The 23-year-old inventor of an eco-friendly alternative to MDF won the Enterprise Hub's fifth annual Launchpad Competition - a nationwide search for the UK's greatest engineering and technology entrepreneurs between the ages of 18 and 25.

On 22 November, HRH The Princess Royal presented Rowan Minkley, CEO and Co-Founder of Chip[s] Board, the JC Gammon Award at the competition's final. This award provides £15,000 of funding, plus training, mentoring and lifelong membership of the Enterprise Hub.

Rowan's innovation is a wood substitute made from industrial potato waste. The judges were particularly impressed with his thoughtful and ambitious plan, which is founded on the principles of a sustainable circular economy.

Professor Andy Hopper CBE FREng FRS, chair of the judging panel, said: “The Enterprise Hub is in a unique position to give independent and realistic advice to the best entrepreneurial engineers who want to commercialise their world-class ideas and scale their businesses. It is immensely exciting to help entrepreneurs with such promise meet their full potential.”

Rowan was one of four finalists to pitch live in front of over 100 attendees and a panel of judges: David Gammon HonFREng, CEO and founder of Rockspring; Ian Ritchie CBE FREng FRSE, Chairman of Iomart; Elspeth Finch MBE, Chair of the Innovators Network; Paul Excell, Founder and CEO of Innovation Excelerated; and Josh Valman, CEO of RPD International, a multimillion manufacturing company that he started aged just 19.

Finalist Nate Macabuag, founder of Mitt, won the People’s Choice Award, a £1,000 prize chosen by an audience and online vote. Mitt builds and provides comfortable, functional and affordable prosthetic upper limbs.

The other two finalists were Connel MacLaughlin, the 19-year-old Founder of Route Reports, which builds custom hardware and software for transport companies to predict and fix hazards; and Rafaël Michali, the 23-year-old Founder of Caura, a next-generation tracker that unlocks molecular signatures to help athletes train smarter, optimise diet plans, and reduce injury risk.

First held in 2013, the competition has helped innovators bring a variety of products to market. At the final, six previous winners and runners-up took to the stage to share their key milestones, including mOm Founder James Roberts. mOm designs mobile infant incubators for use in remote parts of the world. Since winning in 2015, the business has received £630,000 in seed funding and is now preparing to enter clinical trials.
On 22 November, many of our Fellows were among the 2,000 guests who attended a national service to celebrate the Year of Engineering at Westminster Abbey. Those who joined the Secretary of State for Transport included representatives from the engineering community, local schools and government officials. I was honoured to be given the opportunity to deliver the main address, paying tribute to those engineers throughout history who have shaped our landscape, improved our lives and made the world a better place for humans to live in. It was also an ideal opportunity to highlight the importance of working together to inspire the next generation, as engineering will play a central role in tackling the global challenges that we will face in the years to come, such as the effects of climate change and a growing world population.

To ensure the next generation can address these challenges and improve our lives in the way that engineers throughout history have done, we must continue to invest in innovation. The government’s £1.6 billion investment in science and innovation, announced in the Autumn Budget, is an encouraging move in support of the industrial strategy and the aim to increase investment in R&D to 2.4% of GDP by 2027. However, reaching this target also requires a step-change in business investment in R&D in the UK. Recent Academy research with industry leaders has investigated what influences their decisions about where to carry out R&D. The study showed that many elements of UK support for R&D are excellent and are factors in businesses locating R&D here. However, there are a number of areas where the UK incentive is poor – such as support for late-stage development and demonstration and the use of public procurement spend to support innovation. Addressing these gaps could be transformational and would help innovative engineering businesses boost productivity and create jobs and better social outcomes in the UK.

Of course, the Academy’s continued contribution to engineering R&D in the UK supports groundbreaking researchers at all stages of their career and invests in connecting them with industry. At our annual Research Forum, held in November, Dame Julia King DBE FREng FRS, Baroness Brown of Cambridge, reflected on being the Academy’s first Senior Research Fellow and pointed out that for her the benefits of the award include a brilliant and lifelong mentor, and increased productivity, visibility and confidence. These comments were echoed throughout the event, with current researchers speaking about the value of the mentoring they receive from Fellows and the importance of academic-industry partnerships in developing and delivering on the strategic priorities of business. I was extremely pleased to hear many highlight the power of the Academy brand in helping them to attract further funding for their research and in supporting their career development.

In November, the Academy also demonstrated one of ways that it invests in innovation with the final of the Enterprise Hub’s fifth annual Launchpad Competition. It was a privilege to have Royal Fellow HRH The Princess Royal in attendance and to show her and attendees how the Hub supports the UK’s most promising, young engineering entrepreneurs. Winner Rowan Minkley and People’s Choice Awardee Nate Macabug both received funding and Hub membership to help them kickstart their entrepreneurial careers. Investing in people goes hand-in-hand with championing innovation, with the Hub providing bespoke support and one-to-one mentoring from Fellows to members to help them develop their business skills on the journey to commercialising their technology.

The Fellowship itself is of course made up of many pioneers and entrepreneurs with their own unique journeys and success stories. In November, Dame Stephanie Shirley CH DBE FREng became the first woman to deliver the Hinton Lecture. She reflected on her life and career, arriving in England as an unaccompanied child refugee in 1939, to founding an early software company with just £6 in 1959, which went on to employ 8,500 staff. When she established the company, Dame Shirley initially employed only women working part-time and, alongside helping to set up Women in Science and Engineering 30 years ago, she continues to champion the role of women in engineering to this day. She truly is an inspiration to the next generation of engineers.

There is much to look forward to in the new year, January sees the launch of This is Engineering’s third season, building on our goal to inspire potential engineering pioneers. The first two seasons’ films have been viewed more than 26 million times so far and are reaching the target audience: initial research indicates that 72% of young people who have watched the films would consider engineering as a career.

I also hope that, next year, I will continue to have the opportunity to meet with Fellows across the UK and further afield. I am looking forward to seeing many of you at Fellows’ Day on 4 February – a significant event in the Academy’s calendar that gives Fellows the opportunity to meet up with other Fellows and staff, and to learn more about the Academy’s work and how they can get involved. Until then, Merry Christmas and a Happy New Year!

Meetings and visitors
In her capacity as President, Dame Ann has met:
Sir Mark Walport FRS FRSE, with the other National Academy Presidents
She attended the following events and meetings:
The School of Engineering, University of Lincoln
Engineering in REF 2021 consultation meeting
The Institution of Engineering and Technology President’s address
Delivered the Higginson Lecture at Durham University
North East Fellows’ visit and dinner
Newcastle University
Keynote speaker at Global Engineering Congress
International Advisory Board meeting with the Association of British Chinese Professors
Attended the Council for Science and Technology dinner with the Minister of State for Universities, Science, Research and Innovation, Sam Gyimah
Accepted an Honorary Degree at Royal Holloway, University of London and a tour of the Beatrice Shilling building
New Fellows welcomed

On 2 October, the new Fellows of 2018 were welcomed and formally inducted into the Academy.

