

Led by the Academy, Frontiers of Development is a collaborative event held by the four UK National Academies under the government’s Global Challenges Research Fund (GCRF). The symposium supports cutting-edge research that addresses the challenges faced by developing countries.

Topics focus on the Sustainable Development Goals. The programme’s key philosophy is that global knowledge transfer from developing economies in the global South to more advanced economies in the North is essential in tackling development challenges, in addition to North-South, North-North and South-South learning.

This year’s theme was derived from the United Nations’ Emissions Gap Report in 2016, which stated that a 3°C rise in global temperatures above pre-industrial levels is distinctly possible. Such a scenario would result in approximately 275 million people living in areas that are predicted to flood due to associated sea level rise; one such city that would be acutely affected is Rio de Janeiro.

The location of this Frontiers of Development symposium in Rio was particularly timely as 2018 is the UK-Brazil Year of Science and Innovation, a joint venture between the UK and Brazilian governments. This initiative has its origins in the UK’s close science and innovation relationship with Brazil, as its third largest research and development collaborator from 2008 to 2012.

Although there was a strong bilateral connection between the UK and Brazil at this event, Frontiers of Development is a global programme, which has representation from every continent. Discussions focused on three themes: how we use our oceans and unlock the potential of our coasts as renewable resources to create sustainable blue economies; how we can improve ways of protecting fragile marine ecosystems; and how we can build resilience to climate-induced disasters. To carry forward the discussions at the symposium and build their networks, participants also had the opportunity to bid for seed funding or networking grants of £20,000 to £25,000.

The event was chaired by Professor Mark Pelling from King’s College London, also a GCRF Challenge Lead at UK Research and Innovation, and Professor Minhan Dai, Director of the State Key Marine Environmental Laboratory at Xiamen University, China. The programme also featured global and regional expertise with keynote speeches from Rovani Sigamoney from UNESCO, and Professor Carlos Nobre, the World Resources Institute Senior Fellow.

Alongside this event, the Academy’s Leaders in Innovation Fellowship (LIF) programme held a regional hub event, bringing together alumni from the first four years of the programme in Brazil, Chile and Colombia. After two packed days of training, the LIF Innovation Unconference event brought the GCRF and Newton Fund together. Frontiers of Development participants joined LIF alumni for a series of participant-led workshops that shared knowledge, challenges and solutions. This coming together of two communities under two different UK government funds will seed new ideas and aid innovation, while helping to foster new collaborations and professional friendships.

An attendee at the Unconference (left) and (above) the delegates from the Frontiers of Development symposium.
President’s column

I hope that all Fellows have had an enjoyable summer. It was great to see so many of you at the Academy’s first Summer Reception, held at Prince Philip House on 27 July. The initiative provided the perfect environment to meet other Fellows and reflect on what had been a very busy few months for the Academy. For many, it was also their first time on the building’s terrace, which allowed attendees to take in the view over St James’s Park and the Mall.

After a relatively quiet August for the Academy, September kicked off with the launch of This is Engineering season two. Season one of the campaign has proved successful, with the films having been viewed more than 16 million times by teenagers with an even gender split. The new films feature young engineers from a range of disciplines, including aviation, film, disaster relief and energy, demonstrating the variety that a career in engineering can offer. Initial research has indicated that among those who saw the first set of films, consideration of a career in engineering has increased. We hope to work with more companies and organisations in months and years to come to extend the campaign’s reach further.

Philip Duffy, Director of Enterprise and Growth at HM Treasury, attended the Trustee Board Discussion Dinner on 17 September for a broad-ranging discussion on growth, technologies and skills. The dinner was well attended by current and past Trustees and, for the first time, included chairs of our Operating Committees.

Development of our Engineering Policy Centre continues, with the first partner event held in July. This brought together the Academy, professional engineering institutions, the Engineering Council and EngineeringUK, to start laying the groundwork for the centre’s priorities and workplan. As well as furthering collaboration between these organisations, I hope that the centre will build close relationships across government so that policy outputs can meet both the government’s and profession’s needs.

The day after the Trustee Board and Discussion Dinner, the Academy held its Annual General Meeting (AGM) and announced the election of 50 new Fellows, four international Fellows and one Honorary Fellow. The new Fellows’ achievements span the breadth of engineering, from exciting space missions to groundbreaking research in sustainability. Each one has contributed significantly to society, whether through industry or academia, and I look forward to welcoming them all into the Academy at the new Fellows’ briefing and dinner next month, and to their involvement in the Academy’s work. The AGM also provided the opportunity to welcome our new Trustees and new Vice-President for Fellowship Engagement, Naomi Climer CBE FREng.

