



■ Think you know what an engineer looks like?

■ IET hosts round-table discussion on Graduate Apprenticeships

■ Students design 3D-printed prosthetic robot limb

■ Sound check: acoustic yarn monitors military hearing health



Want to recognise an outstanding student?

The IET Prize is now open for nominations

The IET Prize is global and is awarded annually to outstanding students who are undergoing or have completed a course of study which has been accredited by the IET.

Prize winners are nominated by each approved university for having shown distinction in a specified stage of a course leading to the award of their first degree. One nomination is available per IET accredited university.

Nominations for this Prize are by invitation only.

This prestigious Prize consists of a certificate and two years' free IET membership.

To find out if your university is already part of this scheme please contact:

Jenny Tilley
Awards and Prizes Coordinator
jtrolley@theiet.org

For more information, visit

www.theiet.org/student-prizes

Foreword



Welcome to issue 36 of *Partner News*. In this issue, we feature articles showcasing our academic, corporate, enterprise and MOD partners as well as featuring some of the brilliant projects the IET is working on.

We feature a thought provoking piece to challenge the stereotypes of engineers and to promote nominations for the Young Woman Engineer of the Year Award. Turn to page 4 to find details of how to nominate.

The students from the University of Aberdeen who make up team PrototAU showcase their prototype hydrogen-fuelled car as they prepare to compete against teams from around the world. More information can be found on page 13.

We speak to Dr Vincent Thornley from one of our founding enterprise partners, Fundamentals regarding his view on moving to a distribution system operator (DSO), and we hear about the fantastic event Fundamentals held at IET London: Savoy Place recently.

Finally, we find out about the brilliant work corporate partner Xaar is doing to get young people interested in STEM (science, technology, engineering and maths) subjects. The Imagineering clubs they are supporting are a great way to inspire children, turn to page 30 to find out more.

If you have any comments or would like to submit an article, please contact partnernews@theiet.org or tweet us [@TheIET](https://twitter.com/TheIET) using the hashtag [#IETPartnerships](https://twitter.com/TheIET).

Michelle Richmond CEng FIET

Director, Membership and Professional Development



[#IETPartnerships](https://twitter.com/TheIET)

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Partner News is produced by the IET. For any enquiries, please refer to pages 38-39 for contact details. Edited by Keri Allan, with special thanks to Laura Beard.



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Think you know what an **engineer** looks like?

**THINK
AGAIN**

Think you know what an engineer looks like?

Applications are now open for the 2018 IET Young Woman Engineer of the Year Awards, honouring exceptional female engineers working in the UK.

The IET Young Woman Engineer of the Year Awards promotes fantastic early career female engineers and their achievements. The awards also help raise vital awareness of the shortage of female engineers in the UK, who currently make up one in ten (11%) of Britain's engineering and technology workforce, helping us challenge the prevailing stereotypes that have contributed to this skills shortage.

Applications are now open for this year's three awards:

The IET Young Woman Engineer (YWE) of the Year (£2,500)

We're searching for a dynamic

early career engineer who represents the very best of our profession. She's a high achiever, a problem-solver and a team player. She should be an inspiration to her colleagues and have the charisma and personality to inspire others to follow in her footsteps.

The Mary George Memorial Prize for Apprentices (£750)

Awarded to an outstanding female engineering apprentice who has made a contribution within the workplace beyond the realms of her normal duties and demonstrated dynamism in her approach to solving engineering problems. A real team player, she will be seen

as an 'all-rounder', who will act as an enthusiastic role model to potential engineering apprentices.

The Women's Engineering Society (WES) Prize (£750)

Awarded to an early career female engineer who is able to engage and inspire early career people's involvement in STEM. She wants to attract young people into engineering and may already have some experience of doing this, and is interested in the challenges women face in maintaining their engineering careers.

All applications will be considered for any award providing they meet the criteria

of that award, but remember:

- All applicants must be currently working in the UK
- You do not need to be a member of the IET to enter
- The awards are aimed at early career professionals, aged 18-35 years old.

Entries to the YWE Awards close 8 July 2018, with the winners announced at a ceremony at IET London: Savoy Place on 6 December 2018.

The IET YWE Awards are free to enter. Apply online at www.theiet.org/ywe.



IET hosts roundtable discussion on Graduate Apprenticeships in Scotland

The IET recently hosted a round-table event at IET Glasgow: Teacher Building to discuss the opportunity for Graduate Apprenticeships in Scotland.

Working with Skills Development Scotland (SDS), the IET invited individuals from its corporate, academic and enterprise partnership communities, as well as representatives from the Scottish Qualifications Authority and Dundee University.

The development of Graduate Apprenticeships in Scotland

Dan Canty, IET Accreditation and Awards Manager, chaired the discussion. He gave an overview of how the IET has played a role in Degree Apprenticeships in England, shared some pertinent findings from the IET's *Skills in Demand* survey and outlined the agenda for the day.

SDS's Laura Brown gave a presentation on the story so far, highlighting how Graduate

Apprenticeships are being developed in Scotland, their benefits, what to expect as an employer, learning provider and individual, and plans for the future. Attendees also heard from Professor Caroline Parker, currently seconded to SDS, who spoke on the future architecture for standards and touched on the layers of skills and behaviours and how they are grouped.

Dundee University's David Mackie also spoke about their experience with delivering Graduate Apprenticeships, how they work with employers to provide consistent and flexible learning, and the different approaches they have taken with assessments.

The presentations prompted discussion from attendees. This covered topics such as best practice from universities, how companies can get the best out of individuals on a Graduate Apprenticeship while supporting their learning, and how Graduate

Apprenticeships could be part of the solution to bridging the skills gap in Scotland.

Collaboration leads to success

"One of the key elements of Graduate Apprenticeships is the integration of more work-based learning into higher education. Apprentices, their employers and higher education providers must collaborate to make this a success," says Dan.

"The IET was delighted to provide a shared space to explore these issues and celebrate successes. We are also pleased to work with SDS as they roll out the Graduate Apprenticeship programme to ensure engineering apprenticeships are aligned with professional engineering standards outlined in UK-SPEC."

"We were delighted to welcome our academic, corporate and enterprise partners along to our roundtable event in conjunction with Skills Development

Scotland," continues Fiona Harvie, IET Regional Development Manager – Scotland. "Their fantastic support showed us how important our partnerships are in bringing together academia and industry to discuss hot topics like this. The event was well attended, and received, and we would like to thank everyone who took the time to get involved in helping to shape the future of Graduate Apprenticeships for the better."

The IET is always keen to support partners in hosting roundtable events on hot topics within industry, academia and the MOD.

If you have a topic you think would interest the partnership community, please let us know by contacting your Regional Development Manager or emailing partnerships@theiet.org.

Returning to STEM

The IET recently launched a webzone dedicated to information on returning to STEM (science, technology, engineering and maths) careers, designed to support individuals who have taken or would like to take a career break.

Entitled Returning to STEM, the new webzone includes information on the support available, ways to return with confidence and the growing number of employers offering dedicated ‘returner’ programmes. Individuals also share their stories of returning to work after a variety of career break scenarios.

Returning with confidence

There are many ways you can improve your confidence when returning from a career break. This section outlines the ways you can improve your confidence as well as pre-empting confidence issues. Guidance includes taking refresher courses and reconnecting with colleagues before returning, finding a coach or mentor to help with the transition, and finding out what support your employer offers.

What skills are needed?

As the engineering and technology industry is an ever-changing entity, it’s a good idea to ensure your skills are kept up

to date to combat any changes that take place while you are on your career break.

Doing research and looking at the current state of your sector before you return to work will stand you in good stead to hit the ground running. Keeping in touch with managers and colleagues you used to work with will also give you a good idea of how the business may have changed.

While updating your knowledge and skills, remember not to overlook the skills you already have. While being away from work you may have picked up transferable skills you can use when you return to employment.

“Look at your CV in a different way from when you were in employment, because there are a lot of transferable skills you may have gained through the things you’ve been doing since out of paid employment,” notes Julie Thornton, Head of HR at Tideway. “If you’ve worked on committees, for charities, or volunteered, make sure this is included as it could be of interest to employers.”

Support available

There are an ever-growing number of resources and organisations out there offering support to potential returners.

Professional institutions, recruitment agencies, trade unions, online communities and advisory organisations all offer varying amounts of help, from member networks and training opportunities through to returners schemes and even fellowships.

