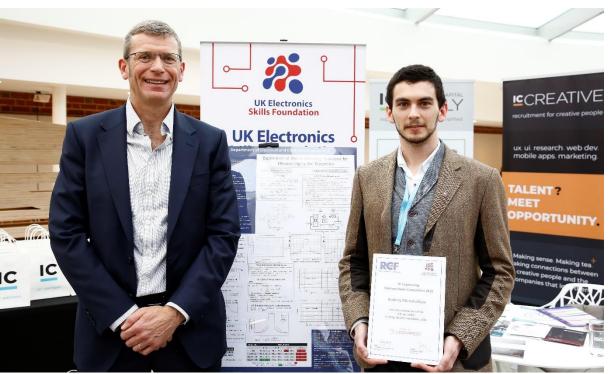


# Annual Review 2018/19



Stew Edmondson with UKESF and RF Eng & Comms Competition winner Andrey Miroshnikov

"The UKESF is doing a fantastic job of encouraging more young people to study Electronics and embark on a career in one of the world's most important and dynamic industries."

Georgie Barrat, The Gadget Show presenter

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#### Brendan, UKESF Scholar

"I absolutely loved my placement, it was nothing like any job I have done before; it was intellectually stimulating, exciting and really fun."

## **About the UKESF**

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

Almost

**500** 

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

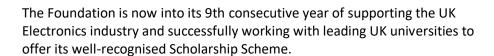
www.ukesf.org

Over
90%
of employers rated the UKESF as 'excellent' or 'good'

#### Introduction

Indro Mukerjee, Chairman

As you will see from this Annual Review, the last year was another successful one for the Foundation.





While the UKESF Trustees are proud to make a difference to our university and industrial partners, we are most proud to make a difference to our scholars, the people who go through our programme. We help these young, capable, individuals at the very start of their careers by giving them the chance to be prepared for the workplace, enabling their first graduate work experience with leading UK technology companies, and giving them support and a sense of community as they develop their careers. In some way or other, the UKESF team gets to know the scholars as individuals; gets to know their hopes, their ambitions and each and every scholar is an example of how we can work together to develop the right skills to make our Electronics technology companies and UK industry successful.

Next year will be the 10th anniversary of the UKESF. That will be a considerable milestone and achievement, bearing in mind that we started things from scratch.

On behalf of the UKESF Trustees and Board, I would like to thank all of our sponsors, partners, scholars and, of course, our hard working UKESF team.

### The Year at a Glance

leading UK universities for Electronics are UKESF partners **154** 

sixth formers attended a university taster course

65

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

11

new companies joined the UKESF Scholarship Scheme

**26** 

percentage increase in Scholarships awarded

**57** 

scholars graduated

86

percentage of scholars helping UKESF with outreach activities

893

**Twitter followers** 

1,889

average number of unique website users per month

#### **Scholar Destinations**

The UKESF has information about **96%** of the 221 scholars who have graduated between 2012 and 2018. Of those, Electronics &Technology companies employ **83%** and a further **14%** are studying for a PhD or doing research at a university.

Almost 50% of graduated scholars are working for a UKESF Sponsor Company.

#### **Executive Statement**

Stew Edmondson, CEO

Welcome to our Annual Review for 2018/19. This last year has been a really exciting and busy one for the UKESF and this Review captures some of the many highlights. Einstein famously proclaimed, "The definition of insanity is continuing to do the same thing over and over, and then expecting different results". This



year, as we try to raise awareness about Electronics among young people and to encourage them to think about careers in the sector, we decided to do something 'different'.

In our case, 'different' was a national campaign to try to change people's perceptions about Electronics. The campaign, called Turn On To Electronics, was launched, after much hard work, at the TechWorks Summit in November. With the support of our 21 Partner Universities, industry and the media (including our ambassador, Channel 5's Georgie Barrat) we believe that we can make a difference. The campaign message is simple: Technology is the future, technology depends upon Electronics, and there are some fantastic career opportunities in the UK for youngsters.

Elsewhere, we have seen our undergraduate Scholarship Scheme continue to grow and we have delivered a number of successful residential courses at our partner universities for sixth formers, as well as beginning to scale-up our 'Electronics Everywhere' projects for secondary schools.

None of this would have been possible without the hard work of the UKESF team and the cooperation and support of all of our partners across both industry and academia. Collaboration is at the heart of everything that we do at the Foundation, and I would like to extend my personal thanks, once again, to all those individuals and organisations with whom we have collaborated this year. Although there is much to do, I have been heartened by a couple of recent statistics.