The AGM allows us to reflect on the Academy’s activities and achievements over the past year, but it also affords an opportunity to look ahead. After the official business of the AGM, we heard presentations from two young engineers who have both demonstrated excellence early in their careers. Enterprise Fellow Seyi Sosanya spoke about co-founding an engineering business developing virtual reality design software, Gravity Sketch, and how support from the Enterprise Hub is helping to grow this further. Winner of the 2018 George Macfarlane Medal, Khouloud El Hakim, talked about her work as Project Engineer on Crossrail’s Farringdon Station.

The Academy continues to champion young engineers and engineering researchers through its grant programmes, and these will be boosted by £20 million funding from the Investment in Research Talent fund, announced by Greg Clark MP at the end of June. Over three years, this funding will help the Academy support a greater number of researchers, innovators and entrepreneurs, which will be an integral part of addressing our aim of making the UK a great place for engineering innovation and businesses.

The AGM also marked the start of my last year as President of the Academy. There is much to achieve in the final year of my term, and as I said in my foreword to the Annual Review, I would like to see the Engineering Policy Centre up and running, and the continuing success of This is Engineering. After the summer break, I hope that you are all feeling refreshed and re-energised to contribute to these goals and join us in our efforts to advance and promote excellence in engineering for the benefit of society.

Meetings and visitors

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

Dr Patrick Vallance FRS, Government Chief Scientific Adviser and Head of the Government Science and Engineering profession
Professor Helen Atkinson CBE FREng

She attended the following events and meetings:

ICE 200 Celebration Dinner at Buckingham Palace, hosted by HRH The Duke of York KG GCVO CD ADC
Operating Committees Group meeting
Trustee Board meeting and dinner
AGM
New Fellows Reception
AGM

On 18 September, the Academy’s 42nd AGM took place at Prince Philip House.

Attendees celebrated the election of 50 new Fellows, four International Fellows and one Honorary Fellow. The full list of new Fellows can be found at [www.raeng.org.uk/newfellows2018](http://www.raeng.org.uk/newfellows2018).

During the AGM, the President, Professor Dame Ann Dowling OM DBE FREng FRS, presented her final review of the Academy’s year. Highlights included the *This is Engineering* social media campaign; the five-year anniversary of the Enterprise Hub, which has supported over a hundred startup and scale-up companies; the annual Awards Dinner at the Tower of London; and the establishment of the Engineering Policy Centre.

The Annual Review and Financial Report and Accounts for the year ending 31 March 2018 were received, and Professor Stephen Young FREng presented the financial report.

After the formal proceedings of the AGM, Seyi Sosanya, Co-Founder of Gravity Sketch and a 2017 Enterprise Fellow, gave a presentation about his technology and how joining the Enterprise Hub helped him to develop his business further.

Khouloud El Hakim, Project Manager at Bechtel and winner of the Academy’s 2018 Sir George Macfarlane Medal, gave a presentation on her role in the development of Crossrail’s Farringdon Station and how it has transformed the careers of many who worked on the project, including her.

The President then presented three Academy awards. The President’s Medal, awarded to a Fellow of the Academy who has contributed significantly to the Academy’s aims, was awarded to former Senior Vice-President Professor Sir William Wakeham FREng. His role leading the 2013 Governance Review has had a huge and positive impact on the organisation.

The Sir Frank Whittle Medal, awarded to an engineer whose sustained achievements have had a profound impact upon their engineering discipline, was given to John Bartlett CBE FREng, an outstanding tunnelling engineer whose responsibilities included the second Dartford Tunnel, London Underground’s Victoria Line and the Channel Tunnel.

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, was this year presented to a team from the University of Nottingham and Teledyne e2v, whose collaborative work led to transformative approaches to minerals processing using high-power microwave energy. The evening concluded with a networking reception.

Celebrating 50 years of innovation - MacRobert Award 2019

In 2019, the MacRobert Award will celebrate its 50th anniversary. Established in 1969, the MacRobert Award is the UK’s longest-running and most prestigious national prize for innovation in UK engineering.

The MacRobert Award is awarded annually to a company from a shortlist of three finalists for an outstanding innovation, proven commercial success and tangible benefit to society. It honours the winning organisation with a gold medal and the team members with a prize of £50,000.

Past winners have included the engineers behind innovations such as the Pegasus jet engine, catalytic converters, the roof of the Millennium Dome, intelligent prosthetic limbs and the Raspberry Pi microcomputer. This year, the award was won by Owlstone Medical for its unique breath sampler for diagnosing diseases.

Originally founded by The MacRobert Trust, the award is managed and presented by the Royal Academy of Engineering and supported by the Worshipful Company of Engineers.

Applications are now open. For further information and to apply, please visit [www.raeng.org.uk/prizes/macrobert](http://www.raeng.org.uk/prizes/macrobert).

Email macrobert@raeng.org.uk or call 0207 766 0607

Closing date: 31 January 2019
Public Engagement

2018 Create the Trophy competition

On 5 October, the Queen Elizabeth Prize for Engineering’s (QEPrize) international Create the Trophy competition will open for entries.