In addition, to help change views on returners and what they can offer businesses, organisations such as Prospect and the IET have developed materials that help to demystify the whole process of returning to work – for both those looking to return and employers themselves.

“We believe this guidance can make a useful contribution to realising the benefits of bringing returners into a strong, diverse and skilled workforce. It sets out a range of realistic and practical steps, and we particularly hope it will encourage a more confident mindset amongst employees



and employers alike” says Mark Thomas FIET who supported the IET and Prospect in producing the literature.

Dedicated returners programmes

There are lots of ways you can refresh and reskill yourself as an individual, but it’s important to be aware of the support available from business. A growing number of companies are now offering dedicated returners programmes, often made up of courses that help people transition back to work, networking opportunities, support groups, mentors and



workplace ‘buddies’.

“We assign a mentor that is out of their reporting line and also a buddy – someone doing a similar role elsewhere within the business.

“This helps our returners get up to speed and have someone they can go to if they have questions,” says Julie.

Dealing with unconscious bias

When returning to work after a career break, many people can face issues around unconscious bias. This is when employers or colleagues make assumptions regarding a returner’s skills,

experience and commitment – often without even being aware that they are doing so.

This is often down to perceptions around career breaks and people’s views that they may result in a lack of skills or that someone who took time out from work may no longer be a ‘professional’.

To combat this, a growing number of STEM employers are moving in the right direction by challenging perceptions and updating best practice recruitment and equality procedures to include unconscious bias training.

Returning to work case studies

As part of our new webzone, we spoke to individuals who have taken various types of career breaks for a variety of reasons, including sabbaticals, career changes and long-term sick leave.

We also spoke to organisations that have dedicated returners programmes to find out how they are structured.

Visit our new Returning to STEM webzone at www.theiet.org/careerzone-returners

Collaboration with Prospect

The IET and trade union Prospect have worked together to develop several documents around returning to work and supporting women in STEM careers.

To learn more about best practice guidance and support around returning to the STEM sector, please follow the links below to the latest reports:

Supporting the Step Back into STEM Careers - www.theiet.org/stem-returners

Progressing Women in STEM Roles – www.theiet.org/women-in-stem



Electrician EngTech – a focus on the individual competence of electricians

With the introduction of the contextualised Recognised Electrician EngTech Standard, developed by the National Working Group – Electricians (NWG-Elec) and published by the Engineering Council, the IET's recent pilot scheme has enabled a successful pathway to EngTech for electricians working in the UK.

The Recognised Standard is specific to electricians working in the domestic, commercial and/or industrial sector, as it contextualises the generic standards of competence and commitment set out in the Engineering Council's UK-SPEC (UK specification professional engineering compliance) framework for those applying for EngTech. It's fully compliant with UK-SPEC and fulfils the usual requirements of individual competence-based peer review.

Key benefits to electricians:

- Enhances their professional recognition to the public, employers and clients through their individual commitment to professional standards and continuing professional

development (CPD);

- Demonstrates their ability to work safely in a way that contributes to sustainable development through their individual commitment to a professional code of conduct.
- Improves their career prospects and employability by showing employers they are committed to maintaining and enhancing their knowledge, skills and competence.
- Provides a clear and transparent career pathway that may open opportunities for further professional development and progression.
- Builds a professional profile that provides them with a sense of achievement, credibility and respect from the wider community and helps to build self-esteem and confidence.

The IET has begun working closely with employers of electricians in the social housing sector and will extend this successful programme to other relevant sectors, including the medical industry and academia.

Key benefits to employers:

- Provides a benchmark of assurance that assists with the recruitment and retention of professional electricians.
- Supports the employer's commitment to staff by demonstrating their commitment to the education, training, skills and experience of electricians working in a safety critical role.
- Highlights the value employers place on monitoring the individual competence of electricians they employ, through the individual's record of CPD, audited by the IET.
- Opens up new opportunities to tender for work where contracts specify a need for professionally qualified electricians.

Three experienced and qualified IET members, Keith Marshall, Andrew Ball and Graham Kenyon have been involved in a series of planned external meetings with large social housing providers across the UK. This work is continuing

during 2018 as part of the IET's national level research phase of the programme.

Review and analysis will take place later this year and the findings will be reported.

Such is the success of this work to date that the IET will be setting up a new National Electrician Employers Advisory Board (NEEAB), with a very clear focus on the competence assessment and CPD of individual electricians working in the UK in all sectors.

Employers of electricians who would like to be involved in this national research and/or involvement in the NEEAB should email the IET at electechs@theiet.org.

Interested in finding out more? Then please read on to find out how Jamie Holmes became one of the first registrants to be awarded Engtech against the new Recognised Electrician EngTech Standard.



Introducing EngTech for electricians

Meet **Jamie Holmes** EngTech TMIET, one of the first registrants to be awarded Engineering Technician (EngTech) against the Engineering Council's new Recognised Electrician EngTech Standard.

Jamie Holmes comes across as a man with a plan. The newly awarded EngTech Technical Manager started out as a trainee electrician with a penchant for problem-solving in 2003.

His first job in construction gave him an introduction into the world of electrical installations, and he's had a clear eye on the horizon ever since.

"I realised that being an electrician is not actually an end game in itself; you're always developing. It can lead on to other things and the more you're willing to put in then the more you'll get out of it," he says.

His first job gave him an understanding of a broad range of electrics with basic hands-on

tasks from re-wiring to installing cable containment and learning the basics in testing and fault identification. A key characteristic of Jamie's career path from the outset has been a willingness to work hard, learn on the job and adapt to the task at hand: "You have to be proactive about your career because no-one's going to do it for you!"

The turning point came with the offer of work in an area he wanted to move into: a large building site job via a sub-contract, to complete 150 new-build houses for East Electrical Services, now his employer. This signalled the start of training and formal

qualifications, which saw Jamie starting out on a clear pathway of career progression, leading up to EngTech.

As the new-build job progressed, Jamie was simultaneously working on a full City & Guilds electrical installation NVQ Level 3 qualification to underpin his experience and knowledge.

By the time he was finishing the last plots Jamie was carrying out more complicated aspects such as rectifying damaged cables via test procedure, setting out from drawings to install points and positioning, plus he had responsibility for last-visit snags.

"My career was following a clear progression and I became a member of the JIB (Joint Industry Board for the Electrical Contracting Industry), getting my gold Electrotechnical Certification Scheme (ECS) card.

Other work projects followed with ever-increasing levels of complexity and responsibility, backed up with a growing body of qualifications, including the City & Guilds 17th edition, underpinning the requirements of electrical installations.

It was at this time that Jamie first learnt about the IET.

"I realised that I could go on to achieve more in my career and be part of the very



institution that writes the book I conform to. As soon as I looked into it, I thought it's definitely something that could benefit my career."

"The minute I became an IET member and started getting more involved, advertising the fact that I was a Technician Member (TMIET), more companies were interested in using me.

"They know that you can meet that standard, and as a sub-contractor, being wanted is quite an asset. From there EngTech registration really became the natural next step for me."

A new benchmark

The first Recognised Standard for Electrician EngTech Registration has been developed by a working group made up of IET members, employers of electricians and representatives from JIB and SJIB (Scottish Joint Industry Board) so that electricians like Jamie can be assessed against a specific Electrician EngTech Standard, as opposed to the generic Engineering Technician Standard.

Engineering Council-licensed institutions have the ability to contextualise these generic standards in order to meet the needs of the particular technologies or industries with which they are primarily concerned. Published as 'Recognised Standards', these bespoke standards must be fully compliant with UK-SPEC, with all the associated peer-reviewed assessments of competence and commitment.

"Once I'd read about the recognised standard it suddenly all just became very relevant to my own career. It's really important that people can access it and realise that it's for them and that it can be achieved. There's plenty of information out there: on the websites of the licensed institutions or on the end of a phone line. Otherwise I think there's a danger for electricians to read through the standard spec, applying to so many different trades, and think that they don't meet that requirement."

Like the other registration categories, the Recognised Electrician EngTech Standard

works as a benchmark through which the public, employers and their clients can have confidence and trust that an applicant's competence has been assessed and meets a set of globally recognised standards. It improves career prospects and employability by showing employers an individual's commitment to maintaining their knowledge and skills.

