

## 1. UK and Ireland Women In Engineering Affinity Group

The UK and Ireland Women in Engineering affinity group is an active and diverse group of professional innovators who strive to change the face of engineering and enable all genders to have the opportunity to make a difference for the benefit of humanity. Our aim is to advance women in technology at all points in their life and career.



(L-R) Princy, Helen, Naeemeh, Noushin, Keeley, Amy, Annabel and Ruth

### *Our contact details:*

- WIE UKI website: <https://www.ieee-ukandireland.org/affinity-groups/women-in-engineering/>
- Email address: [wie-chair@ieee-ukandireland.org](mailto:wie-chair@ieee-ukandireland.org)
- Twitter: @IEEEWIE\_UK
- Facebook page: <https://www.facebook.com/IEEE-Women-in-Engineering-UK-and-Ireland-388792468134835/>
- Facebook group: <https://www.facebook.com/groups/448170842034606/>
- LinkedIn: <https://www.linkedin.com/groups/13717266/>
- YouTube channel: <https://www.youtube.com/channel/UCUymTatyxO9oQQ2tjWqcGNg>

### *The WIE UKI Committee*

Our committee is a strong group of women passionate about realising positive change in the representation of women and girls in technology. As such, our activities across the UK and Ireland are inclusive, with no limits by academic/professional level, age or gender. To focus our efforts at a strategic level, we have each taken on a role and aim to link with similar organisations, collaborate and share good practice. We also aim to establish a network of regional volunteers so that we can be represented more widely (eg. Ireland network of volunteers led by Ruth Lennon).

WIE UKI committee members for 2019 are:

- Chair (2019): Annabel Latham
- Secretary: Charchita Misra
- Past Chair (2015-2018) & WIE liaison: Keeley Crockett
- Social media, publicity and event reporting: Helen Duncan
- Ireland Lead & IEEE Chapters & SIGs liaison: Ruth Lennon

- Industry Societies liaison: Princy Johnson
- Industry Societies liaison: Liana Cipcigan
- Schools liaison: Maebh Larkin
- Universities liaison: Noushin Karimian
- Business liaison: Amy Khalfay

### *Our membership*

In May-19 there were 186 UKI WIE members, 83% of whom are women, across 35 technical societies, made up of:

- 1 Life Senior
- 22 Senior Members
- 78 Members
- 73 Graduate Student Members
- 11 Student Members
- 1 Associate Member

## 2. Activities in 2018

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### *June 2018 – STEM Bee in the City*

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In summer 2018, a colony of giant Bee sculptures took to the streets of Manchester for an art trail we'll never forget...

Thousands of people discovered more than 230 Bees all over Manchester, taking in the city's landmarks and undiscovered gems. Each of the 101 super-sized Bees was designed by a different artist and celebrated the unique buzz of Manchester, from its industrial heritage to its vibrant music scene. 131 little Bees joined the trail, created by the children and young people of our city.

One bee was dedicated to Manchester scientists and engineers – the Science Technology Engineering and Mathematics (STEM) bee.

Here's Annabel Latham representing women in computer science by signing the STEM bee:



***Annabel Latham and the STEM bee***

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*12-Jul-18 IEEE Women in Computational Intelligence Network Event co-sponsored by IEEE WIE UKI, Rio de Janeiro, Brazil (as part of WCCI 2018)*

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Keeley Crockett represented WIE UKI in this event at IEEE WCCI in 2018, which she co-organised. There were a number of speakers, followed by a networking session with refreshments. Attendance was good, with 85 WIE members taking part.



The theme of the talks was **'3 top tips for Women in computational intelligence'**

The speakers were:

- Prof. Bernadette Bouchon-Meunier from CNRS-Université Pierre et Marie Curie, France
- Prof. Simone Ludwig from North Dakota State University, USA
- Prof. Mardé Helbig from University of Pretoria, South Africa
- Dr Keeley Crockett from Manchester Metropolitan University, UK

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*Lego Robots: London Christian Primary School*

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Amy Khalfay spent a day with year 5 and 6 children from this school talking about technology and its power to change not only how we live our day to day lives but wider impacts. We used lego robots and created a race track for our robots to navigate around. The children had to work in teams to be able to program their robot to move around the track. We also delved into the more creative side of things and made our robots have a 'dance off'. These types of activities are important because it encompasses not only teamwork, but teaches children how to structure and work through a problem, and shows them that technology can be fun.