First, the number of female UK students starting Electronic & Electrical Engineering degrees. According to UCAS, from a low point in 2013, there has been an 18% increase (to 555 females in 2018). Second, this year we had a record number of UKESF Scholarships awarded to female undergraduates. Now, these percentages are still lower than we would like; however, the upward trend is encouraging and it shows that there are some grounds for optimism.



Headstart Course, University of Sheffield

# **Highlights of the Year**



#TurnOnToElectronics Campaign

In November 2018 we launched a new national campaign, #TurnOnToElectronics, aimed at making more schoolchildren aware of Electronics. The campaign includes a manifesto, website and video, and is fronted by 'The Gadget Show' presenter Georgie Barrat (pictured left).

Over the course of the first three months following the launch, the website had 793 unique visitors; of these, 214 watched the video on the homepage (with an additional 285 views on YouTube) and 131 downloaded the manifesto. During the same time, the tweets from @TOTElectronics earned 45,400 impressions on Twitter.

Articles covering the campaign launch appeared in fifteen Electronics new outlets, including *EE Times, Electronics Weekly* and *New Electronics*, and earnt over 15,500 combined estimated coverage views.

Richard Harrington, Business & Industry Minister (June 2017 to March 2019), on our #TurnOnToElectronics campaign:

"The UK has a long heritage of technological innovation, the Turn On To Electronics campaign will help inspire the next generation."



Example of #TurnOnToElectronics campaign coverage, in Future Mag (future-mag.co.uk)

#### Electronics Everywhere

Electronics Everywhere, a partnership with the University of Southampton, shows young people how engaging Electronics can be. We provide specially designed circuit boards to teach core Electronics concepts to A-level students in Physics (the Music Mixer) and Computer Science (the Logic & Arithmetic Kit), along with CPD for teachers, free to state schools. To date, over 170 schools have been supplied with a total of 2,700 boards, with a teacher from each school having received training at the University of Southampton.

# Professor Bashir Al-Hashimi CBE, Dean of the Faculty of Physical Sciences and Engineering, University of Southampton

"Electronics Everywhere matters to me both personally and professionally as part of my key ambition to ignite interest and excitement amongst students and their teachers at schools across the UK. The Turn On To Electronics campaign provides a dynamic, inclusive and original approach to increase awareness amongst 11–16 year-olds. I am proud to support it and to promote the potential of the UK Electronics sector to a new generation."

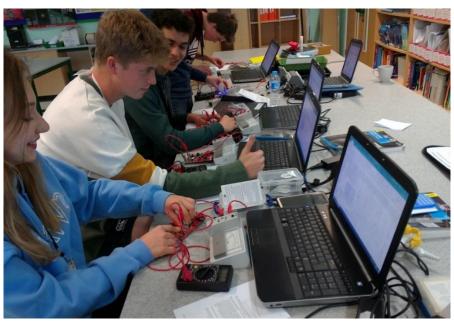
In surveys sent out to teachers using the circuit boards:

- 87% using the Music Mixers considered them an 'excellent' or 'good' teaching resource and reported that 60% of students were more positive about Electronics as a result;
- 57% of the teachers using the Logic Boards considered them 'excellent' and reported that 70% of students reacted 'very positively'.

"The kits made a real difference to the engagement of the students and a quite tricky topic was made much more accessible," commented one respondent.

In December 2018, the Electronics Everywhere project received formal endorsement and support from the **Royal Academy of Engineering**. We are now working together via the Connecting STEM Teachers programme and using their Teacher Coordinators to improve the learning resources.





Students using Electronics Everywhere classroom resources at Hardenhuish School

#### Level 7 Apprenticeship Standard

In July we were delighted to announce the publication of a new Apprenticeship Standard for the Electronics Sector (Level 7) for the occupation of 'Electronic Systems Principal Engineer'. Aimed at post-graduate engineers and developed with a group of major employers, it has been approved for delivery with a funding allocation of £14,000, by the Institute for Apprenticeships & Technical Education.

Stew Edmondson (CEO, UKESF) said, "Agreement by the Government for this Standard is a significant milestone and it offers a major opportunity for employers. We are now encouraging universities to offer programmes aligned to this Standard and for a widespread uptake across the Electronics industry."