"We need people in this industry to be registered to help raise the profile of the profession and standards. Peer-assessment adds to that, helping to raise the professionalism of electricians whatever their field of expertise," Jamie says. "I hope that with my qualifications and EngTech registration I bring professionalism to the company I work for, alongside my sense of personal achievement."

Jamie's commitment to CPD continues apace and alongside the regular responsibility of maintaining compliance with his various professional qualifications, he plans to undertake volunteer training this summer as a Professional Registration Advisor (PRA).

"The new standard is paving the way for more electricians to apply for registration and working as a PRA is something I'm really keen to do. There are people I'm working with now who're very interested in professional registration and some of them are very strong applicants. As the company's new Technical Manager I will be able to put measures in place to support their applications.

For more info about the Recognised Electrician EngTech Standard please visit bit.ly/2qS2iWm.

You can also find out more about EngTech for electricians at: www.theiet.org/electrician-engtech.

Electricians and/or employers of electricians (all sectors) wishing to arrange a complimentary EngTech for Electricians Registration workshop can email the IET at electechs@theiet.org to discuss.



Knitted yarn on helmet.

Sound check: acoustic yarn monitors military hearing health

Dstl (Defence Science and Technology Laboratory) scientists work with Nottingham Trent University on knitted sensors to guard against hearing loss for troops.

Among projects presented at March's Materials Research Exchange exhibition and conference (MRE) was Acoustic Yarn, a textile noise sensor, or dosimeter, created for military use.

Developed by researchers at Nottingham Trent University and funded by the Defence Science and Technology Laboratory (Dstl) through the Defence and Security Accelerator Open Call for Innovation, Acoustic Yarn was created in response to the

specific risks to hearing that face military personnel.

Overexposure to noise is known to cause permanent hearing damage, and as a result, employers are required to implement suitable health monitoring measures when workers will be exposed to loud noises.

A noise dosimeter is the most reliable way to determine a worker's noise exposure, but commercially available solutions are not suitable for military use.

However, this innovative helmet cover made of 'acoustic yarn' means that the sensor does not interfere with kit or with the operational effectiveness of the troops.

"Sound measurements were required from both sides of a helmet cover, as asymmetric hearing damage is known to be more common when firearms are frequently used, compared to general noise exposure, such as in construction," notes Dr Theodore Hughes-Riley,

Research Fellow, Advanced Textiles Research Group, at Nottingham Trent University.

Tiny microphones were soldered onto fine multi-strand copper wire and encapsulated within resin which, with additional packing fibres, was then put through a knitting machine, to form the acoustic sensor yarn. Finally, the acoustic sensor yarn was incorporated into a knitted helmet cover created using computerised flat-bed 3D knitting technology.

A guide to the IET for MOD personnel

How the IET can support those currently serving in the Armed Forces as well as Service Leavers.



Professionalism

Becoming professionally registered indicates you have met a recognised standard of competence as an engineer or technician. Working within the Armed Forces means that certain job roles and career pathways have already been mapped to the requirements of each registration category. See if you can take advantage of these Special Registration Agreements (SRAs) by visiting www.theiet.org/armed-forces*

Service Leavers

If you are a Service Leaver, we also offer support with the transition into civilian life including significantly discounted membership and professional registration fees.**



Support


The IET's MOD Development Manager Kayleigh Winter offers on-site visits to deliver talks to explain in full about the benefits of IET membership and professional registration. Please email armedforces@theiet.org

Membership

Membership with the IET can support you to achieve your career goals with access to essential products and services and gives you the opportunity to engage with the IET global engineering and technology community.

For further info or to apply:

 Text IETMOD and your full name to 62277***

 +44 (0)1438 767648

 join@theiet.org

 www.theiet.org/armed-forces

www.theiet.org/armed-forces



**WITH YOU NOW
AND FOR THE
REST OF
YOUR CAREER**

*Please note, before applying to become professionally registered, Armed Forces personnel must become IET members.

The MOD has recently communicated that serving personnel are now able to claim a refund for engineering professional body fees.

**The discounted Service Leavers' membership fee is only applicable if applied for membership prior to leaving the Service, or within a maximum of three months after leaving. For a full breakdown of the discounted fee, please visit: www.theiet.org/service-leavers.

***Free text line, no charges apply.

Students in the driving seat for Shell Eco-marathon



Team PrototAU.

Students from the University of Aberdeen are building their own hydrogen-fuelled car as they prepare to compete against teams from around the world in this year's Shell Eco-marathon.

Team PrototAU has made it through several qualifying stages to reach the competition finals, which take place in London this July.

The Shell Eco-marathon challenges students to design,

build and test energy-efficient cars, pushing the boundaries of what is technically possible. Students take their designs to the track to see which vehicle can go furthest on the least amount of fuel.

20-strong team

The University's 20-strong team, which consists of engineering and business students, will now set to work building a car to compete in the competition's

Prototype class. The car will be built at the University's Fraser Noble building, which is home to the School of Engineering.

"Our team formed back

in November and since then we've been working hard to pass the initial key stages that will allow us to move on to the final chapter, the actual building of the car," says Lisa Rossi, the team's Chemical Engineering Coordinator.

"It is the first time the University of Aberdeen has participated in the Eco-marathon, and we will build the only hydrogen-fuelled car that will be competing from a Scottish university."

Hydrogen-fuelled car

The students' design has been approved, and the team is now in the process of finding the parts needed to build the car.

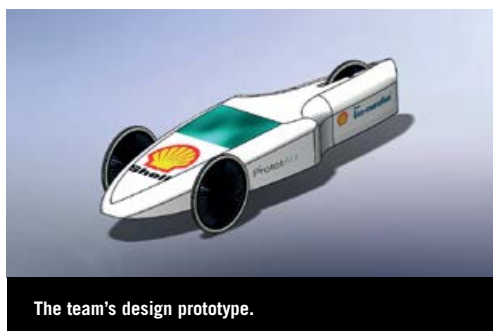
"We are currently looking for sponsorship opportunities with local companies that might help us obtain a 500W fuel cell,

which is the most expensive item on our list of parts," says Lisa. "We'd be delighted to hear from anyone who is interested in working with us."

David Rodger, from Shell UK, works closely with the Scottish universities involved in the competition.

"It is great to see the University of Aberdeen taking part in Shell Eco-Marathon. This is a competition that challenges students from around the world to design and build innovative vehicles where achieving distance, not speed, is at the heart of the challenge."

Anyone interested in sponsorship opportunities with Team PrototAU should contact prototau@outlook.com to discuss further.



The team's design prototype.



Sheffield aims to inspire next generation of female engineers

The University of Sheffield recently welcomed 600 local female school pupils to learn how they can transform the world through STEM (science, technology, engineering and maths).

The University's annual Exploring STEM for Girls event is aimed at local schoolgirls, in a bid to inspire the next generation of scientists and engineers through a variety of interactive experiments, demonstrations and workshops.

The University of Sheffield is committed to inspiring and encouraging women to pursue an education and career in the

engineering industry, an industry in which the engineering workforce is currently 94% white and 89% male. The event aims, along with other initiatives such as the Faculty of Engineering's 'Wall of Women', to urge females across the country to close the gap and create a more diverse engineering workforce.

Dr Gwendolen Reilly, Director of Women in Engineering and Senior Lecturer in Bio-Engineering at the University of Sheffield, was lead speaker at the event.

"All of us at the University of Sheffield are passionate about encouraging more females to

pursue engineering. The Explore STEM for Girls event is just one of the many ways we reach out to the next generation of would-be female engineers," she says. "It is a chance for young females to have an immersive experience with STEM subjects and realise that these subjects are exciting, accessible and achievable."

In collaboration with Sheffield Hallam University, the event also gave pupils the opportunity to speak to current university students and staff about their studies, careers and the real-life applications of STEM subjects that have helped to make a difference.

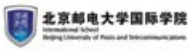
"It is vitally important that young people, but in particular young women, are encouraged to study STEM subjects and work in these industries," says Helen Walker, Senior Schools and Colleges Engagement Officer at Sheffield Hallam University.

"Everyone benefits from having a diverse workforce, whether that's in the classroom, in the workshops or the boardrooms. Sheffield Hallam, along with our colleagues from the University of Sheffield, are proud to champion women in STEM and to be involved in events such as this."