During the afternoon, the new Fellows were invited to Prince Philip House to learn more about the Academy’s key activities and strategic challenges from the President and CEO. A selection of new Fellows also gave short presentations that told their own stories and highlighted their successes as some of the UK’s most eminent engineers.

After the briefing, over 170 Fellows and guests joined the evening celebrations at Drapers’ Hall. New Fellows were officially inducted during a brief ceremony that was followed by a dinner and speeches from the President and new Fellow Air Vice Marshal Sue Gray CB OBE FREng.

Professor Dame Ann Dowling OM DBE FREng FRS spoke of the Academy’s role in leading the profession and addressing the skills crisis: “We are working to ensure that there are opportunities for more (and hopefully eventually all) schools to engage with practising engineers.” She mentioned the success of the This is Engineering campaign, which was launched to transform young people’s perceptions of engineering and “promote modern engineering as the aspirational career of choice”.

This is Engineering engagement event

On 16 November, the Academy hosted a This is Engineering engagement event, hosted by Alok Jha, science journalist, author and broadcaster.

The event aimed to encourage a greater understanding and awareness of good practice in public engagement with engineering and to build links and understanding between those who look after and fund public engagement in engineering companies, and those who lead engagement for smaller independent projects and STEM charities. It was attended by 70 delegates from a range of organisations including Crossrail, the British Science Association and the National Space Centre.

The event included a panel session titled Why large companies engage with young people, chaired by Mark Titterington, Chief Executive of EngineeringUK. Representatives from BP, Rolls-Royce and Siemens discussed their companies’ engagement strategies and how they measure success.

The event then looked at three independent projects that are having a real impact on engineering engagement in underserved communities, including SMASHfest, a science festival that takes a narrative driven festival to a community; I’m an engineer, get me out of here, an online project that gives students a chance to connect with engineers; and Code Club, which teaches students aged 9 to 13 the basics of coding.

The event closed with a panel session with engagement specialists on the challenges and opportunities in the year ahead.
In September, the Academy took This is Engineering to New Scientist Live. Held at ExCeL London, the four-day event saw nearly 40,000 visitors enjoy talks and demonstrations about the world’s most innovative science and engineering.

The Academy’s stand brought the This is Engineering campaign to life, featuring activities based on the engineering seen in the films. Visitors explored engineering activities including green screen special effects, assembling earthquake-proof towers, creating pop rockets, and discovering the latest lighting technology. Engineering technician Alan Proud from Peacocks, who features in season two of the campaign, demonstrated how he makes custom orthotics to help patients with conditions such as spina bifida, cerebral palsy or the effects of stroke. For a short time, the stand also displayed the vertical compression spacesuit designed by Vinita Marwaha Madill, who featured in season one of the campaign.

The Academy’s stand provided visitors with careers and education resources, including guidance on routes into engineering through campaign partners EngineeringUK. Academy staff members also gave out over 350 free copies of Ingenia magazine.

For more information on This is Engineering, visit www.thisisengineering.org.uk or follow @ThisIsEng on Twitter.

On 30 October, Captain Tim Stockings, former Operations Director at British Antarctic Survey, gave a talk about how the RRS Sir David Attenborough was built, highlighting some of the ship’s special features.

The RRS Sir David Attenborough is one of the most advanced polar research vessels in the world. From 2019 onwards, scientists researching oceans, ice and atmosphere will have access to state-of-the-art facilities on this floating multidisciplinary research platform, which can host up to 60 scientists.

Described by Captain Stockings as a “renaissance in the UK’s shipbuilding capability”, the £200 million project aims to keep the UK at the forefront of polar research and support science in extreme environments.

The presentation was hosted by Fiona Harvey, Environment Correspondent at the Guardian. For a short period of time, the Academy also displayed a 100th scale model of the RRS Sir David Attenborough to demonstrate its size, design and functionality to over 200 delegates attending events at Prince Philip House.

Extreme engineering: Antarctica

Communications training pilot

In October, the Academy delivered further training workshops in York and Manchester as part of its Trans-Pennine communications training pilot.

Over 20 engineers and STEM professionals attended the workshops, which covered topics including: understanding your audience; language and use of images; an introduction to the Year of Engineering and This is Engineering; and planning an activity. Attendees will put their training into practice at events at the National Railway Museum in York and Manchester’s Museum of Science and Industry.

This event followed on from public engagement training events in Bradford over the summer. 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.

To find out more about the Academy’s public engagement programme, visit www.raeng.org.uk/ingenious
National service at Westminster Abbey to celebrate the Year of Engineering

On 22 November, a Service of Thanksgiving to celebrate the engineering profession was held at Westminster Abbey.

The service was the first of its kind, and was led by The Very Reverend Dr John Hall, Dean of Westminster, to mark the government’s Year of Engineering and the bicentenary of the Institution of Civil Engineers (ICE). The event was jointly organised by government, ICE and the Academy.

Representatives from across the engineering community, engineering charities and government attended the event, which celebrated great British engineers of the past and present, including Thomas Telford FRS FRSE, a Scottish civil engineer, and Robert Stephenson FRS, a railway engineer, who are buried at the Abbey. Students from local schools also attended the ceremony.

The service included personal testimonies from engineering ambassador Roma Agrawal MBE, Associate Director at AECOM, famed for her work on The Shard, and Colonel Deborah Porter, Deputy Commander of the Defence Medical Group, on how engineering had changed their lives and enabled them to help and inspire others through their work.

Secretary of State for Transport Chris Grayling said: “The Year of Engineering has been a chance to show young people across the UK all that this profession has to offer them - and to spread the message that engineering needs talented young people from all walks of life to tackle some of the biggest challenges we face. I hope today’s service serves as an important reminder not just of our proud engineering history but of the role young people will play in writing its next chapter.”

3D printing at Science Museum Lates

On 31 October, the Queen Elizabeth Prize for Engineering (QEPrize) had a stand at the Science Museum’s engineering-themed Lates event, where attendees had the chance to create in 3D using both physical and digital tools.

Participants could bring their ideas to life by creating innovative trophy designs in the QEPrize design app and by sketching tangible creations using 3D printing 3Doodler pens.

As the Lates event aligned closely with the QEPrize’s aim of raising the profile of engineering, it was an opportunity to change perceptions of engineering by demonstrating its fun and creative applications.

QEPrize ambassadors were also at the event, showing people what real engineers look like and spreading the word about the QEPrize and the Create the Trophy competition.

Entrants submitted their trophy designs via QEPrize3D on iOS, which is the app that was designed for the competition. The best design on the night won a 3D printing pen.

For more information about the QEPrize and trophy competition, visit www.qeprize.org

Hinton Lecture

On 5 November, software engineering pioneer Dame Stephanie Shirley CH DBE FREng dispelled what she termed the ‘gender myth’ of engineering when she became the first woman to give the Academy’s annual Hinton Lecture.