We also created a new factsheet, for TechWorks and NMI members, specifically to promote Degree Apprenticeships in Electronics. The factsheet provides a clear and concise overview of how these apprenticeships work and how companies can get involved.

#### Sir Gerry Berragan, CEO, Institute for Apprenticeships & Technical Education

"Congratulations on the successful approval of the Electronic Systems Principal Engineer apprenticeship standard. A big thank you for the work that you have completed to get to this point."



UKESF Partner Company representatives, Leesa Kingman (NMI) and UKESF Scholars Lauren and Megan with Stew Edmondson at the Girls into Electronics course, Royal Holloway, University of London

# **Activities & Partnerships**

#### **Schools**

#### Girls into Electronics

This year we sponsored The Smallpeice Trust's first Girls into Electronics residential course at Royal Holloway, University of London. Over three days, 24 girls aged 14–16 had the opportunity to experience university life while finding out what Electronic Engineering is all about. 80 girls from the Girls into Physics course joined them for talks by Stew Edmondson, Leesa Kingman (Network Manager, NMI and Power Electronics) and UKESF Scholars Lauren and Megan, followed by a hugely successful networking with companies session, attended by 11 UKESF Company Partners.

#### Anne McAleer, Director, Intellectual Properties, IDEX Biometrics

"My colleague and I met a fantastic crowd of young women who were enthusiastic, smart and incredibly confident ... It was great to be involved and I hope we inspired them to consider a career in electronics."



Networking with companies session of Girls into Electronics

Prof David Howard, Head of Department of Electronic Engineering, Royal Holloway, University of London

"It has been a pleasure to host the event here at Royal Holloway; I look forward to future years."

#### Headstart Summer School

The UKESF-sponsored Summer School for 2019 took place in June at the University of Sheffield, organised in partnership with Headstart EDT and the Faculty of Engineering at Sheffield. Almost 70 STEM-focused Year 12/S5 students attended the residential course to get a first taste of university life and learn more about studying Electronics at degree level, with a variety of lectures, labs and activities. The networking with companies session was particularly successful, with an excellent level of interest and engagement from the students, and was supported by seven UKESF Company Partners.



Stew Edmondson speaking at the Headstart Summer School

#### **Headstart Summer School attendee**

"The course made me realise that there are people similar to me in STEM, I made some really good friends and it has definitely confirmed for me that this is what I want to do."

#### Robokid

We have continued to supply primary schools – and a Beavers group (pictured left) – with Robokid



kits to run activities with their pupils, and have now completed our overhaul of the accompanying resources for teachers (ukesf.org/schools/robokid). Robokid, developed by Heriot-Watt University, is a handson electronics project for use in the classroom with ages 9–11 that aims to encourage enthusiasm for Electronics and STEM subjects. Around 150 children have benefitted from working with the kits this year, and we hope to progress the project in the future and expand to more primary schools.

#### Daisy, age 10, on the Robokid robots

"My favourite thing was making them move, my least favourite bit was taking it apart again!"

#### **University Taster Courses**

This year we supported a number of residential taster courses for sixth formers at universities, giving students who love STEM the opportunity to apply their skills to Electronic Engineering while experiencing life as a university undergraduate. We helped with courses at the universities of Southampton and York, as well as one at Imperial College London in conjunction with The Sutton Trust.

#### **Undergraduates**

#### RF Engineering & Communications Competition

This annual competition, run in partnership with the Radio Communications Foundation (RCF) and with support from Leonardo, is now in its third year and showcases the work of students at UKESF partner universities who are focusing on RF engineering and communications in their final year. The 2019 finalists were awarded at a ceremony as part of the Cambridge Wireless International Conference in June 2019. UKESF Scholar Andrey Miroshnikov (Bristol/Dialog Semiconductor) was named the winner for his outstanding project, 'Exploration of Under-Sampling PA Output for Efficient Digital Pre-Distortion', a unanimous decision by the judges. Andrey received £1,000, with two runners up, Edward Lewis (Lancaster) and Calum Bolland (Edinburgh), receiving £500 each.



L–R: Stew Edmondson, Trevor Gill, Calum, Edward, Andrey and Prof Kevin Morris at the RF Competition prize-giving

#### Andrey Miroshnikov, UKESF Scholar & RF Competition winner

"UKESF is an organisation that helped a great deal during my degree by connecting me with an employer who I've had three successful internships with, providing me with annual bursaries, as well as connecting me with fellow graduates and people in the industry during the UKESF Workshop.

