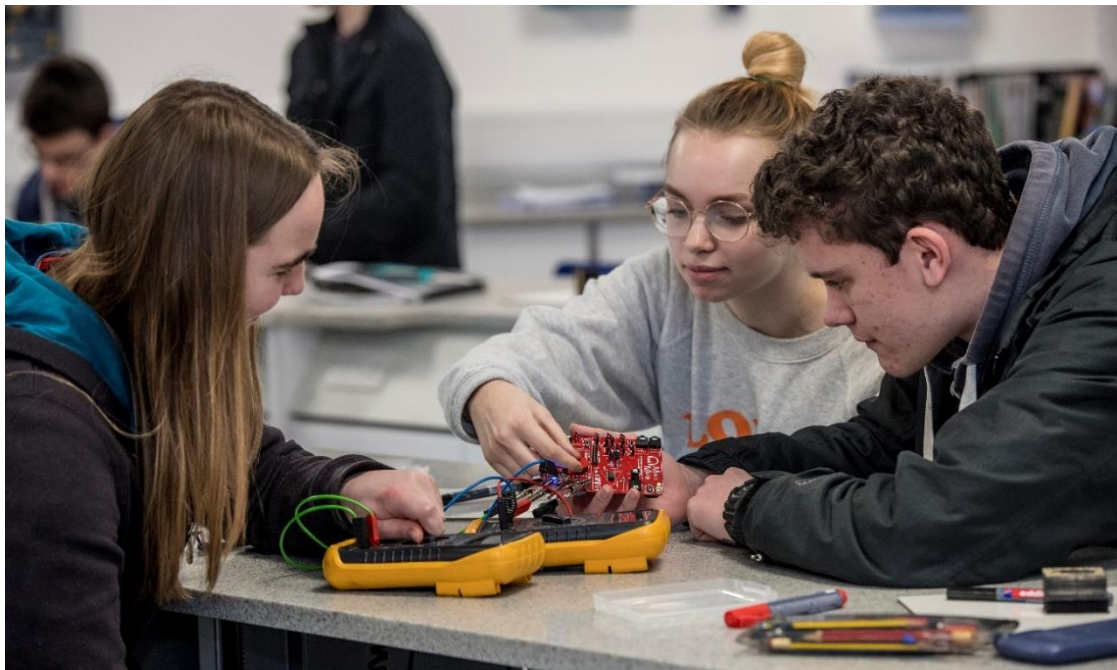




**UK Electronics
Skills Foundation**

Annual Review 2017/18



Music Mixer Kit (© University of Southampton)

**“We need to both encourage and nurture a new generation
of brilliant engineers.
That’s why we decided to join the UKESF.”**

Warren East, CEO, Rolls Royce

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Oana, winner of UKESF Award for Female Undergraduates, 2017

“We’re living in exciting times, with electronics at the heart of our dynamic and globalised society. Progress in this field is so steep that I believe by the time I graduate, careers which do not even exist today will become available to us. Especially exciting to me are the advances in AI, deep learning, autonomy and swarm robotics, and maybe other technologies that we haven’t even begun to think of right now, all of which are inherent to the fourth industrial revolution. Electronics in my view represents the foundation for them all.”

About the UKESF

The UKESF’s mission is to encourage more young people to study Electronics and to pursue careers in the sector.

420

scholarships have been
awarded since 2010

In the UK, the Electronics sector is big, valuable and growing; however, the demand for capable, employable graduates is currently outstripping supply. The UKESF is an educational charity, launched in 2010, with both public and private seed-corn funding. We operate collaboratively with major companies, leading universities and other organisations to tackle the skills shortage in the Electronics sector.

We ensure that more schoolchildren are aware of Electronics and the opportunities available, helping them to develop their interest through to university study. At university, we support undergraduates and prepare them for the workplace.

