



# Inspiring Future Engineers

Impact Report | 2019



### Diamond Jubilee Scholarships

**73** scholarships were awarded in 2019



**17** donor funded

**8** IET match funded



**48%**

of scholarships were awarded to women



**93%**

of 2017 graduates are working in or studying engineering or technology

**78%**

of 2019 graduates from both Diamond Jubilee Scholarships and Engineering Horizons Bursaries are either employed in an **engineering or technology** role or postgraduate study in an engineering subject.

### Engineering Horizons Bursaries

**84** bursaries were awarded in 2019



**32** donor funded

**23** IET match funded



**28%**

of bursaries were awarded to women



**31%**

of bursaries were awarded to apprentices

### Faraday Challenge Days

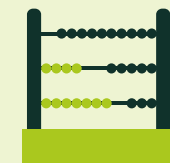
2019/2020 season

**134** Faraday Challenge Days delivered up to 16 March 2020



**55** donor funded

**43** IET match funded



Engaged with

**47**

schools defined as **hard-to-reach\***

**4,493**

students engaged in the programme up to March 2020



**51%** of participants were girls

\* high percentage of free school meals, rural schools and social mobility indicators

### IET FIRST® LEGO® League

2019/2020 season

IET FIRST® LEGO® League

9-16 years old

**8,484** students in **1,010** teams took part



**390** teams were funded

IET FIRST® LEGO® League Jr.

6-9 years old

**839** teams registered to take part



**258** teams were funded

IET FIRST® LEGO® League Jr. Discovery

4-6 years old

**755** teams registered to take part



**431** teams were funded

Engaged with

**52**

schools defined as **hard-to-reach\*** as well as 10 Extra Provision Network classes in Scotland\*\*



**40%**

of 9-16 year-old participants were girls

\*\*for children with special educational needs and disability



## Team Dersi\_Coders of Dersingham Primary School, London

IET FIRST® LEGO® League team funded by the David Family Foundation

Champions of the inaugural Newham tournament

Winners of the HM Government Award for Insight into Learning at the England & Wales National Final

Thanks to a donation from the charitable foundation of the late Gerald David FIET, this team from Dersingham Primary School in Newham competed side by side with schools from all over the country and took home a prize.

The students competed with their robot and presented their innovation project to build a homeless shelter and foodbank as part of this year's CITY SHAPER theme, which asked what they would do to build a better world.



# Working to engineer a better world

When the IET first set out to inspire the next generation of engineers as part of our response to the skills shortage, we hadn't expected to find ourselves the ones to be inspired.

Innovation and creativity are fundamental to becoming a great engineer.

These skills are in abundance in the children and young people that we meet. They just need the opportunity to thrive.

In these pages you can read about some of the people who have inspired us.

While preparing this report COVID-19 has swept the world with devastating consequences. Engineers and technicians from a wide range of companies – many of which feature on our donors page – are collaborating with the medical profession to innovate solutions. Our profession matters. This is the time to reach out to those who will take on the next big challenge.

I would like to thank all the generous individuals, companies and charities who have given their time, in-kind support and funds to make the programmes we offer more successful than ever.

All new donations to the programmes featured here have been matched by the IET. I am delighted to say that as at December 2019 almost £700,000 of the £1m set aside for match funding has been committed.

Help us reach the £1m. Get involved. Be inspired.

**Professor Bob Cryan CBE DL CCMi CMgr FEng FIET**  
IET Development Steering Group Chair

# STEM Competitions



Whether it's a one-day engineering challenge or 12 weeks of preparation culminating in a high-energy tournament, our STEM (science, technology, engineering and maths) competitions capture imaginations.



Thousands of students across the UK experience a Faraday Challenge Day each year. Most have no prior interest in engineering and yet by the end of the day they will have completed a project with their team-mates, produced a working prototype and given a presentation – including a "lessons learned" element.

Does one day make a difference? You can read what past winners and students of Ulverston Victoria High School say on page 4.

We look forward to similarly catching up with the 2018/19 season champions, Lenzie Academy, pictured top, whose team-work and design skills impressed the judges from the James Webb Space Telescope team at the Royal Observatory in Edinburgh.

