



NATIONAL WOMEN  
In ENGINEERING DAY  

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23 June 2015



*Manchester Victoria Station  
National Football Museum*

# Welcome

## Welcome to our National Women in Engineering Day Celebration 2015

During the event we will host engineer-led tours of Manchester Victoria Station alongside a networking session with female engineers, scientists and technologists from industry and academia. Throughout the event you will have the opportunity to have an informal chat with successful women who will share their inspirational stories and discuss the challenges they have faced.

### Keynote Address (13:05-13:25)

Our keynote address will be given by **Professor Danielle George**, Professor of Radio Frequency Engineering, School of Electrical and Electronic Engineering (EEE) and Associate Dean for Teaching & Learning. Danielle will talk about her research and journey in academia, notable achievements, juggling caring responsibilities, challenges faced and hints/tips on how to be a successful woman in STEM.

### Technical Presentation (13:25-13:45)

**Faisal Farooq**, Project Manager for Manchester Victoria Station Redevelopment, will talk about the station, the new roof construction, the restoration of the iconic building and the 'electrifying' side of the railway.

### Networking Session (GROUP 1: 14:00-15:00, GROUP 2: 15:00-16:00)

In groups of four you will have 10mins with two contributors before moving onto the next table to repeat the process.

### Technical Tour of Victoria Station (GROUP 2: 14:00-15:00, GROUP 1: 15:00-16:00)

Join **Faisal Farooq**, **Caroline Griffin**, and **Suzanne Prieditis** for a technical tour of the station where you will see the redevelopment and hear about the work involved. Caroline is a graduate engineer from Morgan Sindall and Suzanne is an Assistant Asset Engineer from Network Rail. Both have been directly involved in the redevelopment of Victoria Station.

### Careers Service

**Rachel Mutters**, **EPS Careers Manager** will be at the event to answer any questions about the support available from the careers service.

## *NWED and Statistics*

National Women in Engineering Day was first celebrated in 2014 to celebrate the Women's Engineering Society (WES) 95<sup>th</sup> anniversary. To tweet use **#nwed**

### **WES aims are:**

**Women:** Support women to achieve their potential as engineers, applied scientists and leaders and to reward excellence

**Education:** Encourage and promote the education, study and application of engineering

**Sustainability:** Work with organisations and influencers to promote gender diversity and equality in the workplace and sustain the historic legacy and future effectiveness of the Women's Engineering Society.

Further details can be found on their website at [www.wes.org.uk](http://www.wes.org.uk)

### **National Women in Engineering Day Stats (from WES website)**

- 7% of the engineering workforce is female.
- 17% of engineering students are female.
- 3.4% of Engineering and Manufacturing Apprentices are female
- The UK needs to double the number of recruits into engineering to meet demand. Industry simply needs more people and whilst appointments are always made on merit if we only look at half the population (i.e. the boys) to fill the gaps you're definitely missing a trick!
- Companies with more women on their boards were found to outperform their rivals with a 42% higher return in sales, 66% higher return on invested capital and 53% higher return on equity.

### **Faculty of Engineering and Physical Sciences at the University of Manchester Stats:**

- 30% Female Undergraduate Students,
- 37% Female Postgraduate Taught Students,
- 29% Female Postgraduate Research Students,
- 22% Female Research Staff
- 23% Female Lecturers,
- 18% Female Senior Lecturers/Readers
- 9% Female Professors

## *Meet the Professionals - Keynote Speaker*



### **Professor Danielle George, EEE – The University of Manchester**

Professor Danielle George is Associate Dean for Teaching and Learning in the Faculty of Engineering and Physical Sciences, and a Professor in the Microwave and Communications Systems research group at the University of Manchester. She completed her BSc in Astrophysics, MSc in Radio Astronomy at The Victoria University of Manchester based at Jodrell Bank Observatory, and her PhD in Electrical and Electronic Engineering with UMIST. She worked at Jodrell Bank Observatory as a senior Radio Frequency Engineer until 2006 when she took up a lectureship post in the School of Electrical and Electronic Engineering. She was awarded a Professorship in 2014 at the age of 38.

Danielle's expertise in radio frequency and microwave communications has a wide range of applications across a number of industries. To date most of her research and development work has been carried out on a variety of aspects relating to ultra-low noise receivers for Space and Aerospace applications. She is involved in the \$1B astronomical instrument, the Square Kilometer Array, is the UK lead for amplifiers for the \$1B Atacama Large Millimeter Array telescope and has worked with NASA and ESA on the development of instrumentation for researchers exploring the Big Bang. She has worked with agriculturists on the development of instrumentation to measure water usage and with a number of multi-national companies such as Rolls Royce where she worked on industrial gas turbine engines.