Registered charity number: SC043940
www.ukesf.org

91%

graduated scholars are
employed by
Electronics/Technology
companies or are
undertaking PhDs

Introduction

Indro Mukerjee, Chairman



From my perspective this has been a pivotal year for the UKESF.

As we know, the UK has a long heritage of technological innovation and has a world-class Electronics sector. However, the shortage of Electronics Engineers (especially graduates) means that there are too few engineers and designers to develop the next generation of products and help produce creative technological solutions needed by society. This situation is likely to worsen post-BREXIT. The shortage is also exacerbated by a fragmented landscape across the sector. Ultimately, this will undermine the Electronics sector as a whole in the UK, which in turn, will adversely affect our economic prosperity.

Therefore, we have taken steps to ensure that the UKESF responds to these challenges. In particular, I was delighted to welcome four new Trustees to the Steering Board in January. Subsequently, with their help, we have conducted a strategic review. As an outcome, we are now taking the Foundation forward; to build on our role as a connector across an increasing network of partners, from both academia and the industry.

The Year at a Glance

20

leading UK universities for Electronics are UKESF partners

120

sixth formers attended a university taster course

68

A-level Physics and Computing teachers participated in Electronics CPD course

10

New Electronics companies join the UKESF Scholarship Scheme

54

scholarships awarded

50

scholars graduated

72

Percentage of scholars graduating with a 1st class degree

630

Twitter followers

1,490

average number of unique website users per month

Executive Statement

Stew Edmondson, CEO



According to an article in *New Electronics*, the UKESF is now ‘bigger and better’. Of course it is for others to make such statements; however, I do know that we are certainly busier than ever!

As this Annual Review shows, we have undertaken a wide array of activities over the last 12 months. I am particularly pleased with the progress that we have made with our projects to help teachers promote Electronics to sixth formers. With the considerable assistance of the University of Southampton, we have now delivered CPD to over 100 teachers and provided classroom resources to their schools. Another activity, which demonstrates our close relationship with industry, has been our work to develop a new Apprenticeship Standard; providing effective routes into the sector will be increasingly important as we all face future uncertainty.

These types of collaboration are at the heart of our Foundation and I would like to extend my personal thanks to all those individuals and organisations with whom we have collaborated this year; we really do appreciate your contribution and support.

Unfortunately, there is still a low level of awareness and understanding about Electronics among schoolchildren and among those who influence their subject and career choices. This is the crux of the skills shortage. This has been recognised by our Steering Board and, therefore, in the coming year we need to focus our energy on a national campaign to increase awareness and to promote Electronics.

Strategic Priorities

The purpose of the UKESF is to tackle the skills shortage in a coherent way. Our aim is to:

“Encourage more young people to study Electronics and to pursue engineering careers in the sector.”

To achieve the aim, we have four strategic priorities:

- Ensure more schoolchildren are **aware** of Electronics. Show these children, their parents and teachers that there are exciting and worthwhile careers available as designers and engineers in the Electronics sector.
- With our partners, provide opportunities for them to develop their **interest** in Electronics and engineering, through to university study and/or apprenticeship.
- At university, ensure that undergraduates are encouraged to pursue careers in the Electronics sector and they are supported in their professional **development** so when they graduate they are equipped with work-ready skills and experience.
- After graduation from university, we will help create a community of Electronics engineers to secure the future pipeline. We will **build relationships** and act as the representative voice for the sector on skills.

2017/18 Review

Scholar Destinations

The UKESF has **information about 168 of the 175 scholars** who have graduated since 2012.

Of those, **76% are employed by Electronics or Technology companies** and 16% are studying for a PhD or doing research at a university.

Of our ex-scholars, **49% now work for a UKESF sponsoring company**.

