WISE CONFERENCE & AWARDS 2015

Celebrating female talent in STEM

SPECIAL FEATURES:

Exclusive interviews with winners of WISE Awards 2015

Women leaders share their ‘secrets to success’

SPOTLIGHT ON Ten Steps
AND People Like Me
“The dialogue that we need to use more of with women is: become an engineer and help change the world. Because engineers create things that help people.”

DR SANDY MAGNUS
Retired NASA Astronaut, and Executive Director, American Institute of Aeronautics and Astronautics (AIAA)

“A career in science and engineering is varied, exciting and rewarding and being a woman has never hampered me – in fact, if you’re any good it’s the opposite, you’re more likely to stand out”

AILIE MACADAM
Managing Director, Infrastructure Europe and Africa at Bechtel Corporation

“One thing I do think is important is for a woman to make her own choices about work and family and to feel comfortable with it, whatever it is. Remember that none of us are superwoman and you can’t be the perfect worker, mother, wife, housewife and daughter all of the time”

ELIZABETH WATSON
Retired Head of Product Safety Assurance, Rolls-Royce PLC

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Nominations for WISE Awards 2016
Championing diversity in STEM

The WISE Awards 2015 were attended by key women leaders in STEM and presented by WISE’s patron, HRH The Princess Royal.
The WISE Awards provide a unique opportunity to recognise the individuals and organisations actively working to attract women and girls to STEM fields, as well as improve retention rates and increase the number of women in leadership positions. In particular, the Awards celebrate female talent in STEM at all levels, from the individual role models that inspire the next generation to the women leaders growing the talent pipeline.

WISE’s overarching mission is to add 1 million more women to the UK STEM workforce. There are currently 793,437 women in STEM occupations in the UK, representing 14.4 per cent of all those working in STEM fields. The Awards are an important step towards achieving the 1 million target – not only do they encourage women to further their careers in STEM, but they also keep the goal at the top of the STEM agenda.

“The WISE Awards started in 2012 and what we found was that it was a real touchstone and touchpoint,” said Trudy Norris-Grey, WISE Chair of the Board. “People wanted a moment to take a deep breath, enjoy the hard work of the previous year and bring together those who are women in STEM, or those campaigning in STEM, or both. Then additionally to take a deep breath after the celebrations and recommit, with more women we can promote.”

This year’s WISE Awards, held on November 12 at a gala dinner in central London, coincided with the 40th anniversary of the Sex Discrimination Act being passed in the UK. At the event, WISE called upon the UK Government to intensify its efforts to increase diversity in STEM fields and raise the percentage of women in the STEM workforce from 14 per cent to 30 per cent by 2020. “We need to inspire more girls to choose STEM qualifications as a route into fulfilling careers that benefit themselves, future employers and our economy,” WISE stated in an open letter to the Financial Times and the London Evening Standard. “We challenge the Government to provide a clear commitment to accelerate diversity in our STEM industries. We cannot afford to wait another 40 years to achieve this change.”

Presenting the Awards, WISE’s royal patron, HRH The Princess Royal said: “WISE is not asking anyone to make a special case for women […] our aim is to break through the stereotyped image of the kind of people who work in science, technology and engineering so that it becomes a career of choice for more people”. Dame Mary Archer, Chair of the Science Museum Group and former chemistry lecturer, who also spoke at the ceremony said: “This movement has been a long time on the launch pad, but now it is really on the runway and ready to take off”.

WISE Awards 2015

KEY RECOMMENDATIONS FROM THE PANEL

- Incentives for businesses and schools that invest in STEM
- Business quotas for women in STEM (or at least a threat of quotas)
- Mandatory publishing of company diversity statistics around improvement, retention promotion and pay
- More flexible working options
- More Government investment in STEM education
- 1 in 3 UK Government apprenticeships to go to women

Other highlights of the conference included talks presented by the UK Medical Research Council, Goldman Sachs, Winton Capital and McKinsey. Alongside the conference was an exhibition featuring hands-on interactive displays and a premier of a film about women in STEM, produced by the Institution of Civil Engineers (ICE).

There is still work to be done to encourage 1 million more women into the UK STEM workforce, but progress is being made. Compared to last year’s figures, in 2015 there were:

- 104,000 more women working in STEM
- 47,000 more women working as ICT professionals
- 12,000 more women working as professional engineers
- 6,000 more women working as science and engineering technicians
- 15,000 more women working as STEM managers
Blazing a trail

Role models and pioneers in their fields, three women STEM leaders discuss the efforts required to increase the representation of women in science and engineering. They also share what makes them passionate about STEM and the secrets to their success.

TRUDY NORRIS-GREY
Chair of the Board, WISE, and General Manager, Central and Eastern Europe, Microsoft. Named one of the 50 most influential women in IT in 2015.

NAOMI CLIMER
Former President of Sony’s Media Cloud Services in Los Angeles, USA, and first female President of the Institution of Engineering and Technology (IET).

DR SANDY MAGNUS
Retired NASA Astronaut, and Executive Director, American Institute of Aeronautics and Astronautics (AIAA).
About 9 per cent of the UK engineering workforce is female. It’s frustrating as it’s about what it was when I started 30 years ago, and I wholeheartedly believed that it would just slowly fix itself, but it just hasn’t. Despite an awful amount of effort and initiatives, it’s been very static for a very long time. I think that’s a loss for society, as well as a hard slog for the few women who do take that path. I think there are lots of little barriers rather than one big one. And one of the things that I talk about a lot is just a kind of perception thing, that engineering is perceived as a male domain.

We’ve done some research recently which says 50 per cent of parents and teachers think that engineering is mainly for boys – 50 per cent today think that! Shame on us, clearly we have some work to do. It does feel like in Britain the perception of engineering is less female friendly than in some other countries – tied up to that are role models, where there aren’t enough role models. And whilst I do see myself as having a role model status, actually for children you need 20 and 25 year old role models – you need role models all the way up the chain, but we don’t have enough of those. We need to make the women we do have in STEM more visible. Lack of role models and the perception of engineering would be the two biggest barriers, but there are all sorts of subtle things like language and marketing images.