She thoroughly enjoys the teaching aspects of her career and lectures to both undergraduates and postgraduate students, in particular Electronic Circuit Design to undergraduates and Microwave Systems to MSc students. She is passionate about raising public awareness of the positive impact engineering has on all aspects of our everyday lives and highlighting to young people the immense depth and breadth of opportunities a career in engineering can offer.

The middle one of three sisters, Danielle grew up in Newcastle where her parents still live. Fascinated by science from an early age, she was given a telescope by her parents when she was eight years' old and would regularly get up in the middle of the night to watch lunar eclipse. She credits this experience as the moment she first realized how physics and mathematics could be applied in a practical sense outside the classroom and as the first step on her path to her current career. She now lives in Manchester with her husband, Richard, and daughter, Elizabeth.

*You can follow Danielle on Twitter at: [@EngineerDG](https://twitter.com/EngineerDG)*

## *Meet the Professionals - Manchester Victoria Station Redevelopment Team*

### **Faisal Farooq, Project Manager, Network Rail**



I graduated in 2006 from the University of Leeds with a BEng in Civil & Structural Engineering. Following graduation I joined Network Rail's Graduate Engineering Scheme working within various roles and teams as well as condiments to Design Consultancies and Contractors. In 2011 I took on the position of Scheme Project Manager in Network Rail working on multi-disciplinary projects including the procurement, design development and construction stages of the Manchester Victoria Station Redevelopment Project. In May 2015 I took on a secondment leading as Project Manager for Manchester Victoria Station Redevelopment and other projects in London North Western.

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## **Caroline Griffin, Section Engineer – Morgan Sindall**

I graduated in 2012 with a MEng (Hons) in Civil Engineering from the University of Southampton. During University I was sponsored by Morgan Sindall on the QUEST scheme, where I completed three summer placements in the Severn Trent water division. Once I graduated, I was based at Manchester Victoria full time for two years, in the role of a site engineer. Following on from this, I have recently moved up to Glasgow for my next new project, Edinburgh to Glasgow Improvement Scheme. During this time Morgan Sindall have greatly supported me in my professional qualifications, and have organised a secondment for me to gain design experience as part of my Chartership. I am currently working within the Rail and Ground Engineering department.

I strongly encourage students, if available, to undertake a Summer placement. Due to the invaluable experience I received during my three site experiences, beginning work for the first time, did not faze me. It was great to finally be on a site and to use all the skills shown to me during the summers.

I have never felt at a disadvantage because of my gender, and am thoroughly enjoying working in the STEM industry. Since graduating I have been involved with a number of events with young students promoting STEM and within Morgan Sindall's "Women in Rail" group. I am very passionate about promoting the industry and even through my relatively short industry experience, have seen a massive change of the number of women on building sites and gaining the higher promotions.

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## **Suzanne Prieditis, Assistant Asset Engineer, Network Rail**

I graduated in 2010 with a BEng (Hons) in Civil Engineering from the University of Southampton. I then spent three years on Network Rail's graduate development scheme. It was during this time that I worked at Manchester Victoria, in the role of site engineer on secondment to Morgan Sindall and then as a graduate engineer in Network Rail's project team. Following on from this I moved in to the role of Assistant Asset Engineer. My core responsibilities in

this role are to evaluate the condition of railway structures and make decisions on the actions required to maintain and enhance the structures to meet the demands of running a safe railway. This can be very varied due to the vast range of structures and the stakeholders they interface with, and requires spending time out on site, reviewing assets and works first hand.

I am married with two young sons and find that maintaining a good work/home life balance is something that continues to evolve as my family has expanded and children grow. My employer has a flexible working policy to support those with caring responsibilities. Having a family has meant I have had to re-evaluate and prioritise my career goals; this has been difficult at times but has helped me focus on what I see as most important in my career at the present time.

I have never felt that my gender has been a disadvantage when studying and then pursuing a career in STEM. I however feel it would be positive to see more female role models and this will help with both attracting women to and retaining women in STEM careers.

## *Meet the Professionals - Our Contributors*



### **Mariana Asinari, Principal Structural Analyst, Mott MacDonald**

I am a Civil Engineer, I graduated from the University of Cordoba, Argentina. After my graduation in 2005 I was acknowledged with a European scholarship to study a MSc in Earthquake Engineering at the University Joseph Fourier, France and University of Pavia, Italy. After my graduation in 2007 I started as a researcher engineer in the European Centre for Training and Research in Earthquake Engineering (Eucentre). In 2008 due to my seismic background I was offer a job position to join the Mott MacDonald Nuclear Division in Manchester. I currently have more than 6 years' experience in the nuclear sector.

