Championing Equality and Diversity
“Top-Down, bottom-up for impact”

Dr Rachael Rothman – Director for Women in Engineering
Kate Watson – Women in Engineering Project Manager
University of Sheffield

ECU Conference 2016: Connect, Collaborate, Share
30th November 2016, Nottingham
What does an Engineer look like?

15.8% Engineering & Technology UGs are female
Only 9% of the Engineering Workforce is female
...where are the Women in Engineering?
Faculty of Engineering

5,000+ students \(\uparrow 64\%\) since 2008

Academic departments:
- Materials Science
- Civil & Structural
- Computer Science
- Electronic & Electrical
- Mechanical
- Chemical & Biological
- Automatic Control & Systems

7 interdisciplinary programmes:
- MEng Engineering
- Bioengineering
- Aerospace

900 staff \(\uparrow 36\%\) since 2008

£150m invested in new facilities

£77m research income \(\uparrow 105\%\) since 2008

65 countries
Some History...

- Faculty of Engineering E& D working group in 2009 – part of “Excellence through Inclusion” project
  - Gender highlighted as area we could (and should) make the biggest difference
  - Recommendation to have a “tsar” for female staff and students
- Director for Women in Engineering
  - Post created in 2011, enables top down approach and influence at all levels
  - 20% role
  - Sits on Faculty Executive Board
  - Ensures E&D input into every decision taken at Faculty level
  - Regular meetings with Pro Vice Chancellor
- Women in Engineering team + resources
  - Staff budget ~£40k + 20% of me
  - Non-staff budget ~£23k + widening participation + outreach + admissions and recruitment

“Our aim is that the Faculty of Engineering at the University of Sheffield should be the first choice for women to come both to study and to work”
Senior Lecturer Promotions:
7 females (100% success), 14 males (93% success)
Reader/Professor Promotions:
5 females (4 approved, 1 STR), 6 males (4 approved, 1 STR)
Students

UG

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Students</th>
<th>Female</th>
<th>Male</th>
<th>% Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>3500</td>
<td>625</td>
<td>2875</td>
<td>18%</td>
</tr>
<tr>
<td>2012</td>
<td>3600</td>
<td>630</td>
<td>3070</td>
<td>18%</td>
</tr>
<tr>
<td>2013</td>
<td>3550</td>
<td>610</td>
<td>2940</td>
<td>17%</td>
</tr>
<tr>
<td>2014</td>
<td>3800</td>
<td>720</td>
<td>3080</td>
<td>18%</td>
</tr>
<tr>
<td>2015</td>
<td>4000</td>
<td>800</td>
<td>3200</td>
<td>19%</td>
</tr>
</tbody>
</table>

PGT

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of students</th>
<th>Female</th>
<th>Male</th>
<th>% Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>700</td>
<td>175</td>
<td>525</td>
<td>26%</td>
</tr>
<tr>
<td>2012</td>
<td>750</td>
<td>190</td>
<td>560</td>
<td>25%</td>
</tr>
<tr>
<td>2013</td>
<td>750</td>
<td>190</td>
<td>560</td>
<td>25%</td>
</tr>
<tr>
<td>2014</td>
<td>770</td>
<td>194</td>
<td>576</td>
<td>26%</td>
</tr>
<tr>
<td>2015</td>
<td>800</td>
<td>200</td>
<td>600</td>
<td>27%</td>
</tr>
</tbody>
</table>

PGR

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of students</th>
<th>Female</th>
<th>Male</th>
<th>% Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>100</td>
<td>21</td>
<td>79</td>
<td>21%</td>
</tr>
<tr>
<td>2012</td>
<td>100</td>
<td>21</td>
<td>79</td>
<td>21%</td>
</tr>
<tr>
<td>2013</td>
<td>100</td>
<td>21</td>
<td>79</td>
<td>21%</td>
</tr>
<tr>
<td>2014</td>
<td>120</td>
<td>24</td>
<td>96</td>
<td>24%</td>
</tr>
<tr>
<td>2015</td>
<td>120</td>
<td>24</td>
<td>96</td>
<td>24%</td>
</tr>
</tbody>
</table>
Athena SWAN Awards