In 1939, Dame Stephanie arrived in the UK as an unaccompanied child refugee on the Kindertransport. Twenty years later, she founded a pioneering software company that initially employed only women, and was ultimately valued at $3 billion.

Reflecting on her own career, Dame Stephanie said: “Tackling gender diversity is the easiest way to improve an organisation’s economic and cultural wellbeing, but it’s multi-faceted. All women also have an ethnicity, sexual orientation, socioeconomic background, ability or disability, and may be younger or older. We shouldn’t be treated as an amorphous mass.”

The lecture was followed by a drinks reception and dinner that was hosted by the Academy’s President, Dame Ann Dowling.
The Academy and the Royal Aeronautical Society have launched two prestigious awards programmes to recognise the exceptional contribution to engineering and industry of Sir Ralph Robins DL FREng, Chairman of Rolls-Royce from 1992 to 2003.

The Academy will award up to three Sir Ralph Robins Engineering Scholarships each year to undergraduates from underrepresented and disadvantaged backgrounds, who show exceptional engineering potential and who may otherwise be unable to further their engineering education. Awardees will receive £10,000 towards university fees, as well as mentorship and support to create a career development plan, and annual training and networking sessions for a three-year period.

The Royal Aeronautical Society will award the Sir Ralph Robins Medal for Engineering Leadership annually for 25 years to an early- or mid-career engineer who has successfully led and delivered a significant aerospace engineering project.

Initial funding for both awards has been raised by Sir Ralph’s friends and former colleagues, who wished to mark the 30th anniversary of the Rolls-Royce Trent engine.

Professor Dame Ann Dowling said: “We are delighted that friends and colleagues of Sir Ralph Robins have chosen to honour his contribution to engineering in this way. This is a unique opportunity to support the next generation of leading engineers, and ultimately address the engineering skills shortfall by encouraging more exceptional students to pursue a career in engineering. This is a fitting tribute to Sir Ralph.”

The Academy is now undertaking a further fundraising programme to ensure the longevity of the Sir Ralph Robins Engineering Scholarship. Contributions to the scholarship fund are invited.

If you would like to support this initiative, please contact Fiona Stewart at Fiona.Stewart@raeng.org.uk or 020 7766 0652

The competition first opened to international entrants for the 2017 QEPrize. Given the unique scale at which the QEPrize winners’ innovations impact the world, it is important to provide the engineers responsible with an equally innovative and inspiring trophy.

On 10 December, nine-year-old Lily Hill was announced as the winner of the Academy's Christmas card competition at her school assembly.

Following last year’s successful competition, the Academy invited primary school pupils from its Welsh Valleys Engineering Project to design the Academy's Christmas card.

The year-six pupil from Willowtown Primary School in Ebbw Vale, South Wales, won the competition with a technical drawing of a snowflake. She was presented with a pack of her cards and a letter of congratulations from Dame Ann Dowling.

The runner up, Leona, nine, from Pantysgalllog Primary School, Merthyr Tydfil, designed a Christmas tree card inspired by the pattern of a printed circuit board.

At Lily’s school, Willowtown Primary School, the Welsh Valleys Engineering Project has provided support for a weekly Science Club, funding towards programmable robots, ideas for British Science Week and the opportunity to build links with local schools and higher education providers.

Paul Keane, head teacher at Willowtown Primary School, said “I have found the Welsh Valleys Engineering Project to be a brilliant and highly timely initiative that is so well suited to the future that our community needs.”
Technologies for the military aircraft of the future guest lecture

On 23 October, David Short, Technology Director at BAE Systems, gave a lecture at the Academy on Technologies for the military aircraft of the future.

As well as an insight into the battlespace of the future, the talk highlighted the importance of systems thinking in defence engineering and described some of the new and novel manufacturing techniques required to deliver combat systems for the 2030s and beyond.

The lecture was followed by a Q&A session chaired by Academy President, Professor Dame Ann Dowling. David Short was joined by colleagues Professor Andy Wright, Strategic Technology Director for BAE Systems’ CTO organisation and Neil Graham, BAE Systems’ Engineering Director for Europe and International within its air sector.

The audience was at capacity and included Fellows, members of the public, engineering students and early-career engineers.

In conversation with 2018 MacRobert Award winner: Owlstone Medical

On 7 November, MacRobert Award winners Owlstone Medical gave a talk at Prince Philip House.

David Ruiz-Alonso, Co-Founder, and Dr Max Allsworth, Chief Science Officer, told the story behind the development of the company’s ReCIVA Breath Sampler, the first device capable of capturing breath samples for analysis in a robust and reproducible way. The system can identify chemical ‘biomarkers’ in human breath for a variety of diseases, aiding earlier diagnosis, which leads to better patient outcomes and reduced treatment costs.

The event was introduced by Dr Dame Sue Ion DBE FREng FRS, Chair of the MacRobert Award judging panel, and chaired by Sabah Meddings, Business Reporter at The Sunday Times. The team talked about some of the challenges they faced as well as the company’s mission to save 100,000 lives and their next steps towards achieving this.

The event was supported by The MacRobert Trust and the Worshipful Company of Engineers.

Celebrating 50 years of innovation: MacRobert Award 2019

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

The MacRobert Award is awarded annually 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.

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

For further information and to apply, please visit www.raeng.org.uk/prizes/macrobot email macrobert@raeng.org.uk or call 0207 766 0607.

Closing date: 31 January 2019

Thought leadership

Business perspectives on R&D investment

The Academy has published a series of explainers on the government aim to increase investment in R&D from the current 1.7% of GDP to 2.4% by 2027.

The series looks at how the UK can build on the strengths that it already has, and highlights areas where further action is needed. The ambitious 2.4% target requires not only increased public investment but also needs businesses to do more. Engineering companies are the lifeblood of UK R&D and are a critical voice in reaching this target.

Over the summer, the Academy spoke to chief technology officers within engineering companies to understand the factors influencing decisions on R&D investment. This work was overseen by an advisory group of Fellows, chaired by Professor Sir Jim McDonald FREng FRSE.

Increasing R&D investment: business perspectives identifies two broad groups of factors that influence R&D investments:

- Building on strengths: what drives companies to invest in the UK.
- Action needed: where the UK performs poorly and action could have greater impact.

The explainers can be found on the Academy website at www.raeng.org.uk/IncreasingRandD

This is the first phase of this work and the Academy will continue to engage actively with relevant stakeholders.
**Data-driven culture change**

On 27 November, the Academy’s annual diversity and inclusion (D&I) event took place with a focus on how data can be used to drive culture change across engineering organisations. Over 130 people attended from more than 80 organisations.