My role as a Principal Structural/Analyst Engineer, as part of the advanced seismic analysis and aircraft assessment team of Mott MacDonald, involves the assessment/design of nuclear power plant structures when subjected to extreme loading, such as; explosions, seismic events and tornados using finite element techniques.

As a woman, I feel that the most important values to develop a professional life are diversity and inclusion together with respect. I have a special care for these values and to show my support I have created a women in engineering group in the internal yammer website of Mott MacDonald were women can find support from others sharing experiences of being a woman working in a predominantly man's world.

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## **Sarah Beck, Civil Engineer, Amey**

Sarah studied Civil Engineering at the University of Liverpool and completed three industrial placements. Her first two industrial placements were in the consulting environment working for Mott MacDonald's highways team working on various designs for roads, junctions and car parks. Her third industrial placement was with the Highways Agency where she

gained site experience working on a resurfacing and carriageway drainage scheme on the M60 and the replacement of the Bowdon View Bridge deck over the M56.

Sarah strongly encourages all students to undertake industry placements as she gained a lot of valuable experience during this time which helped her secure a graduate job during the recession when a lot of others were struggling.

Sarah graduated from the University of Liverpool in 2011 with a Civil Engineering BEng (Hons) degree and started working for Amey on their Graduate Pathways Program in January 2012. She began working on the Civil Examinations Framework Agreement which is an asset management contract for Network Rail. Having never worked on the railway before this was a new challenge for her. Since starting her career at Amey Sarah has been given increased responsibility from conducting inspections under the mentorship of others to planning the inspections and taking the role of site team leader. All graduates joining Amey are supported whilst perusing their professional qualifications and this was a big draw for me when choosing a graduate job; Sarah has recently signed off her training agreement which allows her to sit the Incorporated Engineer review with the Institution of Civil Engineers (ICE).

During the last two years Sarah has become more involved with the ICE and has been the Chair of the Graduates and Students Committee for the North West region (2013-2014). As part of this role she gets to meet many engineering role models including the President of the ICE on his visit to the region. She has also recently launched the ICE Equality and Diversity group in the North West with some of my colleagues from the ICE Committees, and they are getting a lot of support for this group not only from our region but nationally.

All the different branches of engineering have their own institutions and I would highly recommend getting involved as much as possible, I have found the phrase 'you get out what you put in' to be very true in this case.



**Claire-Marie Boggiano,  
Director Lurig Ltd**

Claire-Marie graduated in 1992 with a MEng in Electrical & Electronic Engineering. She is an energetic and innovative BUSINESS CHANGE & PEOPLE DEVELOPMENT professional. She is a Chartered Engineer holding an MBA from Manchester Business School.

Claire-Marie is experienced in rapidly establishing & coaching high performance teams. In 2003 she said up her own business, Lurig Ltd and she works with Business Directors to crystallise, scope and execute emerging business strategies. She is a creative and motivating leader comfortable in dynamically changing environments. She uses strong team-building, communication and facilitation skills to achieve results. She applies pragmatic project management discipline to make things happen. She believes businesses succeed by working with the imagination and talents of their people.

Claire-Marie's Key Performance Indicators (KPI's) are measured in terms of shoes & cream!

**Advice to current students:**

- Aim High
- Have a Dream and follow your dream.
- Do what you love
- Get Chartered
- Keep learning
- Dress for the job you want, not the job you have
- Get plenty of work experience
- Perseverance and resilience - read 'The Dip' by Seth Godin
- Live a whole life - it's not just about your career.



**Dr Lisa Bradley, CEng MIMMM  
Site Manager at 3M and UK&I Energy  
Infrastructure Programme Leader**

Lisa graduated from The University of Manchester in 2006 with a PhD in Corrosion Science. She spent two years as a postdoctoral research associate before joining 3M in 1999 as a senior scientist. She has since progressed to within 3M to her site manager position and the Programme Lead for UK&I Energy Infrastructure.

**Advice to current students:**

- Be open minded and try new things - you never know what you will enjoy. This became more obvious to me as I took on new roles within the company I work for. Some of the roles I have had, I had not considered until someone asked me if I was interested and would consider a new challenge, and I have found that the most unlikely roles have actually been my favourites.
- Work hard and do your best - that way you will never have regrets about what you have achieved.