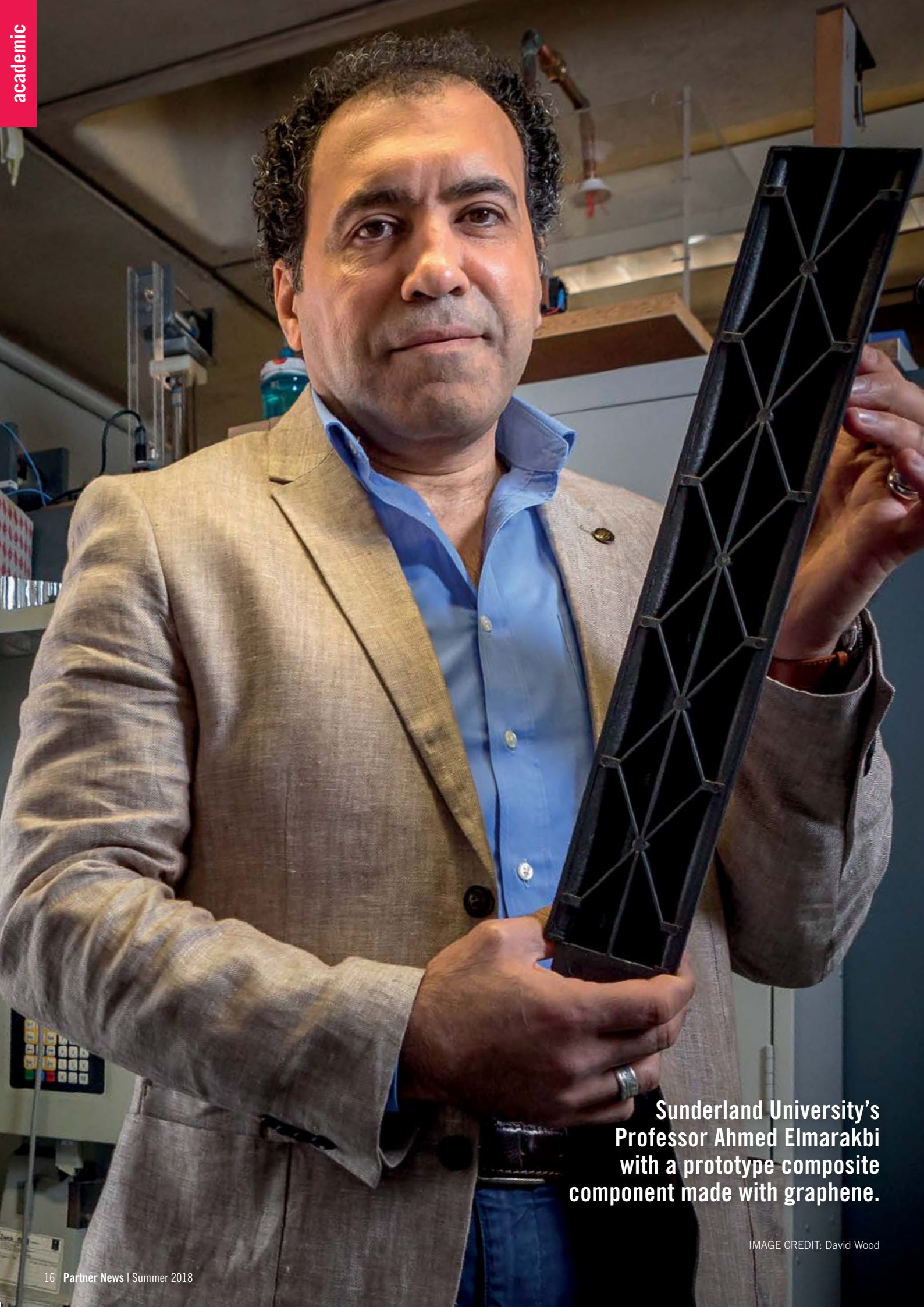


Academic Partners

The Institution of Engineering and Technology



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Sunderland University's Professor Ahmed Elmarakbi with a prototype composite component made with graphene.

IMAGE CREDIT: David Wood

“Automotive manufacturers and Tier 1 suppliers are very interested in our work”

Researcher unveils graphene prototype set to shake up the automotive industry

An academic from the University of Sunderland has produced the world's first graphene prototype composite component for the automotive industry.

Ahmed Elmarakbi, Professor of Automotive Composites, is leading Task 10.11 – Composites for Automotive, part of the European Commission's Graphene Flagship.

The pioneering project is exploring how graphene could be used to create lighter, stronger, safer and more energy-efficient vehicles.

Over the last two years, Sunderland, leading a consortium of five research partners from Italy, Spain and Germany, has been conducting a series of tests with support from Centro Ricerche CRF of Fiat Chrysler Automobiles, analysing the properties of graphene to determine how it behaves when used to enhance the advanced composite materials in vehicle production.

Lighter, stronger, tougher vehicles

Taking the bumper of the car, graphene was embedded into a polymer and mixed with traditional carbon fibre or glass fibre structural material, making it lighter, stronger and tougher.

This allowed the researchers to reduce the thickness of the structural components.

“The material is very light and very strong and the impact testing showed a 40% higher specific energy absorption than in traditional composite materials,” enthuses Ahmed. “It's also more stable; it's a controlled fracture when you hit it, even at a higher velocity it absorbs the energy in a controlled way. We expected this at the beginning but did not anticipate the results to be this high.”

Challenges to overcome

The ultimate prize will be new lightweight components for vehicles, which will lead to significantly lower fuel consumption and emissions. However, Ahmed says there are still challenges to be overcome. First, there are difficulties in applying graphene, which is only a few layers thick, as the thicker it's applied the more brittle it becomes – like graphite. Secondly it's difficult to uniformly disperse the graphene in the polymer.

“Getting the right balance between the graphene and the polymer is crucial,” he explains. “The composite cannot be too weak, or so

strong that it's unable to absorb energy in the event of a collision. Modern cars are designed to crumple in a crash – protecting the passengers – whereas a composite that is too strong would transfer energy to the car's passengers, compromising their safety.

“We have a very good uniform dispersion now, but it's not an easy task. We need to make it lightweight and at the same time very safe. Part of the challenge in reaching this point has been that everything we're doing is a first. We've even had to design the software to simulate the graphene applications from scratch.”

Research on an unprecedented scale

The Graphene Flagship represents a new form of joint coordinated research on an unprecedented scale. Forming Europe's biggest ever research initiative as part of the European Commission's Future and Emerging Technology Flagship, it has a budget of €1bn. It is tasked with generating economic growth, new jobs and new opportunities by bringing together academic and industrial researchers to take graphene from the realm of academic laboratories

into European society in the space of 10 years.

The Flagship's findings have the potential to bring huge changes to the future of product design and manufacture, with research collaborations across Europe focusing on the use of graphene in five areas: Internet of Things (IoT), wearables and technology, datacom, energy, and composites.

And this research is already attracting a lot of interest.

“We're in talks with the automotive manufacturers and their Tier 1 suppliers, who are very interested in our work and how they might apply our findings in the future,” says Ahmed. “10 years is nothing in automotive development, their research and development teams will be looking well beyond that and they can already see the potential of graphene.

“It's an honour for the University of Sunderland to lead on a project that has been recognised through the Graphene Flagship. It reinforces our reputation as leaders in internationally relevant research in automotive, manufacturing and ultra-low carbon vehicle technology,” he concludes.



IMAGE CREDIT: Jon Linnell and Julia Salazar

Over 600 students tackle real business challenges in special project

A Loughborough University London project challenged students to help solve real problems set by a wide variety of organisations.

At a special event held in March, Loughborough University London staff, students and company partners came together to hear the outcomes and achievements of the latest Collaborative Project module.

The Master's initiative, which commenced last September, has seen more

than 660 postgraduate students work in 122 multidisciplinary teams to deliver tasks set by 19 organisations.

The Collaborative Project Show
Speaking at The Collaborative Project Show 2018, Dean of Loughborough University London, Professor

Mike Caine, said: "The Collaborative Project is, globally, one of the largest programmes of its kind. It brings together students from different disciplines, nationalities and cultures to address contemporary challenges set by a wide range of organisations through team-based action-

learning with a focus on creativity and innovation.

"The recent World Economic Forum meeting highlighted the need to create a shared future in 'a fractured world' and I believe the Collaborative Project is helping do just this. Outputs from the module have the potential to deliver societal

impact locally, nationally and internationally.”