Budding designers aged 14 to 24 from around the world can take advantage of the new and improved 3D Design Studio app to create unique trophies that capture the spirit and wonder of engineering.

The app provides a catalogue of different shapes and materials for designers to choose from. Whether users design a trophy, an animal or a small-scale building, they can preview their masterpieces in real time, replay the entire design process when they finish, and export the file for 3D printing.

An expert panel of judges will select the winner, who will receive a high-end laptop and an invitation to see their trophy awarded to the winner(s) of the 2019 QEPrize.

The competition closes on 2 December and the winner will be announced on 12 February, along with the winners of the 2019 QEPrize. For more information, visit www.qeprize.org.

This is Engineering at the Houses of Parliament

In July, the Academy, in collaboration with EngineeringUK, launched a 10-point action plan in Parliament to help inspire future generations of engineers. The plan was informed by students aged between 13 and 16 years old as part of the This is Engineering campaign.

The action plan calls for more businesses to pledge to run ‘taster days’ – a shorter version of work experience – to help students understand the varied role of engineering and for the government to incorporate ‘taster days’ into its upcoming careers strategy.

It also urges politicians, education providers and the wider business community to support and promote local careers fairs and for politicians and businesses to proactively champion GCSE design and technology (D&T) courses in their local areas. According to 2017 figures, D&T has disappeared from nearly half of schools.

The event was sponsored by Vicky Ford MP, who is a member of the Science and Technology Committee and the Women and Equalities Committee, and was attended by a variety of MPs, industry partners, professional engineering institution representatives, young people and young engineers.

Apprenticeships and Skills Minister Anne Milton MP said “Engineering is an exciting and varied career that can open up all sorts of opportunities. It is great to see the Royal Academy of Engineering highlighting what needs to be done to encourage the engineers of the future. We are determined to boost engineering across the country. This year our Year of Engineering campaign is highlighting the amazing opportunities these fascinating subjects can give. Since becoming Minister for Skills and Apprenticeships I have been fascinated to see that engineering touches almost every aspect of our lives, from managing our environment, to sending satellites into space.”
Communications workshops for engineers

In June and July, the Academy planned and delivered a series of pilot communication and engagement workshops for engineers and public engagement professionals in Bradford.

Fifteen attendees came to the four workshops, which covered topics including: understanding your audience; language and use of images; and an introduction to the Year of Engineering and *This is Engineering*. At the end of the training, attendees had the opportunity to put their new skills to the test at Bradford Science Festival.

The pilot aims to increase public engagement skills among engineers across the Trans-Pennine region and is part of the Academy’s ambition to improve public awareness and recognition of the crucial role of engineers everywhere.

The pilot is set to be rolled out in Manchester and York in the autumn.

Next phase of *This is Engineering* launched

On 6 September, *This is Engineering* launched the second phase of its campaign at a film preview event at the Academy.

The event included a panel discussion with two of the engineers who feature in the films, Pavlina from the season one campaign, who uses engineering to light events and fashion shows and Joshua, from the new set of films, who uses his structural engineering skills to help people after natural disasters. The director of the films, Rich Hall, also took part.

Season two builds on the first five films in the campaign with seven new role models showcasing a greater variety of engineering jobs, impacts and educational backgrounds.

They give more visibility in particular to social impact, teamwork and non-graduate routes. The engineers include Ala Hammad, a tunnel engineer and blogger; Dr Enass Abo-Hamed, CEO and Co-Founder of H2GO Power and Enterprise Hub member; and Joshua Macabuag, who volunteers as a search and rescue engineer.

The films from the first phase have so far been viewed more than 16 million times by an audience of teenagers with an even gender split. A survey of more than 1,200 young people before and after the campaign launch indicated a 41% increase in the number of teenagers who said, after seeing the campaign, that they would consider a career in engineering.

The films can be viewed at [www.thisisengineering.org.uk](http://www.thisisengineering.org.uk) and on twitter [@ThisisEng](https://twitter.com/ThisisEng)

(Left) Joshua Macabuag, and (right) Dr Enass Abo-Hamed, who feature in the second season of *This is Engineering* films
Engineering ethics conference
On 6 September, engineers from across engineering research, education and industry came together for a one-day conference in Leeds that addressed current ethical issues in engineering and how to embed ethical standards across the profession.

The conference began with a welcome from Sir Alan Langlands FRSE, Vice-Chancellor of the University of Leeds, and a speech from Professor Chris Atkin FREng, Chair of the Engineering Council. Professor John Uff CBE QC FREng chaired a panel discussion, with contributions from Richard Maudslay CBE FREng, Chair of the Academy’s Ethics Working Group, Dame Judith Hackitt DBE FREng, Chair of EEF, The Manufacturers’ Organisation, and Professor Raffaella Ocone FREng FRSE, Heriot-Watt University.

