The Institution of Engineering and Technology

Issue 40 | **Summer 2019**

Partner News

ARTistic AI

Training a new generation in accountable, responsible and transparent AI

Published by
The Institution of Engineering and Technology

Partner News is edited by a steering group of IET members and staff. The group includes:
Michelle Richmond
Director, Membership and Professional Development
Mark Organ
Head of Membership
Sally Davidson Jones
Partnership and Development Manager
Debbie Swale
Membership Scheme Coordinator
Rachael Lubinski
Editor and Content Specialist

Partner News has been produced by:
thePageDesign
Second Floor, The Old Pumping Station, Great Northern Terrace, Lincoln, LN5 8HN.
01526353555
info@thepagedesign.co.uk
thepagedesign.co.uk

Content has been coordinated by **Laura Beard** and edited by **Keri Allan**.


Partner News is a news magazine for partners of the Institution of The Engineering & Technology (IET).
The IET is not as a body responsible for the opinions expressed in Partner News.
The IET is registered as a Charity in England & Wales (No. 211014) and Scotland (No. SC038698).

Printed by Villanueva Visual Communications

Welcome to Partner News

This edition

For any enquiries, please refer to pages 38-39 for contact details.

Michelle Richmond **Director – Membership and Professional Development**

Welcome to issue 40 of Partner News. As always, we'll be showcasing some of the fantastic projects our partner organisations are getting involved with, their pioneering research, and celebrating the achievements of their employees.

We'll also be covering a few things the IET is doing including the fantastic work that's being done with schools to raise the profile of STEM (science, technology, engineering and maths) subjects at the Big Bang Fair and our *FIRST*® LEGO® League and EngFest events.

The Royal Navy have also been encouraging young people to think about studying STEM subjects by opening the doors of HMS Sultan in Gosport to students from across the UK to participate in a design and build challenge.

We also speak to Bethany Harrod, a recent graduate of the University of Sunderland and one of an increasing number of teenage girls and young women opting to take the STEM route. She talks about addressing the gender imbalance in industry, busting myths about the engineering profession and re-writing the rulebook.

Our Enterprise Partner initiative has been soaring since it launched in 2016 and we are delighted to welcome Brentwood Group as one of our most recent partners. Partnership Account Manager, Nidhi Shukla visited their Leeds office to present the certificate to them, turn to page 29 to read more about them.

If you have any comments or would like to submit an article, please contact **partnernews@theiet.org** or tweet us **@TheIET** using the hashtag **#IETPartnerships**.

Michelle Richmond
MBE CEng FIET
Director – Membership and Professional Development

News

IET causes Big Bang at engineering fair

Coding games, LEGO® robots and space telescopes – it was all happening on our stand at this year's Big Bang Fair.

This March staff and volunteers put on a range of fun, hands-on activities designed to enthuse young people about the possibilities of careers in engineering and technology.

The Big Bang Fair is Europe's largest engineering fair for young people. Now in its eleventh year, it welcomes a staggering 80,000 visitors over four days at the NEC, Birmingham. Our volunteers' enthusiasm was as infectious as ever and young people, their teachers and parents were drawn to our stand to find out more about getting involved with our programmes and activities.

Showcasing IET programmes

This year we showcased the Education 5-19 team's work with activities covering the *FIRST*® LEGO® League programmes and Faraday Challenge Days, with coding activities carried out by some of our own volunteer IET Schools Liaison Officers.

As well as trying their hand at some of this year's space-themed *FIRST*® LEGO® League robot missions, younger visitors also had a taste of the newest of the programmes – *FIRST*® LEGO® League Jr Discovery for 4-6 year olds, which launches this year. The IET's Faraday Challenge Days were represented by this year's partner; the James Webb Space Telescope (JWST). The spiritual successor to the Hubble, JWST will use a series of infrared cameras and a specially designed segmented mirror to look into the coldest and oldest parts of our universe. Visitors to the IET's stand had the chance to use a small handheld infrared camera to explore how different objects give off heat and how we can use this technology to learn about the universe.

Coding challenges

The coding activities were also a huge hit this year with visitors and volunteers competing to use physical coding blocks to code a character to eat as many strawberries as possible.

"It was a jam-packed, fun-filled and rewarding four days – and great to see so many budding engineers wanting to take part in our activities. I'd like to say a massive thank you to our amazing team of volunteers," says David Lakin, Head of IET Education 5-19.

> A jam-packed, fun-filled and rewarding four days.

The Big Bang Fair takes place every March at the NEC, Birmingham. We're always on the lookout for volunteers, so if you're in the Birmingham area and interested in helping out next year, the IET Education team would love to hear from you. Please contact education@theiet.org.

News

Challenging bright young minds

A group of young engineers from Bath have been crowned champions of the IET's *FIRST*® LEGO® League UK and Ireland competition.

The winning team, L2O, is made up of Alister Guenther, Joshua Guenther, Monty Burrows, Fraser Samuels, Luther Gaines-White and Thomas Blethyn, aged between 14-16-years old. They were crowned champions at the competition's final, held in Bristol this February, which saw over 500 young people attend. In April they went on to represent the UK at the *FIRST*® LEGO® League World Festival in Detroit, USA, along with five other qualifying teams from the UK and Ireland.

The challenge

The science and technology challenge, aimed at 9-16 year olds, tasks teams with building a robot designed to tackle a series of missions, and creating an innovative solution to a real world problem. This year's challenge was all about space – how humans can survive for extended periods in this environment.

L2O impressed judges with the members' advanced robotics skills, as well as their project, which focused on improving the way astronauts carry out repairs to their spacecraft during long-distance space missions.

Their solution was a temporary, pressurised balloon-like enclosure that encompasses the whole craft, allowing astronauts to work inside without the need for cumbersome, restrictive spacesuits.

"Receiving this award has been an amazing experience," says Alister. "We were overjoyed that all our hard work had paid off. We would encourage others to participate, as this competition is a great way to learn about engineering, computing, teamwork and time management."

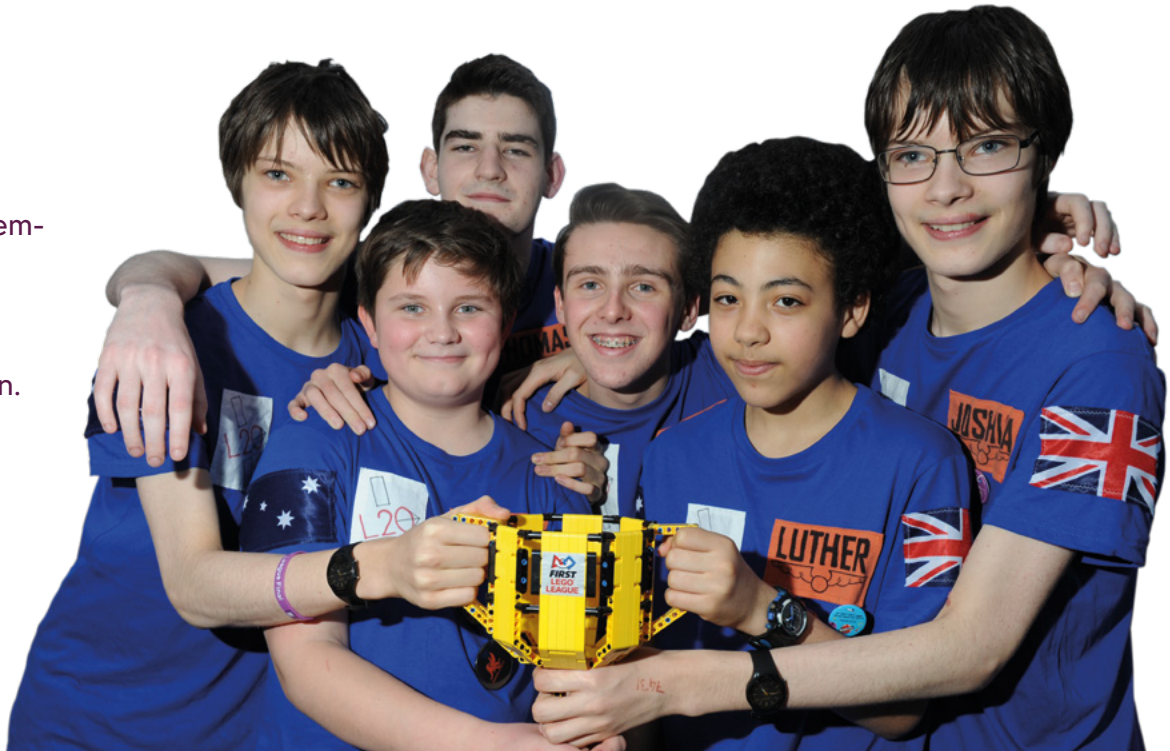
Experiencing engineering in action

"*FIRST*® LEGO® League allows young people to experience engineering in action," says Lowri Walton, *FIRST*® LEGO® League IET Education Manager. "As well as bringing excitement to science, technology, engineering and maths (STEM) subjects, the students get hands-on experience with robotics, and designing innovative solutions to real world problems. Developing computer programming, teamwork, problem-solving and communications skills has never been so much fun.

"There is a great need for young people with STEM skills to fill the next generation of engineering role and we are excited to see such bright young engineering minds take part."

The teams all did exceptionally well, with the UK and Ireland teams bringing back six awards – one of which was for L20 – a 2nd Place Robot Design Award for Strategy and Innovation.