A variety of challenges were presented to the students for this year’s project, from helping London Stadium with its goal to become the most connected stadium in the world to suggesting ways EDF Energy Blue Lab can enhance home battery appeal.

NHS England challenge

NHS England asked students

to think of ways to enhance appropriate usage of accident and emergency services and support international students to better utilise services. The teams carried out qualitative research and suggested concepts such as an online network – supported by health professionals – for carers of the elderly and an NHS workshop for international students during Welcome Week.

A spokesperson from NHS England said they were “very impressed with the students’ dedication and enthusiasm,” and hope “the outputs can be developed further to contribute towards improving healthcare services”.

Other companies that also took part in the module include architect firm Foster+Partners, BT Sport, Manifesto and independent creative agency HeyBigMan!.

The Collaborative Project, now in its third year, is open to all full-time and part-time students at Loughborough University London.

For more information on the module or how to become a collaborating organisation please visit: www.lborolondon.ac.uk/collaborate.



IMAGE CREDIT: Jon Linnell and Julia Salazar

Students design 3D-printed prosthetic robot limb

Students from The University of Manchester have designed and built a 3D-printed, low-cost robotic prosthetic hand that could provide a much cheaper alternative for amputees.

The hand's joints are all fully poseable with each individual finger and the thumb being able to move as well as make a fist. The functionality of the hand allows its user to do simple, everyday tasks such as picking up items, eating using a knife and fork, typing and clicking a mouse or opening doors. It can even play rock-paper-scissors.

Low cost

But what also makes the prototype limb stand out is its cost. The students

built the hand for just £307 and believe the cost can still be lowered further. In comparison, an advanced robotic prosthetic limb can start at approximately £25,000, going up to £60,000 if bought privately. More affordable robotic hands with basic multi-grip functionality start at £3,000.

The student design was awarded 'best new development' in the Digital Innovation Challenge at the recent Industry 4.0 Summit and Factories of the Future Expo held in Manchester.

The hand is the brainchild of mechanical

engineering student Alex Agboola-Dobson and his team, which is made up of lead electrical engineer Sebastian Preston-Jensen, lead software engineer Panagiotis Papathanasiou and mechanical and software engineers Maximillian Rimmer and Shao Hian Liew.

According to the NHS around 6,000

major limb amputations are carried out each year in the UK alone. Non-robotic prosthetic limbs available on the NHS are either purely cosmetic, whilst other more functional ones are simple plastic-moulded limbs with hooks. This was also another inspiration for the team's futuristic, but life-like design.



inted

“ We think our design can really make a difference ”



Inspiration

“Not only do we want to make it affordable, we want people to actually like the look of it and not be ashamed or embarrassed of using or wearing it,” says Alex. “Some traditional prosthetics can both look and feel cumbersome or, those that don’t, are extremely expensive. We think our design

really can make a difference and we will be looking to commercialise the project in the future.”

Connectivity is another key advantage of their design as it comes with a Bluetooth connection and an Android smartphone app. The hand is controlled by muscle sensors

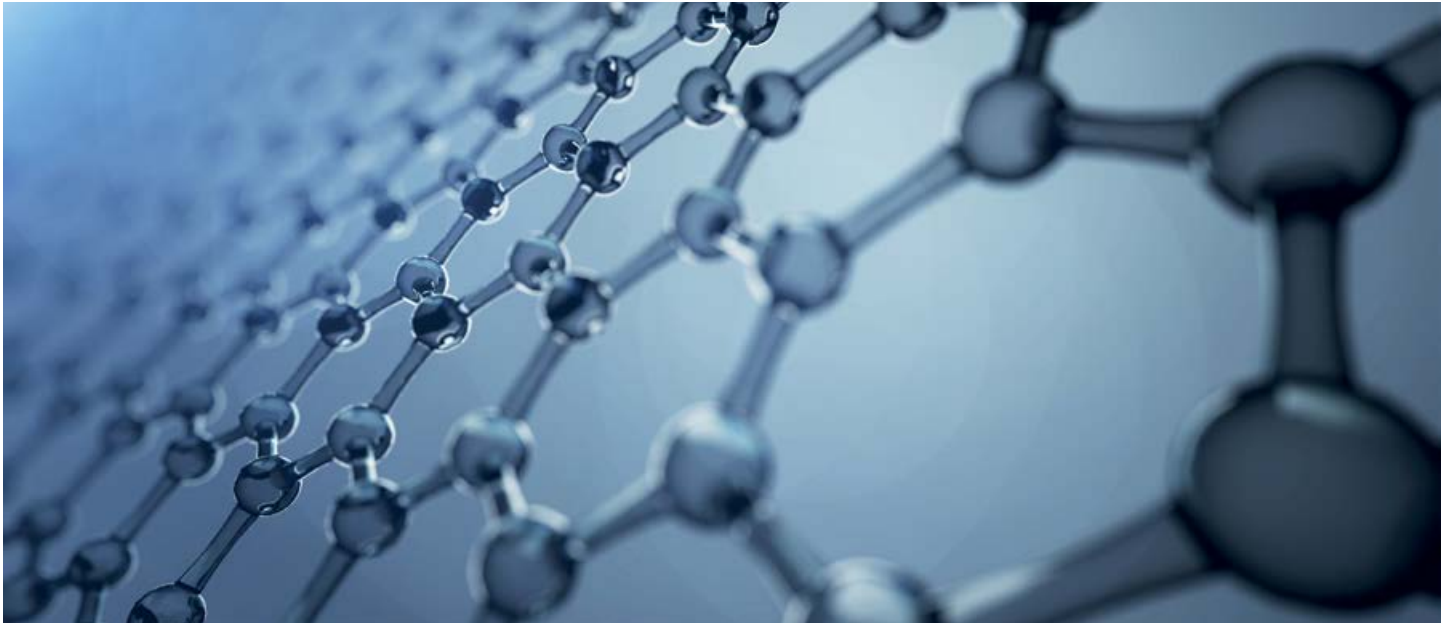
placed on the wearer’s arm that can be paired to the app, which was also designed by the group.

“The functionality is customised through the phone app, but the muscle sensors provide the control by moving the hand whenever necessary. It is really simple to use,” Alex notes.

Manufacturing of the hand is

by a type of 3D printing called stereolithography, which uses a high quality resin plastic for production.

Eventually the team is aiming to move to fused deposition modelling (FDM) 3D printing, which will make the hand even cheaper to produce, but not lose any of its quality.



Multimillion-pound project to improve the safety of nanomaterials

Heriot-Watt University is leading a multi-million global project that will assess the risks of nanomaterials and develop an approach to minimise the harm they may pose to humans or the environment.

A team from Heriot-Watt University's School of Engineering and Physical Sciences is coordinating GRACIOUS, a project involving 23 partners from the UK, US and Asia. The aim is to reduce the need to individually assess the risks posed by the thousands of nanomaterials used in products including clothing, medicines, cosmetics and electronics, by building a framework which allows decisions on nanomaterial safety to be made.

"Nanotechnology promises significant benefits. Materials can be made stronger, lighter, more durable and more reactive among many other traits. Many products that are in daily use already rely on nanoscale materials but the growth of this industry is threatened by safety uncertainties," notes Professor Vicki Stone, Director of Nano-Safety Research Group.

Assessing toxicity

"To ensure that nanomaterials are safely used, their toxicity needs to be assessed. As regulators are now more receptive to non-animal, alternative models of assessing safety, we are developing a framework based on predictions about the toxicity of nanomaterials. This will be achieved by grouping those with similar properties that have already been assessed.

"By building a framework, in partnership with industry and regulators, we can make decisions about the safety of tens of thousands of different nanomaterials without individually testing each one. Given the close partnership in this project between scientists, regulators and industry, we anticipate the framework will be used widely once developed.

"This is a very exciting time for research into the long-term

safety of nanomaterials with the UK playing a key and prominent role in these activities."

Heriot-Watt will be working closely with industry, including chemical companies BASF and Unilever, on the development of the framework.

Nanomaterial safety projects

Funded by the European Commissions' Horizon 2020 scheme, GRACIOUS is one of three large European nanomaterial safety projects being led by institutions in the UK. The Heriot-Watt team is also a partner in PATROLS, led by Swansea University. This project will establish and standardise a battery of innovative, next-generation safety testing tools that more accurately predict the adverse effects caused by long-term engineered nanomaterial exposure in humans and the environment. The team will also work on

the BIORIMA project, led by the Institute of Occupational Medicine, which will develop new approaches to assess the human and environmental safety of nanomedicines which are used to diagnose and treat diseases such as cancer and cardiovascular disease.