An afternoon session addressed a range of developments in engineering that raise ethical issues, including big data, cyber security, artificial intelligence, autonomous systems, climate change and the environment. This was followed by a session on embedding ethics in engineering higher education and professional development, chaired by Professor Helen Atkinson CBE FREng, Pro-Vice-Chancellor, Cranfield University.

The final session of the conference was a discussion between conference contributors and attendees on defining a 10-year vision for next steps in engineering ethics. The event was captured by an artist and will be written up by the conference organisers and shared for further comment and debate within the profession.

The conference was organised by the University of Leeds, with the Academy contributing via a steering group of other partners including the Engineering Council, the Engineering Professors’ Council and Engineers Without Borders.

If you are interested in seeing the outputs of this conference, please email andrew.chilvers@raeng.org.uk

First partner event for the Engineering Policy Centre
On 12 July, the Academy held a half-day event to explore and progress the development of a cross-profession national Engineering Policy Centre.

Attendees included the professional engineering institutions (PEIs), Engineering Council and EngineeringUK, and a small number of Academy Fellows. Keynote speakers introduced perspectives from the PEIs, policymakers and media on the timeliness of the Engineering Policy Centre to support the profession and offer a space to collaborate on policy development, a better route to specialist advice and interfacing with key audiences.

Participants also engaged in discussions to develop the proposed mechanisms that will make the centre work in practice and started to gather ideas for policy issues, as a first step towards setting the centre’s priorities and workplan.

Speakers included: Jenny Dibden, Director Science, Research and Innovation at the Department for Business, Energy and Industrial Strategy; Dr Mike Short CBE FREng, Chief Scientific Adviser to the Department for International Trade; and Simon Whalley, Head of External Affairs at the Royal Aeronautical Society (RAeS).

The event was introduced by Dr Hayaatun Sillem and Dr Nick Starkey for the Academy, and Simon Luxmoore, Chief Executive of RAeS, who hosted the event. Professor Jeremy Watson CBE FREng, Chair of the Engineering Policy Centre Working Group said: “I was very impressed by the degree of accord in the room this afternoon and the quality of thinking that led us to some initial cross-cutting collaborative themes for the Engineering Policy Centre to consider. I look forward to working with PEI colleagues to pilot how we can progress these themes together as part of a new, closer working relationship.”

For more information, please email Marine Shah, Senior Manager Policy Centre, at marine.shah@raeng.org.uk

Graduate Engineering Engagement Programme
On 25 June, the Academy’s Graduate Engineering Engagement Programme (GEEP) launched at the Academy.

GEEP is an employer-led programme that aims to increase the transition of engineering graduates from diverse backgrounds into engineering employment. The 2018 - 2019 programme consists of events that will be happening throughout the autumn, which will be hosted by the Academy, Buro Happold, BAE Systems and Aston University. The programme gives employers the opportunity to engage with cohorts of 50 students, with the aim of encouraging them to apply for engineering student and graduate employment opportunities.

Sixteen engineering employers are signed up to the programme. Any engineering employer that is interested in GEEP should visit www.raeng.org.uk/geep or email diversityteam@raeng.org.uk
Transforming healthcare through engineering and technology

On 5 September, the Academy partnered with the Academy of Medical Sciences to support its annual FORUM lecture on the topic Transforming healthcare through engineering and technology.

The keynote lecture was given by Dr Omar Ishrak, Chairman and CEO of Medtronic, one of the world’s largest medical equipment development companies. This was followed by a panel discussion with Fellows and experts from across the two Academies on a diverse range of cutting-edge technologies set to have a significant impact on health and care. These ranged from machine learning for medical image analysis to mobile tools for patient self-management.

The event brought together the Academy of Medical Sciences’ FORUM network of individuals and organisations across industry, academia and the NHS, with the engineering community. This led to an interdisciplinary discussion on the increasingly prominent role that engineering and technology is playing in providing high-tech health and care solutions.

Discussion also focused on how these technologies can be effectively integrated into the healthcare system in practice, so that they deliver real improvements in patient safety and outcomes.

Diversity and inclusion implementation group for professional bodies

The Academy has set up an implementation group to address recommendations from the first engineering and science diversity and inclusion (D&I) benchmarking report, which was disseminated in February.

The group, chaired by Rosemary Cook CBE, CEO of the Institute of Physics and Engineering in Medicine, first met in May. Since then, a further two meetings have taken place and the group has identified key issues and potential practical actions to deliver change. To drive progress, four subgroups have been established that focus on communications and language, developing better measures, extending use of the framework, and sharing resources.

The implementation group has set ambitious aims: to raise the percentage of professional engineering institutions and science bodies using the D&I Progression Framework from 50% to 75% of organisations; and to demonstrate positive change in D&I across all eight areas of the framework.