Keynote speaker, Gary Kildare, Chief HR Officer at IBM, discussed how IBM is using data and artificial intelligence (AI) to develop more inclusive cultures. Henrik Hagemann, Co-Founder and CEO of CustoMem, spoke about culture change from an SME perspective. The Academy’s D&I team also presented the findings from an Academy commissioned survey on D&I across engineering employment, giving attendees the opportunity to discuss implications for the profession. Emerging findings from the survey are that:

- SMEs need convincing of the benefits of D&I to their business.
- A significant proportion of engineering employers do not see a link between increasing D&I and reducing the engineering skills gap.

However, many see links between D&I and organisational image and reputation, legal compliance, increased collaboration, and customer satisfaction.

- The industry is actively promoting engineering as a desirable career.
- Engineering employers do not only consider D&I in the context of HR, but also in the context of wider business activity such as product or service design, marketing, the supply chain, customer experience, and community relations.

The Academy’s D&I programme and Enterprise Hub are embarking on a collaboration to develop a bespoke framework to help increase D&I across engineering SMEs, including startups, micros and scale-ups.

The D&I Measurement in Engineering guide was also launched at the event. Produced by members of the Academy’s D&I Leadership Group (DILG), it provides a structure that employers can use to measure progress on D&I in their organisations. The guide can be found on the Academy’s website at www.raeng.org.uk/dimeasurement.

**Academy diversity and inclusion plan**

In October, the Academy’s senior leadership team signed off its refreshed internal D&I strategic plan.

The plan focuses on embedding D&I into the Academy’s DNA using the D&I Progression Framework and by supporting effective and consistent monitoring and reporting on progress. It also aims to provide training and briefings for staff and Fellows to increase D&I delivery capacity and ensure that the Academy attracts, recruits and retains people from all backgrounds into its Fellowship, committees, programmes, awards, prizes and staff.

Key projects to be developed over the next year include refreshed D&I training and inclusive selection training using an inclusive recruitment toolkit developed by the Academy’s DILG of employers. The Academy will also apply for the government’s Disability Confident scheme, which recognises disability-friendly organisations and aims to help them to attract people with disabilities.

**Policy roundup**

The Academy, alongside the other National Academies, recently hosted fringe events at the party conferences for the Liberal Democrats, Labour and Conservative parties, with panel discussions focusing on the economic and societal benefits of research and innovation. Professor Liz Tanner OBE FREng FRSE represented the four Academies at the Conservative Party Conference event in Birmingham, speaking alongside Sam Gyimah MP.

On 5 November, the Academy brought together experts in design ethics, computer science and engineering to explore issues of bias and fairness in algorithms with officials from the Department for Digital, Culture, Media and Sport. The discussion covered the origins of unconscious bias in AI, possible technical and non-technical solutions, and how policy intervention might support the development of trustworthy AI.

As a Fellowship with reach into both industry and academia, the Academy is well placed to convene policymakers, engineers and other thinkers to address issues of national importance. The Academy is leading a new Engineering Policy Centre in partnership with the professional engineering institutions (PEIs), EngineeringUK and the Engineering Council, which will launch in 2019 and will further enhance the impact of engineering on policy.

To find out more about policy work, contact luiz.guidi@raeng.org.uk.

---

*Image: Event chair Natasha Broomfield-Reid, Gary Kildare from IBM, Dervilla Mitchell CBE FREng from Arup, and Henrik Hagemann from CustoMem*
Thought leadership dinners

The Academy’s programme of thought leadership dinners continues to bring together distinguished experts from industry, academia, the policy community and other sectors.

On 11 September, guests discussed how the UK can achieve 2.4% R&D investment by 2027. On 13 November, this was followed by Making the UK a tech global great, which examined how the UK’s world-class research base and entrepreneurial expertise can best be harnessed to build the technology success stories of tomorrow.

This series of events is helping raise greater awareness of the strength of the Academy’s policy work and activities more widely with key influencers.

Using role models to inspire the next generation

In celebration of Black History Month 2018, the Academy profiled leading black, Asian and minority ethnic engineers to inspire the next generation.

The engineers shared their passion and engineering journeys in a series of interviews. Achievements of the engineers profiled include working on infrastructure to withstand natural disasters, development of safe and speedy transportation, design of internationally renowned building projects, development of replacement limbs, and reduction of global emissions. The engineers also gave their thoughts on creating racial parity in engineering.

The series complements a previous celebration of leading female engineers created for International Women’s Day in 2016.

The profiles were shared on Twitter throughout October, and can be viewed at www.raeng.org.uk/BHM

Promoting inclusion in engineering

In September, National Inclusion Week provided an opportunity to disseminate data on the inclusion of disabled, lesbian, gay and bisexual engineers, and engineers from different religious backgrounds, extending the work of the Creating cultures where all engineers thrive report.

Published in 2017, the original report gave insight into culture and inclusion in engineering informed by responses from 7,000 engineers. The report showed that male engineers feel more included than female engineers who in turn feel more included than minority ethnic engineers. Additional analysis found that disabled engineers feel least included. Analysis of responses from individual engineers, 83% of whom were male, supports a strong business case for promoting inclusion in engineering: 80% of respondents reported increased motivation, 68% increased performance and 52% increased commitment to their organisations when they felt included.

For inclusion week, the Academy produced mini reports that looked at religion, sexual orientation and disability in engineering in more detail.

All engineering employers are encouraged to review the data and reporting to develop more inclusive cultures within their own organisations.

To find out more, visit www.raeng.org.uk/inclusivecultures

Greenhouse gas removal report launched

On 12 September, the Academy and the Royal Society published a major report on greenhouse gas removal (GGR), which presents an ambitious plan for how the UK can lead the way to deploy GGR to avoid the impacts of climate change.

Produced at the request of the Department for Business, Energy and Industrial Strategy, the report considers a range of technologies from well-known and ready to deploy methods, such as forestation and direct air capture to carbon storage. Technologies were evaluated for their real-world CO₂ removal potential while considering the environmental risks, social perception and scalability, considering how a suite of these GGR methods, together with rapid cuts in emissions, could allow the UK to reach net-zero emissions by 2050.

The report also assesses the global picture, and how a portfolio of GGR technologies could be used to achieve carbon removal across the world by 2100. The report calls for action in several areas, such as the need for field-based pilot demonstrations and substantial infrastructure for transport and storage of CO₂, in order to enable GGR technologies to meet the overall goals of the Paris Agreement. The findings have been presented to the Committee on Climate Change and across government departments.

To read the report, visit www.raeng.org.uk/greenhousegasremoval

The seven indicators of inclusion in engineering. These are the signs that engineers look for as indicators of an inclusive culture

Thought leadership dinners

The Academy’s programme of thought leadership dinners continues to bring together distinguished experts from industry, academia, the policy community and other sectors.

On 11 September, guests discussed how the UK can achieve 2.4% R&D investment by 2027. On 13 November, this was followed by Making the UK a tech global great, which examined how the UK’s world-class research base and entrepreneurial expertise can best be harnessed to build the technology success stories of tomorrow.