- Chemical & Biological Engineering 2013
- Materials Science & Engineering 2015
- Computer Science 2016
- Electronic & Electrical Engineering 2013
- Civil & Structural Engineering 2013
- Mechanical Engineering 2015
- Automatic Control & Systems Engineering 2015
- Nuclear AMRC 2016
Top-Down
Directing

- **Visibility!**
- Faculty Equality and Diversity Committee 2014 - onwards
- Sit on University Equality, Diversity and Inclusion Committee, Gender Equality Committee and Women@TUOS Steering Group
- Faculty Executive Board Focus Meetings on WiE
  - Direct influence on HoDs
  - “Is equality and Diversity strategically important?”
  - “What step changes are needed to achieve our female professor KPI?”
- **Impact:**
  - Departmental Executive Committee membership
  - Champions have 150 hours (~10%) workload allocation during Athena SWAN submission years, 50 hours at other times
  - Engaged and informed HoDs
Directing

• Task & Finish Groups
  – Student Group 2011 - 2014
  – Staff Group 2011 – 2014
  – Comms Group 2011 – 2014
  – BME Attainment 2014 - 2016
  – Unconscious Bias 2016 – 2017
  – Data 2016 - ...

• Unconscious Bias training for all in Faculty

• Events and Activities
Faculty Equality and Diversity Committee

- Created in 2014
- Representatives from:
  - every department, across the whole range of staff roles
  - Student Women in Engineering Society
  - Student’s Union
- Focus at each meeting
  - LGBT staff and students – input from Open@TUOS
  - BME Attainment
  - Faculty E&D Strategy
  - Mental Health is next...

“Our aim is to be the first choice for women to come both to study and to work in Engineering. We will build an inclusive community that actively attracts a diverse range of people and supports staff and students to achieve their potential”
LGBT and engineering: The silence must stop

Professor Mike Hounslow, Pro-Vice Chancellor for Engineering

I’ve been thinking for some time about what we should be doing and saying to make it clear that people of all sexual orientations are welcome in our Faculty. Given the events in Orlando this month, if I don’t talk about it now when would I? Here’s what I’ve been thinking: in our Faculty we don’t talk about things like religion, sexual orientation or gender identity - so I am going to. Whether you are straight, gay, lesbian, bi or trans it should be made clear that the University and our engineering Faculty is a safe place and that people of all orientations are absolutely welcome.
Bottom-Up
Faculty of Engineering Athena SWAN Role

- Appointed (temporary contract) April 2014
- Legacy of previous submissions
- Expectations of the role varied wildly
- Project Management Skills invaluable
Faculty of Engineering Athena SWAN Role

- Temporary contract flew by
  - Visiting self assessment teams
  - Awards from previous submissions announced
  - First Athena SWAN Panel July 2014
  - New Director for Women in Engineering appointed
  - First submission supported November 2014 round

- December 2014 role made permanent (0.6 FTE)
  - Rebranded and more clearly defined in light of experience

- Today – Endless Possibilities and Strict Priorities
Top Down or Bottom Up?

• As an experienced project manager I think both are essential

• As a good project manager I keep my eyes on both and make small barely visible interventions to make the most of them

• In my role of Athena SWAN Project Manager I see the bottom up influences as very powerful in creating change that is embraced rather than resisted.
Unconscious Bias Training

- University provision – no interest
- 2014 - Small local taster session organised within Faculty for Athena SWAN Champions – interest sparked - +ve feedback
- 2015 Women in Engineering funded and promoted two sessions – approximately 70 attended
- Athena SWAN Champions - led request for more Unconscious Bias training and.....
- The Faculty Equality and Diversity Committee responded with the recommendation all Faculty staff should have training.
- A Task and Finish group is working to embed the training locally going forwards
- Hundreds have received the training. The last session attended by 60 staff. One department has 98% attendance.
Athena SWAN Champions Forum