26-Sep-18 'Work-life balance in modern engineering disciplines, an event for all genders!'



**The organisers: Melike Selcen Ayaz, Yushi Chen, Siwei Liu and Angeliki Loukatou with their poster**

This joint, one-day event was organised by the IEEE PES student branch chapter and was supported by WIE UKI, the School of EEE at the University of Manchester and IEEE Women in Power.

A special **WIE UKI poster** was created featuring the research of the WIE student members (see photo left).

The event featured motivational talks by four inspirational women, followed by an **interactive workshop** and an **open discussion**.

The speakers were:

- Prof. Aline Miller, School of Chemical Engineering, The University of Manchester
- Dr. Nandini Chakravorti, Data & Information Systems, Manufacturing Technology Centre (MTC)
- Prof. Danielle George, School of Electrical and Electronic Engineering, The University of Manchester
- Ms. Samantha Price, Morson Group

The talks are available to watch on the UKI WIE youtube channel.



**Inspiring engineers**

The afternoon workshop featured sessions on developing **personal skills** and carrying out a **self-assessment**.

Finally there was a lively **open discussion** on tackling challenges related to work-life balance.

*25-Sep-18 European Microwave Week 2018, Women in Microwaves event*



***Women in Microwaves visit to NASA-MDSCC (Madrid Deep Space Communications Complex)***



***Helen Duncan rocks that space suit!***

Helen Duncan was involved in the IEEE Women in Microwaves event including parallel visits to the NASA-MDSCC (Madrid Deep Space Communications Complex) and ESA-ESAC (European Space Astronomy Centre) on 25 September 2018, as part of European Microwave Week.

There were over 60 attendees, including twenty-five 16-17 year old high school students (mostly girls) and their teachers.

Helen went to NASA-MDSCC, which was a fabulous visit, attended mostly by young women members, with an inspiring talk by a woman engineer who is a veteran of the US space program.

Speakers included by Dr. Tony Carro, Dr. Lorene Samoska, Dr. Javier Ventura-Traveset and Dr. María Santos-Lleó.

At NASA-MDSCC, Dr. Lorene Samoska talked about her research and also her career as a female engineering researcher.

*20-Oct-18 Manchester Science Festival: Platform for Investigation: Me versus machine - who's in control? – 6 – 8 family activities in the Manchester Science Museum*



The Manchester Science Festival is an established UK science festival that attracts around 30,000 visitors to events around Manchester, UK. Two WIE members, Keeley and Annabel, based at Manchester Metropolitan University, organised a day of events. This Platform for Investigation, entitled “Me Versus the Machine”, featured eight activities designed to introduce families to artificial intelligence, coding and computer science through offering hands on STEM activities. The platform was held at the Science and Industry Museum, Manchester within the Old Warehouse.



**Volunteers at Platform for Investigation: Me versus Machine**

Activities included:

**1) Activity 1: Pixelart - which used the** excel spreadsheets to introduce the basics of computer graphics. Pixel images will be provided and participants will get to create their own piece of artwork.

**2) Activity 2: Kick Start your Programming with Scratch** - Follow step-by-step instructions to write a simple computer programme. What will you programme ? Programmes include: Animating your name, Make a flying character, animate a butterfly.



**3) Activity 3: Bridge over the River Squelch:** Architect your own tower using only spaghetti and marshmallows. This hands-on structural challenge focuses on problem solving and the stepwise solutions to complex problems needed in computer programming

**4) Activity 4: I, Teacher** Could a computer do a better job than your teacher at school? Here you can try out our most advanced conversational agent tutoring system which can detect how much you have understood and automatically adapts its content and teaching accordingly. Let OSCAR teach you something new!

**5) Activity 5: Automated Border Guards** - try out and evaluate new technology in border security. Ethically approved.

**6) Activity 6: Artificial Intelligence and You** - Is that ethical? Some applications of AI muddy the water of what is ethical and what is unacceptable. Tell us what you think by taking our AI-ethics quiz and join in the debate about some of the challenging ethical questions that scientists have to think about every day!