> Developing computer programming, teamwork, problem-solving and communications skills has never been so much fun.



News

Electricians and their employers choose registration with the IET

We're offering electricians a new way to differentiate themselves in the workplace.

> Those who gain Electrician EngTech demonstrate they have a level of competence that goes above and beyond the norm.

Back in 2016, IET members and staff contributed to the development of a new route for electricians to achieve EngTech professional registration. This was through a 'Recognised Standard' that acknowledges electricians' specialist qualifications and experience. Since then, in collaboration with the Engineering Council, we've introduced this route to the wider UK electrical industry, offering electricians a new way to differentiate themselves in the workplace.

Nikki Dennis, Qualified Supervisor at facilities management company MITIE, achieved Electrician EngTech last June. He's already seen the benefit of having letters after his name.

"My individual competence has been proven by the process that I've gone through. I already feel like I stand out against others who might go for the same job, but don't have EngTech."

Raising standards across the board
Electricians who achieve EngTech show employers that they are thinking along the same lines – that they care about the work they do and are committed to proving their individual competence and raising the standard of electrical work.

"Electricians and technical officers who gain Electrician EngTech demonstrate that, as individuals, they have a level of competence that goes above and beyond the norm," says Andy Ball, Mechanical and Electrical Services Manager at Leeds City Council. "It would be great to bring everyone in line and raise standards across the board. The driver for encouraging EngTech is to bring up the quality of work across the industry."

Jamie Holmes, a Technical Manager at East Electrical Services, agrees. "Having something like EngTech that you don't have to do, but choose to, gives employers and contractors peace of mind that you take your work seriously."

He adds that IET membership and EngTech registration have increased his professional networks and opportunities. "My electrical world is not as small as it once was," he says.

To find out more about Electrician EngTech and how to apply, or to organise a complimentary workshop for your team, please visit theiet.org/electrician-engtech-mn.

News

Training field-based engineers at Royal Mail

IET Academy chosen for Royal Mail's online training needs.

Royal Mail has a number of engineers based across the UK who need to keep up to date with IET Wiring Regulations requirements.

These engineers are critical to the delivery of automated systems, therefore arranging mass release for a full-time residential course was not an option.

Choosing an online training provider meant that the engineers could take the course without disrupting their usual work, studying hour-long modules at times that fitted in around their existing responsibilities.

Choosing IET Academy
Royal Mail chose IET Academy to deliver 18th Edition IET Wiring Regulations training to its staff because:

- IET Academy gave Royal Mail the flexibility to achieve what it needed to continue to provide consistent customer support, achieve regulatory compliance and maintain the safety of its staff.
- The IET's reputation meant that Royal Mail's engineers knew that they were receiving quality training, which led to a more successful learning outcome.
- IET Academy offered Royal Mail competitive costs.
- The flexibility of the delivery method met the company's requirements to avoid business disruption.

Getting results
Royal Mail was pleased with the outcome of the training, which all of its engineers completed while maintaining their usual work. The online training helped the engineers become confident in their learning and they found the system user-friendly.

"Because of the history and knowledge of the IET we knew we were getting a high quality training package," says Manoj Vadher, Royal Mail's Head of Engineering Reliability and People Development. "We have been able to achieve a positive learning outcome that benefits both the business and the engineers we employ."

"The ease of accessing the IET Academy from home was great," continues David Proctor, Engineering Team Coach. "I particularly liked the assessment at the end of each part which gives you an idea of how much you had taken in. You were able to go back over the presentations for anything that you struggled with and then retake the test.

"I found the e-learning to be a very good experience – the content quality was excellent for the changes from the 17th to 18th Edition."

News




Students take part in EngFest

Over 800 students and their teachers attended our third EngFest event in London this April.

The event took place at IET London: Savoy Place on 2 April and gave secondary school students a taste of being an engineer for the day. The event included inspiring talks, exciting exhibits – such as HYPED's very own Hyperloop prototype – and hands-on workshops from the likes of The Royal Navy, Bloodhound, Transport for London, IBM, Cyber First and Glasgow Science Centre.

The event had two streams aimed at different age groups: EngVentures for students aged 11-15 and Fast Forward for students aged 16-18.

EngVentures
EngVentures opened up a world of engineering possibilities with a variety of talks covering topics such as how to harness the power of a man-made sun, the astounding facts and figures behind Crossrail – Europe's largest infrastructure project and how to engineer the perfect gaming experience.

Fast Forward
Fast Forward showcased some of the technologies the next generation of engineers might be working on. Students were given insights into future trends and technologies that have the potential to improve people's lives and address some of the world's grand challenges, such as how swarm robotics are revolutionising medicine and discussing whether we'll ever get to Mars.

To find out more about EngFest, please visit engfest.org.

Writing evidence for professional registration

Do you have employees working towards professional registration and need help capturing evidence in a way that does not compromise company confidentiality?

Our Writing Evidence for Professional Registration course has been designed to help individuals who are ready to write their applications for professional registration, or who are coaching candidates on their written evidence, to become professionally registered through the IET.

The course provides delegates with guidance and support on how to best showcase their skills against the Engineering Council competency framework (UK-SPEC) and how to write clearly and concisely without compromising sensitive information.

This course is delivered over three and a half hours by our own trainers. During the course delegates are given the opportunity to modify a piece of written evidence to help them showcase best practice and equip them with the skills to desensitise confidential and sensitive information when completing their own application. As case studies are used during the course, the need to discuss any individual work examples or experiences is eliminated.

If you have several employees who you feel would benefit from this course, then we can come to you at your company premises and deliver this training. For more information on booking an in-company course with us, please email lsbookings@theiet.org.

Alternatively, we have one public course scheduled for this which will be taking place on 7 August. To register for one of these please visit events.theiet.org and type in the course title.

MOD

Double win for Royal Signals apprentice

A communications systems engineer in 3rd Division Signal Regiment was recently awarded the titles of both Engineer Apprentice of the Year and Royal Signals Apprentice of the Year.

L-R: BAE Systems' Steph McMenamin, Cpl Mike Gibson and Lt Gen Sir Gerry Berragan KBE CB.

Cpl Mike Gibson received the awards in response to demonstrating a single-minded dedication in pursuing the qualifications and experience he needed to achieve his goals. Frequently, this required him to operate in high profile roles that took him outside his comfort zone.

His obvious hunger to expand his knowledge and deliver solutions is matched only by his enthusiasm to innovate and improvise. It is to his credit that Cpl Gibson actively sought to pass on his newly acquired knowledge to his fellow soldiers, willingly stepping up to take on the role of mentor and assist in their personal development.

"Cpl Gibson's work ethic and enquiring mind, coupled with the formal qualifications gained to date, gives him a skill set that he's constantly seeking to expand, qualities recognised by the Royal Signals awards selection panel," says Lt Col (Retd) Phil Osment, Director of the Royal Signals Institution (RSI).

For Engineer Apprentice of the Year, Cpl Gibson received a cheque for £250, sponsored by the IET, an RSI tie and certificate.

As Royal Signals Apprentice of the Year, he was awarded a further £750 and a resin falcon. He was also presented with a silver falcon, which will be held by the 3rd Division Signal Regiment for a year. These were presented by Lt Gen Sir Gerry Berragan KBE CB, CEO of The Institute for Apprenticeships and Ms Steph McMenamin from BAE Systems – sponsor of the Falcon presentation pieces.

> **His work ethic and enquiring mind gives him a skill set he's constantly seeking to expand.**

MOD

Royal Navy challenge brings students' designs to life

Students from across the UK recently gathered at HMS Sultan in Gosport to compete in the Royal Navy Engineering Challenge – Exercise Downbird Recovery.

Held in partnership with university technical colleges (UTCs), Eaton Ltd, Babcock and BAE Systems, the Royal Navy Engineering Challenge aimed to inspire young people to engage further with STEM subjects.

Participants were tasked with designing and building two remote-controlled vehicles; a land-based recovery vehicle capable of carrying a stranded helicopter and a ship that can transport it to safety.

Over 70 teams competed in the challenge, with several enjoying the opportunity to experience 24 hours of naval life, including a night on board HMS Bristol.

Toughest challenge to date

"Our most complex challenge to date brought together elements of additive manufacturing and robotics in real-world conditions," says Commodore Andy Cree, the Navy's Head of Training and Lead STEM Coordinator.

Prizes were awarded across 10 different categories between groups aged 14-16, 16-18 and for apprentices from industry aged 18-24, with the RAF team from RAF Cosford – the 'Bomber Buoys' – declared overall winners for their design.

Key Stage 4 students from the WMG Academy, Coventry scooped three of the prizes on offer with their team HMS Brady. The academy also accomplished further success as their team HMS Greensock claimed the winner's trophy in the Key Stage 5 competition.

Educational fun

"It's been really good, very fun and the tanks have been great to play with. I even managed to do doughnuts with the boat," says HMS Brady team member Danny Sutton.

"Loads of months of creation have all come down to one day. Some parts of the design were quite fun and others were quite stressful – it's definitely taught me about using CAD and the importance of prototypes."

"Through this competition, the Royal Navy offers students a unique experience and the opportunity to apply the technical knowledge and practical skills they learn every day at their UTC," says The Rt Hon Lord Baker of Dorking, Chairman of the Baker Dearing Educational Trust.

"The work the Royal Navy does to inspire young engineers has never been more important as this country's need for talent and skills has never been greater."