"This RF award was an incredible surprise, and I am ecstatic to have won. It's great to know that the time I have spent researching and writing lead me to conclusions that other people may use in the future. This wouldn't be possible without the guidance of my supervisor, feedback from my assessors and fellow class mates, moral support of my friends and parents.

"What happens next? I will use the award prize to upgrade my lab at home and continue tinkering with personal projects during my spare time!"

#### Scholarship Scheme

The number of UKESF Scholarships awarded to Electronics undergraduates at partner universities for 2018/19 rose by 26% compared to the previous academic year. It is also pleasing that 16% of

Scholarships were awarded to female students, a 5% increase. Applicants were able to apply to up to four of the 39 leading companies in the Electronics and Engineering sectors offering our scholarships.

Each scholarship includes a bursary, a paid summer work placement and a paid-for place at our residential workshop, among other benefits. Successful applicants are also now paired with buddies (established or graduated scholars), who will share their experiences and provide support as the newly awarded scholars enter the workplace, take part in outreach activities and start to set objectives for the future.

#### Internship Programme

Complementary to our Scholarship Scheme, this year we launched a new Internship Programme, which offers paid summer work placements with no long-term commitment to first-year and foundation-year students at our partner universities.



Scholar of the Year Ricki Tura with Neil Dickins (IC Resources) and Stew Edmondson

#### Scholar of the Year Award

Scholar of the Year 2018 was awarded to Ricki Tura (University of Southampton/UltraSoc), who received £500, a trophy and a certificate 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. It is kindly sponsored by IC Resources. Ricki graduates in 2020.

#### Ricki, Scholar of the Year, 2018

"I am delighted to be named 2018's UKESF Scholar of the Year. It feels great to be recognised not only for my achievements in academia and industry, but also for my contributions in promoting Electronics in the community. My experience as a UKESF scholar has been fantastic, and I recommend the scheme to anyone considering a career in the Electronics industry."

#### Scholar Workshop

Regarded as a highlight of our Scholarship Scheme, our Scholars' Workshop for 2018 (pictured right) took place in September at the University of York. The Workshop encouraged both personal and professional development and was delivered by a team of renowned facilitators. Feedback was overwhelmingly positive: of the 50 attendees, three-quarters rated their overall experience as 'excellent' (the highest possible rating), with the remaining quarter rating it 'good' (the second highest).



#### 2018 Scholar Workshop attendee

"Very impressed! Lots of good content over the course of the week, and plenty of different things learnt ... Thanks for all the time and effort put in to make this all happen. We really valued it!"

#### Skills 4 UK Scholar's Award

The recipient of the 2018 Skills 4 UK Scholar's Award was Lauren Page (Surrey/Renesas), who benefitted from 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. Following graduation, Lauren is planning to work in Canada for six months before returning to the UK to seek a graduate engineering role in 2020.

#### Lauren, Skills 4 UK Scholar's Award winner 2018

"Meeting the wonderful people at the UKESF and at the TechWorks event, who have nothing but encouragement to offer to myself and others in my position, has made me further realise the importance of supporting and raising up others. This award will not only benefit myself, but also those I work with now and in the future."

#### BrightSparks

Our graduated scholars have continued to receive national recognition. *Electronics Weekly* selected four former UKESF Scholars as part of the group of 'BrightSparks' for 2019 – find out more about them in the Governance & Organisation>Media section. Additionally, in November 2018, Emma Curati-Alasonatti (Southampton/Arm) became the TechWorks' Young Engineer of the Year.

#### Dialog Award for Female Undergraduates

In collaboration with our long-standing corporate partner Dialog Semiconductor and the Arkwright Trust, we have established an award for female undergraduates who are commencing the first year of their studies on Electronics-related degree courses. The first two recipients (Alice, Cambridge, and Katherine, Imperial) are currently undertaking their work placements with Dialog in Swindon.



Stew Edmondson, Katherine, Ian Kent (Senior Director, Dialog), Alice, Kevin Stenson (CEO, Smallpeice Trust)

#### **Competitions**

In early 2019 we launched two new competitions, the Automotive Electronics Competition (run with AESIN and sponsored by UltraSoC; entrants produce a 'thought piece') and the Embedded Systems Competition (also supported by UltraSoC; entrants submit a poster summarising their project), with the aim of raising awareness about and interest in each of the areas among undergraduates. For each competition the winner will receive £1,000 and a runner-up £500, to be awarded at major industry events taking place in the autumn.