**7) Activity 7: Robots and Me** - Code a Robot and race them round a track.

**8) Quiz Competition** – find the answers to quiz questions by visiting the exhibits, and post your entries to win



*Keeley Crockett, Naeemeh Adel and Annabel Latham collect the public's votes: Is AI a benefit to humanity?*

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*18-Oct-18 Manchester Science Festival: Future on trial: artificial intelligence – court room drama*

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As part of Manchester Science Festival, there was another innovative event called 'AI: The Future on Trial'. During this event, held in the beautiful historical courtroom of the Greater Manchester Police Museum (pictured left), Keeley Crockett was called as a witness in the trial and cross examined by a team of "barristers" about her research and her view of the future.

The public in the audience acted as judge and jury, and after the cross-examination were asked to vote as follows:

Trial #1: Artificial intelligence:

- "Guilty": The Use of Artificial intelligence research is more of a threat than a benefit to future society
- "Not guilty": The Use of Artificial intelligence research is more of a benefit than a threat to future Society



*Prosecutor Joanne Lewthwaite with Keeley Crockett*

**The verdict:** AI was found not guilty!

*6-Dec-18 'Inspiring girls with STEM - Careers in Computer Science'*

This 'speed networking' event took place in Manchester at Connell Sixth Form College. The event aimed to introduce the girls to professionals in Science, Technology, Engineering and Mathematics (STEM) careers, and for them to ask questions.



**Annabel's table: Computer Science and AI  
(at the start of the day!)**

150 female school children aged 13-15 from girls schools from disadvantaged areas of Manchester took part. Many had never have met STEM professionals before, or had 'adult' discussions.

Throughout the day, girls were put into groups of 25 and attended activities such as the speed networking, careers talks, etc. During the speed networking, 1-3 girls would sit at a table representing a discipline or job and ask about opportunities for study and careers, and ask questions of volunteers. There were six 45-minute sessions, a very intensive day of talking, but a great opportunity to share my passion for computer science.

*STEM Activities throughout 2018 – programme of events targeted at Key stage 2 UK Primary Schools in Rural areas*

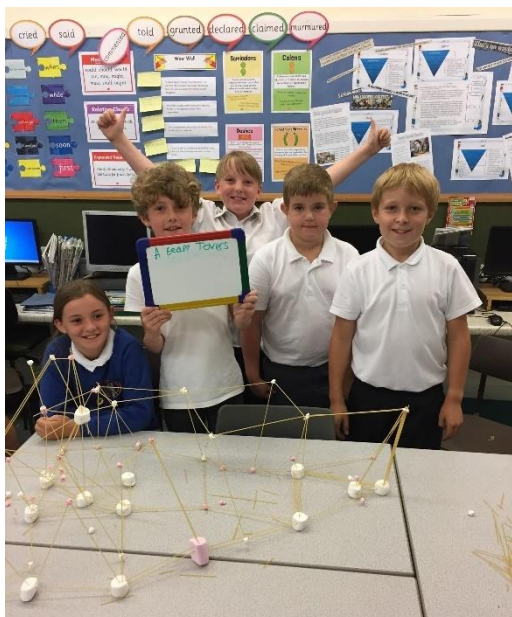
Pupils at rural schools in the UK have fewer opportunities to take part in technical clubs and activities at their school, and are also less likely to have access within school to equipment such as the Sphero robots (seen right).

As part of our strategy to introduce opportunities for all, while showcasing women's leadership in technological areas, Keeley Crockett has developed a programme of activities delivered in rural schools.

A) **Coding with Sphero robots** (right) - years 5 and 6. This activity introduces children to logical thinking and coding as they try to navigate the Spheros along a track. (Photo has already been circulated with permission from the school on social media)







**B) Structural Engineering and Problem solving with Spaghetti.** Spaghetti and marshmallows – much fun can be had, whilst developing strategies for problem solving, breaking down complex problems and practising team work skills.

(Photo has already been circulated with permission form the school on social media)

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*Careers talks in schools - Example:*

*13-Dec-18 'Spotlight on Careers in Computing: From software house to Artificial Intelligence researcher', at Stockport Grammar School*

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This careers talk was given at lunchtime in the library at Stockport Grammar School. The talk was optional, and was advertised to secondary school children, aged 11-19. The talk aimed to inspire and encourage school children to take up careers in Computing, covering changing careers, different kinds of jobs in software houses, AI research and how to get involved. The talk was well attended and there followed a lively Q&A session.



***Annabel talking to school children about AI research***

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### *STEM Ambassadors*

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On a local level, to further our reach with minimal resources, IEEE WIE members in the UK have been encouraged to become STEM ambassadors, and to take part in activities for schools and local groups in their neighbourhood.