> The work the Royal Navy does to inspire young engineers has never been more important.

The Institution of Engineering and Technology

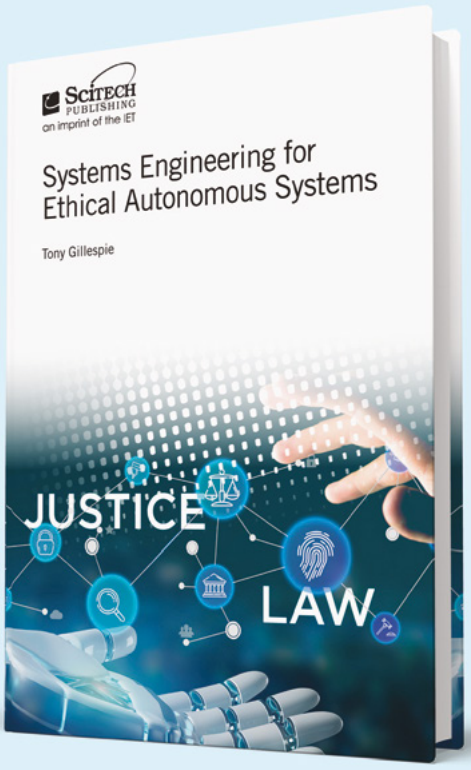
Systems Engineering for Ethical Autonomous Systems

New Book

IET Members save £35%

Proven methodologies to ensure newly designed systems meet growing ethical and legal constraints

Author: **Tony Gillespie**



A practical guide for every profession involved with autonomous systems operating in complex environments. This book describes, for the first time, how an autonomous system can be designed so it will only act legally. Readers will learn how human and machine decision-making processes become part of the design process and gain a deeper insight into the legal framework for autonomous systems.

Order online at
theiet.org/ethical-systems

Academic

Engineering her way to a great career

Ten years ago, **Bethany Harrod** was the girl at school who liked maths. Today, as she looks forward to graduating from the University of Sunderland, she has the world at her feet.

Bethany, 22, is among an increasing number of teenage girls and young women opting to take the STEM route into a high-paying career. Having chosen to study mechanical engineering at university, she's keen to bust the myth that women and engineering are an unhappy coupling.

Busting myths

"I guess, like a lot of people, my preconceptions of engineering were visions of men in overalls, covered in oil. Of course, the reality is very different," she says. "I have worn the odd hard hat in my time but there are so many different avenues that a career in engineering can take you down. It's an incredibly exciting and varied career.

"I spend a lot more time sitting at desks, doing mathematics, than I do getting covered in oil. I think we need to move away from the traditional way of thinking and make people aware this is a path with a lot of very different opportunities."

Bethany surprised her career advisors when, still at school, she expressed an interest in becoming an engineer.

"I was just 13 or 14 at the time. I don't really think they knew what to say. Even today the stereotype still exists."

She studied maths, chemistry, and media at A level, but not quite receiving the grades she hoped for, Bethany feared she might not get to study engineering. However, she investigated the possibility of doing a foundation year at the University of Sunderland before embarking on her BEng (Hons) in Mechanical Engineering.

A year in industry also proved a great step for Bethany, landing her a dream job with a multinational engineering company after she graduates this summer.

Addressing the gender imbalance

Traditionally a male-dominated industry, the engineering sector is starting to address the gender imbalance to get more women like Bethany into engineering roles.

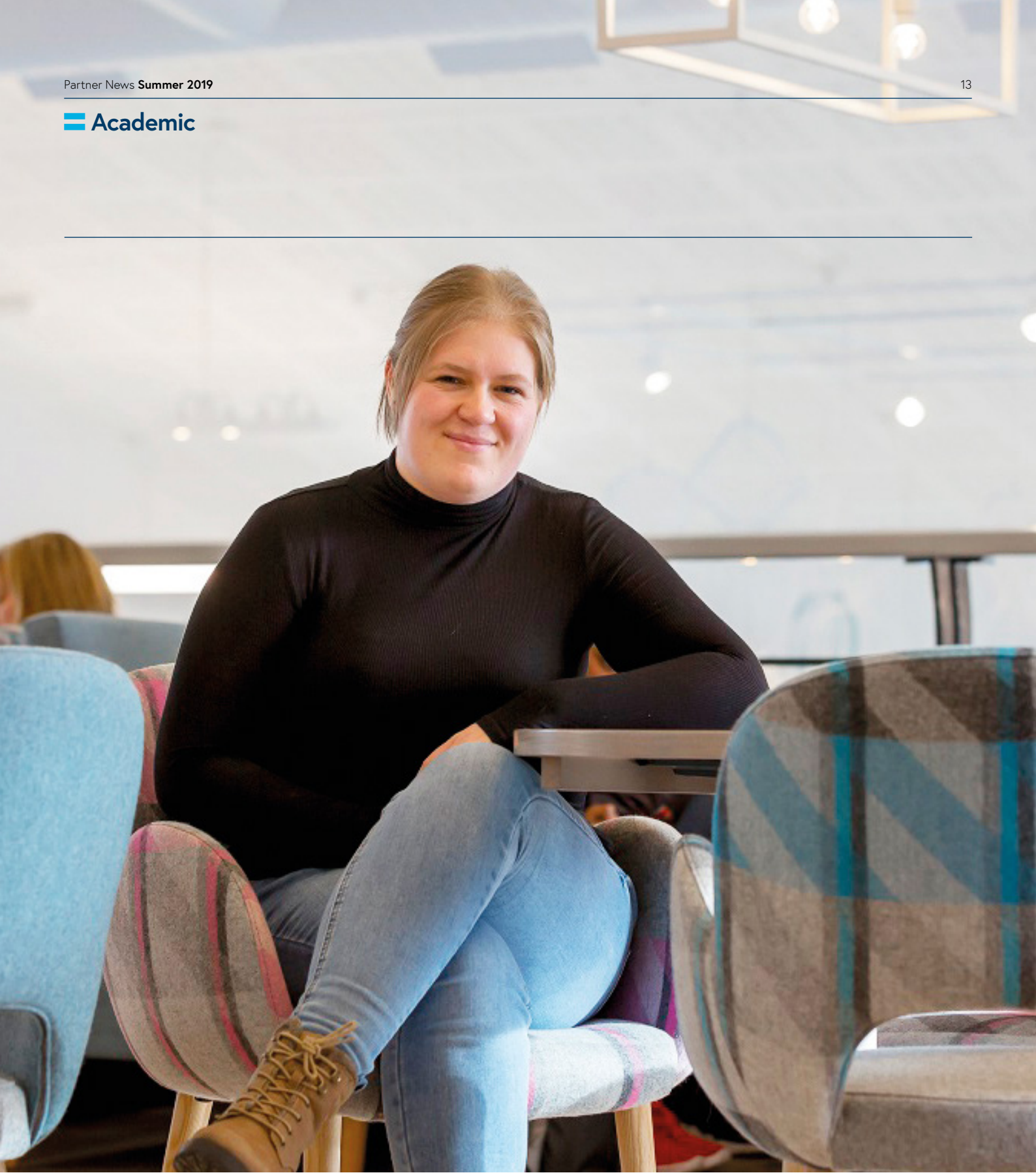
Women in STEM are generally underrepresented, but this is particularly apparent in engineering. In 2018, just 12% of the engineering workforce was female, according to EngineeringUK's *The State of Engineering* report.

There has been a considerable push in recent years to encourage and support female school-leavers who have shown interest in STEM subject areas and the University of Sunderland is leading the way by helping students like Bethany successfully complete engineering programmes.

Rewriting the rulebook

"The increase in girls studying STEM subjects is a trend we are keen to see continue – and accelerate," says Professor Alastair Irons, Dean of the Faculty of Technology at the University of Sunderland. "Through our work at the university and with our industry partners, I'm confident we can address the current shortage.

Academic



Bethany Harrod, a mechanical engineering undergrad at the University of Sunderland.

"We have a series of interventions underway to challenge perceptions and address the gender imbalance. We're beginning this activity before Year 9; encouraging girls to see the opportunities open to them.

"Then, as they progress towards higher education, we're keeping the conversation open, hosting women-only university open events, giving female students the option of a guaranteed female personal tutor in their first year, access to female industry mentors and offering postgraduate programmes for women returning from a career break.

"We're trying lots of different approaches – we have to rewrite the rulebook."

> The increase in girls studying STEM subjects is a trend we are keen to see continue – and accelerate.

Academic

Hull student wins coveted work placement

A first year engineering student from the University of Hull has reached the final of the Telegraph STEM Awards, securing a placement at McLaren.

Mechanical engineering student Asa Green.

Asa Green, who is studying a BEng in mechanical engineering, won the automotive technology category of the Telegraph STEM Awards after impressing motoring bosses with his idea of using bamboo parts to build high-performance sports cars.

He went on to present his idea to judges at the national final, held at Babcock International Group's UK headquarters in London in April, with the overall winner being announced at the final awards ceremony this month (June).

The Telegraph STEM Awards are open to science undergraduates who are currently studying in the UK. The overall winner receives £25,000 and a bespoke mentoring programme. Each category winner receives a work placement with the sponsor of the category they entered.

To qualify for the final, Asa had to write a 1,000-word essay and then present his idea to senior managers at McLaren's Woking headquarters.