**Balancing caring responsibilities with your career:**

- I have two sons - one grown up and the other almost grown up. When they were younger I was lucky to have family who helped to take care of them while I went to work.
- Many companies now appreciate the importance of work-life balance - for men and women, so finding ways to manage your home life commitments with your work commitments is easier now - but still has some challenges.
- I have found that as my sons have grown up I have had more freedom for business travel, but I still try to minimise this - and with technological advances; sharing information via web conferences is now much easier and slicker.

**Challenges faced as a female working in engineering/science/technology**

- I have been in many situations where I was the only female, ranging from board meetings, to technical meetings, and also at one point I managed a production department of around 100 men and I was the only female!
- When I first started work, it was not unusual to see calendars etc. containing pictures of women in bikinis (or less!), thankfully this is no longer acceptable in the work place. So barriers like that are no longer an issue.
- My experience is that, on the whole, a person's knowledge, skills, strengths etc. are the focus as opposed to whether they are male or female.
- My experience has been positive and I have not been faced with many challenges associated with working in male-dominated roles.



## **Marie Cahill, Engineering Project Manager, Waters Corporation**

Marie graduated from UMIST with a BEng in Electromechanical Systems Engineering before completing her Masters at the University of Surrey. Marie joined 3Com (California) in 2001 as a junior hardware engineer and in 2005 she joined Pace (Yorkshire) as a senior software engineer. Her career progressed to project coordinator and manager for several engineering research initiatives. Marie has recently (March 2015) joined Waters Corporation in Manchester as Engineering Project Manager.

Marie is a highly motivated Prince2 project manager with a 15 year background in R&D and New Product Development and four years track record of delivering multimillion dollar complex engineering product lines.

She is tenacious and upbeat in a pressured, high-volume environment where demanding deadlines are the norm. Used to being a self-starter, operating with a high degree of autonomy, Marie enjoys the challenge of getting complex technology out to demanding customers and takes pride in what she does.

### **Advice to current students:**

A summer placement or internship can be a vital part of winning your first professional role - it'll provide your introduction to the industry and inform your choice of role in it. Interns that perform well are often called back in for graduate job interviews. I found an engineering degree is usually a pre-requisite for a career in software, electrical and electronic engineering. My first degree helped me get started, my masters allowed me to focus on a more specialist route in the medical industry.

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**Liz Davenport, Experimental Officer, School of Chemical Engineering and Analytical Science (CEAS), The University of Manchester**

I am currently managing an laboratory within the School of Chemical Engineering and my main duties are to demonstrate analytical techniques, discuss research support/requirements, help develop robust methods of analysis and do (lots of) data interpretation.

I was awarded a BSc(Open) in Chemistry and worked as a food scientist at United Biscuits from 1976-79 before I joined the Department of Chemical Engineering where I have worked to present day.

I am currently setting up a Liquid chromatography-tandem mass spectrometry project, and predominately use chromatography in the analysis of fuels, pharmaceuticals, bio-products and precursors.

I enjoy the different challenges that range of research within chemical engineering brings to my role.

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## **Professor Melissa Denecke, Dalton Nuclear Institute, The University of Manchester**

Professor Melissa A. Denecke is the Scientific Director of the Dalton Nuclear Institute at The University of Manchester and holds a Chair in the University's School of Chemistry. She has two decades experience in nuclear fuel cycle R&D, notably in disposal of radioactive waste and legacy clean-up. She is a world expert on studies of radioactive materials using synchrotron radiation.

I graduated many moons ago (1994!) from the German Universität Hamburg with the fancy title of 'Doctor rerum naturalium', following my 'Diplom' or Masters equivalent in 1988. I bore three children between degrees, so it took a bit longer than usual. I have both a Bachelor of Science from Carroll College in the United States and the German equivalent (Vordiplom).

My career is exciting and challenging. I have had an academic research career and have concentrated on development of new/novel X-ray techniques. I have never been bored in the realm of cutting edge research technology and never actually had a boss telling me what to do, which matches my personality. I have enjoyed a traditional career vector, starting as a post-doc and working my way up the ladder to where I am today. I have a notable list of scientific firsts, the advisory roles I have, being a department head in my last role and the present role I have now at the Dalton Nuclear Institute. My career was in Germany until I came to the UK a little less than 2 years ago.

I have caring responsibilities and, for the majority of the time, as a single parent. This has been challenging indeed, but I love my family, as I love my job, and enjoy the stimulation and satisfaction of both 'worlds'. My tip: never be too proud to accept all the help you can get!

What do I love about being a woman in STEM? - Nothing and everything really; I never saw a relation between my gender and my work. I do love that there are more women now than there used to be when I started.