This UK scheme involves a unique partnership of Government, charitable trusts and employers that is dedicated to raising young people's engagement and achievement in STEM subjects and careers.

STEM Ambassadors are volunteers from a wide range of science, technology, engineering and mathematics (STEM) related jobs and disciplines across the UK. They offer their time and enthusiasm to help bring STEM subjects to life and demonstrate the value of them in life and careers.

WIE members can use this opportunity to take part in a range of activities in local schools, and to talk about women in engineering, and represent women in technical roles. We also use this opportunity to get some female faces on the walls of schools and colleges, by taking along our posters.

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### *Chapter & SIGs Liaison*

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As part of our ongoing activities we have established a new role: Chapter & SIG liaison. The first activity of this role involved establishing a list of the SIGs and Chapters in the IEEE UK & Ireland region. The chair of each Chapter and SIG was then contacted and offered assistance in finding speakers for any events held throughout the year. Further the WIE offered support through the establishment of a WIE section in any event held by any of the SIGs or Chapters throughout the year. As a direct result of the campaign to highlight the WIE and the role of Women in Engineering we wish to promote a greater number of female keynote speakers and have already succeeded in doing so. The response to this campaign has been positive from a number of chapters and SIGs. Many others have emailed to indicate their desire to link up for future events. This is the first year of this campaign and we hope to grow the campaign in the near future.

### 3. Press and Publicity

#### WIE UKI Posters campaign

One of our missions is to challenge gender stereotypes in STEM disciplines.

We have developed posters showcasing women engineers from UK and Ireland. Our posters aim to demonstrate the diversity of engineers and of exciting career choices in STEM, and to share our passion for our subject. We aim to get these posters on walls wherever we visit, and they are freely available for anyone to download and print from our website under the Resources section.



We have started to create posters highlighting particular fields, as shown here in the Power and Engineering poster (Right).

We created this poster for 2018’s Power and Engineering Society/WIE event.

We plan to draw on our connections with IEEE chapters and industry societies to develop more posters that showcase the work of women engineers in the UK and Ireland across the STEM arena.



#### Social media

We have been steadily building up a social media presence in order to connect with both members and non-members of IEEE. From a standing start at the end of 2015, we continue to widen our network.

Our WIE community shares articles, events, activities, job adverts, campaigns and more. On our YouTube channel we share videos promoting girls and women in engineering, and talks and panel discussions from our sponsored events.

In May-19, our followers are:

Twitter: @IEEEWIE\_UK – 115 followers

Facebook page: <https://www.facebook.com/IEEE-Women-in-Engineering-UK-and-Ireland-388792468134835/> - 68 followers

Facebook group: <https://www.facebook.com/groups/448170842034606/> - 102 approved members

LinkedIn: <https://www.linkedin.com/groups/13717266/> - 21 members

YouTube channel: <https://www.youtube.com/channel/UCUymTatyxO9oQQ2tjWqcGNg>

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### *Press articles*

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We aim to be visible, publishing articles on girls and women in technology, and also acting as role models by just being women engineers. Here's a selection of recent articles.

- “7 Practical Ways Parents Can Inspire Girls to Get into STEM”, Annabel Latham, **Huffington Post**, 15-Mar-18, available at: [https://www.huffingtonpost.co.uk/entry/inspiring-girls-into-stem\\_uk\\_5aa7b5a7e4b03c9edfaf8584](https://www.huffingtonpost.co.uk/entry/inspiring-girls-into-stem_uk_5aa7b5a7e4b03c9edfaf8584)
  - (Also published in South Africa: **MSN South Africa**, 15-Mar-18, available at: <https://www.msn.com/en-za/lifestyle/lifestylenews/7-practical-ways-parents-can-inspire-girls-to-get-into-stem/ar-BBKivka>)
- “Cambridge Analytica scandal: legitimate researchers using Facebook data could be collateral damage”, Annabel Latham, **The Conversation**, 20-Mar-18, available at: <https://theconversation.com/cambridge-analytica-scandal-legitimate-researchers-using-facebook-data-could-be-collateral-damage-93600>
- (republished widely as follows:
  - **The Metro News**, 22-Mar-18, available at: <https://www.metro.news/cambridge-analytica-scandal-legitimate-researchers-using-facebook-data-could-be-collateral-damage/985289/>
  - **Business Insider Australia**, 22-Mar-18, available at: <https://www.businessinsider.com.au/legitimate-research-facebook-data-collateral-damage-cambridge-analytica-2018-3>
  - **Catch News (India)**, 21-Mar-18, available at: <http://www.catchnews.com/science-technology/cambridge-analytica-scandal-legitimate-researchers-using-facebook-data-could-be-collateral-damage-104032.html> )
- “Fallout from Facebook data scandal may hit health research”, Annabel Latham, **New Scientist**, 22-Mar-18, available at: <https://www.newscientist.com/article/2164521-fallout-from-facebook-data-scandal-may-hit-health-research/>
- “How the scandal will hit academics”, Annabel Latham, **i newspaper**, 24-Mar-18.
- Why data centres are essential to the success of UK plc by Ben Rooth featuring Keeley Crockett, Manchester Evening News interview, 4/10/2018, [online] available: <https://www.manchestereveningnews.co.uk/business/business-news/data-centres-essential-success-uk-15235544>