Formula 1 legends

Following his presentation, Amanda McLaren, daughter of team founder Bruce McLaren, took Asa on a guided tour of the company's facilities, showing him cars driven by Formula 1 legends Niki Lauda, James Hunt and Lewis Hamilton.

"The best thing about the competition is having the opportunity to spend time at McLaren. It's such a prestigious company," he says. "Hopefully, my placement will set me up for life. Work experience is so valuable in this day and age, and having the chance to prove myself to them is just amazing.

"I'm hoping to get the opportunity to shadow the engineers as they build the cars and to see how the business works.

Academic

> Work experience is so valuable in this day and age. Having the chance to prove myself to McLaren is just amazing.

I'm also hoping that I get the chance to contribute to the end product. To say I was part of that would be incredible."

Telegraph STEM Awards
The Telegraph STEM Awards give some of the UK's most talented undergraduates the chance to present potentially game-changing ideas to leading names in British industry.

Now in their sixth year, they were set up to recognise the importance of STEM subjects and the students who study them.

The awards are made up of challenges set in partnership with leading companies. To enter, students need to come up with a solution to one of the challenges.

As sponsors of the automotive category, McLaren asked students to come up with new products or processes that could be used to achieve weight benefits for a high-performance sports car, with the potential to be developed for wider use.

Lightbulb moment
Asa revealed that his lightbulb moment to use bamboo instead of expensive carbon fibre came after he read an article about Thomas Edison.

"Thomas Edison used carbonised bamboo filaments to produce the first commercial lightbulb," he says. "It seemed like such a strange idea to use an organic material in something that had such a high level of current passing through it. You'd think that it would just burn up. It got me thinking about what other capabilities it might have as a material.

"In my first semester, one of the major topics we covered was materials. Learning about stress, strain and all these other key parts was super important when it came to writing my essay. The entire essay was about lightweight material that was strong and capable. Having that knowledge from that semester really helped me make my essay more technical and show my capabilities.

"The head of department also helped with my presentation. I went through it with her and she gave me some pointers. The university also funded me to go to Woking to take part in the competition."

"We are incredibly proud of Asa's achievement and the fact he has already put into practice what he has learned in his mechanical engineering studies at Hull – using the knowledge he has gained to develop innovative ideas, particularly in the first year of his studies. I'm sure an exciting and fulfilling career as a fully-qualified engineer awaits him in the future," says Dr Catherine Dobson, Head of the Department of Engineering.

Academic

Counting orangutans using star-spotting technology

A collaboration between astrophysicists, conservationists and ecologists aims to save rare and endangered animals.

A scientific collaboration is harnessing technology used to study the luminosity of stars to carry out detailed monitoring of orangutan populations in Borneo.

Liverpool John Moores University, WWF and HUTAN came together to examine better ways of detecting the great apes in the Bornean forest canopy, by using drones fitted with thermal-imaging cameras.

Orangutans, like all great apes, build a sleeping nest in trees. Traditionally orangutan numbers are estimated by counting these nests from the ground. However, this method is costly and time consuming due to the large areas that need to be surveyed. Drones can cover large areas of difficult ground quickly and monitor endangered wildlife from above.

Thermal imaging

The addition of thermal-imaging cameras has even more benefits. They can detect difficult to find animals at any time of day or night because of their heat signatures. The field team conducted 28 flights at two sites over six days and successfully spotted 41 orangutans from the air, all of which were confirmed by ground observers.

"We tested the technology on orangutans in the dense tropical rainforest of Sabah in Malaysia. In thermal images, animals shine in a similar way to stars and galaxies, so we used techniques from astronomy to detect and distinguish them. We were not sure at all whether this would work, but with the thermal-infrared camera we could see the orangutans quite clearly because of their body heat, even during fog or at night," says Dr Claire Burke, an astro-ecologist at the university.

This technology could potentially be used to understand and monitor population numbers of orangutans or other endangered primate species.

Monitor multiple species

"As ever more species are decimated, due to human activity such as deforestation, we must embrace and scale up innovative approaches to monitoring wildlife populations, to better protect them for generations to come," says Nicola Loweth, Asian Programme Manager at WWF. "Our collaboration with Liverpool John Moores has proven promising and could have a wide range of applications, benefitting wildlife conservation as a whole."

The astro-ecologists are now developing a machine learning algorithm to tell animal species apart, based on their unique thermal fingerprint.

"In the future, we hope to be able to track, distinguish and monitor large numbers of different species of animals in real time, all around the globe, so that this technology can be used to make a real impact on conservation and stop poaching before it happens," Dr Burke concludes.

Academic

Escape room challenge wins award for teaching excellence

Manchester Metropolitan University's escape room-style challenge, designed to help children overcome their fear of maths, has won the Guardian University Award 2019 for Teaching Excellence.

> Hundreds of children were able to engage with maths in a fun and inspirational way.

The challenge, named Oubliette, saw teams work together to complete a series of brain-teasing tasks. These included participants dancing their way to a target number in a 1970s club, calculating trajectories and velocities with a projectile launcher on an alien landscape and unlocking ancient Egyptian mysteries.

Inspired by the TV series *Crystal Maze*, Oubliette was developed by students at Manchester Metropolitan University, led by Dr Mark Peace.

The challenges are made up of hands-on learning scenarios for young people to overcome their anxieties around maths.

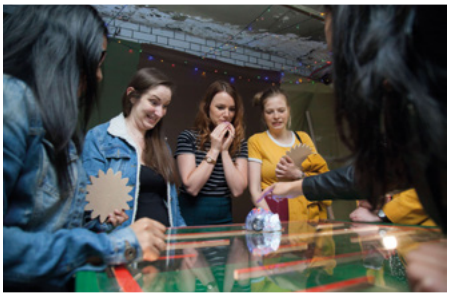
The project picked up the award for helping the students, who came from a variety of university departments, to develop confidence, work together and use research to develop the escape rooms.

Its external impact was impressive too – more than 1,500 young people from across the northwest visited Oubliette during its six-week run last summer.

"The award is testament to the creativity and innovation our students showed in creating this engaging installation. They worked together to develop their capabilities in team work, creativity and teaching methods," says Dr Peace, Academic Lead for Student Centred Curriculum and Project Director.

"Importantly, it also helped to deliver real impact in the community. The university has a valuable role to play in this area – hundreds of children were able to take part in Oubliette, engaging with maths in a fun and inspirational way to break free from any anxieties they may have had.

"The award is also testament to the enthusiasm and teamwork from across the university. The collaboration of all the different teams to deliver Oubliette was fantastic and will help Manchester Metropolitan to continue to shape education."



Academic Partners

Correct at the time of going to print June 2019.

Academic

Ulster University takes on global water challenge

Project SAFEWATER is tackling the global challenge of safe drinking water with the development of easy-to-use smart devices.

According to the United Nations, three in 10 people lack access to safely managed drinking water services and each day nearly 1,000 children die due to preventable water and sanitation-related diarrheal diseases. Ulster University's SAFEWATER project is looking to tackle this global challenge with a smart device that quickly tells if water is safe to drink.

In the UK drinking water quality is monitored on a routine basis, and one of the key indicators of safety is the absence of faecal contamination. Samples are sent to a microbiological laboratory and analysis can take 24 to 48 hours before contamination is confirmed. If faecal indicators are detected, the public in that supply area are notified and told to boil their water or to drink bottled water.

Technology as an enabler

In the low-to-middle-income countries of the Global South this is not the case. Due to economic circumstances, lack of skilled staff, labs and infrastructure, water quality may be only intermittently determined, or sometimes not at all. Ulster University's transdisciplinary research project SAFEWATER aims to change this through the use of new technologies.

SAFEWATER is developing autonomous Internet of Things (IoT) devices that can rapidly determine microbiological water quality in remote locations without the need for highly skilled staff or specific microbiology laboratories. The devices have been tested in rural Colombia and Mexico with very positive results.

Professor Tony Byrne, School of Engineering, Ulster University leads the project.

"The IoT prototype devices are no bigger than a coffee cup," he says. "The user simply adds the water to the device and closes the lid. Within a matter of hours the device notifies the user of a positive or negative result for faecal contamination, but also communicates via the cloud to inform researchers of the information including position, time, and level of contamination. The community can then take steps to make their water safe."

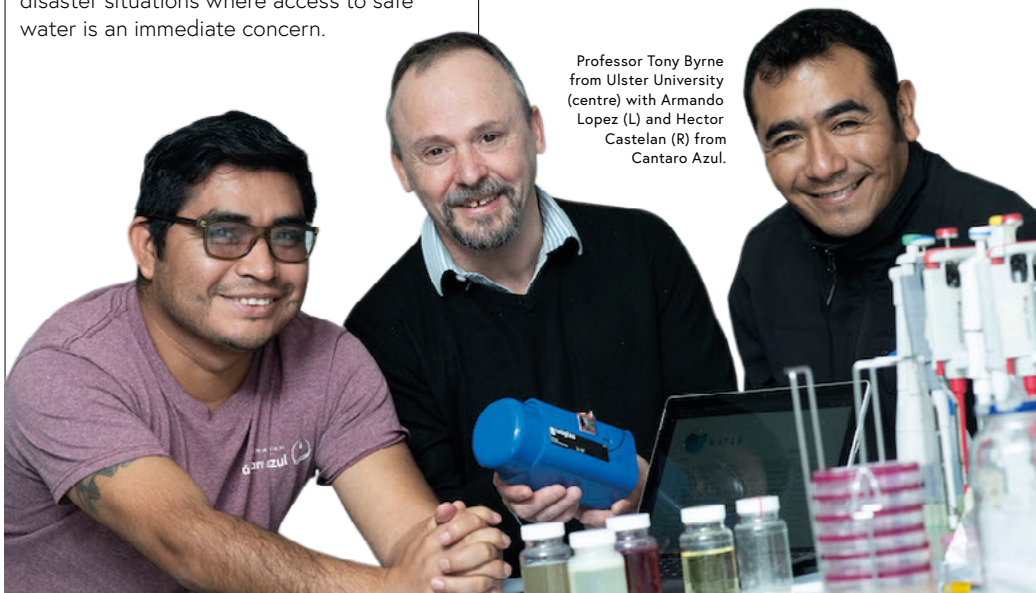
Fighting disease

The development of these devices is a major step forward in the fight against waterborne disease and for surveillance of outbreaks. They can also be deployed for water quality monitoring in emergency or disaster situations where access to safe water is an immediate concern.