Young Researchers’ Futures meeting

From 4 to 6 September, the biennial Young Researchers’ Futures Meeting, organised by the Academy’s Panel for Biomedical Engineering and hosted by Professor Joe McGeough FREng FRSE, took place at the University of Edinburgh.

This year’s theme was Nanoengineering approaches in biomedical science. The event aimed to provide the best young biomedical postdoctoral engineers and scientists from throughout the UK with a forum to showcase their work. It provides opportunities for mentoring and guidance from selected experts across academia, industrial and clinical sectors.

The event was attended by 25 outstanding early-career researchers from across the UK who presented their work alongside 10 senior speakers.

There were also workshop sessions to explore the broader themes of the conference: interdisciplinarity, cross-sectoral working, and the impact of engineering on society. These included presentations from senior clinicians and industry experts, ensuring that the young researchers were encouraged to consider the impact of their work beyond academia.

Discussions were continued over the conference dinner, which included an after-dinner presentation from Professor Richard Williams OBE FREng FRSE, Principal and Vice-Chancellor of Heriot-Watt University.

It is hoped that the themes explored and connections made by the young researchers will support them to deliver real impact to society as their careers develop. The Academy would like to thank the sponsors of this year’s meeting: the Wellcome Trust, the Engineering and Physical Sciences Research Council, and the Mayneord-Phillips Trust.

For more on the engineering and science D&I benchmarking report, visit www.raeng.org.uk/peis
For more on the implementation group, email diversityteam@raeng.org.uk

Attendees gathered in Edinburgh, where postdoctoral biomedical engineers presented their work to experts from across academia, industrial and clinical sectors.
Research and innovation

Investing in talented researchers

At the end of June, Greg Clark MP, Secretary of State for Business, Energy and Industrial Strategy, announced £20 million funding for the Academy research and enterprise programmes over the next three years, recognising the importance of engineering research and innovation to the UK.

The funding will allow the Academy to fund 25 Chairs in Emerging Technologies, providing long-term funding for up to 10 years to engineering global visionaries. It will also enable the Academy to support an additional 23 early-career engineering academics to develop their research careers through the Academy’s Research Fellowships scheme.

A further 24 Enterprise Fellowships will equip entrepreneurial engineers with the necessary skills, experience and networks of expert advisors to develop their outstanding innovations.

At least 44 further awards will help strengthen the Academy’s commitment to supporting academic engagement with industry, including a relaunch of the Industrial Fellowship scheme, new initiatives to help researchers engage with the SME partners of their industrial sponsors, and proof of concept funding for award holders to help them prove that their innovations will be successful.

The Academy’s President said: “We are delighted by this extra investment by the UK government in supporting the finest engineering researchers and innovators, an important contribution to addressing the Academy’s strategic challenge of making the UK the leading nation for engineering innovation as well as reinforcing the government’s industrial strategy.”

Industrial Fellowships

In September, the nine Industrial Fellows who received their awards in April 2018 started their fellowships.

The Industrial Fellowship scheme provides an invaluable opportunity for early to mid-career academics to undertake a collaborative research project in an industrial environment. It aims to strengthen the strategic relationship between the university and the industry host by providing an opportunity to establish or enhance collaborative research between the two parties.

The awardees for this year are:

• Dr Federico Alberini, University of Birmingham/Johnson Matthey - use of advanced diagnostic data for complex fluid process scaleup.
• Dr Halim Alwi, University of Exeter/Prismatic Ltd - flight control for high altitude long endurance unmanned aerial vehicles.
• Madeleine Bussemaker, University of Surrey/Arcadis UK Ltd/CE Geochem - ultrasonic degradation of per- and poly-fluoroalkyl substances.
• Dr Matteo Ceriotti, University of Glasgow/Alba Orbital Ltd - attitude determination and control for PocketQube picosatellites.
• Dr Abigail Hathway, University of Sheffield/Ove Arup and Partners - model predictive control for low energy building operation.
• Dr Matthew Himsworth, University of Southampton/Defence Science Technology Laboratory - quantum sensing in dynamic environments.
• Dr Zafer Kazanci, Queen’s University Belfast/Bombardier Aerospace - low-velocity impact analysis of composite sandwich panels utilising auxetic cores.
• Dr Alistair Mcilhagger, University of Ulster/Bombardier Aerospace - multi-optimisation and development of advanced textile composites.
• Dr Hui Yu, University of Portsmouth/Emteq Ltd - dynamic facial expression reconstruction from upper half-face data.

The Industrial Fellowship scheme has been redesigned to enable more flexible and longer fellowships. These changes will be implemented in the next call for applications, which will be announced in December 2018.

For more information, visit www.raeng.org.uk/ifs

New Research Fellows

In August, the Academy announced support for nine new engineering Research Fellowships, with each awardee receiving five years’ worth of funding to advance their academic research. It follows the seven Research Fellowships that were announced in March.