- Can you fool a lie detector? Manchester Evening News interview, Keeley Crockett, 27/10/2018, [online] available: <https://www.manchestereveningnews.co.uk/news/greater-manchester-news/lie-detector-test-border-control-15319641>
- The Guardian podcast, “Can we trust AI lie detectors? Chips with Everything podcast”, Keeley Crockett, Available: <https://www.theguardian.com/technology/audio/2018/nov/23/can-we-trust-ai-lie-detectors-chips-with-everything-podcast>, November 2018
- Royal Northern College of Music Research Coloration. Composer Bofan Ma and Dr Keeley Crockett collaborated on a piece called offset iii – etude, inspired by research into Artificial Intelligence - <https://www.rncm.ac.uk/research/research-centres-rncm/prism/collaborations/new-music-science/offset-iii-etude/>
- “Are schools doing enough to ensure that IT professionals of the future are fostered from the start?”, Keeley Crockett, Manchester Evening News, Available: <https://www.manchestereveningnews.co.uk/business/business-news/schools-doing-enough-ensure-professionals-13744975> with the latter article referred to on the “Schools Improvements” national school news website.
- Could the skills gap stifle the IT sector's future success?, Keeley Crockett, Interview Manchester Evening News, 25th April 2019, Available: <https://www.manchestereveningnews.co.uk/business/business-news/could-skills-gap-stifle-sectors-16163736>

#### 4. International Activities

We believe an important part of challenging stereotypes is to be visible as women engineers ‘doing our thing’. WIE UKI members are professionals in an industrial and academic setting, and so everything we do helps a little towards changing the face of engineering. Two examples are given below, where Princy Johnson was integral in a number of activities at an International workshop held in Bahrain.

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*18-Nov-18 Workop on Internet of Things (IoT): Technology and Applications, Bahrain Co-sponsored by University of Bahrain*

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Princy Johnson led a **Workop on Internet of Things (IoT): Technology and Applications** as part of the **International Conference On Innovation And Intelligence For Informatics, Computing, And Technologies**.

The 3-hour session explored technology, creativity and applications.

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*19-Nov-18 Invited Keynote, ‘Open source trustworthy platforms for personalised care’, International Conference On Innovation And Intelligence For Informatics, Computing, And Technologies, Bahrain*

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Dr Princy Johnson gave an invited Keynote speech on: Open source trustworthy platforms for personalised care as part of International Conference On Innovation And Intelligence For Informatics, Computing, And Technologies. This 1-hour talk explored the important topic of technology, data and ethics.

## 5. So far in 2019...and future planned events and activities

- Afternoon tea drop-in for International Women’s Day, Mar-19, QA Learning academy, Salford
- House of Lords (5-Mar-19) reception for launch of “The role of women as drivers of change in the energy transition” produced by Regen’s Entrepreneurial Women in Renewables Network (EWiRE)
- 2-day Hands-on IoT workshop 21-22 March with talk from WIE UKI and free places given to a group of female A-level students – Liverpool