Half of our state schools don’t have a single girl studying A-level Physics. There must be bias in the system that gets us that. It’s not about Physics as the be all and end all, but it’s a great mechanism for learning structure and the capability it builds in you are the capabilities that many employers look for. What is it that says to girls or teachers or those who set curriculum that we don’t need physics careers?

The percentage of women in engineering in the US has been hanging around 20-22 per cent forever. What’s interesting is that if you look at that 20-22 per cent, a majority of them are in biomedical or environmental engineering – and not as many are in things like civil, electrical, mechanical or aerospace engineering. I was chatting with the President of the Society of Women Engineers in the US, and they have a theory that when we talk about engineering to the students, we talk about how fun it is to build, make and create things – but for women, if you look at where the women go in engineering, it’s towards the fields that help people.

The dialogue that we need to use more of with women is: become an engineer and help change the world. Because engineers create things that help people. For instance, civil engineers build bridges to help people connect with each other, mechanical engineers build strong buildings or structures, or help build cars that protect you in an accident and electrical engineers build technologies to help you connect with people all over the world. So perhaps to attract more women we need to emphasise that engineers build things that make the world a better place. That really resonates more with females.
STRATEGISE TO ATTRACT AND RETAIN WOMEN IN STEM

NC: I’m not in favour of quotas and generally hardly anyone is. Even the people that benefit from them don’t really enjoy the experience because it is resented on the whole. It’s not something I like, however, if you need a quick step change in numbers, then quotas is one way of achieving it. We’ve got to face the fact that 30 years of good intentions and great initiatives have got us nowhere, so we definitely need to do something a bit stronger.

I personally think there are things we could try that are short of quotas that would at least be something different. So for example, I would like to see it mandated for all companies to have to measure and publish their diversity statistics like recruitment, retention, promotion and pay, for example, and I actually think that would just force companies to think about it a bit more regularly and face up to their own statistics. With the best will in the world it’s not going to happen naturally. Maybe it will happen naturally over 100 years but I think that’s too long to wait.

CALL FOR GOVERNMENT INTERVENTION

NC: I do think that some government action around the mandating of statistics would be helpful. I’ve asked politicians to do simple things like in their constituencies to encourage connections between the educational establishments and industry to help with some of the perceptions and connections there – there are practical things that government can do at a local level as well as at a national level.

I think government is also concerned about this because there is a kind of UK PLC problem looming, if we don’t have enough engineers we aren’t going to be able to do infrastructure projects, and we aren’t going to be the technology innovator that Britain is capable of being. So I think they are quite motivated, but because there are so many little things that need fixing it isn’t that easy to take it on and fix one little problem. So I think between us, parents, teachers, educators, government and industry – all of us need to do a few little things.

SECRETS TO SUCCESS

NC: I feel the secret to my success is that I’ve always been true to myself, so that I’ve always operated by my values – integrity, collaboration and energy are the core values that make me tick and I have always been very true to them. I think that it’s appreciated and it’s easier to operate when you are operating as yourself. So I’ve just kind of thrown my heart and soul into whatever I’ve done and just tried to do the best job I can.

SM: Well, I think the secret of success for anybody is to find that thing you are passionate about. You will be successful at that because you’re putting a lot of heart and soul and energy into enjoying it, and when you’re doing something you’re enjoying you will do better at it. If you’ve ever had a job that doesn’t interest you, it makes it much harder to go to work every day – it makes it harder to get excited, it makes it harder to get involved. So if you find that thing you’re passionate about, it’s half the battle. And that’s always been my guiding star – to do things that I’m interested in, passionate about, that I believe in and that really make a difference.

TNG: I’ve tried to do a good job! I guess that’s the first thing. My career advances came when bosses said to me that they were moving to a higher job and they wanted me to come with them. That helped me a lot, but I can also say it helped them a lot, though I didn’t realise it at the time. People look out for good people. One thing I have learnt is that you should look after your own agenda and not just somebody else’s. It is good to get sponsors, but you have the right to be confident. Do not step backwards, step forwards. If you do a good job, you will be good for yourself and good for others.

ADVICE FOR THE NEXT GENERATION

NC: Whatever you are interested in, whether it is nuclear physics or fashion, there will be an engineering career associated with it. You name your interest and there is almost always an engineering career associated with that. The kind of breadth of opportunity and employability are starting points – I do believe that engineers will have jobs for some time to come. There are so many challenges and so many opportunities to make a difference, either to a single life or on a global scale, so there’s that pitch.

SM: Find that thing you are passionate about, and do that. And don’t be afraid to go and explore another passion, because sometimes I think we put limits on ourselves. Sometimes we have practical limits, but there are ways to be creative and explore your passions. The other piece of advice I like to give is that if you have doubt inside yourself, ignore it and keep going.
WISE Awards 2015

Judging Panel

**LAURA SHRIEVES**
UK Engineering Performance Associate, Thales

**JANE SIMPSON**
Chief Engineer, Network Rail

**HELEN SMITH**
HR, AWE

**MEGAN STOWE**
Global Program Manager, Corporate Strategic Procurement, Intel Corporation

**SHASHI WATSON**
Senior Researcher, Winton Capital

**JENNY YOUNG**
Head of Diversity, Royal Academy of Engineering

**HELEN WOLLASTON**
Chief Executive, WISE

**DR KEITH PURVES FRSC**
Board Member, WISE

**SARAH SHAW**
Communications Director, WISE

**LYNNE PALMER**
Partnerships Director, WISE

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**RAMKUMAR AIYENGAR**
Team Leader, R&D News Search, Bloomberg LP

**JOANNE ALMA**
Managing Director & Head of Investment Management Technology, EMEA, Goldman Sachs

**GEMMA DIXON**
Chief of Manufacturing Engineering – Operations, Rolls-Royce PLC

**SIMON HOSKING**
Naval Bases Contract Manager, Babcock International Group

**DAVID JENKINS**
Practice Director Civils and Structures, Transportation Diversity and Inclusion Champion, UK & Europe, Atkins

**TOM JONES**
Vice President Clean Energy, Amec Foster Wheeler

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www.wisecampaign.org.uk
AT A GLANCE

AWARD
WISE Girl Award – sponsored by Intel Corporation

ABOUT
For achievements by a girl under 18 years of age whose passion for science and technology inspires other girls

WINNER
Stephany Baladas, Assistant Clinical Technologist Apprentice, King’s College Hospital NHS Foundation Trust

AWARD PROFILE
As well as recognising young women for their capabilities and commending achievements early on, the WISE Girl Award provides inspiration to the winners’ peers, encouraging others to pursue and excel in STEM subjects.