"This multi-million pound investment in nanotechnology research is a demonstration of the potential and importance of international collaboration in research in general and this exciting research theme in particular," says Professor John Underhill, Chief Scientist at Heriot-Watt University.

"We pride ourselves on being an international university with a global outlook, finding solutions to challenges with wide-ranging applications. Our cutting-edge research into nanomaterials and toxicity could have wide reaching economic benefits to a range of industries worldwide."

Pektron receives Queen's Award for Enterprise



Pektron staff receive their award from the Lord-Lieutenant of Derbyshire at the company's Derby manufacturing facility.

Pektron is a UK electronics designer and manufacturer with over 50 years' experience delivering bespoke electronics hardware and software to companies around the world. Last year it received a Queen's Award for Enterprise, an awards programme for British businesses that excel at international trade, innovation or sustainable development.

Queen's Award winners are chosen by a panel that includes the Prime Minister and leading figures from Government and industry, making it one of the most sought-after accolades for British businesses.

A trip to Buckingham Palace

Winners are invited to a Royal reception at Buckingham Palace, hosted by Her Majesty The Queen and presented the

award at their company. In addition, winners are entitled to fly the Queen's Award flag at their main office, and use the emblem on marketing materials.

Pektron's award was in acknowledgement of the company achieving international sales growth of 250% over the last 10 years, demonstrating its constant drive for success, expanding both its UK and overseas markets.

"We have consistently invested in our business for over 50 years. To receive an award such as this demonstrates how our strategy for long-term growth continues to be the right approach, and gives us further encouragement as we continue our journey designing and manufacturing innovative electronics for our

customers," says Neil Morgan, Pektron Managing Director.

Groundbreaking electronic systems

Most recently Pektron has developed electronic systems for the new Ford GT, including a groundbreaking electronic instrument cluster and the vehicle dynamics system that controls a range of different driving modes.

The company's experience and expertise in designing innovative electronics enables development in a fraction of the time of more traditional suppliers – less than 18 months in the case of the Ford GT. Its responsive approach, coupled with significantly lower costs, appeals to customers operating in competitive markets.

In particular, Pektron's

experience in vehicle electronics has resulted in the company winning a number of large contracts in North America, in areas such as construction and agricultural machinery and electric vehicles.

"Our success at winning business in the US is great news for the UK – we have sold electronics systems to high technology start-ups as well as established brands reliant on us to support their global operations," says John Potts, Sales Director at Pektron.

"This is a massive achievement in a very competitive, technology-led sector. We have been able to fight off fierce competition from the Far East and our brand is recognised as being synonymous with exceptionally high quality."



Holovis and Road King sign the investment deal in Hong Kong.

Holovis secures multi-million investment from Hong Kong

Holovis has announced a multi-million pound minority investment in the company by Hong Kong listed corporation Road King Investment and Asset Management Group Limited.

Established in 2004, Holovis is the creator of multi-sensory immersive experiences and new technologies for the enterprise, entertainment, museum and simulation sectors. It currently has its head office in the UK, with innovation centres in Shanghai, China and Orlando, USA.

This significant investment will allow Holovis to grow more

strategically, particularly in the Far East, whilst maintaining its market leadership position in delivering unique, innovation-led solutions for global clients.

“With Road King’s backing we will accelerate our development of immersive, mixed reality solutions, including rolling out our exciting, market-defining Extended-Experience augmented and mixed reality technology platform,” says Stuart Hetherington, Holovis CEO.

“We will also deepen and extend our innovation pipeline, bringing new and exciting

products to market in the next 12 months. With our new partner investor, our Far East operation will also significantly expand across all market sectors, as well as integrating Holovis experiences into Road King’s existing and new real estate projects they own and operate across China.”

Road King has expanded its investment focus to bring together specialist technology companies like Holovis to work alongside other businesses within its portfolio. The aim is to leverage the opportunities this new multidisciplinary group can deliver across China.

“This partnership with Holovis, along with our other technology investments, brings a unique capability to Road King’s vision and strategy in designing and building the next-generation of visitor attractions and public venue experiences in the Far East,” notes William Zen, Chairman of Road King.

“This investment also supports and underpins Holovis and Road King’s plans to expand into the Chinese enterprise and simulation markets, which are both showing strong year-on-year growth opportunities.”



Open Energi's engineers work closely with their customers to ensure the company's technology integrates seamlessly with operational processes.

Enterprise Partner status recognises Open Energi's commitment to engineering excellence

Open Energi, a UK energy tech company working to radically reduce the cost of delivering and consuming power, has been recognised by the IET as an Enterprise Partner.

IET Enterprise Partners are entrepreneurial and innovative SMEs who are committed to professionalism and market success. Open Energi is working with leading UK businesses, including water utilities, retailers, universities and aggregates companies, to deliver vital demand-side flexibility when and where it is most needed to create a more sustainable energy future.

The company's technology integrates with critical business processes in challenging operational environments and invisibly adjusts power consumption in real-time.

Engineering – a core business skill

Engineering is a core business skill that is vital to the company's success. Being an IET Enterprise Partner gives Open Energi's engineering team a formally recognised route to professional registration as Chartered Engineer (CEng) and Incorporated Engineer (IEng) status with the UK Engineering Council. Although several Open Energi engineers are already professionally registered, it is expected that all engineering staff will achieve registration by the third quarter of 2018.

Alongside CPD (continuing professional development) opportunities, the partnership scheme offers valuable networking opportunities with the IET's corporate and academic partners, which include some of the UK's biggest engineering

employers and educators.

"Open Energi is committed to excellence in engineering and we want to make sure our engineering team benefit from the best resources, networking and professional development opportunities available, so that they can continue to deliver outstanding service to our customers. We're very proud to be recognised as an IET Enterprise Partner, working with the world's largest multidisciplinary engineering institution," says Paul O'Brien, Open Energi's Director of Operations.

The lifeblood of the engineering sector

SMEs, who may have more license to work on new and innovative technology, or work within a niche specialism, make a significant contribution to

the IET community. According to Engineering UK figures from 2017, up to 99.7% of all engineering companies are SMEs.

"SMEs are the lifeblood of the engineering sector, which is currently experiencing a huge skills shortage," notes Mark Organ, IET Head of Membership.

"The IET is already devoting considerable time and resource to education programmes and scholarships to attract the next generation but it is also vitally important to invest in the current workforce and their professional development.

"It's for this reason that we created the IET Enterprise Partner scheme, so that we can engage with SMEs directly to help them develop their workforce and ultimately their business performance."



Dr Vincent Thornley, Technology Director at Fundamentals.

The case for a role-based approach to transitioning to a **distribution system operator**

Fundamentals' Technology Director, **Dr Vincent Thornley**, gives his thoughts on the distribution network operator (DNO) transition to distribution system operator (DSO).

Fundamentals recently held an industry event entitled Electricity Networks: Health, Performance and Transformation, and the transition to DSO featured in a number of presentations across the day.

A common theme for many of the speakers was clarity around a common objective, whether this related to DSO transition, solving customers' problems,

delivering services or building the 1,000mph Bloodhound car.

Wrestling with transformation

In essence, the GB electricity industry is undergoing an introspective period as it wrestles with its latest transformation project: organisations transitioning from DNOs to DSOs. Each organisation has their own view of what it is to be a DSO,

which naturally supports their own business strengths. But in the end it is Ofgem that decides the scope through the licences it issues for the next regulatory period.

Customers of the electricity system and wider stakeholders are demanding greater flexibility, greater security, the ability to use more sustainable sources of electricity and to put it to wider

use. All without huge increases in the cost of energy. We need to keep in mind that a move to a DSO should only be to support stakeholder needs, rather than for its own sake.

Any attempt to define a DSO results in extended discussion about what it is and everyone has a slightly different view. The process, therefore, should be to define the required roles



(or functions) of the electricity system at distribution level.

A good starting point for this is a model already in use at transmission and market level: the ENTSO-E/EFET/eBIX Harmonised Electricity Market (HEM) role model.

A role-based model defines the functions required and the interaction between roles and domains of operation. Different actors can then take on combinations of these roles.

Working in harmony?