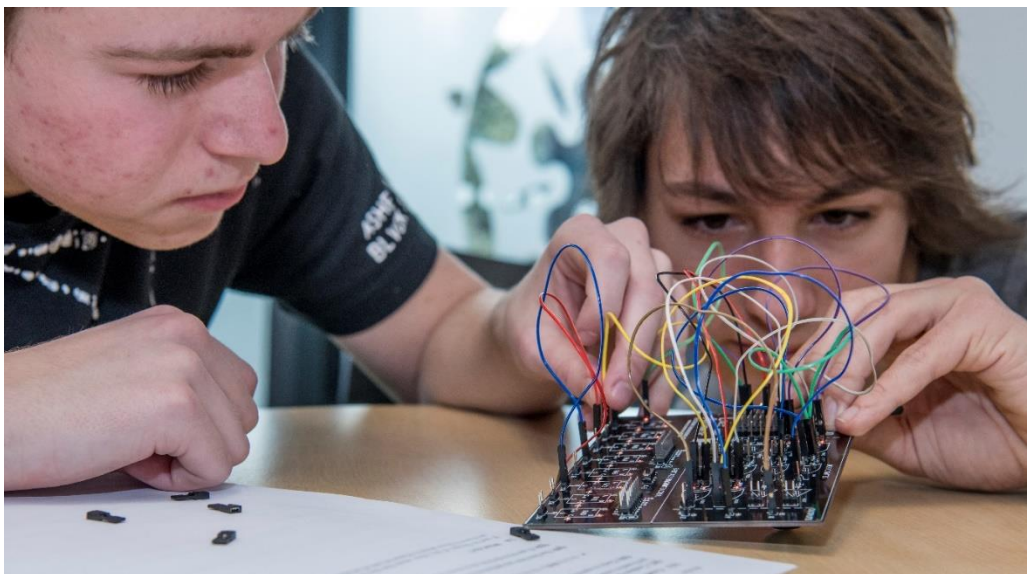
Of the 50 scholars who graduated in 2017, **72% were awarded a first class honours degree**. In total 78% are working in the Electronics/Technology; a further eight are studying for a PhD.

Activities & Partnerships

Schools

Logic & Arithmetic Kit for Computer Science A-level Students

Following the success of a collaborative project featuring the Music Mixer circuit board, we have continued our partnership with the University of Southampton by supporting the Logic & Arithmetic Kit. The kit features hands-on activities with two circuit boards that teach core Electronics concepts for A-level Computer Science students. Through The IET's Engineering Education Grant Scheme we secured funding to develop the boards further and undertake a pilot project for 25 schools, which allowed Southampton to run training sessions for Computer Science teachers (mentioned under 'Electronics CPD Events for A-level Teachers' above) and provide classroom kits for their schools.



Logic & Arithmetic Kit (© University of Southampton)

Malvern Festival of Innovation

We took part in the Malvern Festival of Innovation in October 2017, an annual week-long event showcasing the latest in social, technical and business innovation, with different days dedicated to different audiences. As part of the Schools Outreach day, UKESF CEO Stew Edmondson facilitated three engaging 'People Like Me' sessions for a total of 74 female students from local secondary schools. This revolutionary resource pack uses a self-descriptive quiz to help girls discover their strengths and what STEM-related careers could suit them.

Electronics CPD training attendee on the circuit board kit

"I think it's a really good way of introducing students to something that has gradually disappeared from schools. It is not too daunting for teachers without experience to have a go at using, and it has the feel of 'proper' electronics for students."

Music Mixer Electronics Project for Physics A-level Students

In 2018, with generous support from the ERA Foundation and 16 companies in the Electronics sector, the Music Mixer project grew significantly to reach even more schools. Working with the companies (full list [here](#)) and the Institute of Physics, the focus has been to provide local secondary schools with classroom resources and CPD training for their Physics teachers in Electronics. By investing in teachers, we are promoting Electronics to an increasing number of Sixth Formers. Overall, since the project started, 75 schools have been supported.