Inspirational advice – You should always (!) have a credo to live by. I have a couple of one-liners that define and guide my decisions: Be true to yourself and your person. Be fair.



**Helen Dobson, Lecturer, School of Mechanical, Aerospace and Civil Engineering (MACE) – The University of Manchester**

Helen graduated in 1996 from UMIST with an MEng in Chemical Engineering with Environmental Technology, having been sponsored through her degree by Shell, which included Summer industrial placements at an oil refinery and a research site and also a summer work placement with Unilever. After graduating and working in industry for four years in petrochemicals for Exxonmobil, mainly in an environmental engineering role, Helen chose to return to academia and for the last fifteen years has worked in various teaching roles at Manchester University including posts in Chemical Engineering, the EPS Faculty Teaching Support and Development Unit, Manchester Business School and now in the school of Mechanical, Aerospace and Civil Engineering in the Project Management and Sustainability group.

Helen is enthusiastic about encouraging women into science and engineering courses and careers, having experienced first-hand the impact of seeing science kits marketed as “toys for boys”. Having studied science and engineering, Helen has since spent most of her own career working at the boundary between the technical and management fields. She is keen to help students develop the broader professional skills they need to thrive in the workplace. Since becoming a mother nearly ten years ago and moving out of the city to bring up her children in a countryside environment, Helen has chosen to work part-time and live with a very long commute to the office. It is difficult to imagine as an ambitious 20 year old that at 30 or 40 you might make decisions that mean your own career progression takes a back seat for a while, or that work-life balance is something you have to think seriously about and negotiate. She hopes that being more aware of the issues of dual career families and the need for flexible working opportunities will lead to our graduates being able to manage their own future careers more effectively and also, in the future, be a positive influence in the companies they help to lead, enabling others to combine a rich home and personal life with a strong professional career in whatever field they wish to pursue.



## Sarah T Galbraith, Director



Sarah Galbraith is a management and business consultant with a wealth of experience in consultancy, training and development. Having spent ten years in research within the chemical industry, she then moved into a number of marketing and business management roles, including international marketing, chemical sales, technology licensing, business development and associated services.

Sarah founded The Galbraith Muir Consultancy in 1998 and since then her skills and experience have been widely used, especially in sales, marketing and related areas, where she specialises in linking high-technology enterprises to the worlds of customer expectations, service and delivery of added value. She is experienced in communicating marketing needs and methods to scientists, engineers, technologists and other specialists.

Supporting these activities, Sarah has carried out several studies exploring how technology-intensive organisations deliver economic and societal impact.

All her work, in employment and in self-employment, has been made possible by her broad scientific understanding coupled with expertise and experience in broader business management.

Her clients include UK Government bodies (eg Science and Technology Facilities Council), academic institutions (eg Lancaster University Management School), research organisations, and numerous private sector companies such as Shell, Fresenius, Ineos, ICI, Thomas Swan and Borregaard.

She holds a degree in chemistry, and membership of the Chartered Institute of Marketing; she is a member of the UK Institute of Directors (IoD).

Outside work she is a keen family history researcher, an interest which is not shared in the slightest by her otherwise very supportive husband and daughter.



## Jennifer Grant, Principal Engineer, Mott MacDonald

I graduated from the University of Manchester with a BEng (Hons) in Structural Engineering with Architecture. I am a chartered member of both ICE and IStructE. I have nearly 14 years' experience working on a wide range of structural and civil engineering projects for private, public and nuclear sector clients. I currently work for Mott MacDonald as a principal structural engineer and lead projects within the Nuclear sector.

I am married with two young children and my company has supported me in returning to work after each pregnancy. I have flexible working hours and currently work a 4-day week. I think that it is important to achieve a good working/home life balance which is essential for any working mother but then again women do have the ability to multi-task!

I have definitely noticed a rise in the number of female engineers over the last decade. Attitudes, perceptions and mindsets have changed and companies have worked hard in promoting diversity and equality within the industry. This has had a positive effect on promoting female engineers. However, there is still a long way to go and I think this needs to be tackled at the grass roots. The promotion of engineering as a career for women in schools is very important as I accidentally stumbled onto this career path and did not receive any proper guidance from a career advisor at the time.

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**Lorena Garcia Fernandez, Product Engineer,  
Cummins Turbo Technologies**

I graduated with a BEng in Mechanical Engineering at the Universidad Carlos III from Madrid in Spain and then I went on to study my Master's degree in the University of Cassino, Italy through an international agreement with my Spanish university. This allowed me to study abroad and get my MSc in Industrial Engineering: Machines and Structures by Universidad Carlos III from Madrid, Spain.