#### Aileen Ryan, Chief Strategy Officer, UltraSoC

"At UltraSoC we believe that strong links with the academic world provide benefits to everyone involved and the ability for us all to advance our industry together. We are delighted to sponsor this UKESF project and very much look forward to reviewing the entries."

#### WES Student Conference

In November 2018 we once again enabled all our final-year female scholars (four) to attend the annual Women's Engineering Society (WES) Student Conference, this year kindly sponsored by Enigma People Solutions. 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.

#### Eve, UKESF Scholar 2016–19, WES Student Conference attendee

"I'm used to going into university and maybe being the only girl in the lecture theatre or one of only a few and, although I know there are lots of women in engineering at all different levels, that was the first time I'd been in a room with so many successful women so that was really empowering."

# **Communications & Engagement**

#### Company Satisfaction Survey

In April/May 2019 we sent out a survey to our scholarship-sponsoring company partners, and were extremely pleased to find that employer satisfaction remains exceptionally high. Of the 21 companies who completed the survey:

- 95% said they would recommend the UKESF Scheme to another company;
- 86% rated the students that applied through our Scheme better than other applicants for internships;
- 100% agreed that the Scheme represented value for money;
- Over 90% rated the service provided by the UKESF as either 'excellent' or 'good'.

#### **Online Presence**

On the UKESF website, the average number of unique visitors per month has increased by **400** compared to last year, while the average number of page views per month has increased by **514**.

Our average newsletter open rate is **36%** (the average rate for small-to-medium-sized UK businesses in 2018 was 19%), with an average click-through rate of **5%** (likewise, 3%).<sup>1</sup>

Over the course of the year, we have gained **97** new Twitter followers, taking our total number to **727** – we are delighted that the ratio of male:female followers has changed from 63:37 in 2018 to **48:52** in 2019.

We also gained 37 new Facebook followers, taking the total there to **287**, and have **368** followers on our refreshed LinkedIn company page.

1) Source: getresponse.com/resources/reports/email-marketing-benchmarks.html

#### Media Coverage

Our #TurnOnToElectronics campaign was featured in fifteen Electronics news outlets at the time of launch – see the Schools section of this review for details.

Four UKESF scholars were among the '30 under 30' winners of the prestigious EW BrightSparks Award for 2019, double the number selected in 2018. The award is run by *Electronics Weekly* and aims to highlight the brightest young electronic engineers in the UK. The scholars featured were: Emma Curati-Alasonatti (Southampton/Arm), Nathan Ruttley (Southampton/NVIDIA), Louisa Smith (Southampton/Imagination Technologies) and Ricki Tura (Southampton/UltraSoC).

#### Engagement

In November 2018 we attended the annual TechWorks Awards & Gala Dinner, with more current and graduated UKESF scholars in attendance than ever before. We announced the Scholar of the Year Award winner and also launched our new national campaign, #TurnOnToElectronics, aimed at making more schoolchildren aware of Electronics. During the summit, our CEO Stew Edmondson introduced the campaign to an audience of over 300 leading figures in the Electronics industry. The response was extremely positive and enthusiastic.



TechWorks Awards & Gala Dinner

In May 2019 we participated in the SEMI-sponsored Talent Forum at the University of Bristol.



Stew Edmondson speaking at the SEMI Talent Forum in Bristol, May 2019

We also undertook speaking engagements during the year with GAMBICA, The IET, the Royal Academy of Engineering and the Automotive Council.

# **Income & Expenditure**

Income 2018/19 (2017/18)

Sponsorship and Donations – £79,583 (£126,373)
Scholarship Scheme (bursaries, management fees and workshop fees) – £322,338 (£300,820)
Total income = £401,921

Expenditure 2018/19 (2017/18)

Scholarship Scheme (bursaries and workshop) – £203,036 (£206,869) Educational Activities – £42,467 (£56,522)

#### With Thanks To...

The UKESF Steering Board and our Trustees:

Indro Mukerjee, Prof Bashir Al-Hashimi, Dr Derek Boyd, Neil Dickins, Dr 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, Clarity PR, The Institute of Physics, The Engineering Development Trust, The IET, The Radio Communications Foundation, The Smallpeice Trust, The WISE Campaign, The Women's Engineering Society, Enigma People Solutions and Mathys & Squire.

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



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

### Stew Edmondson, CEO, UKESF

# **Our 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.

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