The awardees’ research topics cover a wide range of engineering disciplines, including the use of next-generation artificial intelligence in automated game design, novel satellite to ground receivers for encrypted quantum communication, and the development of decentralised, networked and resilient energy systems in developing countries.

The Academy’s Research Fellowships are designed to advance excellence in engineering by enabling early-career academics to concentrate on basic research in any field of engineering. Awardees also receive mentoring from an experienced Academy Fellow, providing valuable advice and industry links that will enable the researchers to establish themselves as future leaders in their fields.

Two of the awards have been made as part of the Academy’s new Engineering for Development Research Fellowships. Funded through the government’s Global Challenges Research Fund, these fellowships are awarded to research projects that directly tackle the challenges faced by developing countries and highlight the vital role of engineering in achieving sustainable global development.

For more information on Research Fellowships, visit www.raeng.org.uk/research-fellowships
In the spotlight: Alasdair Pettigrew

In 2017, BOXARR CEO Alasdair Pettigrew joined the Enterprise Hub via the SME Leaders programme, which supports promising leaders of high-growth engineering and technology SMEs through the provision of a grant, training and mentoring.

The BOXARR platform was originally conceived through a collaboration between Rolls-Royce and the University of Southampton, and enables collaborative modelling, visualisation, simulation and analysis of large interdependent systems, such as supply chains, programmes and operations. The technology aims to help businesses solve the problem of emerging complexity, which can overwhelm teams and risk projects running over time and budget.

Since joining the Enterprise Hub, BOXARR has secured a second pre-series-A fundraising round, acquired new global customers, and grown significantly. Its next big milestone is to reach £100,000 monthly recurring revenue, which Alasdair expects to happen this autumn.

He says: “I benefited from opportunities to practise pitching our business ideas to experienced, well-respected leaders in engineering and enterprise. This helped hone our value proposition as it made us think deeply about what we were doing well and what we needed to improve.”

Applications for the next cohort of SME Leaders have opened. For more information, please visit www.raeng.org.uk/sme-leaders

New Research Chairs and Senior Research Fellowships

The Academy has announced the award of seven new Research Chairs and Senior Research Fellowships, two of which are funded through the Investing in Research Talent Fund. The seven awardees cover a broad spectrum of engineering research.

The awardees will hold these positions for five years and will each be mentored by a 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 industrial partners.

The full list of awardees is:

- Professor Amparo Galindo, Lilly/Royal Academy of Engineering Research Chair in pharmaceutical molecular systems, Imperial College London.
- Professor Roy Kalawsky, Airbus/Royal Academy of Engineering Research Chair in digital and engineering information systems, Loughborough University.
- Professor Ian Kinloch, Morgan Advanced Materials/Royal Academy of Engineering Research Chair in carbon materials, University of Manchester.
- Professor Tong Sun, Faiveley Bracknell Willis/Royal Academy of Engineering Research Chair in smart railway electrification: evolvable from contact to contactless, City, University of London.
- Professor Philip Torr, Five AI/Royal Academy of Engineering Research Chair in computer vision, University of Oxford.
- Professor Tom Vercauteren, Medtronic/Royal Academy of Engineering Research Chair in machine learning for computer-assisted neurosurgery, Kings College London.

The next round of applications is due to close in March 2019. For more information, please visit www.raeng.org.uk/researchchairs

Education and skills

Engineering Leaders Scholarships event

On 15 and 16 September, the Engineering Leaders Scholarships (ELS) annual event took place at Conference Aston in Birmingham.

The annual weekend provides opportunities for existing scholars to take part in a variety of activities including business games and various leadership training events. One of the key aspects of the weekend is networking, both with each other and with Academy Fellows, Sainsbury Management Fellows and ELS alumni who willingly give their time to support the event. Of the 105 current awardees, 90 attended the weekend.

Dame Judith Hackitt DBE FREng gave a pre-dinner speech, which was well received. Scholars had the opportunity to hear about Judith’s career and gain helpful advice on their own careers.

The Academy is looking for Fellows to be involved with the ELS programme, either to act as mentors or take part in the selection process for new awardees by assessing applications and taking part in the selection event in late March.

If you are interested in getting involved, please contact Jacqueline Clay at Jacqueline.clay@raeng.org.uk
Connecting STEM Teachers annual celebration event

On 6 July, the Academy’s flagship education programme, Connecting STEM Teachers, celebrated the end of its seventh year with an event at the Academy.

The event was attended by over 130 people including teachers, funders, parents and others from the wider STEM community. It was also attended by 35 students, who spoke to guests about STEM projects they had been working on through the programme. Innovative projects included Micro:Bit BattleBots controlled by motion-sensor gloves, growing plants while conserving water and developing products to support the happiness of zoo animals.