Teacher training at Southampton (© University of Southampton)

Headstart Summer School

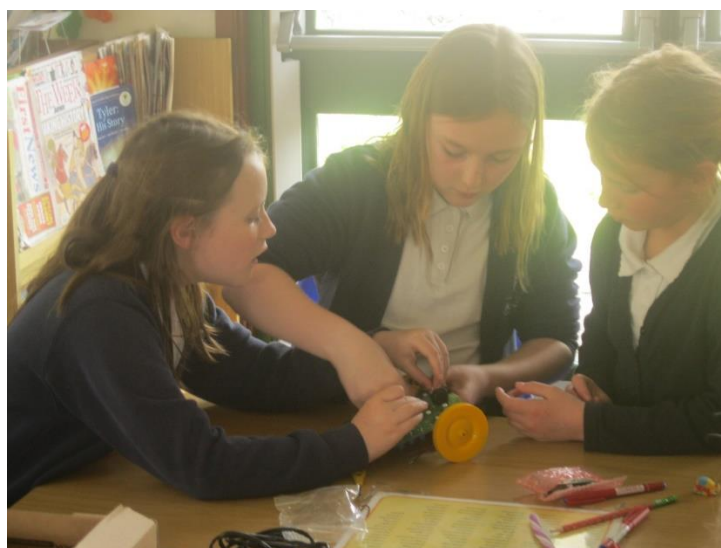
The UKESF-sponsored Summer School for 2018 took place in July at the University of Bristol, organised in partnership with Headstart EDT and the Faculty of Engineering at Bristol. 80 STEM-focused Year 12/S5 students attended the residential week to get a first taste of university life and learn more about studying Electronics at degree level, with a variety of lectures, labs, visits and networking.



Students working on robot challenge at Headstart Summer School (© EDT)

Robokids

We supplied a primary school local to our office with several Robokid kits to trial out with their pupils. Robokid (developed by Heriot-Watt University) is a hands-on electronics project for use in the classroom with ages 9–11 that aims to encourage enthusiasm for Electronics and STEM subjects. The children had a brilliant time working through activities with the robot vehicle, and we are looking to progress the project in the future and expand to primary schools all over the UK.



Schoolchildren working on a Robokids project (© UKESF)

The Smallpeice Trust

We continued our partnership with The Smallpeice Trust through sponsorship of a residential course in Aerospace Electronics, which took place at the University of Southampton in early August 2018. Attendees explored the electronics at the heart of modern aerospace systems and avionics through hands-on activities in state-of-the-art undergraduate labs and visits to a nanofabrication centre and high voltage laboratories.

University Taster Courses

At the end of July we supported residential taster courses for sixth formers at the universities of Southampton and York. These courses are designed for students aged 16+ who love Maths, Technology or Science, and give them the opportunity to apply their skills to electronic engineering while experiencing life as a university undergraduate. At Southampton, we helped arrange for Scholarship Scheme sponsor companies to have stands at the Careers Fair and sponsored t-shirts for student ambassadors (many of whom are UKESF Scholars) to wear during the course.



UKESF scholars supporting Southampton's taster courses (© University of Southampton)