Due to the COVID-19 pandemic our 2019/20 season with theme partner Airbus had to be suspended in March 2020. We will endeavour to visit as many of the schools affected in the new season.

The Faraday Challenges are delivered free to schools – thanks to our donors. The resources are also available free online.

The IET *FIRST*® LEGO® League programmes continue to be phenomenally successful, attracting more teams than ever before. Children can now join in from the age of four up to 16.

The programmes stretch and challenge the students at each stage, pushing them to excel whether in their research, demonstrating core values or their robot design and coding.

Just a bit of fun? No – a lot of fun – but with amazing long-term impact. Aaron can tell you more about that on page 8.

Through the generosity of our donors, we can offer free kit and registration to teams from areas of disadvantage along with training for team coaches.



Coding and building: IET *FIRST*® LEGO® League Jr.

# Faraday Challenge Day Impact

Five years on from their victory in the 2014/15 Faraday Challenge Day season, we caught up with the winning team from Ulverston Victoria High School in Cumbria.

Now studying for their A Levels, the team have vivid memories of the competition and how it impacted them.

The Smart Cycle Challenge was to use a 3D printer to design and create a prototype Smart Beacon to send information to cyclists. Fittingly the National Final was held at the iconic velodrome in the Queen Elizabeth Olympic Park.

"Seeing a concept in our heads be brought to fruition was an amazing experience. In school we didn't get that much direct exposure to actual practical engineering projects, so for us to be able to create our own product was great.

"I will always remember feeling honoured to be allowed to use the 3D printing technology in the challenge. It was something I had only seen on TV and in magazines and being allowed to use it myself was incredible," said Emillie.

"I have chosen to study engineering at university and I have always said that my excitement for STEM was sparked by my involvement in the Faraday Challenge."

Team-mate Amelia, who is studying maths, computer science, physics and history at A Level, added that her most memorable moment was:

"Seeing our design completed and working, having started from an initial idea and worked throughout the day developing and evolving our design.

It inspired me to continue studying maths to A Level as it demonstrated just how useful STEM subjects can really be in real-life situations."



Starr highlighted working as a team and getting stuck into the task as stand out memories.

"It definitely encouraged me to explore other options within maths and I am looking forward to continuing my studies at university."

Hal was in charge of the all-important budgeting on the task and he is now applying for an economics degree.

Jack who is taking maths, music and computer science recalled: "The challenge as a whole required critical thinking and the ability to produce creative solutions to problems. Being able to look at the errors and devise a solution is a vital skill in programming and I think that the Faraday Challenge really helped to prepare me for STEM subjects I now take."

With your support we can take Faraday Challenge Days to more schools across the UK. Please contact [development@theiet.org](mailto:development@theiet.org)

“

*I have chosen to study Engineering at University and I have always said that my excitement for STEM was sparked by my involvement in the Faraday Challenge.*

Emillie

”

# From joining in...

## IET FIRST® LEGO® League Jr. Discovery



Children learn best through play, IET FIRST® LEGO® League Jr. Discovery gives 4-6 year-olds the chance to develop STEM skills and important key habits of learning from an early age.

Using LEGO® DUPLO®, children explore a real-world theme, working through a series of tasks together in teams. Learning is reinforced at home as each child is given a set of six bricks to explore new challenges with their families.

Each week the children learn how to persist with tasks and apply previous knowledge to new situations. They begin to understand STEM concepts and engineering at a base level. Key life skills such as teamwork, communication, language development, listening and confidence develop naturally as the weeks progress.

The children share their learning and achievements with their parents and guardians at a Celebration Event at the end of the programme.

From being one of three countries to pilot this programme globally we are now delivering it widely in schools and libraries across the UK and Ireland. Children with special educational needs have benefited from Discovery and we have also adapted it for older children with additional needs.

We are urgently seeking support to bring Discovery to more parts of the UK and Ireland, with a focus on securing funds to allow children in disadvantaged areas to take part. For further information, please contact [development@theiet.org](mailto:development@theiet.org).