An exhibition held at the Academy allowed visitors to talk directly to the students about what they had learned, as well as talking to other STEM providers and PEIs about their STEM programmes. The afternoon concluded with the Academy’s 43 teacher coordinators working with students and receiving training on Lego Mindstorm kits.

The programme aims to create a national network of support for teachers across all STEM subjects, disseminating free training and learning resources that promote collaboration and enhancing learning opportunities for pupils. It is led by the Royal Academy of Engineering with generous support from Shell, the Helsington Foundation, Petrofac, Boeing UK, BAE Systems and the Royal Air Force.

For more information about the Connecting STEM Teachers programme, visit www.raeng.org.uk/connecting-stemteachers

Discussion on degree apprenticeships

On 20 July, the Academy and BAE Systems jointly hosted a roundtable discussion on the government’s recently introduced degree apprenticeships at Farnborough International Airshow.

The roundtable looked at the limited knowledge and misconceptions around degree apprenticeships among young people, their parents/carers and teachers, and how this can be improved, focusing on three main themes:

• How to increase uptake of degree apprenticeships among employers, in particular SMEs, as well as individuals, and ensure that diversity issues for engineering specifically are addressed.

• How to build effective partnerships between providers and employers so that both benefit from this new form of provision, and create excellent teaching for apprenticeships.

• What needs to be done to address challenges such as those relating to standards, end-point-assessment and inflexibility with funding?

The event was chaired by Professor Helen Atkinson CBE FREng, Pro-Vice-Chancellor at Cranfield University, and included participation from representatives from the Engineering Council, Siemens, MBDA, Airbus, UCAS, City University of London, Blackpool and Flyde College, and the Engineering Professors’ Council, as well as BAE Systems and the Academy.

The outcomes from the discussion will be published as a report later in the autumn.

Sainsbury Management Fellowships

Following interviews in July, 10 new Sainsbury Management Fellowships have been awarded.

The fellowships support engineers that want to complement their engineering experience by undertaking high-quality MBA programmes at some of the top business schools in the world.

The successful awardees came from a range of engineering backgrounds and will be attending top schools in Europe, Asia and the US. Of the 10 fellowships, three were awarded to individuals who had recently graduated from the Academy’s Engineering Leaders Scholarships scheme, which aims to develop future engineering leaders.

Applications are currently open for engineers starting MBA programmes in early 2019. The closing date is 29 October 2018, with interviews in December.

If you are interested in applying or know someone who is, please visit www.raeng.org.uk/smf
Media roundup

In June and July, Owlstone Medical, winner of the 2018 MacRobert Award for its breath biopsy technology, received extensive coverage in The Sun, Daily Mirror, Daily Mail, Mail Online and Daily Telegraph, radio news, and trade press. A Reuters feature on finalists Oxford Space Systems also broadcast the award to a global online audience. Other award winners and finalists continue to generate interest, including widespread coverage in local and engineering trade outlets.

Academy CEO Dr Hayaatun Sillem wrote for New Statesman on the need to recruit engineers from all backgrounds to fully realise the economic and social benefits of emerging technologies. She also wrote a piece for Forbes magazine on why automation is an opportunity rather than threat to the future of work. Dr Hayaatun Sillem also featured on BBC Radio 4 Woman’s Hour to speak about challenging stereotypes of engineering.

The President contributed a piece to The Times for International Women in Engineering Day on the need to challenge misconceptions and outdated views of what engineering is and what engineers do.

The This is Engineering campaign’s 10-point plan to attract young people into engineering gained coverage in The Engineer and regional press after being launched at an event in parliament. Demis Hassabis CBE was featured on BBC Radio 4’s Desert Island Discs.

Roundup

Trustee Board election results

The successful candidates in the recent Trustee election, who joined the Board with effect from the AGM on 18 September, are Professor Peter Goodhew CBE FREng, Dame Judith Hackitt DBE FREng and Professor Stephen Williamson FREng.

Dr Martin Grant FREng was elected as Chair of the Membership Committee and will also serve as a Trustee. Naomi Climer CBE FREng was elected Vice-President for Fellowship Engagement.

Summer Reception

On 14 July, the Academy hosted the first Fellows’ summer drinks reception at Prince Philip House.

Over 140 guests attended, providing the opportunity for the Fellowship to meet in a social setting and for the President to thank Fellows for all that they do. Guests enjoyed drinks and canapes on the Academy’s terrace overlooking St James’s Park.

Due to its success, the Academy will hold another summer reception in 2019, and hopes that it will become an annual event in the calendar. The Academy would like to thank all Fellows who attended the inaugural event.

News of Fellows

Dr Michael Begg and Dr Jim Ramage have been awarded the 2018 Katharine Burr Blodgett Gold Medal and Prize by the Institute of Physics.

Baroness Brown DBE has been appointed Chair of the Carbon Trust.

Suranga Chandratillake OBE has been appointed to the board of Healx.

Professor Stephen Furber CBE has been appointed to the board of advisers of Tachyum Inc.