Funded by the Global Challenges Research Fund (GCRF), the research project combines scientific research and innovative technologies with culture, education and prevention strategies. Ulster University has partnered with the University of Medellin Colombia, the University of Sao Paulo in Brazil and two NGOs working with rural communities; CTA in Colombia and Cantaro Azul in Mexico, to address this challenge.

"Together with our partners in Latin America we are taking a transdisciplinary approach to this global issue," says Professor Byrne. "We're combining the expertise of engineers, microbiologists, chemists, nutritionists and social scientists to develop new technologies and educate and empower communities."

For more information on the project, visit www.safewater-research



Professor Tony Byrne from Ulster University (centre) with Armando Lopez (L) and Hector Castelan (R) from Cantaro Azul.

Academic

The advent of 5G

IET conference discusses radical new approaches to the design, implementation and monitoring of the next generation networks required for 5G.

Speakers and guests at the 5G conference.

5G must deliver valuable, meaningful services to real users, starting soon. Brand new service and solution providers are – quietly but steadily – emerging from multiple research programmes currently being driven forward by universities, governments, vendors and operators around the world.

London Metropolitan University's Director of Communications Technology, Professor Bal Virdee, is Chair of the IET RF and Microwave Technical Network. He organised the sixth annual conference on 5G for industry leaders, academia and decision-making government officials. The event, which took place at IET London: Savoy Place in January, was designed to examine 5G technologies and applications for the benefit of society.

The conference brought together researchers from industry and academia and explored the latest advances, encouraged cross-domain research and discussed early deployment and large-scale pilots that address 5G's challenges.

5G rock stars

The event's presentations were wide-ranging and thought provoking. King's College London's Professor Mischa Dohler is one of the true rock stars of the 5G world and delegates were rewarded with plenty of celebrity name-drops and examples of cool demos during his keynote address.

This focused on public safety and mission-critical applications that will be enabled by this powerful new infrastructure. Emergency services and other critical users can't wait for full 5G to arrive so that they can carry out their vital jobs with the help of powerful new tools that we can barely imagine today.

Pioneering professors

Another passionate advocate of 5G is Professor Dimitra Simeonidou from the University of Bristol's Smart Internet Lab. In a whirlwind 30-minute summary of her past 12 months, Professor Simeonidou discussed the Layered Realities Showcase – a 5G first – and the launch of the university's Institute of Digital Futures.

Another of the conference's highlights came from BT's Principal Network Architect Dr Andy Sutton. He shared the story of the mobile communications industry's remarkable journey from voice/messaging-based 2G (GSM) all the way through to the 5G converged platform. During his talk he also showed how BT is getting ready to start delivering the next generation of services.

Other presentations covered topics such as security, 5G testbeds and trials and all can be viewed on IET.tv. Simply visit **tv.theiet.org** and search for 'the 6th annual conference on 5G'.

IET Academic Partners are welcome to join the seventh IET 5G conference planned for 2020.

Enterprise

Ipswich community benefits from Coderus partnership

Software design engineering company Coderus has announced a sponsorship deal with the Ipswich Makerspace, a community tech and making hub.

Stuart Chalkey from the Ipswich Makerspace with Coderus' Mark Thomas.

Staff from the firm, based in nearby Martlesham, will get involved with the hub, and in return employees are invited to make use of the equipment and facilities available at the Makerspace's Dove Street facility.

Coderus has a long-standing commitment to engaging with its community and feels that it shares the same core values and passion about technology as the Ipswich Makerspace. Pillar drills, laser cutters, a CNC machine and 3D printers are some of the equipment that members can use among a wide variety of tools for any type of project.

Tech enthusiasts will also have the opportunity to work on either individual or group projects, with free soldering consultations on offer. Coderus staff can visit the Makerspace and work on projects, as well as attend the regular meet-ups and in-house projects.

"We've grown from a small group meeting in a draughty church hall to having our own building in just a few years," says Stephen Chalkley from the Ipswich Makerspace. "Our members have an enormous range of experience and skills and they are very generous about sharing them. Being sponsored by Coderus is a great validation of our efforts and we're looking forward to working with them."

"From modern hardware to traditional crafts, Ipswich Makerspace fits perfectly with the interests of our team," continues Coderus' Director Mark Thomas. "There's a great synergy between Coderus and the Ipswich Makerspace as they both provide fertile ground for innovative ideas. It's been really nice seeing some of the guys using the laser cutter and the 3D printers for their own projects already. Stephen has welcomed us all."

> There's a great synergy between Coderus and the Ipswich Makerspace as they both provide fertile ground for innovative ideas.

Enterprise

VIX Suite set to revolutionise the future of digital collaboration

A new software ecosystem has launched that connects all operations and brings them to life in the virtual space.

VIX Suite is the creation of Holovis. The software and data team developed the proprietary software and its emerging technology engineers created the physical platforms that allow engineers and manufacturers to interact with their virtual data in the real world.

The platform comprises seven modules, three of which were showcased for the first time at April's Industry 4.0 Expo and Summit in Manchester. Here visitors were able to experience VIX Review, a data validation and interactive design interrogation platform that captures data from engineer reviews, analyses it and presents the user with possible recommendations and the ability to submit changes. Users can interact with the data in the number of different ways, from Desktop and large format displays to exploring their model in tracked spaces using Machine Augmented and Virtual Reality. Within a tracked space, the CAD model is brought to life allowing engineers to explore the real-time visualisation and accurately tag surface data with comments. High accuracy is guaranteed due to the robust geometrical data integrity. Comments are instantly collated into a database and automatically sent to the respective teams to action. Global teams can collaborate in real-time by logging into the same data sets and annotating in tandem.

Time and cost savings

VIX Review has been designed to replace physical engineering cube models by bringing the dataset to life virtually. For the automotive sector, this saves approximately £690,000 per vehicle programme, approximately 13 weeks of time and the accuracy of the data is enhanced with no room for misinterpretation as it's tagged directly against the CAD underlay.

Once the final model has been agreed, the data is transferred into the VIX Build package. This virtual manufacturing tool uses augmented reality to overlay CAD data onto physical parts to verify tooling, sealant and anti-flutter applications and the position of rivets, holes and flanges. This increases the 'right first time' ratio, avoids rework calls and enables the user to see if they have built in accordance with the signed off design intent.

Connecting teams

VIX Assist augments virtual data over physical products, machines or parts to access interactive tutorials for service and maintenance. This saves time instead of trying to locate the physical manual, reduces the mean time to fix and can escalate problems in real-time from the device, alerting a specialist engineer instantly.

"The VIX Suite platform can be utilised throughout the entire product lifecycle, connecting teams and ensuring each process flows effortlessly into the next," says Linda Duggan, Virtual Manufacturing Portfolio Manager at Holovis. "By connecting and collecting data in this way, manufacturers and engineers can analyse and learn from the results, optimising their time and ultimately saving money, whether that be on rework costs or reduction in physical models being created."

Enterprise

Servalec Controls deliver for Sellafield

Servelec Controls delivers control and safety system for Sellafield's silo maintenance facility.

A vital new silo maintenance facility (SMF) at Sellafield has been officially declared ready to tackle legacy waste.

Working on behalf of the SMF Delivery Team (SMFDT), which comprised of Cavendish Nuclear and Balfour Beatty JV, Servelec Controls designed, manufactured, tested and delivered the complete control and safety system for the SMF.

Eight years in the making
The impressive new facility, which has been eight years in the making, will allow Sellafield to empty waste from its legacy silos, a major priority for the nuclear fuel reprocessing and nuclear decommissioning site.

Servelec Controls' complex multi-subsystem control solution for the new facility integrates monitoring, control and analysis of multiple plant areas and related processes, including:

- local and remote control of all the operations inside the SMF
- flask loading and maintenance
- package collection
- package and shield door operation
- the import and export of components inside package skips
- decontamination, wash-down and effluence collection and sentencing
- bogie maintenance

Servelec Controls' part in the project took three years to complete and included the detailed design, manufacture and testing of the systems, ultimately delivering over 40 control panel cubicles across nine subsystems.

Bryn Thomas, Sales Director at Servelec Controls said: "We're proud to have played an integral role within such an important project for Sellafield and extremely pleased that it has been such a huge success. This triumph is testament to the high-calibre project management and team dynamic between Cavendish Nuclear, Balfour Beatty JV and ourselves. It is strong relationships like these that ensure we are able to deliver robust, reliable solutions to both our clients and their end users, in this case a fully integrated control and automation solution that met Sellafield's high standards and specific requirements."