WINNER PROFILE
Stephany is an 18-year-old who left school to begin an apprenticeship in healthcare. This ignited her passion for medical engineering. She is keen to increase girls’ awareness of scientific apprenticeships in healthcare and encourage others to pursue careers in this area: “People don’t know about the range of careers in healthcare science. Hospitals are not just about doctors and nurses,” she says.

Could you introduce yourself and discuss your background in a little more detail?

I’m currently doing an apprenticeship at Kings College Hospital and before this attended Sacred Heart secondary school and sixth form. For my GCSEs I chose two subjects in addition to the core curricular subjects: art and geography. In terms of my A levels I chose philosophy, geography and business studies. However, I didn’t get the grades I wanted which meant I couldn’t continue studying. I found out about this apprenticeship and, as it’s hands on and linked to health and social care, I decided to grasp the opportunity.

What kinds of work experience opportunities has the apprenticeship offered?

Prior to the apprenticeship I had done a lot of customer based work in schools, museums and a shop. During my course as an apprentice I’ve worked in medical equipment management, where I cleaned and repaired equipment according to procedures, electrical safety checked them and also did a bit of stock handling. I also worked in the ophthalmology department where I checked patients’ vision, blood glucose levels, blood pressure levels and weight. Additionally, I have worked in the respiratory medicine department and theatres.

I have now been offered a job at the ophthalmology department as an ophthalmic technician.

Congratulations on the job offer! Congratulations also on winning a WISE Award – what does this recognition mean to you and how might it help you progress in your career?

The recognition gives me leverage to help persuade girls from my kind of background (mainly those from Asian backgrounds who have protective parents) to enter a similar career. I hope my success will motivate other girls who lack confidence or aren’t aware of such career opportunities to come out and express themselves.

Winning this award has made me even more motivated to pursue this career path, especially having seen how many women are following the same career path and having heard about their experiences and successes. It has also motivated me to help encourage other young girls to embark upon careers in STEM.

As a role model to other young women in STEM, what are the secrets to your success?

The main secret is to believe in yourself and leave your comfort zone. Don’t stay under the protection of your parents, peers, teachers, relatives, etc. and don’t let them determine everything for you. You need to go out and reach for what you want. You need to make mistakes in order to learn to do the right thing. When I didn’t do well in my studies I thought ‘this is it, I can’t prove myself and if I can’t even do this how am I going to do a job?’ but we need to understand that failure is not the end, failure is another word for success.
Can you tell us what attracted you to engineering and give an insight into your remit at TB+A?

I joined TB+A as an apprentice engineer in 2013. I finished my advanced apprenticeship in building services engineering this year and have recently started my degree. My apprenticeship with TB+A is a permanent role, comprising seven to nine years of structured training to get my academic development to BEng, MEng/MCIBSE CEng level.

I was initially drawn to a career in engineering after studying for my A levels. I was encouraged to look into the building services field as it involves a lot of design work. This really appealed to my creative side alongside my strengths in STEM subjects.

I work within a design team that focuses predominately on projects in the commercial/financial sector. My role as an apprentice electrical engineer means I am able to get involved with all aspects of the projects, from initial design, client meetings, calculations and going onto building sites to see the finished design.

What does winning the WISE Apprentice Award mean to you and how might it help you progress in your career?

I already attend career events to promote engineering apprenticeships so winning an award that has recognised my efforts means a lot to me personally. I hope it will help demonstrate to other girls that they can be successful young engineers within a male dominated environment.

I also hope it helps attract more females from a ‘normal’ background. I entered the industry through an apprenticeship, which demonstrates there are alternative routes into the profession other than the traditional university pathway. The award recognises my activities in other areas of the business, showing that you can be involved in wider industry initiatives as well as undertaking the ‘day job’.

I hope the award will open other avenues for me to promote apprenticeships further and that this will allow me to develop my own skills through sharing my experiences. I am keen to explore mentor opportunities on a wider scale with girls of school age interested in STEM subjects in a bid to introduce the career options available at an early stage.

Can you share the main secrets to your success?

I enjoy discussing my experiences with others and believe I can provide a clear path to follow that is achievable, acting as a role model to those starting out. I currently mentor other apprentices within the business and hold fortnightly meetings to discuss progress on specific development activities, as well as how things are going generally.

We now have more female apprentices joining the business and winning the Apprentice of the Year Award demonstrates to our new joiners and other young females looking to enter the industry that my efforts are recognised and acknowledged and are important issues for the industry to tackle. I hope this provides others with the motivation to follow in my footsteps and be an ambassador to other girls.
The award recognises, in particular, the efforts made to reach young women who do not have the support and encouragement from their family or community to choose science, technology or engineering. Atkins understands the importance of, and is passionate about, inspiring the next generation of engineers. It celebrates those who are nurturing the creativity of young people in the early stages of their career choices and creating an environment of inclusion and understanding.

Kris Harrison has been running Selex ES’s outreach programme in Luton for three years. During this time, the number of girls on the work experience scheme has risen by more than 250 per cent. She has provided opportunities for girls from disadvantaged areas and ethnic minority backgrounds, opening their eyes to careers in engineering by bringing them on site to find out more. Anna, a graduate engineer at Selex ES, describes Kris as a positive role model: “Her senior position within the company at a young age shows it is possible to succeed, and while she has a lot of responsibility, she is very approachable and makes time for people”.

How did you become interested in engineering and what are your key responsibilities at present?