I studied my Master's degree in Italy and this just gave me the perspective to understand that everyone approaches things in different ways and that all of them are equally valid, in fact they are necessary or there would be no innovation. The Italian approach was different from what I was used to but the same thing happens between male/female and young/experienced engineers... and all that knowledge is necessary in engineering to translate scientific knowledge into technological innovation.

After that, I moved to the UK to work as a graduate engineer in Cummins Turbo technologies highly attracted by their core values and their focus on diversity. I held different roles as part of the graduate rotation program and as I discovered which areas of the business I was most interested in I decided to apply for a product engineering team 12 months after I joined the company.

I held a product engineering role for 3 years working in different products starting on Variable geometry Turbochargers, and then moved on to Wastegated systems. I currently hold a lead role in developing our next generation Wastegated product which is very rewarding role. It has allowed me to link my engineering background and interest in technical project management. I am currently working towards my Chartership with the IMechE and alongside my everyday job I regularly try to get involved in STEM events to try and attract more talent into engineering.

**Some thoughts for future engineers:**

- There are many paths into engineering, choose the one that suits you.
- Engineering is about innovating and about solving problems, if you like it and put your mind to it anything is possible. Women and men are for sure different and offer different perspectives when approaching problems, but this is the same with different cultures, people just look at things differently depending on their education, their personal backgrounds and life experiences as well. This adds value because engineering is all about working in teams and encompassing each other's knowledge to achieve an optimized solution to a problem.
- There are so many different industries and business that the real everyday-work of an engineer varies greatly across companies, industries and countries.



**Julie Harrison, Technical Functional Excellence  
Leader, Cummins Turbo Technologies**

**Education:** BTEC National Diploma in Mechanical and Manufacturing Engineering (Distinction)

**Experience / Past Roles:** 6S Black Belt; Engineering IT; Drafting and Release all at Cummins; Design Engineer and CAD Leader at AutoSystems Ltd.

**Family:** Single parent to Steven (now 26) for 8 years, married to Greg for 18 years, James (16) and Robert (13)

**Hobbies:** Walking, reading, cooking and baking

**One piece of advice for engineers at Cummins:** Look for opportunities to learn from others every-day and consider challenges outside your comfort zone; you're stronger than you think you are.

**Work / life balance advice:** Be open about your personal commitments, even the best managers forget you have another job that starts every evening. Teach your kids to work the washing machine and to cook the tea – life skills that you can benefit from. Keep perspective: when you look back, you'll remember the school plays and whether you were there – you won't remember the meetings you attended or missed!

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## **Jennie Harrison, Civil Engineer, AECOM**

I graduated from The University of Manchester in 2009 with a MEng (Hons) in Civil Engineering. Since graduating, I have worked at AECOM in Altrincham – predominantly within the highways team, but with a stint in the rail team and a secondment to Manchester City Council as well.

I started out as graduate engineer, being promoted after 3 years to an engineer. On a day-to-day basis, I design roads and drainage systems, as well as helping to manage projects.

I feel when I started I was given more admin based tasks than my male colleagues of a similar level – however I don't feel like I am treated any differently now. I have represented both AECOM and The Institution of Civil Engineers at several school/college/university career events, promoting the industry and trying to inspire the civil engineers of the future.

I love being a woman in STEM because I love engineering and maths – I don't feel I should be treated any differently because I am woman.



**Kirsty Harrison, Refinery Supervisor,  
Cargill**

I graduated from The University of Manchester in June 2012 with a degree in Chemical Engineering with Industrial Experience. Since then I have spent the last 3 years with Cargill working in a wheat processing plant, in a variety of roles in the production team. My first role was a Shift Coordinator where I managed a team of 9 operators responsible for operating the plant which produced around 1000 Te glucose per day. This role was a steep learning curve but I enjoyed the challenge of working in a fast paced manufacturing environment and after 1 year was promoted to the role of Area Supervisor for the refinery section of the plant.

Since graduating I have been fortunate enough to be involved with a number of events with young students to promote careers in STEM, which is something I am particularly passionate about and earlier this year received a nomination for the International Women's Day Awards for my work in this area.

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## **Dr Shijie Liang, Applications Engineer, Industrial Tomography Systems plc**

Shijie completed her BSc in Electronics Information Engineering in North China University of Technology in 2006 before joining the University of Manchester to study for her MSc and PhD. She is currently a visiting academic at the University and an applications engineer for Industrial Tomography Systems plc.