“

*I felt the benefits the children gained was vast and had an impact on their learning in class also.*

Lisa Wyllie, Teacher, Whitehills Primary School

”

# ... to leading

## Aaron Cuthbertson

Degree apprentice in Software Engineering at Queen Mary University of London

Aaron first joined IET *FIRST*® LEGO® League at the age of 12 as part of a home-educated team sponsored by Bechtel. He competed for three years and, in 2016, his team won a place to compete at the Open European Championships in Tenerife.

Four years on, Aaron is still closely involved, helping to support regional tournaments, volunteering as a judge and referee and mentoring teams.

"Although I decided to stop competing, I basically couldn't bring myself to stop participating in some form! Every competition I've been part of I've thoroughly enjoyed, so I've kept doing them."

IET *FIRST*® LEGO® League inspired Aaron to pursue a career in engineering. He is now in his first year of a degree apprenticeship in Software Engineering at Queen Mary University London. Alongside his academic studies, he is working as an Apprentice Software Engineer at a global finance technology company.

"I can say with absolute certainty that without IET *FIRST*® LEGO® League I wouldn't be anywhere near the position I am in now. I could've answered every single question in interviews and applications last year with my IET *FIRST*® LEGO® League experiences alone!

It can be a really transformative experience for the competitors. I've seen young people who've never worked in a team before and wouldn't be seen dead presenting in front of a crowd become fully involved in effective teamwork by the end of the season, and absolutely come to life in front of judges when presenting. It's a lovely thing to see! I find myself now comparing a large amount of what I encounter in engineering to my experiences in the competition... core values, project management, working under pressure – IET *FIRST*® LEGO® League has prepared me for life as an engineer far better than anything else I've ever taken part in."



“

*IET FIRST® LEGO® League has prepared me for life as an engineer far better than anything else I've ever taken part in.*

”

*Aaron as a tournament referee at the England and Wales final in 2020*

# We can't do what we do without great partnerships...



Sage Foundation has generously supported IET *FIRST*® LEGO® League since 2017. The partnership is a fantastic example of the huge difference companies can make to their local communities through our programmes.

Software company Sage, through the Sage Foundation, provides funding for teams who otherwise could not afford to take part and hosts tournaments at their offices.

This year, Sage welcomed teams from 25 schools across North Tyneside to their two regional tournaments and hosted a third tournament for eight Northumberland schools. This was a new opportunity to engage rural schools. A new tournament in Dublin, Ireland was also held.

Sage volunteers, joined by staff from other local companies, generously gave their time to act as judges, team mentors, referees and help with the setting up and running of the days.

Neil Brown, School Improvement Advisor at North Tyneside Council, one of our North East delivery partners, said:

"Many of the schools are from disadvantaged areas and the support from Sage has been vital in allowing them to take part. Most schools do

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*... seeing how much the budding roboteers get out of IET *FIRST*® LEGO® League is why we continue to support the programme.*

Lindsay Phillips  
Executive Vice  
President, Sage

”

not have the resources to pay for the kit and registration and parents simply cannot afford to help out. As well as enabling teams to sign up to the competition in the first place, Sage Foundation has covered the cost for winning teams to attend the national final in Bristol. For some of these children, this is the first time they will have travelled outside of the North East."

Lindsay Phillips, Executive Vice President at Sage, started the company's involvement with the programme back in 2017.

"It's a fantastic opportunity for our colleagues to volunteer. We love hosting the tournaments, but it's really not about us – seeing how much the budding roboteers get out of IET *FIRST*® LEGO® League is why we continue to support the programme."

We're looking for funding partners in all parts of the UK and Ireland. Please contact [development@theiet.org](mailto:development@theiet.org)





# IET Awards

**Diamond Jubilee Scholarships and Engineering Horizons Bursaries are about so much more than £1,000 of funding for up to four years of an IET accredited degree or IET approved apprenticeship.**



Through the awards, we and our funding partners have the privilege of getting to know the aspiring engineers and technicians of tomorrow.

By creating close links, sharing resources and opening our networks we have been able to demonstrate our commitment to inspiring future engineers. In return we are seeing a high commitment to the profession.