I studied physics at the University of Nottingham and joined the graduate programme of what is now Finmeccanica-Selex ES in 2002 as an electronics engineer. Since then I’ve taken on a number of different roles; from electronic circuit design, product integration and environmental qualification to multidisciplinary engineering management. Each of these positions has afforded me the opportunity to work on different sites, with various customers and suppliers, and see different elements of the engineering lifecycle.

I’m currently Head of Lean Engineering for the UK and Italy. In this role I am responsible for improving the efficiency and effectiveness of the design and realisation of our products. In addition to my engineering role, I lead the outreach programme at our Luton site, working with my team of ambassadors to promote engineering in schools and universities, and helping to improve awareness of the opportunities and careers that it can offer.

What do you hope to be the knock-on positive effects of winning the Inspiring Young People Award?

It’s such an honour to be recognised alongside so many inspirational women and to receive recognition and validation for the work that my ambassador team and I have done in reshaping our outreach programme over the past three years.

I’m hoping the award will help me to promote the benefits of our work with young people and assist in replicating the success of the events we’ve introduced in Luton by adding them to the outreach programmes of our other UK sites. Additionally, I hope that it might open up opportunities for collaboration outside the company, and encourage others to inspire young people in their work.

The award has highlighted the importance of enthusing and inspiring others and the effect that this can have. It has also provided me with the confidence to take those skills and apply them in other aspects of my work during my future career.

Did you always know what career path you wished to follow?

Early on, I kept my options open as I wasn’t sure exactly what career I wanted to pursue. Studying physics gave me a broad base on which to build and a lot of skills that I needed for engineering. I joined Finmeccanica-Selex ES because of my interest in electronics and aircraft, and am still passionate about my work. That has definitely helped me in my career to date, as I enjoy what I do every day. I know that it makes a difference and having that purpose motivates me to succeed. I have always looked for opportunities that make good use of my skills or offer the chance to learn new ones. I think that challenging yourself helps you to develop, and also enables you to meet new people and gain new perspectives – all of which can contribute to a successful, fulfilling and exciting career.
Bloomberg Open Technology Award

AT A GLANCE

AWARD
Bloomberg Open Technology Award – sponsored by Bloomberg

ABOUT
For female role models who are making a difference in open source communities

WINNER
Amanda Smith, Community Engagement Manager, Open Data Institute (ODI)

AWARD PROFILE
The majority of businesses rely on open source technology to run their operations and build their products. Yet women make up only a small fraction of contributors to open source projects. The award hopes to change that by recognising females who are making a difference in open source communities.

WINNER PROFILE
Amanda did not enter into technology via the traditional route. Before joining the ODI, she applied her enthusiasm to open up information and data to the field of policing, developing the national crime map, police.uk and data.police.uk. She wants to prove to other women and girls you don’t have to be STEM educated to work with technology.

What does your work at the ODI consist of and why is this important?

I help governments and industry to release and reuse open data. Part of this role includes developing the platforms, tools, services and guidance that support practitioners embracing this world of openness. This ever developing world includes open data, open access and open technology. I’m passionate about raising awareness and increasing participation in such fields; and through my work on European research projects, I’ve established meet up groups in London, Oslo and Sofia to educate communities about open technology.

Is winning the Bloomberg Open Technology WISE award one of your proudest achievements?

The award means so much to me. To be shortlisted with Hera Hussain and Anne-Gaelle Colom, both renowned practitioners in the open technology space, was such a privilege. To have been awarded such an honour by HRH is a feeling that is impossible to put into words. Walking towards and standing on the stage to receive my award is a moment that will stay with me forever, as well as the congratulatory messages I have received from the colleagues and peers I have aspired to be like. I’m truly humbled by the entire experience.

The work and successes of Bloomberg and WISE are internationally recognised. To receive this award from leading technologists and experts, despite my lack of a traditionally STEM-based education, highlights my achievements in this field and demonstrates that anyone with passion is capable of success. This accolade is testament to the skills and passion that I bring to my communities, clients and partners. They will know that I strive for complete customer satisfaction and that this award is a testimony to that. It raises awareness of what the ODI is here to do: we connect, equip and inspire people around the world to innovate with data.

Finally, the Open Technology Award was a new one for 2015. As the first winner of this category I am determined to leave a lasting legacy, and inspire the next generation of nominees, shortlisted candidates and winners.

What do you believe makes you successful?

I believe I am successful because of my passion that has driven me forwards, my ability to work in an open world where I can see change and the impact of what I have done, and thanks to the support I have received from other inspiring women in technology, such as Jeni Tennison OBE, Deputy CEO and Technical Director of the ODI.

I have found that having space to practise my speaking skills (such as the 300 seconds community) and a coach (Carl Rodrigues) has been invaluable to boosting my confidence, making my voice heard and proudly sharing to networks that want to solve the same problems. I am enthusiastic about listening and learning from others, using online and offline opportunities to gain from others’ skills and experiences to bolster my own.

At the ODI, gender isn’t seen but I’ve not been so fortunate before – I’ve been made very aware that I am a woman and have been labelled and pigeonholed into roles.
“Be confident in whatever role you choose, and know that your skills are just what are required to steer progress to the future.”

What does winning the WISE Campaign Award mean to you and how might it help women progress in engineering?

The recognition by WISE of the National women in Engineering Day campaign is a great endorsement of a campaign that has gone from strength to strength in the last two years, and this will allow us to gain even more publicity to run a bigger and more impactful campaign next year.

In 2015 we had about 350 UK and five international events. Next year we would like to grow our international presence, and the more people that we can reach and tell about the role of women in engineering, the better.

What advice would you offer to women/girls looking to pursue a career in engineering?