This series of events is helping raise greater awareness of the strength of the Academy’s policy work and activities more widely with key influencers.

Using role models to inspire the next generation

In celebration of Black History Month 2018, the Academy profiled leading black, Asian and minority ethnic engineers to inspire the next generation.

The engineers shared their passion and engineering journeys in a series of interviews. Achievements of the engineers profiled include working on infrastructure to withstand natural disasters, development of safe and speedy transportation, design of internationally renowned building projects, development of replacement limbs, and reduction of global emissions. The engineers also gave their thoughts on creating racial parity in engineering.

The series complements a previous celebration of leading female engineers created for International Women’s Day in 2016.

The profiles were shared on Twitter throughout October, and can be viewed at www.raeng.org.uk/BHM

Promoting inclusion in engineering

In September, National Inclusion Week provided an opportunity to disseminate data on the inclusion of disabled, lesbian, gay and bisexual engineers, and engineers from different religious backgrounds, extending the work of the Creating cultures where all engineers thrive report.

Published in 2017, the original report gave insight into culture and inclusion in engineering informed by responses from 7,000 engineers. The report showed that male engineers feel more included than female engineers who in turn feel more included than minority ethnic engineers. Additional analysis found that disabled engineers feel least included. Analysis of responses from individual engineers, 83% of whom were male, supports a strong business case for promoting inclusion in engineering: 80% of respondents reported increased motivation, 68% increased performance and 52% increased commitment to their organisations when they felt included.

For inclusion week, the Academy produced mini reports that looked at religion, sexual orientation and disability in engineering in more detail.

All engineering employers are encouraged to review the data and reporting to develop more inclusive cultures within their own organisations.

To find out more, visit www.raeng.org.uk/inclusivecultures

Greenhouse gas removal report launched

On 12 September, the Academy and the Royal Society published a major report on greenhouse gas removal (GGR), which presents an ambitious plan for how the UK can lead the way to deploy GGR to avoid the impacts of climate change.

Produced at the request of the Department for Business, Energy and Industrial Strategy, the report considers a range of technologies from well-known and ready to deploy methods, such as forestation and direct air capture to carbon storage. Technologies were evaluated for their real-world CO₂ removal potential while considering the environmental risks, social perception and scalability, considering how a suite of these GGR methods, together with rapid cuts in emissions, could allow the UK to reach net-zero emissions by 2050.

The report also assesses the global picture, and how a portfolio of GGR technologies could be used to achieve carbon removal across the world by 2100. The report calls for action in several areas, such as the need for field-based pilot demonstrations and substantial infrastructure for transport and storage of CO₂, in order to enable GGR technologies to meet the overall goals of the Paris Agreement. The findings have been presented to the Committee on Climate Change and across government departments.

To read the report, visit www.raeng.org.uk/greenhousegasremoval

The seven indicators of inclusion in engineering. These are the signs that engineers look for as indicators of an inclusive culture
**Education and skills**

### Additional funding for education programmes

The David Family Foundation has announced support for two programmes to help students from disadvantaged backgrounds pursue engineering careers.

Future Engineer Scholarships will provide Year 11 students with financial support for travel, books and other resources to support their studies. Summer Work Placement Scholarships will provide further education engineering students from underrepresented groups with fully funded summer work experience placements with a technology or engineering employer before starting the second year of their studies.

The Academy is grateful to the foundation, set up by the family of the late Gerald David OBE FREng, for its generous support.

Shell, Boeing and the Helsington Foundation have also all renewed their support of the Connecting STEM Teachers programme. The programme currently has 42 specialist STEM teacher coordinators working with 695 schools across the UK. Since the programme was established in 2011, the programme has trained over 700 teachers, provided more than 275,000 STEM learning opportunities for students and distributed 5,500 STEM resource boxes on various engineering-related subjects.

The Academy is grateful to Shell, Boeing and the Foundation for their continuing support.

### Freshers' Fayre

On 7 September, the Academy held its largest ever Freshers' Fayre in partnership with EDT Headstart. The event was attended by 120 students who are enrolling on engineering degree courses in the UK this autumn.

A successful ‘marketplace’ allowed the students to meet with potential future employers, including BAE Systems, BP and GE, as well as making connections with professional engineering institutions and other key organisations that can support them throughout their studies. The students attended workshops on studying engineering, work experience and careers to discover the support available to them. A dynamic panel session with the Women’s Engineering Society also allowed the students to hear from young engineers about their own exciting career journeys.

The event received great feedback from both the employers and students alike, with the students enjoying the opportunity to network with others who are also at the start of their career.

### Engineering Materials for a Greener Planet

In October, the Academy launched its latest teaching and learning resource at a teacher coordinator training day.

The resource focuses on real-world environmental issues and the big challenges that the next generation of engineers will need to find solutions to.

During the training day, the teachers heard about engineering challenges, including cleaning the world’s oceans and 3D printing sustainable housing of the future. They then worked together in groups to build their own 3D printer and test different types of chocolate to extrude their own printed cubes.

In 2019, 600 schools in the Connecting STEM Teachers network will be sent the new resource boxes with materials, equipment and training to deliver the activities.

In the last academic year, more than 2,250 Academy resource boxes were used to teach STEM in primary and secondary schools across the UK and, to date, all resources have been downloaded nearly 40,000 times.

### Visiting Professors annual conference

On 27 and 28 November, the Academy’s annual Visiting Professors’ conference took place, on the theme of Engineering and education at a time of transformative change.

Visiting Professors, students and academic champions discussed their experiences at a time when AI is transforming education.

The three keynote speakers included Professor Chris Wise RDI FREng, Director of engineering consultancy Expedition; Professor Chris Piech from Stanford University, who gave a live presentation from California on the role of AI in transforming education; and Alasdair Coates, Chief Executive Officer of the Engineering Council, who discussed changing standards of education for changing times.

The conference finished with a discussion on how the Visiting Professor scheme could be improved. These recommendations will be used to formulate an action plan to support current and future Visiting Professors.

For more information on the conference, visit [www.raeng.org.uk/vps](http://www.raeng.org.uk/vps)
**Getting engineering into the classroom**

On 9 October, the Academy launched two education reports, *Tinkering for learning: learning to teach engineering* and *Learning to be an engineer: the role of school leadership*.

The launch event brought together researchers, representatives from the PEIs and STEM education advocates to understand how to better integrate engineering into the education system.

*Tinkering for learning*, presented by Dr Lynne Bianchi and Dr Jonathon Chippandall, shows how educators could apply playing and experimenting with open-ended problems (dubbed ‘tinkering’) as a signature pedagogy to instil ‘engineering habits of mind’ (EHoM) in primary learners. A tinkering approach to teaching gives teachers the tools to create learning opportunities that make links between computer science, design and technology, and science subjects.

Professor Bill Lucas highlighted the findings from *Learning to be an engineer*. These included the important role that school leaders play in actively encouraging engineering education in schools and the effect that creating a supportive environment for teachers to take risks and try new things can have.