The HEM role model is concerned primarily with

the interactions between transmission systems, but the model and its definitions can be extended to the distribution layer.

The ENA Open Networks project seeks to define the functions of a DSO. However, rather than defining the entity of a DSO, taking a role-based approach, including licensing, could yield a number of key benefits:

■ **A more granular approach to licensing network and system services by the regulator**

Ofgem could choose to licence different roles to different

actors, and these may not be uniform throughout the UK. It opens up the possibility of different operating models in rural settings to urban centres, which could include multi-utility system operation, or have a role provided by a city municipality.

■ **Alternative methods of delivery of some of the functions by different operators**

An example of this is some of the ancillary service functions being delivered by Electricity North West's CLASS project, within which Fundamentals is

playing a significant role.

■ **Flexibility to adjust the licensing model as techniques develop**

Indeed, within the bounds of operator suitability assessment, trading of licences could be allowed, reaching a more favourable operating point for the system. This will also enable new market entrants in the system.

Overall, the industry now requires a laser-like focus on the reason for the transformation: solving the energy trilemma.



Safe Workplace Champion Award



Lee is shown receiving his award from the BBC's Steph McGovern and safety experts Arco who sponsored the award.

Double win for PEME engineers

PEME takes home awards from both the Association of Electrical and Mechanical Trades and Manufacturing Management magazine.

PEME had a successful awards season in 2017, taking home the Association of Electrical and Mechanical Trades (AEMT) Industry Supplier of the Year award and seeing its Operations Manager, Lee Dale, recognised as a champion of workplace safety.

AEMT is an international association representing leading companies in the electrical and mechanical service and repair industry. The judging panel, which included independent experts, members of the press and sponsoring companies, analysed every entry to decide on the finalists.

Industry Supplier of the Year

Through a further secret ballot

PEME was declared Industry Supplier of the Year.

This was in recognition of the excellent service provided by its reliability team in delivering productivity improvement to manufacturers in several sectors.

PEME is an asset care partner helping manufacturers ensure they have safe production assets achieving their full potential. Its reliability team mobilises new plant maintenance contracts and makes its embedded teams more effective by developing holistic asset care strategies that enhance the productivity and safety of client's equipment.

"This award adds great

credibility to our efforts to be recognised as a leading asset care partner because of the knowledge and experience of the judging panel," notes Ashley Maile, PEME MD.

National Safety Award

Following on from this win, Operations Manager Lee Dale was recognised among the best in the UK at the Manufacturing Champion Awards 2017.

The awards, from Manufacturing Management magazine, highlight the opportunities on offer in UK engineering and showcase some of the world-class talent within the sector.

Thanks to his dedication and approach to safety, with his

team delivering an engineering support contract with a major food brand, Lee was awarded the Highly Commended certificate in the Safe Workplace Champion category.

"I'm very pleased and proud to have been recognised with this award," Lee says.

"I believe the commendation recognises my colleagues who have helped create an environment that has resulted in behavioural change towards safety and risk assessments in particular.

"We have an improved team attitude towards safety and work really hard to ensure everyone in our team is involved and sees safety as a core activity."

IET Engineering & Technology Photographer of the Year 2018 **OPEN NOW!**



Engineering is exciting and fast-changing – shaping the world around us and improving the quality of our everyday lives.

Traditional images of engineering and engineers have focused on hard hats and dirty overalls, which is an outdated image – **an image the IET is committed to change.**

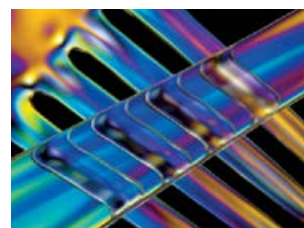
The IET is looking for entries for its annual photography competition in a bid to challenge misconceptions of engineering and to demonstrate the ingenuity, breadth and vibrancy of our profession.

You can enter up to five images in the following five categories:

- Design & Production
- Digital
- Environment & Energy
- Structures
- Transport

Judges will award cash prizes to five adult category winners (over 16) and five youth category winners (age 16 and under). An overall winner across all categories and ages will then be selected for an extra cash prize.

New for this year – the best photo taken on a smart phone will also win a cash prize.



*A selection of Winners and Highly Commended photos from the 2017 competition, visit website for full details.

For your chance to win, enter by 28 September 2018 at

www.theiet.org/photo-competition

Xaar supports Cambridgeshire's engineers of the future



Xaar, a developer of industrial inkjet technologies, is sponsoring two Imagineering clubs at local primary schools, designed to introduce children to engineering through fun activities.

This sponsorship is part of Xaar's role in helping to drive interest in STEM (science, technology, engineering and maths) subjects amongst school students.

Supported by eight volunteer tutors from Xaar's operations and R&D teams, the weekly hour-long after-school clubs are attended by year six students from Grove Primary School in Cambridge and Stukeley Meadows Primary

School in Huntingdon.

The students learn about basic science and engineering concepts and make working mechanical and electronics-based models, such as a Bloodhound SSC-inspired, balloon-powered rocket car, a steady hand game and even an AM radio.

Imagineering clubs are administered by an independent education charity called the Imagineering Foundation. It promotes science and engineering in schools and supplies schools with special kits. In the case of Grove Primary School and Stukeley Meadows, these were funded by Xaar.

Xaar's involvement in the Imagineering clubs is a direct result of COO Ted Wiggins attending and being inspired by a lecture delivered by Bob Shanks, Chairman of Imagineering.

"As a global technology business, Xaar requires the very best engineering talent, and it is therefore essential that we do our bit to inspire the next generation of engineers," says Ted. "Our sponsorship of the Imagineering clubs is the perfect way to capture students' imagination, and the team at Xaar receive a great sense of achievement from working with the students at both schools."

"Our Imagineering club is

a great way for us to build on the work we do in school and develop students' science and engineering skills even further," continues James Singletery, Headteacher at Stukeley Meadows. "The tutors from Xaar provide a deep and inspiring insight into the diverse world of engineering – and ensure everyone has a lot of fun along the way."

"The children love attending," adds Karen Martin, Headteacher at Grove Primary School. "We really appreciate the time Xaar gives to organising and running the club and helping create real excitement amongst the children about the STEM subjects each year."



Gavin Patterson cuts the ribbon to the Flowers Room with Tim Whitley (far left), Mike Carr, Nigel Fine, Kenneth Flowers, Howard Watson and Susan Flowers.

IET Flowers Room officially opened by BT

This February the IET invited guests to IET London: Savoy Place to officially open the Flowers Room at its prestigious flagship venue.

This room has been named after the British engineer Tommy Flowers, who designed and built Colossus, a computer that helped solve encrypted Nazi messages during World War II.

BT created two information boards for the opening detailing Tommy Flowers' life and work, which have been generously donated to the IET.

Senior executives from BT Group, as well as BT graduates and IET Diamond scholars supported by BT, were invited

to the opening, where they heard speeches from BT CEO Gavin Patterson, IET Deputy President Mike Carr, and Zoe Mabo, an IET Diamond Scholar. They were also joined by special guests Kenneth and Susan Flowers, Tommy Flower's son and daughter-in-law.

After the speeches, the room was officially opened with the cutting of a ribbon.

"We are delighted that BT wanted to host this event and we are very grateful that the Flowers family and IET scholars could also attend the official opening of the room," says Sally Davidson Jones, IET Partnership and Development Manager.

"Our relationship with the

IET is founded on our mutual goals to inspire the next generation of engineers and scientists, and to develop the current generation to be the best they can be," Gavin says.

"It was an honour to formally open the Flowers Room and a particular pleasure to do so in the presence of some of this generation's most capable young engineers – the IET Diamond Jubilee scholars. I look forward to seeing how they change the world in the future."

Following the networking lunch, sessions were held for the scholars by BT staff and new graduates. These outlined BT's innovation story, the career of a new graduate,

and the opportunities the organisation can offer.

"This was a great and valuable opportunity for Diamond scholars supported by BT to meet and network with some of BT's senior executives," says Iris Hutchings, IET Scholarship and Development Manager.

IET Partners receive a 20% discount on room hire at Savoy Place. To book the Flowers Room, or any of the other rooms, please contact **+44 (0)20 3797 3240** or visit www.ietvenues.co.uk/savoyplace.



New Corporate Partner aims to leverage all opportunities

Dornan Engineering is delighted to become an IET corporate partner, an acknowledgement of the level of professionalism within its technical staff teams.