Such a rapid recent expansion in technology and innovation means that the future will look very different from the present in terms of how we live and work, how we travel, how we treat illness, and how we cope with energy and security, for example. There are amazing careers out there and a whole bunch of solutions to find, and I would encourage all girls to be part of shaping this exciting future – whether as engineers, designers, teachers, innovators or any of the many other allied roles. Be confident in whatever role you choose, and know that your skills are just what are required to steer progress to the future.
WISE Tech Start-up Award

AT A GLANCE

AWARD
WISE Tech Start-up Award – sponsored by Goldman Sachs

ABOUT
For a woman within a technology, science, engineering or manufacturing environment who has set up, or helped set up, a business to inspire the next generation of female entrepreneurs

WINNER
Charlotte K Williams, Founder and Chief Scientific Officer, Econic Technologies and Professor of Chemistry, Imperial College London

HIGHLY COMMENDED
Kanika Bansal, CEO, Medicen Devise Limited

AWARD PROFILE
This is a new award for 2015 that aims to highlight innovation, whether it be in the business model, product or service, business formation, or the way in which technology is used in the business, recognising the creative and entrepreneurial contributions of the individual.

WINNER PROFILES
Charlotte’s company, Econic Technologies, sells catalysts that enable CO₂ to be transformed into polymers, reducing carbon footprint and cost compared to conventional routes which are dependent on fossil raw materials. She has led a range of scientists to help develop and improve the technology, and has also attracted more than £8 million of funding for the business.

Kanika has devised a simple medical innovation that has huge potential impact. Her new product aims to combat catheter-associated infections, which can cause a range of effects in patients from mild fever to death. She is a former fellow of the Royal Society of Edinburgh and has an MSc in Biomechanical Engineering and experience in medical device design, manufacturing in Indian markets and project management. She is now aiming to get her product to market.

PROFESSOR CHARLOTTE K WILLIAMS

Can you introduce yourself, your company and the new technology you have developed?
I am a professor of chemistry at Imperial College London and the founder of a small business, Econic Technologies, which is commercialising a means to make polymers from CO₂. My group and I discovered catalysts that allow CO₂ to be used to make polymers. Polymers are giant molecules, often referred to as plastics. Our technology allows CO₂ to be used from waste sources like power production to make useful materials. The polymers are used to make things like insulation foams, the soles of trainers and mattresses. Our technology allows a ‘triple win’ in CO₂ emissions, with savings due to the use of CO₂ and the avoided petrochemical usage. Catalysts are substances which allow chemical reactions to occur more quickly and in our case are inspired by nature and key to the whole process.

Econic Technologies was founded in 2011, although the first successful results were achieved in my lab in 2008. The company is based in London and currently employs 15 people. It is working with various multinational companies seeking to commercialise the polymers from CO₂.

Can you tell us what winning the WISE Tech Start-up Award means to you?
The award is a lovely recognition for the work of many people, including the many members of my scientific team, past and present, who have worked so hard to solve these problems over the years. It’s been great fun and has allowed me to work with so many excellent people who should also feel recognised. In addition, I hope it also rewards key members of the management, commercial and investment team who have supported and believed in Econic Technologies. I would like the award to inspire other women to consider commercialising their discoveries and inventions and to take risks in forming new businesses and ventures.

What advice would you give to other women in STEM?
I believe it’s important to challenge yourself and not be afraid to try new areas of science or even working life, like forming a new business. You need to recognise your strengths and weaknesses and ensure you build an overall working team that is strong – you can’t and don’t need to fulfil all roles. Some secrets of success include: 1) working well with broad ranges of teams, 2) seeking advice and help in areas outside your expertise, 3) communicating clearly, particularly with experts in other fields and 4) keeping going – don’t give up on an
Can you provide a brief overview of your work/background?

I design medical products. Medicen Devise is focused on developing new products to combat infections in hospitals. We have now developed our first product, Steriderm, which can reduce infection due to catheters.

Congratulations on being Highly Commended for a WISE Award! What does this recognition mean to you?

Getting a Highly Commended Wise Award means a lot to me. I thank the judges for choosing me for this honour. I consider it a recognition of my hard work and that helps keep me motivated. It also gives me good PR and will help me get the word out about what I am doing, which might help me to connect with investors and/or key opinion leaders in my industry. Importantly, this award will hopefully inspire more women in mechanical engineering to continue their work in this field.

Importantly, we need more male role models that encourage women in STEM. This can’t be a space where women talk only to each other. We need men to support us, to challenge inappropriate behaviour in the workplace and for everyone to be lucky to work and live in an environment where gender becomes invisible.

Barriers are inevitable in any line of work. How do you, personally, overcome them?

When failure comes I remind myself that it’s just a phase that will pass. I remember all of the good things I have achieved, which gives me strength and then I work even harder than before to make things work.

“...You never know what problem will come along next and with a strong team to work together on it, you know you’ll solve it – that’s a great feeling.”

idea or invention too soon! When we were developing the catalysts we had several years of failure; quite simply, nothing worked and it was a difficult time. However, we learned a lot and ultimately used that knowledge to prepare the successful catalysts. You need tenacity and focus to work in science but the rewards are immense. It’s a wonderfully inspiring and constantly varying job and I have found it very rewarding – you never know what problem will come along next and, with a strong team working together, you know you’ll solve it – that’s a great feeling.
Promoting women in STEM for a stronger economic future

Two of WISE’s flagship programmes, Ten Steps and People Like Me, are gaining traction with women and girls across the UK. Aiming to engage individuals at different stages of their STEM journey, these projects will provide wider benefits to the economy and STEM talent pool.

THE TEN STEPS PROGRAMME

In late 2014, the WISE Campaign published data showing that women still make up less than 10 per cent of engineering professionals. If the statistic itself was not enough, the news that this proportion is the lowest in Europe highlighted the need for change. Twenty major UK companies, including engineering giants such as BAE Systems and Rolls-Royce committed to a 10-point plan to support female employees at their organisations. The plan was produced collaboratively by industry members and partners of the Royal Academy of Engineering and the WISE Campaign.

INDUSTRY-LED EQUALITY

With 20 companies leading the way, the Ten Steps initiative has business at its heart. It is unique in supporting diversity and equality, while also setting out action points that can drive company performance. The Prime Minister himself commented, in response to the launch of WISE’s Ten Steps, that: “This is not just a matter of fairness, but a business imperative. Science and technology are driving our economic recovery and if we are going to maintain the UK’s exemplary success then we must draw from our full talent pool.”