Undergraduates

Dialog Award for Female Undergraduates

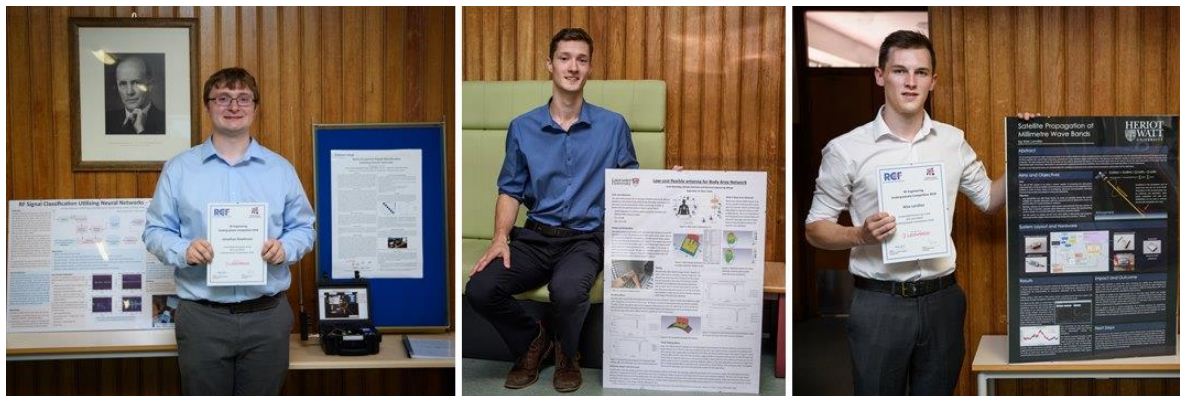
In collaboration with our long-standing corporate partner Dialog Semiconductor, we ran the Dialog Award for Female Undergraduates for the first time. Open to female undergraduates who are commencing the first year of their studies on Electronics-related degree courses at leading UK universities, the award offers a one-off bursary of £1,500, a paid summer work placement at Dialog and paid-for student membership of WES. Dialog interviewed selected candidates from over 20 applications and made two offers, both of which have been accepted.

Max Landles, RF Competition finalist

“It was fascinating to hear what people outside of university thought of the work I had been doing and getting listed as one of the top three entries ... gave me a lot more confidence in myself. It is encouraging to see that companies are prepared to dedicate time and money to run this competition as I believe it shows a willingness to invest in the future of the RF industry and will hopefully encourage more students to consider doing their major projects in this area.”

RF Engineering & Communications Competition

This annual competition, run in partnership with the Radio Communications Foundation (RCF), highlights the work of students at UKESF partner universities who are focusing on RF engineering and communications in their final year. The 2018 finalists were awarded at a ceremony at the University of Bristol in July; Jonathan Rawlinson (Imperial) was the winner and received £1,000, with two runners up, Max Landles (Heriot-Watt) and Scott Dearnaley (Lancaster), receiving £500 each.



RF Competition finalists with their projects (© UKESF)

Kasper (UKESF Scholar 2014–18), extract from guest blog post: ‘UKESF Scholars Create Project for Schools’

“Coming into contact with practical electronics in high school is something I wish I would have had the chance to experience and I am proud to be able to provide this opportunity for others. I have always been excited to explore subjects I enjoy with other people and feel a great deal of satisfaction having designed and realised a successful workshop to do this with electronics. The STEM sector needs more brilliant minds so let’s expose more people to it!”

Scholar Outreach

We often report on the outreach activities of our scholars, but this year three University of Edinburgh undergraduates went above and beyond the obligations of their scholarships by developing and running their own hands-on electronics workshop, including building a custom-designed Arduino-based kit and writing supporting documents. Ben, Justas and Kasper wanted to show how easy and affordable it is to start electronics and share their passion for the subject in a fun and interactive way. We were delighted to provide funding for their project, which enabled the scholars to purchase enough hardware to take the kit into two local schools and run workshops with the students. In the summer, Ben and Kasper travelled to India and led the workshops with children at the Familia organisation too.



Scholar leading workshop with students in India (© Kasper Buckbee)

Stew Edmondson, CEO, UKESF, on the outreach activities of three scholars

“We know that providing children with ‘hands-on’ experiences works really well in promoting their interest in Electronics. At the UKESF, we place a great focus on getting our undergraduate scholars to help us inspire the next generation. This project is a fantastic example, from three inspirational students, of how the UKESF can make a real difference. Really well done to Ben, Justas and Kasper.”

Scholar of the Year Award

This year, for the first time, there were joint winners of our Scholar of the Year Award: Eliza Law (Southampton/Swindon Silicon Systems) and Jamie Tupholme (Leeds/Thales), who each received a certificate and a cheque for £500, presented at the TechWorks Awards & Gala Dinner. The award celebrates scholars who have made a significant contribution during their work placement and who have actively promoted Electronics to young people, and is kindly sponsored by IC Resources.