**More than 78% of 2019 graduates of both programmes are either working or studying in engineering and technology.**

"My award solidified my decision in choosing a career in engineering and technology by showing me the calibre of companies in the technology industry and allowing me to meet the people who run those companies." – 2019 graduate

And it's not just the most recent graduates who stay in the sector. The first awards were made in 2013 and the majority of that cohort graduated in 2017.

Two years later 93% report they are still working or studying in engineering and technology, from household names to tech start-ups.

“

*My award solidified my decision in choosing a career in engineering and technology by showing me the calibre of companies that are involved in the technology industry...*

2019 graduate

”

Successful applicants to the scholarships and bursaries can show their clear ambition to be an engineer.

Diamond Jubilee Scholarships are awarded to those achieving a minimum of ABB at A Level or equivalent.

Engineering Horizons Bursaries are awarded to those with vocational qualifications and/or who are overcoming personal obstacles.

**Each year we receive many more eligible applications than we can offer awards to.**

**We are looking for more corporate, charitable and individual funding partners. Please contact [development@theiet.org](mailto:development@theiet.org)**





## Harriet Gamble MEng

Space Systems Engineer at Airbus

IET Diamond Jubilee Scholar  
2013-2018

Aerospace Engineering at the  
University of Bath

**We first met Harriet as an 18-year-old who was fascinated by space exploration.**

"I thought that the dream to work in the space industry was something really big and out of reach. Now what I would say to my 18-year-old self is – dream bigger.

During my year in industry with Airbus, I worked on the NovaSAR satellite.

Being stood in front of a satellite in a clean room and looking at the payload that I have helped build and knowing that I am part of something bigger is an amazing feeling.

It is already up in space and is observing the polar ice-caps, deforestation and even sent images of a recent volcanic explosion.

During my degree I first got one week of work experience with Airbus, then a year in industry and also a two month summer placement. Now I am on the graduate scheme and will complete this in September 2020.

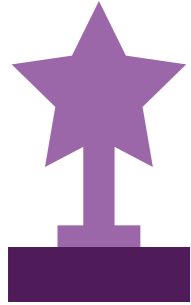
The Diamond Jubilee Scholarship meant that I didn't have to work too many hours to support myself through university, allowing me to focus on my studies. It has opened doors to new opportunities and expanded my network."

Harriet still makes the time to do STEM outreach work in schools and colleges.

"I try and put across that engineering is not scary. It is drummed into you that you must be really good at maths and physics but it is the creativity that I love.

My next step is to become a Chartered Engineer."





## Basma Ali

BEng Electrical and Electronic Engineering, Coventry University

Engineering Horizons Bursary supported by the Manly Trust.

"From a very young age, I have always tried to fix things; open broken radios and try to look at what is wrong and try to fix it. I didn't know then that this was a form of engineering. As I grew up and after seeing the changes other engineers have made to our world, my passion for engineering grew.

I was born in a refugee camp in Nairobi, Kenya. I came to England in January 2009 and started the first year of secondary school. This led to some very challenging years as I could not speak the language, I had no formal education prior to coming here, and was homeless for a couple of years.

From early on I was very aware of my circumstances, especially as a daughter of a refugee single mother and one of four kids. However, I refused to accept this as my reality and believed if I worked harder and was persistent in whatever I do, then I should be able to shape my future in the way I want it to be. I was the first person in my family to go to university and want to show my younger siblings that they can do it too.

The Engineering Horizons Bursary has been a great assistance in enabling me to use my passion and drive to create new projects that could one day be used to improve and benefit the world we live in.



This is simply my greatest ambition, to be in a position to take part in new innovating technologies that will continue to improve the human condition."

Basma is now in her third year and has developed a keen interest in Artificial Intelligence. She is working on a robotic hand, designed to have sensation for the user to allow it to carry out intricate tasks such as bomb disposal and surgery.

Basma plans to study Electrical and Electronic Engineering at Masters' level next year.

“

*I cannot express how valuable this bursary has been for me and the way it has provided me with tools to help me to become a better engineer.*

”

To help more people like Basma realise their dreams, please contact [development@theiet.org](mailto:development@theiet.org)



## Mark Marney and Imogen Relf

Recipients of an IET Engineering Horizons Bursary and Diamond Jubilee Scholarship supported by the Janet Firmin Memorial Fund

**Legacies are a phenomenal way for individuals to give back to the profession, by supporting future talent and securing the skills needed to engineer a better world.**

The first scholarship and bursary from the Janet Firmin Memorial Fund were awarded this year. This endowment fund has been established by the late Harold Firmin in memory of his daughter Janet, who worked for the IET for more than 30 years.