The event concluded with a discussion on how engineering can be integrated into the core primary curricula by advertising EHoM to school leadership as a positive driver of results and cross-curricular learning.

The Academy welcomes these innovative approaches to improving the presence of engineering education in schools and would like to thank the reports’ authors for their contributions.

To read the reports, visit [www.raeng.org.uk/educationreports](http://www.raeng.org.uk/educationreports)

---

**Engineering education systems that are fit for the future**

On 24 and 25 September, the Academy hosted a global conference on *Engineering education systems that are fit for the future*.

The conference brought together over 100 international representatives, including Academy awardees and partners, to discuss adopting a systems approach to addressing the engineering skills gap. The conference looked at redesigning education systems in terms of pedagogy and structure, so that they are more likely to produce people at all levels who think and act like the engineers that society needs if it is to confront the challenges and meet the demands of the future. Employers, the teaching and learning community, and the government must work together to help develop the quality of engineers.

Speakers at the conference included Dr Rick Miller, the First Employee and President of Olin College, who shared his experiences of advocating and implementing a systems approach to engineering education. Dr Allyson Lawless FREng, Managing Director of the South African Institution of Civil Engineering Professional Development and Projects, provided a preview of her research into the needs and numbers of engineers within southern Africa.

For more information and to view the presentations and sessions visit [www.raeng.org.uk/hepssa-activities](http://www.raeng.org.uk/hepssa-activities)

---

**Education resources go international**

In 2018, the Academy’s resources were distributed internationally, providing hands-on educational opportunities in state-run schools in Tanzania, Botswana and Brazil.

Pupils from poorly resourced schools were taught activities from the Academy’s *Engineering in the movies* resource box by teachers, STEM leads and sixth-form students from the Connecting STEM Teachers network schools. Classes of sometimes up to 150 pupils developed practical science and engineering skills through teamwork, problem-solving and creative expression, a new approach to teaching and learning for their schools.

The Academy is currently exploring ways in which to distribute *Engineering materials for a greener planet* to more international schools during the rest of the year.

Students in Tanzania with the Academy’s *Engineering in the movies* resource
Research and innovation

Academy promotes industry-academia partnerships under Newton Fund

In October, Academy Fellows visited Jordan and India as part of the Industry-Academia Partnership Programme (IAPP), which the Academy funds in its role as a delivery partner in the government’s Newton Fund.

IAPP supports capacity development in teaching, use-inspired research and innovation through funding bilateral industry-academic partnerships with eight partner countries. Academy representatives met programme partners, project awardees and wider stakeholders including industry, academics, government officials and British Ambassadors in Jordan and India.

Tim Askew FREng and Dr Keith Carter, Royal Academy of Engineering Visiting Professor, visited Jordan to present the programme at an event held in the Amman Chambers of Commerce. Professor Sir William Wakeham FREng was invited to Delhi as a panellist in the Federation of Indian Chambers of Commerce and Industry’s annual Higher Education Summit, with a theme of Universities of the future.

Academy awards eight new Research Fellowships

Eight outstanding engineers have been awarded Research Fellowships to advance their research careers. Their work addresses some critical issues in engineering, from maximising the capacity of optical communications to developing a new generation of solar cells.

The eight new Research Fellows and their projects are as follows:

- Dr Lidia Galdino, University College London  
  Capacity-approaching, ultra-wideband nonlinear optical fibre transmission systems
- Dr Abderrahim Halimi, Heriot-Watt University  
  Advanced computational methods for smart and extreme imaging
- Dr Robert Lianqi Zhao Hoye, University of Cambridge  
  Designing and engineering a new generation of high-efficiency tandem photovoltaics
- Dr Thomas Kissinger, Cranfield University  
  Doppler-enhanced lidar system using range-resolved interferometry
- Dr Armin Mustafa, University of Surrey  
  4D vision for perceptive machines
- Dr Pavlos Petoumenos, University of Edinburgh  
  Deep learning for easier compiler analysis and optimisation
- Dr Tatiana Trantidou, Imperial College London  
  Novel microfluidic technologies for tissue engineering, organs-on-chip and therapeutic nanovesicles targeted for the heart
- Dr Yue Wang, University of York  
  TOAST – two-dimensional optical amplification for silicon technologies

To find out more about the Research Fellowships, visit [www.raeng.org.uk/research-fellowships](http://www.raeng.org.uk/research-fellowships)

Putting investors in the hot seat

On 12 November, the Academy’s Enterprise Hub hosted its annual ‘Reverse Pitching’ event, overseen by Ian Shott CBE FREng, Chair of the Enterprise Committee.

The event aims to demystify the fundraising process and connect technology entrepreneurs with various financing networks, from venture capitalists to crowdfunding platforms and grant funders.

Around 60 business founders, including many Hub members (entrepreneurs who have completed an Enterprise Hub programme), heard from speakers representing 16 investors and funders including Innovate UK, Octopus Ventures, Cambridge Angels and Saab Technologies. The speakers shared insights on what they look for in a founding team, advice on how to navigate seeking funding and how to demonstrate a business’s edge.

To find out more about next year’s Reverse Pitching event, or any other future Enterprise Hub events, please email [enterprise@raeng.org.uk](mailto:enterprise@raeng.org.uk)

Run in collaboration with governments and funding agencies in-country, the Academy has so far funded 140 projects through IAPP, bringing together 133 partner country universities to collaborate with 61 UK universities and 199 industry partners. These small-scale initiatives are very diverse in nature, ranging from developing skills for renewable energy generation to researching solutions for environmental decontamination and waste management, and developing low cost medical diagnostic devices for rural and refugee camp settings.

A new round of calls to support collaborations with Colombia, India, Jordan, South Africa, Thailand, and Turkey are now open. Please visit [www.raeng.org.uk/IAPP](http://www.raeng.org.uk/IAPP) to find out more.
Academy partners with Lloyd’s Register Foundation for global safety and sustainability

On 23 October, Academy President Dame Ann Dowling announced a £15 million partnership with the Lloyd’s Register Foundation to address critical challenges in engineering safety and sustainability around the world, during her keynote address to the Global Engineering Congress.

The partnership will build on the Academy’s network of global alliances to tackle the most pressing engineering safety and sustainability problems, and develop these into practical outputs for the engineering profession and affected communities.

Over five years, the partnership will allocate £15 million in funding to support programmes that create communities of best practice and build global research collaborations to develop practical solutions that have the most impact upon engineering practice. The partnership will initially focus on three topics: safer complex industrial and engineered systems; enhanced safety in decommissioning and end of engineering life; and developing engineering skills where they are most needed.

Using the Lloyd’s Register Foundation partnership as a catalyst, the Academy is also developing a mechanism for additional funding partners who are interested in adopting engineering approaches to addressing global challenges. This will allow them to use the Academy’s peer-review mechanism and global network of leaders, experts and innovators developed through the Newton Fund and Grand Challenges Research Fund.