Shijie's current role and responsibilities include:

- The design and testing of Electrical Capacitance Tomography and Electrical Resistance Tomography sensors
- On-site installation and commissioning instrumentation systems and process equipment for a global range of industries
- Coordinating and liaising with subcontractors and suppliers during sensor fabrication
- Create and maintain a safe laboratory environment
- Provide advanced technical input to the sales process, specialist support and training
- Technical support including writing applications, reports and problem solving
- Training & developmental needs for the discipline and supporting graduate engineers.

### **Advice to current students:**

Once you set a goal, don't give up too soon. Break it down into several things to achieve. No blame, no regrets, keep trying, and be realistic! Join a related engineering/scientific institute. It will also be good to have a mentor, who can give you advice, exchange ideas and motivate you.

### **Balancing caring responsibilities with your career:**

I have a 21-month daughter. As a new mum I was confused and easily emotional by small things at the beginning. Support from family and my colleagues is extremely helpful, however, support and patience from others won't come to me if I don't support others. I found it helpful to speak to other mums who are also working full time. I usually arrange my weekly workload on Monday and try to follow a healthy daily routine which suits me and my family best. I also alter the routine until I am comfortable to follow it on a daily basis. Things change quickly and I am just trying to be calm to face the surprises but of course, it is sometimes easier said than done, so keep calm and crack on!

### **Challenges faced as a female working in engineering/science/technology:**

My work requires me to travel around the world for commissioning in various industrial sectors, where 80% of the engineers are male. I did have to work very hard because my job involves multidisciplinary projects. At the beginning of my career, I was trying to act and think *male*, however, I found it was not necessary. Female engineers I find to be more patient and look things from different angles, which always helps in group brainstorming.



## **Elizabeth Rickard, Highwire Safety Engineers and STEM Ambassador for the Women in Engineering Society**

Liz is a business owner, construction engineer and ambassador for women in STEM. She has a 12 year old child and balances running a business, media representation for women in STEM and family life.

In her spare time she loves music even sometimes taking over her sons DJ decks, fashion and art. But she still keeps her hand in with structural analysis of traditional build

and as well as providing services for her local Moravian settlement built in 1795 by Le Trobe has just completed renovation of her own home.

She is passionate about the ability of the built environment to change lives for the better, and creating a more positive work culture in this sector.

Liz graduated from the University of Salford in 1995, and has worked at the sharp end of the construction sector for over 20 years. Her specialist company employs 16 people and they have recently completed height safety provisions for Manchester Town Hall and Library.

Over the last 3 years Liz has become increasingly involved in industry standards and promoting diversity - her company being the smallest to pilot the BeFair framework for CITB.

“When I started my career there were very few female role models, I came across very few other women and none with kids. When I found I was having my son it was a very lonely time as I did not want to give up my career but saw no one like me in the sector.

You know child care and nursing are more dangerous than construction and women are accepted there!

I believe women need to see role models for a career path - which includes family as much as it is accepted by men. Being a parent gives you skills, and a more accepting diverse industry is a healthier environment for all”



**Dr Vicky Riding EngD CChem**

**Research Scientist (Unilever) & Visiting Academic (University of Manchester)**

I graduated in 1997 with a BSc (Hons) in Chemistry before working for Zeneca, Avecia and Fujifilm in ink-jet printing. Whilst working there I studied a Master's degree part-time in Colour Application Technology.

At this point I also fell pregnant with the first of my two children. In 2009 I took voluntary redundancy, so that I could return to university to study for a doctorate in Chemical Engineering and Analytical Science for which I gained sponsorship from the EPSRC and Unilever. I also picked up a Diploma in Enterprise

Management whilst I was at the university. I got my doctorate in 2013.

Since then I have been working for Unilever, who are involved in developing high-throughput mixers for shampoo and conditioner. The project is a collaboration between the Unilever, Johnson Matthey, ITS and the universities of Manchester and Birmingham, so there is frequent travel within the UK. At times during my career I have worked part-time to fit in with my children's needs.

I think women should stand up and take their place within the STEM community.

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## **Bryony Robinson, Process Development Engineer, Mondelez International**

I currently work for Mondelēz International at the Chocolate RD&Q centre located in Bournville (south Birmingham). I completed an industrial placement with MDLZ in 2013/2014 as an Engineer in the Centre of Excellence for coffee in Banbury RD&Q. I re-joined the company as a graduate in August 2014 with a job title of Process Development Engineer. I am currently on a secondment in another team within chocolate RD&Q which has a greater focus on process optimisation.

### **Advice to current students:**

Get the most out of your degree and learn as much as you can while you have all of the University resources at your fingertips. I graduated in 2014 with a MEng in Chemical Engineering and my degree has proven to be invaluable from a career perspective – without even really knowing it you develop during your degree to think in a certain way, approach problems from a certain perspective and tackle problems in a manner as to find the most appropriate solution.