The Ten Steps programme now has more than 30 signatories, including professional associations and science, technology and manufacturing firms. It is looking to expand its reach with more companies committing to the WISE roadmap and creating positive change for women in their businesses.

Sign up to the Ten Steps programme by visiting the WISE website here: http://bit.ly/TenStepsSignup

TEN POINTS FOR ENGINEERING SUCCESS

1. Understand the starting point and put plans in place to improve performance and monitor progress
2. Educate leaders and give them accountability for change
3. Change mindsets by challenging bias and sexism whenever and wherever it occurs
4. Be creative in job design
5. Make flexible working a reality for all employees
6. Increase the transparency of opportunities for progression
7. Sponsor talented women, giving them the same exposure as men and support to develop their career
8. Demonstrate to women that we want to retain them through career breaks and beyond
9. Treat the retention of women as we would any other issue affecting our core business
10. Share learning and good practice with our industry partners

www.wisecampaign.org.uk
THE GENDER GAP

Research has shown that girls tend to describe themselves using adjectives, while boys often characterise themselves with verbs. The difference may seem inconsequential to some, but – as Professor Averil MacDonald OBE commented to WISE – “Traditionally, science outreach programmes focus on what scientists and engineers do using verbs, rather than using adjectives to describe their attributes”. This means, MacDonald argues, that girls can feel discouraged from pursuing science, technology and engineering as they do not recognise themselves in these roles.

With far more girls dropping science and technology subjects at 16 than boys, this is a key demographic to target in order to improve the UK skills gap and economy. In fact, the gender gap is such that in 2015 less than 500 girls took computing at A level, compared to 5,000 boys, though technology is an area of high job growth.

INTRODUCING PEOPLE LIKE ME

Combining this understanding of language differences between the genders and the need for an increase in women in the STEM talent pool, WISE decided to start the People Like Me programme. This new approach, launched in September 2015, aims to help teachers and parents show girls that – contrary to popular opinion – there are women just like them that are doing well in and enjoying scientific and technical roles.

The initiative comprises a resource pack, written by MacDonald, and an app targeted to girls aged 11-14. The resource pack equips teachers and parents with tips, guidance on lesson plans and quizzes to help girls choose adjectives to fashion their self-identity. The latter can be reinforced by an analysis that demonstrates how girls’ self-identity can map to roles and careers where science and maths are important. The app gives girls the opportunity to try the quizzes at home.

RECOGNISING THEMSELVES IN STEM

The People Like Me resource pack and app is being sponsored by leading STEM companies – including IBM, Barclays and Babcock – while the app was developed collaboratively by female technologists at Global Finance Technology and Solutions. They have shown their support for young girls to be able to recognise in themselves the potential for a career in STEM. By focusing on the characteristics of those in STEM careers, rather than what those in STEM do, research suggests that girls will be able to relate better to those in these highly rewarding jobs.

Next, WISE will set up training for STEM ambassadors, teachers and others who work with young people to help them deliver the People Like Me campaign. The programme also hopes to set up bespoke packs to encourage girls to consider careers in more specific fields, such as computer science.

The WISE campaign has set a target of upping the proportion of engineering jobs assigned to women to 30 per cent, a rise of 1 million women in the engineering workforce. Through the People Like Me programme, and Ten Steps, perhaps WISE will move several steps closer to its target.
You are an avid ambassador for tech and continuously look for ways to encourage girls and women to study or pursue a career in STEM. How did your passion for computing begin?

When I was in elementary school I discovered my brother’s old programming books and became fascinated by the fact that I was actually able to interact with computers – I was so used to passive activities, so this seemed out of this world! Sadly, while I was growing up I was the only girl sat with boys in the computer labs – basically all the girls were thinking there was something wrong with me for wanting to keep taking the tech class. About 18 years later, in 2011, I was the first Greek woman and first student from Imperial College London to receive the Google Anita Borg Scholarship that enabled me to do a PhD and eventually work full time at Google. Until today, I have given a total of 3 TEDx talks and I have been awarded a gold medal from Imperial for outstanding achievement as an ambassador for women in tech globally.

What does the WISE Award mean to you and how might it further your goal to inspire and influence young women?

I feel extremely honoured, but also humbled to receive this award. In general I’ve always felt that women should follow their dreams but now I’m given a true opportunity to tell everyone my story and how I was able to follow my passion. Having the support of WISE will help me influence the lives of more and more girls to aim high and to really go out there and make a difference. I cannot really explain what this means to me – being able to motivate people gives me strength to keep going (in both a professional but also a personal level) and be the best person I can be, while also making sure to give back to the community as much and in any way that I can.

Is there anything specific that has led to your success?

I think it all comes down to: ‘aiming for the moon’ as even if you miss, you’ll still fall amongst the stars – so it’s a win-win situation really. I feel that if you are passionate, you work hard and you keep pushing yourself to try again and get better and better, you will find a way to achieve great things, no matter what. But, there is a hidden trap in there: one should definitely aim high but should also be super cautious not to dismiss the baby steps, there are no shortcuts here – maintain your energy and focus and do the work required.

“I feel that if you are passionate, you work hard and you keep pushing yourself to try again and get better and better, you will find a way to achieve great things, no matter what”
What led you to a career in engineering and an interest in safety?

My links to construction and engineering have been influenced by my family, especially my father and grandmother. My gran was a crane operator in the war and my father runs a plant hire company in Wales. I have always been around machinery and muck and dirt – I find it fascinating.

In my early 30s I decided to return to education and did my civil engineering degree. I was fortunate enough to secure a technical scholarship in Year 2 & 3, which really help create opportunities and my summer placement during the downturn in 2010. I graduated in 2011 and started working for BAM straight away. I quickly settled in and found an opportunity with our Beyond Zero culture programme, which encourages everyone to look at their relationship to safety and consider what it means to people at work and at home.

The WISE Award is a recognition of the exceptional efforts you have made to improve health and safety in engineering.

What does this Award mean to you?