Sir Peter Gershon CBE has been appointed the Chairman of the Dreadnought Submarine Alliance.

Professor Patrick Grant has been appointed Pro Vice-Chancellor, Research at the University of Oxford.

Dame Wendy Hall DBE has been appointed first Skills Champion for Artificial Intelligence (AI) in the UK.

Demis Hassabis CBE has been appointed adviser to the Government Office for AI.

Professor John Hennessy has been awarded the Semiconductor Industry Association’s Robert N Noyce Award.

Steve Holliday has been chosen as the next President of the Energy Institute.

Professor Terence G. Langdon has been selected as the inaugural recipient of the Oleg D. Sherby Award from the Minerals, Metals and Materials Society, USA.

Sir Terry Morgan CBE has been appointed chairman of HS2.

Professor John Perkins CBE has received an Honorary Doctorate of Engineering from Brunel University London and an Honorary Doctorate of Science from Kingston University London.

Tony Roche has been appointed President of the Institution of Mechanical Engineers.

Dame Stephanie Shirley CH DBE has received an Honorary Doctorate of Engineering from the University of Portsmouth and an Honorary Doctorate of Science from Royal Holloway.

Professor Sarah Spurgeon OBE has been appointed as a Non-Executive Member of the Defence Science and Technology Laboratory Board and Chair of its External Review College.

Dr Dame Angela Strank DBE has received the Energy Institute’s Cadman Award.

Professor Liz Tanner OBE has been appointed Bonfield Professor of Biomedical Materials at Queen Mary University of London.

Professor Ian White has been appointed Vice-Chancellor and President of the University of Bath.
2019 prizes and medals call for nominations

The following 2019 Royal Academy of Engineering Awards are now open for nominations:
Closing dates: Friday 16 November 2018.

Silver Medal
For an outstanding personal contribution to UK engineering by an early- to mid-career engineer resulting in market exploitation.

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 an Academy Fellow who has contributed significantly to the Academy’s aims and work.

RAEng Armourers and Brasiers Company Prize
A £2,000 prize awarded to an individual for excellence in materials engineering.

To make a nomination, please visit: www.raeng.org.uk/prizes-and-medals
For more information please call the awards team on 020 766 0607 or email awards@raeng.org.uk

Forthcoming events
This is a selection of Academy events. For a complete list, visit www.raeng.org.uk/events

23 October 2018
Technologies for the military aircraft of the future

Venue: Prince Philip House
Speaker: Dave Short, Technology Director, BAE Systems
Time: 6.30pm to 8.30pm

5 November 2018
Hinton Lecture and Dinner: Why am I a Fellow of the Royal Academy of Engineering?

Venue: Prince Philip House
Speaker: Dame Stephanie Shirley CH DBE FREng
Time: 6.00pm to 10.00pm

22 November 2018
Launchpad Competition Final

Venue: Prince Philip House
Time: 5.30pm to 8.30pm

27 November 2018
Data-driven culture change

Venue: Prince Philip House
Time: 10.00am to 4.00pm

Leave a lasting legacy
Thank you to Fellows who have generously pledged a bequest to the Academy.

Legacy gifts are essential in helping to bring together the most successful and talented engineers from across the profession with a shared purpose: 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 Philanthropy, on 020 7766 0852 or fiona.stewart@raeng.org.uk

Black History Month
The Academy will be celebrating leading Black, Asian and minority ethnic engineers throughout October, exploring stories from engineers involved in the Academy’s work. Find profiles at www.raeng.org.uk/bhm and under #engdiversity.

Publications received
Crossrail – the art of the build has been received from Crossrail and placed in the Fellows’ library.

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Obituaries

Mr John Clark Judson FREng died on 9 December 2017, aged 94. He was formerly Chairman of WS Atkins Ltd.

Dr Pierre Leonce Thibaut Brian FREng died on 2 April 2018, aged 87. He was formerly Vice-President of Engineering of Air Products and Chemicals Inc.

Dr Ing Hahn FREng died on 12 June 2018, aged 89. He was formerly Deputy General Manager at IVECO.

Dr Ian Mathieson Preston CBE FREng died on 21 June 2018, aged 85. He was formerly Chief Executive of Scottish Power.

Mr Kenneth Frederick Slater FREng died on 24 June 2018, aged 93. He was formerly a Visiting Professor at University College London.

Mr James Cadzow Smith CBE FREng died on 10 July 2018, aged 91. He was formerly Chairman of the Natural Environment Research Council.

Mr Stefan Berthold Tietz FREng died on 21 August 2018. He was formerly a Consultant at S B Tietz and partners.

Professor Roger Sargent FREng died on 11 September 2018, aged 91. He was formerly Emeritus Professor of Chemical Engineering and Senior Research Fellow at Imperial College London. He was a Founding Fellow of the Academy.