The new partnership between the IET and Dornan Engineering was kicked off with a webinar presentation by IET Regional Development Manager Sarah Larkham. Going out to over 40 of Dornan's engineers and technicians, located in seven countries throughout Europe, the webinar focused on membership and benefits, professional registration, and gave an introduction to the IET's Career Manager platform.

Committed to the success of its technical staff

This partnership represents the most recent step taken by Dornan Engineering to

demonstrate its commitment to a diverse, highly educated and skilled workforce. This currently includes over 130 technical staff, from students through to registered professionals.

Dornan Engineering has wasted no time in actively engaging with the institution. Several of its engineers and technicians have already joined the company based registration scheme set up in collaboration with the IET. This follows a number of other initiatives that have been put in place by Dornan Engineering as part of its investment in technical staff, who it recognises are key to the future success of the business.

Active engagement

"At Dornan Engineering, we are committed to encouraging and supporting all our engineers and technicians in achieving professional registration," says Barry O'Sullivan, Dornan Engineering's Technical Director. "We look forward to working closely with the IET to help employees achieve their goals."

Other initiatives include the introduction of an engineering scholarship programme in 2017. This was designed to support qualified electricians wishing to further their education to achieve level 7 and level 8 Bachelor of

Engineering degrees.

At present, this scholarship programme is only available through one academic institution. However, as an IET corporate partner, Dornan plans to leverage this relationship to engage with other academic partners and hopefully expand the scholarship to other academic institutions and degree courses.

In addition, Dornan has rolled out a monitored professional development scheme, also in consultation with the IET. Looking forward, the company plans to apply for IET accreditation of the scheme later this year.

“ We actively support staff through their professional development journey ”



NIE Networks holds an annual company awards lunch to celebrate staff who've achieved success over the previous year. Here are 2017's candidates, pictured with NIE Networks Chief Executive Nicholas Tarrant CEng.

Professional development at NIE Networks

Electrical engineers at NIE Networks are gaining invaluable support in their journey to registration thanks to an IET company based registration scheme (CBRS).

The CBRS has now been in place at NIE Networks for over three years. Before the scheme began, employees would apply for professional registration and work their way through the process themselves.

Simplifying the registration process

Vic Foster, Design Engineer and CBRS Administrator at NIE

Networks believes the coordinated scheme makes it easier for the company's engineers to become professionally registered.

“Since we introduced the CBRS 18 Engineering Technicians (EngTech), one Incorporated Engineer (IEng) and 10 Chartered Engineers (CEng) have been registered, with many of these now volunteering as mentors,” he says.

Close ties to the IET

“The CBRS is open to all engineering staff, from those on our graduate scheme through to

long time company engineers.

At NIE Networks we have always had a close link with the IET, with many employees heavily involved in local networks and committees. We believe that IET accreditation provides our engineers with the continuous development and specialised knowledge to work on the electricity network, and we actively support staff financially through their journey, as well as paying professional fees.”

Several accredited schemes

NIE Networks' graduate development scheme has recently



been reaccredited for another three years, with the company's apprentice programme gaining accreditation in September 2016.

Across all the schemes there have already been over 25 members of staff who've achieved professional registration and a further 40 are currently at various stages of professional development.

BAE Systems leads team to deliver additional Type 45 power generation

The UK Ministry of Defence (MOD) has appointed an alliance team led by BAE Systems to deliver its Type 45 Power Improvement Project (PIP).

The Type 45 fleet is supported by BAE Systems at home and overseas. Type 45 destroyers are the United Kingdom's most advanced air defence warship. Resolving the power and propulsion issues will allow the Royal Navy to carry out its full range of operations to protect UK and NATO interests anywhere around the world, with confidence in the power and propulsion system.

BAE Systems joined with shipbuilding and conversion specialist Cammell Laird and naval design and technical support expert BMT to win the PIP contract, signing a charter on board HMS Diamond along with representatives from the Royal Navy and MOD to celebrate the alliance.

Improving power and propulsion resilience

The project will improve resilience in the Royal Navy's Type 45 Destroyer power and propulsion system by replacing the existing two diesel generators, fitting an additional diesel generator and modifying the high voltage system on each ship. The alliance has drawn on each member's expertise across the defence and commercial sectors, including proven power and propulsion capability and over 30 years of unique Type 45 design, build and support experience.

"We firmly believe in the power of teamwork and this agreement sets the seal on the coming together of three highly complementary partners to form the very best team," says Jeremy Berwick, Managing Director, BMT Defence and Security. "We look forward to working with our partners to deliver a fresh, lean and rapid solution for the Royal Navy."

The scope of the PIP

competition was split into two lots, comprising major procurement, design and integration of the solution, and the physical installation and replacement of equipment onboard the Type 45 vessels. The BAE Systems-led team won both lots, with work set to begin immediately.

Work now underway

"We are immensely proud to support the Royal Navy's Type 45 fleet whether at home or on deployment around the world," continues David Mitchard, Managing Director, BAE Systems Maritime Services.

"By combining the collective knowledge, experience and skills of BAE Systems, Cammell Laird and BMT we are demonstrating our commitment to present a robust technical solution with an innovative commercial alliance. Our aim is to rapidly restore command confidence in the power and propulsion system of the Type 45 fleet, demonstrate value for

money and safeguard vital skills for future generations of warship support."

Highly collaborative approach

The installation and replacement of equipment is planned to take place at Cammell Laird's shipyard in Birkenhead, Merseyside. Then a series of harbour and sea trials will enable the ships to return to their home at Portsmouth Naval Base, where they will return to Royal Navy operations supported by BAE Systems.

"This highly collaborative approach is very much in line with the Government's national shipbuilding strategy by maximising the effectiveness of the complementary expertise and experience of each partner," adds Linton Roberts, Cammell Laird's Managing Director. "The Ministry of Defence has driven a challenging competition for this contract, and we are confident that our alliance will deliver a very innovative technical solution to the Royal Navy."



Type 45 destroyer HMS Dragon pictured in the English Channel close to her home port of Portsmouth.



Autostore in action.

Supporting the skills that drive omni-channel fulfilment

Dematic, a global supplier of integrated automated technology, software and services has entered into a corporate partnership agreement with the IET.

Engineering skills and the development of new technologies will play an increasingly important role in the future profitability of many industrial sectors. In particular within the retail sector, where the huge growth of online sales is driving a boom in the automation of manual tasks.

Omni-channel retailers are facing a huge logistical challenge. Creating a seamless supply chain capable of replenishing stores efficiently, and simultaneously coping with an ever-growing volume of Internet orders, calls for a radical rethink of the distribution centre.

Retailers can no longer afford to consider store and Internet fulfilment as separate operations. Consolidating inventory and integrating

processes offers considerable cost and availability benefits. But creating an omni-channel fulfilment capability that has the flexibility to deal with store replenishment and Internet sales presents both a challenge and an opportunity.

Dematic has a range of solutions to support both store replenishment operations and goods-to-person piece-pick processes.

At the heart of any efficient automated solution is the storage subsystem.

Here, Dematic offers three subsystem types: MultiShuttle, AutoStore and Mini-Load AS/RS – all of which are backed by Dematic's iQ software.

The Dematic MultiShuttle 2 buffers and sequences products between bulk stock and functions like piece-pick

order fulfilment and mixed-case pallet assembly.

Capable of increasing throughput by up to 10 times that of conventional storage systems, the solution is fast, flexible and well suited to high volume operations.

For applications with a varied SKU range and moderate throughput velocity, AutoStore is the ideal storage subsystem, providing ultra-high storage density through a combination of five elements: robot, workstation, bin, grid and controller.

There are no dedicated access aisles in AutoStore so the entire cube can be used to store product up to a height of six metres – although higher structures can be built on mezzanine platforms.

Designed to fit easily into

existing buildings – around pillars and within awkward spaces – its inherent flexibility lends itself to future expansion, when needed.

Dematic's Mini-Load AS/RS is optimised for distribution centres, production facilities and buffer stores, offering flexible load handling that supports a wide range of container and carton sizes.

This energy-efficient automated storage and retrieval system has a modular design, lightweight mast construction, and a high-performance capability with maximum travel acceleration of 5.5m/sec².

Dematic provides flexible, scalable and compact storage subsystems, all controlled by Dematic's iQ software – making it a single source of intelligent automated solutions.



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