I am truly overwhelmed to win this award, I give recognition to our whole workforce who have shown exceptional hard work in making a change for the better and keeping people safe in BAM Nuttall. This remarkable energy and commitment has been employee led and has shown a true passion for care and concern among people within our workforce. I also thank them for believing in me and nominating me for such prestigious recognition.

You are passionate about your field and always seek to make a difference. What makes it such an exciting environment to work in?

When deciding to return to education I thought about my interests and what I really enjoy doing which led me to choose Civil Engineering – I enjoy the wide variety it brings.

My role offers a wide scope of opportunity and I work right across our business to improve people’s learning, as well as improving the way our business performs – my role involves bringing new initiatives into our business to improve performance. Beyond Zero has safety at the heart of everything we do – this principal applies to everyone.

I enjoy working with people especially if it involves developing their skills, knowledge and learning. I constantly feel challenged and encouraged to always go the extra mile to make a difference.
WISE Hero Award

AT A GLANCE

AWARD

WISE Hero Award – sponsored by Babcock

ABOUT

To celebrate the inspirational story of a woman using a science, technology or engineering qualification to make the world a better place

WINNER

Dr Jennifer Walsh-O’Donovan, Clinical Scientist / Rehabilitation Bioengineer, NHS Lothian

AWARD PROFILE

As a leading Engineering Support provider Babcock works with WISE to encourage the recruitment, retention and development of women within its business. The Hero Award aligns with Babcock’s commitment to ensure each employee goes home safe every day.

WINNER PROFILE

After graduating with a degree in Medical Mechanical Engineering, Jennifer undertook a PhD using her engineering skills to design customised wheelchair seating systems. She now works in a wheelchair seating department and gait analysis laboratory, supporting amputees and children with cerebral palsy. The patient information leaflet she produced on improving mobility has a dual purpose in educating children about the role of a bioengineer, a role which is not well known.

Could you describe your work as a Rehabilitation BioEngineer in the South East Mobility and Rehabilitation Technology (SMART) Centre in Edinburgh?

My role is split between the special wheelchair seating department and the gait analysis laboratory. In the special wheelchair seating department I apply my engineering skills to design a bespoke solution to solve a patient’s postural needs when seated in a wheelchair. This has long term benefits to keeping the person in an optimal position as well as improving their support and comfort.

In the gait lab I work with a range of patients with pathological gait, mostly amputees and children with Cerebral Palsy. As part of a multidisciplinary team I analyse a patient’s walking pattern and provide treatment recommendations for surgery, orthoses, prosthetics and therapy.

What might the WISE Award help you motivate others and further your work as a STEM Ambassador?

Since winning the Hero Award I have had the opportunity to be on BBC Radio 4 Woman’s Hour where I was able to raise awareness of the work of a rehabilitation bioEngineer to a national audience.

Winning this award has provided me with an excellent spring board to further my aspirations of encouraging more women and girls into this career. It has allowed me to showcase the patient facing work that can be carried out by scientists and engineers in the NHS and how this can be a fulfilling and rewarding career.

I am a STEM Ambassador and can use this Award to highlight the success and recognition that can be achieved by women in science and engineering.

What are the secrets to your success?

Do you offer any advice to young women looking to work in STEM?

I believe that the secret to my success has been hard work and perseverance. I am passionate about the area that I work in and this has helped me in my determination to fulfil my goals.

From a young age, I volunteered as a carer of children with a range of disabilities. This challenging work inspired me to pursue a future where I could help people on a daily basis. At school I had a keen interest in STEM subjects. I knew even then that combining these two passions would be key to a fulfilling and rewarding career. My role to date has provided me with an interesting and varied career.

For women interested in STEM, I recommend they seek out the area they are most passionate about and pursue it. Within STEM there is a vast range of areas to work in; there’s one out there for everyone.
Amrita was the first woman in GlaxoSmithKline’s 40-year history to receive its Prize in Clinical Pharmacology. What impact has her work made to pharmacology?

Amrita has made major contributions to our understanding of vascular physiology and translational cardiovascular pharmacology. Her work spans the pre-clinical and clinical border, enabling translation of her work in the laboratory into patient care. Amrita now leads translational clinical research on the potential for inorganic nitrate as an affordable treatment of hypertension and cardiovascular prevention. This is important because of the paucity of new therapeutic targets in hypertension in spite of unmet need and a growing epidemic (1 billion worldwide now and 1.5 billion in 2025). Inorganic nitrate is a dietary constituent previously thought to be inactive in the body. Amrita’s work has contributed to a radical reappraisal of this issue and the emergence of dietary-nitrate based approaches to therapeutics of hypertension, but also for other cardiovascular diseases including atherosclerosis.

You must be thrilled to win a WISE Award! How important is this recognition to you?

It is a real honour to win this award, providing valuable recognition for my research that will undoubtedly help me in achieving my aim of testing inorganic nitrate in large scale clinical trials as a potential cheap and easily administered therapeutic for one of our biggest health problems both within the UK and worldwide. I am sure that the WISE Award will make an impact upon funders and in this way lend weight to my efforts to raise funds to pursue inorganic nitrate as a therapeutic. This is particularly important since as a therapeutic a dietary option is not particularly financially lucrative and it is unlikely that research in this area will be funded/supported by pharma.

What has led to your success as a researcher? Are there any qualities that one should have?

Of course all researchers need to have certain qualities to make research a viable and successful career and this includes being creative and having an imagination – an ability to ‘think out of the box’. But in addition to this rather attractive and exciting side to our work we need to be dogged in our determination to see something through, as well as having both the patience and persistence to keep at it. The research world is a very competitive one and having a thick skin, and being able to face rejection, is something we all have been through and will continue to experience. Being able to cope with this tough side of our work makes the moments of success all the sweeter.
**AT A GLANCE**

**AWARD**

WISE Employer Award – sponsored by AWE

**ABOUT**

For an employer who has adopted the Ten Steps or a similar framework and can demonstrate a positive impact on the recruitment, retention and progression of women in their organisation, through their supply chain in the wider industry

**WINNER**

Bechtel (represented by Ailie MacAdam, Managing Director, Infrastructure – Europe and Africa at Bechtel Corporation)

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**AWARD PROFILE**

AWE is crucial to national defence in supporting the UK’s nuclear deterrent and is heavily reliant on STEM skills. The company is a proud sponsor of the Employer Award for an organisation that has championed the recruitment, retention and progression of women in STEM.