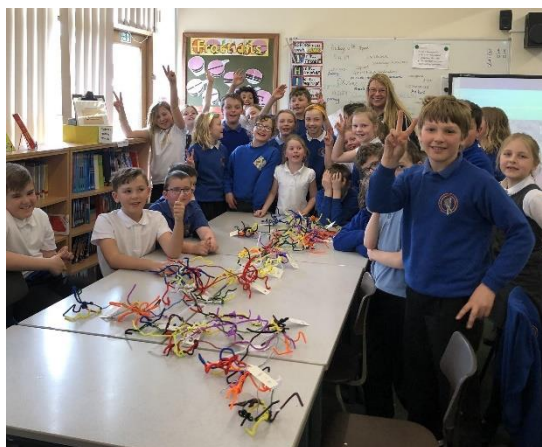
The two-day workshop on ‘Industrial IoT’ was held during 21-22 March 2019 at Sensor City, Liverpool. The program comprised a wide range of activities including Key notes, short industry talks, team building and ideation session, tutorial sessions, hands-on workshops developing solution for an industrial problem, and a talk from WIE IEEE UK&I chair. 30 participants attended the workshop, with the majority from SMEs, and one third were students. Though the female participants formed less than a 3rd of the total number of participants, the speakers had equal gender distribution between male and female.



*(photos L-R) Above: Dr Annabel Latham, chair, WIE IEEE UK&I; Industry talk by Emily Crittenden from Pycom; Team building and ideation by Anna Sexton, Centre for Entrepreneurship. Below: Dr Joanne Phoenix, Executive officer & Interim CEO, Sensor City; team discussions. Bottom: Industry talk by Jen Fenner from Defproc*



- British Science Week March 2019 - Adventures in Artificial Neural Networks, Learning and the Brain with Key stage 2 students (Years 3, 4, 5 and 6) at a rural primary school. (Permission for the photo to be shared on social media has already been given by the school.)



*Key stage 2 pupils with Keeley Crockett*

- IEEE 5th World Forum on Internet of Things – WIE programme including talks and panel sessions – Limerick Apr-19
- **Future Stars of Tech.** By identifying and promoting the industry's top female career climbers, Future Stars of Tech presents a tomorrow where diversity is a positive force, not a challenge, in the world of technology. WIE committee member **Amy Khalfay** has been shortlisted for the **2019 Future Stars of Tech award for Data Scientist** - see <https://futurestarsoftech.uk/2019-shortlist/>
- Women in Microwaves event at the International Microwave Symposium in Boston Jun-19: Helen Duncan
- Transport Futures conference, Cardiff, 6-Jun-19, co-organised by Liana Cipcigan. The event brought interdisciplinary and multi sector groups together to identify opportunities for working collaboratively, to tackle these challenges. Key industry stakeholders, funders and policy makers delivered presentations (photo right).



- Workshop on IoT in Healthcare organised as part of the GloTS2019, during the IoT week (June 17-21, 2019) in Aarhus, Denmark. The workshop to feature a panel session on 'Adoption of IoT in health and social care', with WIE committee members leading the discussions.
- IEEE Women in computational intelligence and Women in Engineering joint Reception at the IEEE International Conference on Fuzzy Systems June 2019 - co-organised by Keeley Crockett. Theme is 'Careers and Top tips for Women in Computational Intelligence', with speakers, discussions and networking activities.

- Glasgow Caledonian Research in Sustainable Environments (RiSE) Conference – WIE keynote 6-Sep-19
- Joint event WIE and Students at the University of Manchester with the IEEE PES student branch chapter in September 2019
- European Microwave Conference, Paris (Oct-19) – WIE panel session - Helen Duncan is a member of the committee for the Career Platform at this year's European Microwave Week, which is holding a joint session with Women in Microwaves
- October 2019 Science Festival – Platform for Investigation – a day of events
- European Microwave Conference 2021 (London) – joint WIE/women in microwaves event being organised

#### *Our Plans for 2019:*

- Develop a mentoring scheme (join with Section mentoring scheme) – formalise existing arrangements
- Contact each IEEE section and invite to do joint events, and to include WIE representation/talks
- Work with industry associations and companies to deliver joint events (eg. Eaton Intelligent Power Ltd Dublin, Maebh Larkin new committee member)
- WIE committee members to actively engage in STEM events in Schools (weekly- monthly activities) including career talks, hours of code, engineering challenges etc
- Posters campaign – publicise posters and get them on walls whenever we visit anywhere (e.g. when in schools in STEM ambassador role)
- To produce WIE UKI Promotional banner
- Collate STEM resources – to promote activities for different age groups – eg. CIGRE storybook, People Like Me
- To write press articles of events sponsored / run by UKI WIE to liaise profile
- To maintain an active social media presence and YouTube Channel.