The Academy would welcome interested organisations to get in touch via shaarad.sharma@raeng.org.uk

Korean delegation visits Academy

In October, the Academy hosted a large delegation from the National Academy of Engineering Korea (NAEK), which resulted in the signing of a declaration of Academies supporting entrepreneurship.

The visitors from Korea included the President of NAEK, Oh-Kyong Kwon, a Senior Fellow, a former government minister and 10 entrepreneurs supported by NAEK, and the newly created government Ministry for SMEs and Startups. A delegation from Korea visited the Academy in 2015, and since then the innovation landscape in Korea has changed drastically.

During this year’s visit, the senior delegation held a series of roundtables with the Academy and a diverse range of government stakeholders. These discussed issues including innovation policy, how academies fit into this ecosystem, and how to share mentorship best practice.

Entrepreneurs were put through their paces with a week of training on UK market entry and pitching skills. The visit culminated in the signing of the declaration by President Dame Ann Dowling and President Oh-Kyong Kwon. Guests then attended an evening of exciting pitches from UK and Korean entrepreneurs with innovations using AI, machine learning, medical devices and sensors.

Entrepreneurs were put through their paces with a week of training on UK market entry and pitching skills. The visit culminated in the signing of the declaration by President Dame Ann Dowling and President Oh-Kyong Kwon. Guests then attended an evening of exciting pitches from UK and Korean entrepreneurs with innovations using AI, machine learning, medical devices and sensors.

The Academy is aiming to work more with advanced economies and is looking to strengthen the partnership with NAEK. As a follow-up, some members of the Enterprise Hub travelled to Busan in November to participate in the Global Startup Summit.

Awardee induction event

On 17 September, the Academy held an induction event to welcome the 2018 cohort of research awardees from the Academy’s Research Fellowships, Engineering for Development Research Fellowships, UK Intelligence Community Postdoctoral Research Fellowships, and Industrial Fellowships programmes.

The event allowed research awardees to learn more about the Academy’s other programmes and activities, meet Academy staff and ask questions related to their fellowships.

It was also a great opportunity to network with other awardees, Academy Fellows and alumni. Over 60 people attended the event, and feedback suggests that it was well received.

The Academy plans to repeat the event next year at a similar time.

Visit www.raeng.org.uk/research to find out more.
APEX awardees announced

Eight researchers have been awarded funding in the 2018 round of APEX awards (Academies Partnership in Supporting Excellence in Cross-disciplinary research).

The grants, which promote collaboration in science, engineering, social sciences and humanities, are jointly awarded by the Academy, the British Academy and the Royal Society, funded by the Leverhulme Trust. The scheme offers up to £100,000 to established independent researchers wanting to pursue interdisciplinary and curiosity-driven research that benefits wider society.

The list of 2018 successful proposals are:

- Professor Jennifer Barclay, University of East Anglia
  *Making sense of risk and uncertainty: narrative and metaphor in the face of volcanic activity*

- Dr James Burridge, University of Portsmouth
  *Spatial theories of linguistic and cultural evolution*

- Professor Fay Dowker, Imperial College of Science Technology and Medicine
  *The emergence of the continuum*

- Dr Andrew Duncan, University of Sussex
  *Data driven profiling and assessment of conflicts in Africa*

- Professor Andrew Hogg, University of Bristol
  *New models of sediment suspensions*

- Dr David Horsell, University of Exeter
  *Hot fuzz: bumble bee hair as a thermal metamaterial*

- Dr Christina Lee, University of Nottingham
  *Nettles and networks: new ways to tackle wound infections*

- Dr Tom Mitchell, the University of the West of England
  *Exploring molecular data with immersive technology: interactive sonification in virtual reality.*

Africa Prize shortlist selected

On 19 November, the 16 innovators shortlisted for the 2019 Africa Prize for Engineering Innovation were announced at an event in Cape Town, South Africa.

The shortlist includes the innovators behind a smart glove that translates sign language to speech in real time, an affordable delivery kit for midwives to improve birth rates, and a ‘farm-in-a-box’ vertical garden that uses waste to grow food in small urban spaces. Other inventions include a smart dryer that enhances the nutritional value of grain, a solar irrigation system specific to semi-arid areas, and a language app that allows toddlers and young children to learn basic numeracy and literacy in their native tongue.

After seven months of mentoring and training, four finalists will be selected from the shortlist. In June 2019 the finalists will present their businesses to judges in front of a live audience in Kampala, Uganda, after which one winner will receive £25,000 and three runners up will be awarded £10,000 each.

Each of the shortlisted engineers will develop skills and become part of a growing community of African engineers working to accelerate socioeconomic development through business.

Innovation at work

The Africa Prize is celebrating its fifth year in 2019. It provides a package of support that includes funding, comprehensive business training, bespoke mentoring and access to the Academy's network of high profile, experienced engineers and business development experts. Judges and mentors of the Africa Prize for Engineering Innovation have provided over 1,500 hours of support to entrepreneurs since the prize was established.

To find out more, visit [www.raeng.org.uk/africaprize](http://www.raeng.org.uk/africaprize)

Anne Rweyora from Uganda - her innovation is a combination of technologies that help women acquire their first homes affordably and sustainably.

Frontiers of Engineering for Development

From 30 October to 2 November, the sixth symposium of the Global Challenges Research Fund Frontiers of Engineering for Development programme took place in Ho Chi Minh City, Vietnam. It focused the theme of *Engineers as healthcare practitioners*.

The event enabled 60 early- to mid-career engineers from the UK, sub-Saharan Africa, Asia and around the world to meet and build new interdisciplinary, collaborative partnerships. They discussed themes of anti-microbial resistance, machine learning in healthcare, and smart and mobile devices.

The event was co-chaired by Professor Alison Noble OBE FREng FRS, Technikos Professor of Biomedical Engineering at the University of Oxford and an expert on ultrasound imaging, and Dr Louise Thwaites, a clinical researcher at the Oxford University Clinical Research Unit in Ho Chi Minh City, an expert advisor to the World Health Organization and a previous Frontiers of Engineering for Development awardee.

At the end of the event participants collaborated to write applications for follow-up seed funding worth between £15,000 and £30,000 that will help to kick-start new interdisciplinary projects between groups of event participants. To find out about the successful applications or to nominate someone to attend a future symposium, please visit [www.raeng.org.uk/FoE-for-Dev](http://www.raeng.org.uk/FoE-for-Dev)
Fellows survey

The Academy would like to thank the Fellows who recently completed the publications survey.

Over 300 people responded. These responses will be used to inform future development of the newsletter and List of Fellows, and will help to ensure that the newsletter contains the content that you want to see.

You can change which publications you receive by logging in to the Fellows’ area of the website at www.raeng.org.uk/fellows-area

Media roundup

In September, the Academy published a report with the Royal Society on greenhouse gas removal that received extensive national media coverage, including in the Financial Times, the Guardian, The Times, BBC and the Independent.