In terms of career choices, make sure you fully consider all opportunities available to you when deciding which career path to take, there may be less obvious opportunities that turn out to be the best ones. Don't worry about it too much – you will have a long career during which you can change your mind and alter your career path based on your passions and interests.

### **Challenges faced as a female working in engineering/science/technology:**

I embarked upon a career path in STEM due to my passion for science, maths and engineering. In the Research and Development Centres that I have worked in to date, the employees have been fairly evenly split in terms of gender. There are situations in which I find I'm the only female but I'm quite sure this would be the case in a lot of industries – I don't feel my gender impacts my work life in the engineering industry.



**Dr. Flor Siperstein, Reader, School of Chemical Engineering and Analytical Science, The University of Manchester**

Flor Siperstein got her undergraduate degree in Chemical Engineering from the National Autonomous University of Mexico in 1994. She worked for a year at the Ministry of Finances before starting her PhD at the University of Pennsylvania, where she worked under the supervision of Prof Alan Myers and Prof Ray Gorte on adsorption of multicomponent gases in zeolites.

After graduation, she joined the group of Prof Keith Gubbins at North Carolina State University, where she started working on molecular simulations. During her 3-year postdoctoral appointment, she spent 3 months at the Universite de Paris Sud, in the physical-chemistry laboratory head by Prof. Alain Fuchs. There she met researchers from Tarragona who encouraged her to apply for a research fellowship in Spain.

She obtained the prestigious Ramon y Cajal Fellowship and in 2003 she moved to Tarragona, Spain, and started her job as a researcher at the Universitat Rovira i Virgili. She took a lecturer appointment at the University of Manchester in 2006 and was promoted to Reader in 2012.

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**Dr. Rossmarie Villegas, Lecturer in Petroleum Engineering, School of Chemical Engineering and Analytical Science (CEAS), The University of Manchester**

Since December 2009, Rossmarie is a Lecturer in Petroleum Engineering at the University of Manchester. Her professional career started in the year 2000 when she got a Petroleum Engineering degree in Venezuela and she started to work as a Reservoir Engineer in the Venezuelan Oil Company (PDVSA-Intevep). In order to advance her career in 2003 she decided to start a PhD in Applied Mathematics, in Spain, funded by The Spanish Oil Company, Repsol YPF. In the year 2007 she completed her PhD and she went for a postdoctoral research position at the Institute of Petroleum Engineering at Heriot Watt University in Edinburgh. In 2008 she started to work as a Lecturer in Petroleum Engineering at The University of Leeds.

In Manchester Rossmarie has been collaborating with the School of Earth, Atmospheric & Environmental Sciences (SEAES) in order to improve the Petroleum Engineering programme, helping with the curriculum review, designing and developing new courses and continuously aiming at improving the Manchester student experience. As a result, she received two awards at the beginning of the year 2012: the Teaching Excellence Award from the University of Manchester in the 'rising star' category, and the exceptional performance award from her school (SCEAS). Shortly afterward, she had two children and now she is trying to cope with the many challenges of family life and academic career.

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## Networking

Networking is a great way to gain personal insights and start deciding on a career path. You will hear others' experiences and make contact with people in the area you're interested in. Try to talk to as many people as possible from a variety of roles and consider talking to people from a different background to you to broaden your options.

### Possible questions

- What is a typical day like in this role?
- How did you get started in this role?
- What kind of work experience would be helpful?
- What is the selection process like?
- What are the key skills needed for this role?
- What is the working environment like?
- What do you enjoy most about this role?
- What is the most challenging part of your role?
- Is there any other advice you could give someone interested in this career path?
- Additional questions specific to your role and background.

## Careers Service

Whatever stage you are at in your career planning, hopefully this event will have inspired you to take the next steps with confidence. There is a huge network of support for you at The University of Manchester so take advantage of it while you are here. You can benefit from a wide range of services such as:

- Help finding internships/work experience
- CV/covering letter writing guides and workshops
- Company profiles and testimonials
- Guidance services
- Appointments with careers consultants
- Mentoring schemes
- Practice interviews/practice psychometric tests
- Paid work vacancies

**Website:** [www.careers.manchester.ac.uk](http://www.careers.manchester.ac.uk)

**Open Times:** Monday—Friday, 9am—5pm

**General enquiries:** +44 (0)161 275 2828

**Student and graduate information and guidance enquiries:** +44(0)161 275 2829

**Visit us:** The Atrium, 1st floor University Place, Oxford Road, Manchester M13 9PL