Watch Sellafield sites' official video unveiling the Silo Maintainance Facility at bit.ly/2IC0avh.

Enterprise

Breathing a fresh lease of life into St Thomas' A&E department

Eta Projects was commissioned to undertake the design of the electrical, mechanical and public health services for St Thomas Hospital's Emergency Care Pathway (ECP) Project.

The accident and emergency (A&E) department at St Thomas' Hospital, London, is open 24 hours a day, 365 days a year to treat patients with the most serious or life-threatening injuries and conditions. Therefore it had to remain operational throughout the Emergency Care Pathway (ECP) Project. Eta Projects was commissioned to complete the Mechanical and Electrical (M&E) design elements.

The redevelopment project began in March 2014 and lasted three years, with the aim of creating a safer and more efficient environment for the 140,000 patients who visit the department each year.

The new layout improves the patient journey for the sickest patients who require admission from A&E to intensive care and inpatient wards. A bigger and better major's area incorporated 25 treatment cubicles, a more efficient layout and an improved waiting area for relatives. The final stage of the project included a new clinical decision unit.

Critical care

At all times, the services remained operational to ensure the existing A&E was not interrupted. The project was further challenged as The Guys & St Thomas's NHS Foundation Trust's backlog maintenance programme had identified constraints on the electrical and mechanical infrastructure – some dating from the original hospital build. Therefore, the upgrade and replacement of the high voltage and low voltage infrastructure was paramount to ensure the success of the ECP project.

Eta Projects developed an M&E scheme design with maximum resilience and flexibility to enable each phase to be completed and integrated into the new infrastructure. The key to the electrical scheme design was the background knowledge of the hospital's electrical infrastructure and the constantly changing load demands.

Working in collaboration with the Trust's architects, dedicated mechanical and electrical service risers were integrated into the architectural layouts for each department. This approach enabled each of the phased construction programmes to be completed as separate projects and handed over to the trust fully operational.

The electrical scheme design was comprehensive with every room individually reviewed and given a medical category inline with the NHS' safety guidance for electrical systems HTM 06-01.

Working behind the scenes in collaboration with the estates engineering team, Eta Projects customised options. These options were reviewed on a regular basis and a long-term infrastructure strategy formulated that met the immediate needs of the hospital and achieved the long-term aspirations of the Trust to reduce their backlog maintenance programme.

Maximum resilience

As part of the project realisation LV inter-connectors were installed between between key sub-stations.

Enterprise

> Not a single day was lost in the busy A&E department.

In view of the requirements for robust, resilient and maintainable electrical supplies, Eta Projects proposed an additional level of services integrity over and above the traditional NHS essential and non-essential services. This was the introduction of a 'critical' level with services normally defined as essential were elevated to critical.

These were supplied from dedicated A&B critical services switchboards, which were afforded three levels of supply. Two of the three supplies were configured for automatic changeover and the third supply was configured as a manual bypass supply should the changeover supply fail or a total loss of substation occurred.

To add further resilience the downstream UPS and associated IPS system were provided with dual supplies and manual bypass facilities. A further important element was the introduction of a formal application for connection to the Trust's electrical infrastructure.

After three years intensive onsite redevelopment works, the project was successfully completed and handed over. In the words of the Trust: "Not a single day was lost in the busy A&E department."

Enterprise

Blazing a trail as a Cosworth apprentice

Cosworth has long recognised the importance of an integrated apprenticeship scheme that puts young people at the heart of the initiative.

Cosworth has welcomed many aspiring automotive and motorsport engineers over the years, who have been supported by an apprenticeship scheme that successfully combines business needs and on-the-job learning.

Callum Jervis, an 18-year-old from Liverpool, is one of these apprentices, putting his passion for engineering into practice on a daily basis.

"Since a young age, I have been interested in engine building," he says. "I have always worked in the garage at home with my dad; that's my favourite part of building a car. I applied for an apprenticeship at Cosworth because it was a great opportunity to follow my dream at an amazing level.

Treated as an equal

"Cosworth is one of the most prominent companies in the industry. I felt immediately at home on my training days, in an extremely friendly environment. You aren't made to feel like an apprentice, you are treated just like an equal, as part of the wider team. That's one of the best things about being here."

Like all Cosworth's apprentices, Callum's role is hands-on and all encompassing, with involvement in real-world projects that are contributing to the company's growth. Attention to detail is important.

"My responsibilities on a daily basis are building engines and stripping them down," he says. "I also provide support to the dyno team should it be required. After each job, I clean the build shop and my work area, as well as cleaning and washing all of the parts. To have the opportunity to work on projects like the Aston Martin Valkyrie powertrain is very exciting. It's an important project for Cosworth but also for the automotive industry."

Developing skills

Cosworth enables its apprentices to think critically and problem-solve, while developing their interpersonal skills by interacting with people in a variety of roles across the business. The apprentices are given a dedicated mentor to help them every step of the way. As a result of their experiences, most move into full-time positions within the company, underscoring the authenticity of the scheme. "In my relatively short time at Cosworth, I have already learned many different tricks of the trade: from basic engine build, to the point where I can confidently build and strip engines on my own without assistance, to more skilled techniques with a range of equipment.

"My colleagues are easy to work with and are always there to pass down the knowledge they have accrued over many years," Callum says.

Hitting the right professional notes

Callum's love of engineering is matched only by his musical prowess. A Cosworth apprenticeship has certainly allowed him to hit the right professional notes.

"I love to play and learn new songs on the guitar, attending open mic nights, but cars have also played a big part in my life, and that of my family," he says. "My dad has inspired me massively. With him working in the industry, and at home with me, I have grown up aspiring to follow in his footsteps. Cosworth has allowed me to do just that. My brother has also been a

Enterprise

source of inspiration with a great work ethic, which I aim to match whenever I can.

"The knowledge I have gained from working at Cosworth has also assisted a lot in my spare time. I am currently building and working on a 1967 Mini Cooper S from the ground up. It has a lot of distinct components, not least the engine, which has been tuned to make over 100bhp with special camshafts, roller rockers, pistons and rods."

Apprenticeships allow Cosworth to harness the enthusiasm and passion of aspiring automotive engineers for the greater good of the organisation. It's a two-way street: the apprentices learn from some of the best in the industry, while Cosworth develops its engineers of the future.

"The opportunities and experiences at Cosworth are second to none," Callum says. "I couldn't recommend it any more highly. The environment is positive and gives me the opportunity to learn and practice something I enjoy. If you have a passion for automotive engineering, this is absolutely the best place to work."

"The opportunities and experiences at Cosworth are second to none. If you have a passion for automotive engineering, this is absolutely the best place to work."

Enterprise

HVPD expands into the Middle East

HVPD has placed its first roots in the Middle East with the relocation of one of its senior business development figures and new, co-opted offices in Abu Dhabi.

Samuel Green, who has over 10 years' experience of the oil and gas industry, has stepped into the role of Middle East Sales Manager at High Voltage Partial Discharge (HVPD), having spent the last two years developing the company's customer base in the USA. His relocation to Abu Dhabi marks the Manchester-based company's third satellite office after China and Australia respectively.

"This is a very good move for us because the market wants and needs HVPD to be here on a permanent basis," he says. "This now means that oil and gas operators, heavy industry and utilities providers in the region will have market-leading partial discharge solutions available on demand to help improve the reliability of their electrical networks."

Support on demand

"We're confident this move will enable us to better support our customers, ensuring the local market has access to our technology and global expertise," says Marc Foxall, HVPD's Business Development and Test Services Director.

"HVPD has recognised the importance of the Middle East as a key market for many years, with clients such as Saudi Aramco, Dubai Metro, Dubai Petroleum, Total, Dolphin Energy, PDO and Sohar Aluminium, which is why we are pleased to finally make this transition. Through a combination of building on existing projects and working closely with our local representatives Al-Mousawi Trading Co. LLC, we're confident this new venture will be a great success."

HVPD manufactures a range of specialist condition monitoring equipment that warns operators about dangerous electrical insulation defects in their high voltage assets. When left unchecked, assets with high partial discharge can experience costly and catastrophic in-service failures, posing a physical threat to nearby personnel and to production processes.

Award winning solution

The company also has a patented solution for monitoring complete electrical networks, including motors located in the ATEX hazardous gas zone, directly from the switchgear. The solution earned HVPD a Queen's Award for Enterprise for Innovation.

"Samuel's presence here will help local customers to understand the importance of partial discharge monitoring, its commercial and safety benefits and overall contribution to the improving their electrical asset maintenance strategies," says Sayed Ahmed Al Mousawi, General Manager of Al Mousawi Trading Co. LLC.

"By working together, I believe we can further the growth of HVPD in the region."

> Oil and gas operators, heavy industry and utilities providers in the region will now have access to market-leading partial discharge solutions on demand.

Enterprise

Brentwood becomes an IET Enterprise Partner

Brentwood Group celebrates IET partnership at Leeds head office signing event.

Brentwood Group is an independent firm of mechanical, electrical and public health (MEP) consulting engineers specialising in lighting and building performance. Brentwood are dedicated to creating spaces that reflect real-life within buildings, offering control over what matters most to the people that use them.