Dr Ross Donaldson, one of the Academy’s Research Fellows, discussed his work on developing the UK’s first commercial receiver for quantum communications with BBC Scotland. In October, BBC News interviewed Dr Hayaatun Sillem for CEO Secrets about the need to change perceptions of modern engineering, and a letter in The Times from Professor Dame Ann Dowling discussed the value of engineering to society. In November, Dame Stephanie Shirley CH DBE FREng was interviewed on BBC’s Today programme ahead of the Academy’s Hinton Lecture.

The Academy’s new Fellows and award winners continue to generate media coverage, with a number of articles in trade and local outlets.

Academy roundup

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 Fundraising on 020 7766 0852 or fiona.stewart@raeng.org.uk

Publications

The three-volume Encompassing the future: Offshore oil and gas operations, edited by William Cairns and Ann Wilkie was given to the Fellows’ Library by Professor Brian Smart FREng FRSE.

The following books have been added to the Fellows’ Library: Discovering engineering that changed the world by Julian Edgar, Special Collection donated by Clare and Stephen at Wright and Wright Architects, and Shaping the World, donated by Nick Baveystock, Director General of the Institution of Civil Engineers.

A view from the bridge – an industrial journey by Past President Sir John Parker GBE FREng has recently been published and is available at Waterstones and Amazon.

Leave a lasting legacy

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

News of Fellows

Professor Richard Allsop OBE has been awarded the Kometani-Sasaki Award for contributions to the International Symposium on Transportation and Traffic Theory

Dr Alan Begg has been appointed Chair of the Smallpeice Trust

Professor Steven Chu has been appointed to the Pontifical Academy of Sciences by Pope Francis

Professor Peter Clarkson has been awarded the Sir Misha Black Medal 2018 for distinguished contributions to design education

Dr David Cleevely CBE has been awarded Barclays’ High Growth and Entrepreneurs ‘Icon of the Year’ award

Alan Cook CBE has been appointed Chair of High Speed 2

Dame Judith Hackitt DBE has been made an Honorary Fellow of the Institution of Engineering and Technology

Professor Jim Hall has been awarded the 2018 Prince Sultan Bin Abdulaziz International Prize for Water

Dr Caroline Hargrove CBE has been appointed a Non-Executive Director of Ceres Power

Professor Dame Jane Jiang DBE has been appointed a member of Engineering and Physical Sciences Research Council’s (EPSRC) Strategic Advisory Network

Professor Brian Launder has been presented with the 2018 Energy Systems Award of the American Institute of Aeronautics and Astronautics

Professor Juergen Maier has been appointed to the government’s Industrial Strategy Council

Andrew Mitchell CBE has been appointed Co-Chair of the Construction Leadership Council

Alan Newby has been appointed a member of the EPSRC’s Strategic Advisory Network

Professor Alvin Nienow has been awarded the UK Biotechnology Association’s Peter Dunnill award

Colin Smith CBE FRS has been appointed Non-Executive Chairman at Sensyne Health

Professor Lionel Tarassenko CBE has been appointed Director of Research and Development at Ceres Power

Professor William Webb has been appointed to the government’s Industrial Strategy Council

Professor Howard Wheater has been awarded the 2018 International Hydrology Prize (Dooge Medal) by UNESCO, the World Meteorological Organization and the International Association for Hydrological Sciences, and has been elected a Fellow of the Royal Society of Canada
Obituaries

Dr Robin Campbell Jeffrey FREng died on 4 November 2018, aged 79. He was formerly Chief Executive of Scottish Nuclear, and Chair and Chief Executive of British Energy.

Mr Albert Edward Naylor FREng died on 22 October 2018, aged 93. He was formerly County Engineer at Greater Manchester Council.

Sir Alec Morris KBE CB FREng died on 7 November 2018, aged 92. He was formerly Chief Engineer for the Royal Air Force.

Sir Sze-Yuen Chung GBE JP FREng died on 14 November 2018, aged 101. He was formerly a politician in Hong Kong.

Mr Peter Arthur Cox FREng died on 17 November 2018, aged 96. He was formerly Chairman of Rendel, Palmer and Tritton Ltd.

Mr George Harrison Inglis CBE FREng died on 6 December 2017, aged 90. He was formerly Managing Director of URENCO Ltd.

Professor Sir John Rowlinson FREng FRSE died on 15 August 2018, aged 92. He was formerly Emeritus Professor of Chemistry at the University of Oxford. He was a Founding Fellow of the Academy.

Professor John Brian Griffith Roberts FREng died on 14 June 2018, aged 82. He was formerly Senior Fellow at the Defence Evaluation and Research Agency.

The closing date for the awards is Friday 15 February 2019.

To make a nomination, please visit: 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

The MacRobert Award 2019 is open for applications until Thursday 31 January (see page 7).

For further information and to apply, please visit www.raeng.org.uk/prizes/macrobot, email macrobot@raeng.org.uk or call 0207 766 0607.

Forthcoming events

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

4 February 2019
Fellows’ day
Venue: Prince Philip House
Time: 3.30pm to 7.00pm

13 March 2019
Fellows' visit
Venue: Royal Holloway, University of London
Time: 11.00am to 3.00pm

8 May 2019
Enterprise Hub Showcase
Venue: Prince Philip House
Time: 6.00pm to 9.00pm

5 June 2019
Royal Academy of Engineering/Royal Society of Edinburgh joint lecture
Venue: University of Glasgow
Time: 6.30pm to 9.00pm

11 July 2019
Awards Dinner
Venue: Banqueting House
Time: 6.30pm to 10.30pm

16 to 18 September 2019
Global Grand Challenges Summit
Venue: Queen Elizabeth Hall, Southbank

2019 prizes and medals call for nominations

The following 2019 Royal Academy of Engineering Awards will open for nominations in January:

Rooke Award
For the public promotion of engineering by an individual or small team.

RAEng Engineers Trust Young Engineers of the Year / Sir George Macfarlane Medal
For early career UK engineers who have demonstrated excellence. Supported by the Worshipful Company of Engineers.

Sir Frank Whittle Medal
For outstanding and sustained achievement in any engineering discipline.

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.

Professor Paul O’Brien CBE FREng FRS died on 16 October 2018, aged 64. He was formerly Professor of Inorganic Materials at the University of Manchester.

Mr Peter Joseph Usher CBE FREng died on 15 October 2018, aged 92. He was formerly Chairman of Vosper Thornycroft plc.

Professor Michael Walker OBE FREng died on 27 September 2018. He was formerly Vodafone Fellow and Professor of Telecommunications at Royal Holloway University of London.

Sir Anthony Gill FREng died on 6 August 2018, aged 88. He was formerly Chairman of Lucas Industries plc.

Professor Sir Charles Kao KBE FREng FRS died on 23 September 2018, aged 84. He was awarded the 2009 Nobel Prize in Physics.