Eliza has been working in the IC Layout Department of her sponsor company, Swindon Silicon Systems, over the summer, ahead of starting a PhD in Optical Fibre Sensors at the University of Southampton’s Optoelectronics Research Centre in September 2018. Jamie is now employed as a full-time Systems Engineer at his sponsor company, Thales.

Jamie, Joint-Scholar of the Year, 2017

“The award is a huge boost to my career and will hopefully lead to some fantastic opportunities. Throughout my scholarship I have been able to work with some amazing STEM organisations and charities and this award shows how much of an impact we can have. The electronics industry is desperate for engineers and I am proud to have played my part.”



Scholar of the Year winners Jamie and Eliza (© TechWorks)

Scholar Workshop

Our 2017 Scholar Workshop took place in September at the University of York, with a record number of scholars (61) taking part in the event, which focuses on both personal and professional development. 90% of the workshop attendees rated their overall experience as being ‘excellent’, the highest possible rating. Feedback included comments such as: “I have loved the whole week, it was a really great opportunity to meet new people and to get to know so much about the other side to the industry”.



A session at the Scholar Workshop (© UKESF)

Skills 4 UK Scholar's Award

Kathryn Frankland (Nottingham/Imagination Technologies) was the 2017 winner of the Skills 4 UK Scholar's Award, receiving a place on Skills 4 UK's award-winning Career Development Programme, as well as additional coaching. The award is open exclusively to final-year female scholars and takes into account academic performance, placement feedback and STEM-awareness contribution. Kathryn is due to start on the BT Software Development Graduate Scheme in September 2018.

WES Student Conference

For the second year running, we supported three final-year female scholars in attending the annual Women's Engineering Society (WES) Student Conference with all-expenses-paid places in November 2017. The conference brought together over 150 students, academics and young engineers, providing an opportunity to network with role models, gain insight into societal challenges, improve technical skills and self-confidence, and develop career-life balance strategies.

Kathryn, UKESF Scholar 2016–18, WES Student Conference attendee

"The WES Student Conference was an excellent opportunity to network with a range of female engineers, who were all at different stages in their careers ... I found the 'CVs and Applications' and the 'Managing Unconscious Bias' workshops to be the most enjoyable aspects of the conference, and particularly useful as I am due to graduate this year. I would like to thank the UKESF for supporting my attendance at the event – it was a fantastic opportunity."

Consultancy

Apprenticeship Standard

We have been supporting a Trailblazer group of employers to develop a new apprenticeship standard at Level 7 for Engineers in the Electronic Systems sector. The IfA has published the new Standard for Principal Electronics Systems Engineer (read it [here](#)) and it should be ready for delivery in 2019.

Compound Semiconductor Skills Report

There is a growing Compound Semiconductor (CS) Cluster in South Wales, which currently directly employs around 1,500 people. We were asked to produce an independent report to identify the future education and skills requirements to support the success and growth of the CS Cluster, and found that there were significant concerns about sourcing sufficient additional, skilled, staff at all levels to meet the future demand. Furthermore, the future growth for high-value jobs within the CS Cluster core partners is forecasted to be high; we estimate almost a thousand (939) additional jobs are likely to be created by 2024.

Drew Nelson, CEO, IQE, in the Compound Semiconductor Skills Report

"What we are trying to achieve here in South Wales will be unique. It's an opportunity, not only for Wales but for the UK and Europe."

Governance & Organisation

Steering Board

Four new trustees were appointed to our Steering Board, all of whom had been involved with or supported our work previously:

- Bashir M. Al-Hashimi, Professor of Computer Engineering and the Dean of the Faculty of Physical Sciences & Engineering, University of Southampton
- Neil Dickins, Founder and Director, IC Resources
- Graeme Philp, retiring Chief Executive, GAMBICA
- Darren Race, Managing Director, Think Eleven

Media

This year we have been featured twice in *New Electronics* articles: 'The glue in the middle' and 'So where are all the women?'. Additionally, two graduated UKESF scholars, Mary (Surrey/Embecosm) and Herman (York/EDA Solutions), were among the '30 under 30' winners of the prestigious EW BrightSparks Award for 2018, which is run by *Electronics Weekly* and aims to highlight the brightest young electronic engineers in the UK.