Brentwood works across a variety of sectors and at all stages of a building's lifecycle, from inception through to demolition. The most recent sectors it's ventured into is data centre and mission critical, including upgrading current mission critical platforms specifically in the telecoms industry, and building new infrastructure to support technology such as Li-Fi and smart cities.

Part of Brentwood's mission statement includes "having the best engineers for our business and to do that we need to develop the very best engineers of the future". By becoming an IET Enterprise Partner, the company's engineers and technicians have a professional institution to support them throughout their career.

The organisation officially became an IET Enterprise Partner at a signing event held at Brentwood Group's Leeds office.

"We are delighted Brentwood Group has joined as an Enterprise Partner with us," says IET Partnership Account Manager Nidhi Shukla. "This proves the company's commitment to its engineers' continued professional development and the ongoing support it will offer in conjunction with the IET."

The IET's Nidhi Shukla presenting the certificate to Brentwood Director Mark Johnson.

Corporate

BAE Systems wins national Diversity In Engineering Award

BAE Systems has been recognised for its commitment to increasing diversity and inclusion in the workplace at the prestigious SEMTA Awards.

BAE Systems was recognised for its commitment to increasing diversity and inclusion in the workplace

BAE Systems was awarded the Diversity In Engineering Award at the Science, Engineering and Manufacturing Technologies Alliance (SEMTA) Awards ceremony, held in London this March. This was in recognition of the company's achievement in doubling the number of female apprentices in its UK business over the past seven years, as well as its approach to attracting more diverse candidates through education outreach activities that help to tackle gender perceptions about engineering.

Diversity and inclusion

"We are delighted to be recognised for our commitment to growing a diverse workforce and creating an inclusive environment where everyone can achieve their best," says Natalie Sigona, BAE Systems' Head of Diversity and Inclusion.

"It is important that we lead and inspire high performing teams and we are committed to creating a diverse workforce, which reflects the communities we work in."

BAE Systems has undertaken an innovative approach to bridging the diversity and inclusion gap within industry. Each year it delivers 98 Movement to Work placements to young unemployed people and has encouraged over 40 suppliers to participate in the scheme by offering similar placements.

Coveted award for apprentice

The company celebrated further success at the event with Glen Fraser, a fourth year technician apprentice from its Naval Ships business. Glen scooped the coveted Apprentice of the Year – Large Employer Award thanks to his drive and determination to overcome personal challenges with dyslexia and become a talented engineer.

Glen was identified as having dyslexia in primary school but did not see this as a barrier to having a successful career in engineering. He is excelling in his apprenticeship and has won a number of awards, including the Prince Philip and Hammermen awards, and was named Naval Ships Apprentice of the Year in the first and third years of his apprenticeship.

BAE Systems technician apprentice, Glen Fraser scooped the coveted Apprentice of the Year - Large Employer Award

> We are committed to creating a diverse workforce, which reflects the communities we work in.

Corporate

Accountable, responsible and transparent AI

BMT and the University of Bath partner to deliver training for the UK's new generation of AI leaders.

BMT has partnered with the University of Bath to train a new generation of experts in accountable, responsible and transparent (ART) artificial intelligence (AI), as part of a UK government-backed investment initiative between academia and industry.

The new Centre for Doctoral Training (CDT) at the Cotswolds campus will be one of 16 new UK AI Centres for Doctoral Training funded by £100m from UK Research and Innovation (UKRI), as well as investment from industry and partner universities. The funding will train 1,000 PhD students across the UK to support a technology that has the potential to drive up productivity and enhance every industry throughout the economy.

Disruptive technology

"Artificial intelligence is a disruptive technology in a range of sectors, enabling new products and services and transforming data science," says UK Research and Innovation's Chief Executive, Professor Sir Mark Walport. "It allows us to develop new approaches to challenges as diverse as early disease diagnosis and climate change."

BMT will be working with the University of Bath, providing its AI expertise to support the development and growth of Britain's future leaders in artificial intelligence.

"This is a fantastic opportunity to grow the talent pool in the area and further develop BMT's pipeline of AI capabilities in partnership with a world-class academic institution," says Simon Luck, BMT's Head of Technology and Innovation. "When it comes to AI, BMT has a real understanding of disruptive and exponential technologies, as well as the human element involved in the core of artificial innovation including ethics and accountability."

Specialists with perspectives

"We're delighted to lead the UKRI ART-AI from the University of Bath, where we'll train world-leading 'specialists with perspectives'," continues Professor Eamonn O'Neill, Head of the Department of Computer Science at University of Bath and Director of the ART-AI CDT.

"The UK is at the forefront of the artificial intelligence and data revolution, and explicit consideration of ethics is essential as AI increases the ability of machines to inform, augment and even replace human decision-making. ART-AI will provide a national and global lead on AI ethics and its influence on AI innovations, applications and implications."

Corporate

We're delighted to see Leonardo's ongoing commitment to their people recognised with the Investors in Young People Gold award.

Leonardo gets the gold

Corporate

Leonardo becomes the first UK aerospace company to receive the Investors in Young People Gold award.

Leonardo is among the top 10 global players in aerospace, defence and security and employs over 7,000 people across the UK. It has now become the first aerospace company in the UK to be accredited Investors in Young People (IIYP) Gold.

This new gold standard of accreditation reflects Leonardo's continuing commitment to the recruitment, development and retention of a diverse range of young people throughout the UK.

Empowering young people
Leonardo employees support an array of STEM engagement programmes to empower young people, including their annual Rampaging Chariot Robotic Games and International Women in Engineering Days. These are targeted towards improving the long-term career prospects of young people in the communities surrounding the company's sites across the UK.

"We recognise that young talent is our future," says Alastair Morrison, Leonardo's Deputy Managing Director UK. "We know that we have to lay the groundwork now to create an environment where talent can thrive in the future. That means helping young people to believe in the power of their own creativity, giving them a sense of confidence about the transferrable skills that they could bring to industry.

"Our apprentices, graduates and engineers have made an enormous contribution to our gold accreditation and I look forward to seeing how they will engage the next generation in the excitement of our industry."

Investors in Young People
Investors in Young People was developed in 2014 as a result of the Wood Commission recommendations. It is a unique framework that helps organisations recruit, develop and retain young people, supporting youth employment. It also seeks to recognise employers who already demonstrate excellence in recruiting and retaining young people, while encouraging others within their organisation to begin working with young people.

The second generation of accreditation emerged the following year, incorporating higher levels of accreditation to stretch and challenge employers. In early 2015, Leonardo was the eighth company in the UK to be accredited with IIYP – over 440 organisations have since been accredited across all award levels.

Leonardo, which is already Investors in People (IIP) gold accredited, was most recently assessed by a team of specialists from Remarkable, the organisation that delivers Investors in Young People, to be evaluated against the new gold IIYP accreditation.

Dedication and passion
"The rationale for employing, developing and retaining young people is not only accepted throughout the business, there is a passion for it," says Hilary Crick, the Lead Specialist who evaluated Leonardo.

"Many of Leonardo's employees are in the later stage of their careers and are committed to sharing their knowledge and skills as a way of ensuring the continuing success of the business, to which they have dedicated so much of their lives. We observed how this commitment has become a part of the Leonardo culture with significant opportunities for young people to grow and develop transferable skills within the business."

"This is a fantastic achievement," adds Peter Russian, Chief Executive of Remarkable. "Having worked with Leonardo since 2005, we are delighted to see its ongoing commitment to its people recognised with the Investors in Young People award. Back in 2015 it was the eighth organisation to be accredited, at that time achieving the standard award, so it's wonderful to see the company develop its work and now achieve the highest level of accreditation – Investors in Young People Gold. Congratulations!"

Corporate

Cavendish Nuclear launches early careers exchange programme

Cavendish Nuclear has broadened its early careers programme to include a cross-industry exchange scheme.

Representatives from Cavendish Nuclear, host a reciprocal visit for representatives at Bel Engineering (British Engines) with a view to establishing an Early careers Exchange Programme

The company's long-established early careers programme has grown and diversified significantly over recent years and spans technical and professional functions including engineering, project management, procurement and supply chain and commercial.

It also provides opportunities for everyone from schoolchildren undertaking work experience through to apprentices, interns and employees on its industry-accredited graduate scheme.

Broadening experience and exposure
The purpose of the company's new Early Careers Exchange Scheme is to ensure that these individuals have the opportunity to broaden their experiences by providing exposure and time within organisations outside of Cavendish Nuclear.

It aims to provide experience of different work practices and cultures and give them a wider appreciation of engineering techniques and innovation, all of which will be brought back to aid development and progression in their current role.

BEL Engineering is the first company to work with Cavendish Nuclear on this project. In January, a group of senior representatives from Cavendish Nuclear took a tour of BEL Engineering's Newcastle facilities.

This was reciprocated in February with a visit to Cavendish Nuclear's Birchwood site.

The benefits of exchanges
The exchange programme formally commenced in April with the first group from Cavendish Nuclear's design and engineering scheme spending time learning about manufacturing techniques at BEL Engineering.

"This is a very exciting time for the Early Careers Programme and I am really pleased to sponsor this," says Mark Dearden, Engineering and Assurance Director and Executive Sponsor of the Early Careers Exchange Scheme.

"The opportunity of participating in a cross-industry exchange is priceless for everyone involved. It aims to broaden horizons, develop new skills, ways of thinking and develop an all-in service of creating talent that is adept and agile for the future challenges in the nuclear sector."