**WINNER PROFILE**

Bechtel’s diversity and inclusion goals are included in the corporate plan and channelled through four operational lines, each with its own champion: Map it; Teach it; Share it; Nail it. Practical actions include unconscious bias training for over 400 senior leaders; flexible working, sponsorship for further education or chartership, improved mentoring and Nextgen – a collaborative forum for junior employees. Female resignations have reduced from 20 per cent in 2013 to just nine per cent and a 13 per cent rise in the female graduate population has been seen in just 12 months.

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**How does Bechtel’s approach to diversity and inclusion differ from other organisations?**

Bechtel has a systematic approach to tackling diversity and inclusion on multiple levels within its organisation. In 2013, the company launched Women@Bechtel, a global collaborative forum for both men and women to share perspectives and experiences, as well as learn about tools for success. The group has carried out a Six Sigma data analysis of all its gender data and led a number of strategic initiatives to share learning and good practice; to retain and develop women; and to sponsor female talent and increase the transparency of opportunities for progression. Recent events have included speed mentoring, the ‘10 lunch’ initiative in which senior managers have lunch with small groups of employees to share ideas and concerns, and a ‘Family Matters’ event to tackle the challenges of women returning to work.

Bechtel now employs more than twice the number of women engineers than the UK average and almost 40 per cent of Bechtel’s engineers on Crossrail are women. More importantly, we have agreed what success looks like in regards to the diversity of our teams going forward.

**What does winning a WISE Award mean to Bechtel? How important is this recognition?**

We are absolutely thrilled to have won the 2015 WISE Employer Award! We are proud of what we’ve achieved so far, but we know there is still a lot to do until diversity and inclusion are no longer an issue. We believe that the only way to tackle the issues surrounding diversity and inclusion is to combine forces as an industry. This stance is critical for the long term competitiveness of our business and the industry as a whole.

It is through participation in and external communication of events like these, which highlight the industry as a whole, that we can help promote women’s achievements and the amazing careers to be had. We will use the WISE Employer Award as a ‘news hook’ to further publicise the efforts to date of not only our own people, but the wider industry. The award will act as a baseline for what we have achieved to date, and hopefully a catalyst for further change. As an industry we need to create a bespoke framework centred on lessons learned, best practice and hard data, which will allow us all to map out where we are today and where we want to be in the future.

**What advice do you offer young women looking to pursue a career in STEM?**

Just do it! With the predicted shortfall of 35,000 engineers in the UK by 2050, the industry needs female engineers as much as men. A career in science and engineering is varied, exciting and rewarding and being a woman has never hampered me – in fact, if you’re any good it’s the opposite, you’re more likely to stand out.
Where did your interest in STEM begin and what led you to pursue a career in engineering?

I studied physics, chemistry and maths at A-level and then went to University and did a degree in Engineering. I chose Engineering because my friends, many of whom were boys, were doing engineering and I thought anything they could do, I could do too. Just like many other 18 year olds, I did not know much about engineering or what jobs it might lead to then. After university in 1975 I got a job with Rolls-Royce on their graduate training scheme. I progressed gradually to more senior roles with people working for me, eventually becoming the first woman to hold the prestigious post of Chief Engineer. Liz has worked in the marine, aerospace and nuclear divisions, designing groundbreaking technology, leading teams of hundreds, and working on low emission combustion technology. Liz has been a champion of women in engineering throughout her distinguished career, chairing the company’s UK Diversity Committee, and through external organisations such as the Women’s Engineering Society, the UKRC and WISE.

The WISE Lifetime Achievement Award is a huge accolade. What does winning this Award mean to you?

I am absolutely delighted to win the award and feel honoured to have this recognition from WISE. There are many people who have helped me during my career and I want to use the award to encourage more women into science and engineering and help them achieve whatever it is they set their mind to.

As a role model to other women in STEM, could you share some of the secrets to your success?

It is great to be a role model for others, but I don’t think I’m particularly special. I am good at sciences, but so are a lot of women, and there are many successful women in all professions now. The only thing that is different about me is that I chose to pursue engineering as a career. I am sure that as more women choose science and engineering there will be many more that are very successful. I was also lucky that I joined a good company and enjoyed most of the jobs I did, which made it easier to do them well.

Success came slowly. It wasn’t all straightforward and there was a time when progress was so slow I thought it was over, but then unexpectedly a new opportunity arose. One thing I do think is important is for a woman to make her own choices about work and family and to feel comfortable with it, whatever it is. Remember that none of us are superwoman and you can’t be the perfect worker, mother, wife, housewife and daughter all of the time. I certainly wasn’t!
Nominations for WISE Awards 2016 open in the spring

Please contact WISE Communications Director Sarah Shaw to discuss sponsorship of the WISE Awards & Conference 2016 at s.shaw@wisecampaign.org.uk and +44 (0)7545 208 530

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Training on this resource will educate your staff and empower them to deliver high-quality outreach that is more effective at attracting girls into STEM by speaking their language.

Learn how girls are happy and successful at work

It’s great to work on projects that not only directly benefit society, but also have a lasting impact

Victoria Sutherland, Assistant Civil Engineer, Mott MacDonald

I really like understanding how complicated things work and then explaining them to others in a simple way

Emma O’Mara, Dockside Manager, Babcock International

I’m really good at spotting tiny details and I love solving puzzles

Louisa Awolaja, Analyst, Accenture

PEOPLE LIKE ME is a revolutionary resource for STEM Ambassadors, teachers and careers advisors to show girls the range of fantastic career opportunities that open up by continuing to study science and maths.

Training on this resource will educate your staff and empower them to deliver high-quality outreach that is more effective at attracting girls into STEM by speaking their language.

You can make a difference: Find out more, book training or get a bespoke resource for your business: www.wisecampaign.org.uk/peopletlikeme

WISE helps girls to find great careers in science, technology and engineering

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