Online Presence

On the UKESF website, the average number of unique visitors per month has increased by 160 compared to last year, while the average number of page views per month has increased by 705. Our average newsletter open rate is 37% (the average rate for small-to-medium businesses is 25%), with an average click-through rate of 7% (likewise, 4%).¹ Over the course of the year, we have gained nearly 200 new Twitter followers and over 35 new Facebook likes, taking the totals to 630 and 250 respectively.

Sponsor Companies

Ten new sponsor companies joined our Scholarship Scheme over the last year:

- | | |
|-------------------------|-----------------------|
| • Altran | • Rolls-Royce |
| • Intersil | • RS Components |
| • Moortec Semiconductor | • Solomon Systech |
| • ON Semiconductor | • ST Microelectronics |
| • Renishaw | • Viper Innovations |

This means that 55 companies have been involved with the Scholarship Scheme since its inception in 2010.

¹ Source: [smartinsights.com](https://www.smartinsights.com)

Techworks Awards & Gala Dinner

In November 2017, UKESF trustees and representatives from company sponsors joined us on our tables, along with several graduated and final-year scholars on the Young Engineers Table, at the annual Techworks event. This year we held a silent auction and raised over £3,000 to support our vital work in the Electronics sector. The funds will be channelled into hands-on STEM activities for children, summer schools for A-level students, professional development for UKESF scholars, and much more.



Scholar of the Year winners with the hosts and Stew Edmondson (© TechWorks)

University Partners

Two new universities joined our Scholarship Scheme, meaning that company sponsors are able to connect with even more high quality students. The addition of the University of Birmingham and Aston University takes the total number of university partners to 20.



UKESF university partners with Stew Edmondson (© UKESF)

Income & Expenditure

Income 2017/18 (2016/17)

Sponsorship and Donations – £ 126,373 (£102,900)

Scholarship Scheme (bursaries, management fees and workshop fees) – £ 300,820 (£293,902)

Expenditure 2017/18 (2016/17)

Scholarship Scheme (bursaries and workshop) – £ 206,869 (£250,271)

Educational Activities – £ 56,522 (£50,387)

With Thanks To...

The UKESF Steering Board and our Trustees:

Indro Mukerjee, Prof Bashir Al-Hashimi, Dr Derek Boyd, Neil Dickins, Graeme Philp, Darren Race, Andrew Repton and Lynn Tomkins.

All the scholarship-sponsoring companies and all of our partner universities.

All the organisations that we have collaborated with:

TechWorks, Blackwell's, Skills 4 Ltd, ThinkEleven, GAMBICA, Clarity PR, The Institute of Physics, The Engineering Development Trust, The IET, The Radio Communications Foundation, The Smallpeice Trust, The WISE Campaign and the Women's Engineering Society.

Special thanks to the following companies for their donations this year: ARM, AWE, Dialog, Infineon and Qualcomm.

The ARM logo consists of the lowercase letters 'arm' in a bold, blue, sans-serif font.The Qualcomm logo consists of the word 'Qualcomm' in a blue, sans-serif font.

“Moving beyond talk about the skills shortage to take positive action is what the UKESF is all about.”

Stew Edmondson, CEO, UKESF

UK Electronics Skills Foundation
North End House
North End
Ashton Keynes
Wiltshire
SN6 6QR

www.ukesf.org

info@ukesf.org | [@theUKESF](https://www.facebook.com/UKESF) | [facebook.com/UKESF](https://www.facebook.com/UKESF)

Stew Edmondson (CEO) can be contacted on 07894 899544