Unique opportunity
"The Early Careers Exchange Scheme is a unique experience and an exciting opportunity to highlight the full 360 degree journey of manufacturing," adds Jonathan Lamb, BEL Engineering's Chief Executive Officer.

"It provides our employees with a chance to develop their understanding of practical design for engineering solutions within the nuclear waste industry."

> A cross-industry exchange broadens horizons and develops new skills and ways of thinking.

Corporate

Jaguar Land Rover awards promotion of engineering

Jaguar Land Rover held its Technical Excellence Awards at the British Motor Museum in Gaydon earlier this year.

The event, held in February, was opened with an introduction by Nick Rogers, Executive Director, Product Engineering, while Ralph Speth, Jaguar Land Rover's CEO, oversaw the award ceremony itself.

245 people received awards in 14 different categories, including higher education achievement, Six Sigma Black Belt training completion and professional accreditation.

Four individuals were also recognised in a special prize for the promotion of engineering, awarded jointly by the IET and the Institution of Mechanical Engineers (IMechE). Andreea Angelescu, Natalie Dobson, Rebecca Madden and Victoria Hawthorn were presented their awards by IET Head of Membership, Mark Organ.

These individuals were recognised for their diligent work in keeping the professional registration schemes running and also providing supporting guides, manuals and a website. They were nominated by CAD AVA Engineer and Professional Engineering Development Committee Chair Michael Brown and Competence Developer Professional Simon Wood.

"With best intentions, little guidance and using their own experiences as mentees, they have provided advice and guidance to their peers and mentors," they wrote in their nomination. "Not content with maintaining the status quo, they have also initiated the use of the SuccessFactors' mentoring programme which provides a route for linking mentee to mentor and is ultimately becoming a register of professionally registered engineers and those actively seeking registration."

Mark Organ, IET Head of Membership.

"Events that celebrate achievement and make individuals feel valued within companies are very important," says Mark. "To see so many people recognised is testament to the great working environment Jaguar Land Rover provides its employees. It's a great example to other organisations," he concludes.

Virgin shows early career cohort pathways to career success

Virgin Media recently invited graduates, apprentices and interns to IET London: Savoy Place for a career development workshop.

The event supported Virgin's early career engineers and technologists in planning their career paths in line with the UK Standard for Professional Engineering Competence (UK-SPEC). The group of 17 was also shown tools to help them gain professional registration, such as the IET's skills development and recording tool, Career Manager.

Key topics at the workshop included an introduction to the IET and how a professional institution can support engineers and technicians at every stage of their career. There was also an inspiring speech from Clive Phelps, who started his career as an apprentice and rose through the ranks in a variety of firms and industries to be a Vice-President in Virgin.

During the workshop, groups were challenged to assess fictional engineers' and technicians' competence against the UK-SPEC for CEng. They were also tasked with creating a development plan for each of the fictional characters before being encouraged to apply the process to themselves.

After the workshop the group was treated to a tour of IET London: Savoy Place, including the chance to take in fantastic 180-degree views of the River Thames from the building's impressive Johnson roof terrace.

Corporate

Success for Dstl's first virtual reality collaboration

Dstl has held its first-ever VR collaboration, with staff based at different sites meeting in cyberspace to build a virtual aircraft engine.

This first Defence Science and Technology Laboratory (Dstl) trial was a great success, leaving the way open for more virtual meetings, including supporting training for a wide range of law enforcement and defence agencies.

If there's a major incident or humanitarian crisis anywhere in the world, the police agencies and the military could come together in a safe virtual reality (VR) environment to prepare for the challenges they will face before they arrive on site. The technology can also support training together from remote locations.

This virtual collaboration can take place between multiple sites, without anyone ever leaving their office, and can be done over secure lines, allowing sensitive scenarios to be used.

One Dstl tester said: "I was standing in a warehouse and could see a table with items. I could move over to it by clicking on the hand controller. Suddenly, I'm near some engine parts, part of an aeroplane on a bench. It's hyper real and totally immersive.

"The VR headset and hand controllers allow people to interact, talk to each other, point at and pick up items, and even fist bump at the end of a successful meeting."

"Collaborating in a virtual volumetric space, using the latest VR technology, is very new," says Mike Ferguson, Dstl's Security and Policing Group at Dstl. "We've tried other systems, but this is the first VR system that we've found which is really effective. It's still evolving; in the future we'll be in a virtual space as ourselves and be able to see lifelike avatars. It's connecting with people. It's making the world smaller.

"For us, we're really interested in how we can develop the technology to support our customers to train more smartly, efficiently and effectively in the future.

"We learn by doing – enhancing muscle memory. By actually doing it, it helps you to perform better. With ever-increasing demands on our policing and defence colleagues, finding the time for quality training is becoming a challenge. We think we can alleviate some of the burden through use of this technology."

> It's hyper real and totally immersive.

The Institution of Engineering and Technology

ROOF SMASHING
GROUND BREAKING
BAR RAISING
EDGE CUTTING
PERCEPTION SHIFTING
INNOVATING

Have you got what it takes to win the **IET Innovation Awards?**

Enter for free.
Submission deadline 5 July 2019
Find out more at **theiet.org/innovation**

#TomorrowToday

#IETInnovation

Proudly sponsored by:

ALTRAN · ARROW · FRAZER-NASH CONSULTANCY · GCHQ · MathWorks · nationalgrid · ROYAL NAVY · RS · SIEMENS Ingenuity for life

Membership Contacts UK

Mark Organ
Head of Membership
T: +44 (0) 1438 765685
M: +44 (0) 7889 317908
E: markorgan@theiet.org

Partnership and Development Team

Sally Davidson Jones
Partnership & Development Manager
T +44 (0) 1438 767409
M +44 (0) 7725 498135
E sdavidsonjones@theiet.org

Matthew Barber
Senior Partnership Account Manager
T +44 (0) 1438 767292
M +44 (0) 7720 090918
E matthewbarber@theiet.org

Jo Deal
Senior Development Manager
Area: London and South East England
M +44 (0) 7713 387567
E jdeal@theiet.org

Paul Stephens
Senior Corporate Account Manager
M +44 (0) 7725 498152
E pstephens@theiet.org

Fiona Harvie
Regional Development Manager
Area: Scotland
M +44 (0) 7711 406376
E fharvie@theiet.org

Sam Law
Regional Development Manager
Area: South West
M +44 (0) 7843 344489
E samlaw@theiet.org

Vaughan Lingwood
Regional Development Manager
Area: North East
M +44 (0) 7766 445768
E vlingwood@theiet.org

Mark Samson
Regional Development Manager
Area: Midlands and North Wales
M +44 (0) 7710 725112
E marksamson@theiet.org

Stephanie Smith
Regional Development Manager
Area: East of England and Northern Ireland
M +44 (0) 7725 498147
E stephaniesmith@theiet.org

Matthew Walton
Regional Development Manager
Area: North West
M +44 (0) 7725 207931
E matthewwalton@theiet.org

Jordan Osborn
Academic Account Manager
T +44 (0) 1438 761495
M +44 (0) 7725 205684
E jordanosborn@theiet.org

Kayleigh Winter
MOD Development Manager
M +44 (0) 7720 090913
E kayleighwinter@theiet.org

Nidhi Shukla
Partnership Account Manager
T +44 (0) 1438 211477
M +44 (0) 7725 498150
E nshukla@theiet.org

Membership Contacts UK

Partnership and Development Team

Joe Brewin
Regional Account Manager
T +44 (0) 1438 767648
E jbrewin@theiet.org

Heather Brophy
Regional Account Manager
M +44 (0) 7936 341419
E heatherbrophy@theiet.org

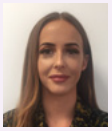
Jack Crosswell
Regional Account Manager
M +44 (0) 7710 320760
E jcrosswell@theiet.org

Sam Heron
Regional Account Manager
M +44 (0) 7936 341410
E samheron@theiet.org

Professional Registration Account Team

Adam Parnell
Professional Registration Account Manager
M +44 (0) 7720 090921
E adamparnell@theiet.org

Clare Peacock
Registration Account Process Manager
T +44 (0) 1438 211472
E cpeacock@theiet.org



Rhiann Birch
Technician Account Manager
T +44 (0) 1438 765516
M +44 (0) 7850 731444
E rbirch@theiet.org

UK International Operations

Ian Mercer
Head of International Operations
T +44 (0) 7872 844419
E imercer@theiet.org

James Howe
International Business Manager
T +44 (0) 1438 765631
E jhowe@theiet.org

International Contacts

India

Shekhar Sanyal
Country Head
T +91 (0) 9538 400777
E ssanyal@theiet.in

Raghavan S
Head - Membership and Partnerships
T +91 (0) 9538 400137
E raghavans@theiet.in

The Institution of Engineering and Technology

Working to engineer a better world

Read more inside...

Our offices

London, UK
T +44 (0)20 7344 8460

Stevenage, UK
T +44 (0)1438 313311

Beijing, China
T +86 10 6566 4687

Hong Kong
T +852 2521 2140

Bangalore, India
T +91 80 4089 2222

New Jersey, USA
T +1 (732) 321 5575

@TheIET

theiet.org

The Institution of Engineering and Technology (IET) is working to engineer a better world. We inspire, inform and influence the global engineering community, supporting technology innovation to meet the needs of society. The Institution of Engineering and Technology is registered as a Charity in England and Wales (No. 211014) and Scotland (No. SC038698).