Janet took enormous pride in her work supporting generations of engineers in their professional development before her untimely death at the age of 57. Her father's thoughtful legacy has enabled that work to continue.

One of the first recipients is Mark.

"I was first properly introduced to engineering in the military. I spent ten years fixing helicopters as a technician and learning about avionics."

But ultimately he felt like he was missing something – so he left to start an undergraduate degree in electronic engineering at the University of Essex.

His bursary will help him support his young family with childcare costs and ensure he can dedicate as much time as possible to finishing his studies. Eventually Mark would like to start his own engineering business and achieve Chartered Engineer status while inspiring his daughter to get involved with STEM too.



Imogen has been awarded a Diamond Jubilee Scholarship and is studying Sports Technology at the University of Loughborough.

She told us: "My inspiration is the Olympic and Paralympic Games. The commitment of not only the athletes, but also the vast number of people who are involved with every aspect of making the Games come together, inspires me to put 100% into everything I do, whether it is in my studies or hobbies."

We are looking forward to making many more awards in the years to come from the Janet Firmin Memorial Fund.

**If you have a vision of the legacy you wish to leave, please contact us at [development@theiet.org](mailto:development@theiet.org) to discuss it.**

# Our donors

Without their kind support, our inspirational programmes would not have the reach and impact they achieve.

We would like to express sincere thanks to all our donors for their ongoing support.



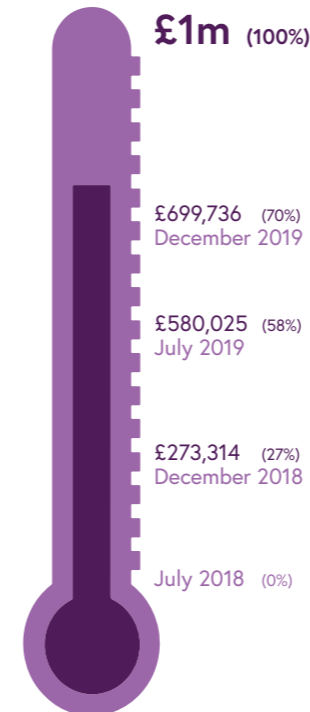
Legacies: Mr David Hutcherson Mr John Rose We are also grateful to the many individual donors who have supported our work.

We are delighted to be well on the way to releasing £1m of IET funds to match donations towards the programmes featured in this report – pound for pound.

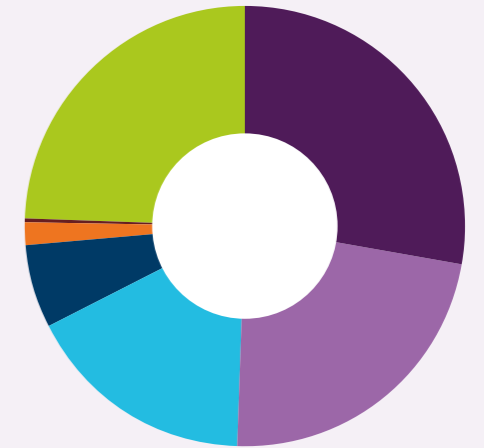
Through the continued support of all our donors, we look forward to nurturing long and fulfilling careers for many new engineers and technicians.

Help us to hit our target in time to celebrate the IET's 150th anniversary from October 2020.

Thank you



## 2019 pledged donations



- IET *FIRST*® LEGO® League (£157,286)
- Faraday Challenge Days (£128,830)
- Engineering Horizons Bursaries (£95,700)
- Diamond Jubilee Scholarships (£35,200)
- Inspiring Future Engineers Fund (£9,406)
- Other income – various restrictions (£2,000)
- Unrestricted income (£137,006)

**Total £565,428**

## Get in touch

If you're passionate about the future of engineering, contact the IET development team to find out how you can help make a difference.

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