- Every department has 2 – 3 Athena SWAN Champions
- Faculty of Engineering Athena SWAN Champions Forum
  - My aim was to empower the champions and help them to feel supported
  - The sessions were led/facilitated by the Athena SWAN Project Manager and a simple structure used:
    1. Athena SWAN news
    2. Something about Athena SWAN e.g. Impact, Action Plan refresher
    3. opportunity to feedback/be listened to
  - The format was a success in bringing people together and the group matured
Champions Forum Growth

- Champions started to influence the sessions; saying what they wanted to see (e.g. a presentation on the University Athena SWAN submission) and as our experience grew I enjoyed finding more stretching sessions such as
  - An ask the panellist session with our staff representatives on Athena SWAN panels
  - A university-wide shared learning and celebration event - this is developing to be three co-organised events per year
- Developed from predominantly academic champions to a wider mix of staff - pre-empting the expanded Charter
- Our membership has grown, the increased diversity bringing shared learning and extending good practice to more staff and students.
  - Now have Athena SWAN champions representing units outside the traditional academic departments such as our Interdisciplinary Programmes (students but no staff) and Multidisciplinary Engineering Education (staff but no students)
  - In 2015 we were joined by representatives from our offsite Nuclear Advanced Manufacturing Research Centre (Nuclear AMRC). Their work was so different to the campus norm and Kathryn’s passion to make a difference awe inspiring and quickly leading to a Bronze Athena SWAN award under the expanded Charter.
Individual Champion Success

- It has been heartening to see Athena SWAN Champions achieving parallel career successes

- Several have gained promotions and/or taken on high profile department and faculty roles
  - Champion → Faculty Director for WiE
  - Champion → Director for Learning and Teaching
  - PDRA → Lecturer
  - Lecturer → Senior Lecturer → Reader

- While their success sits firmly with their own passion and hard work, it is worth considering the unique experience being an Athena SWAN champion provides in terms of exposure, collaborative working, and detailed understanding of a department
Champions Growing Influence

- YES! The outburst of an Athena SWAN Champion achieving the full set – a representative from the Self Assessment team onto every departmental committee including Exec!
- Oft-cited good practice from engineering and leading the way on sharing learning (June 2016 event)
- In Autumn 2015 the Pro Vice Chancellor invited Champions and their HODs to present progress against actions at the Faculty Executive Board. This was a previously unheard of level of exposure for many of our champions. Great presentations, discussions and engagement followed. With one memorable outcome:-
Women in Engineering

Founded in 2012 at the University of Sheffield

Inspire the young generation & raise awareness

Involve engineering students with outreach & projects

Improve the employability of students

www.womeninengineering.org.uk
“We want to show the huge diversity of the engineering discipline; to break preconceived notions of what engineering is and to showcase our excellent Women in Engineering at Sheffield.”
Suzie & Ricky

The Crash Landing
Engineer Profiles

**Bruce the Bioengineer** (Sheffield, UK)
Job: Creating devices and engineering tissues to benefit the medical field.
Research Area: Designing exoskeletons and growing skin.
Past Projects: Making an insulin pump to continuously treat diabetes.
Hobbies: Rock climbing and football
Pets: 4 Goldfish – Buster, Bertie, Betty and Boo
Favourite Subjects at School: Biology and Physics
Favourite Toy: Board games

**Anna the Aerospace Engineer** (Boston, USA)
Job: To research, design, develop, maintain, monitor and test the performance of aircraft, missiles, satellites and space vehicles.
Research Area: Space flight simulation analysis.
Past Projects: Developing the safety features in new aircraft and system integration in space shuttles.
Hobbies: Running, travelling and eating
Pets: 2 tabby cats named after astronauts, Buzz Aldrin and Neil Armstrong
Favourite Subjects at School: Physics, Geography and Art
Favourite Toy: Barbie

**Molly the Mechanical Engineer** (Nairobi, Kenya)
Job: To research, design and evaluate machines, devices, equipment and systems, which overlaps with many other forms engineering.
Research Area: The development of new areas of energy production by researching the use of water turbines under the sea.
Past Projects: Robotics projects, development of diggers and brake pads for cars, and making improvements to manufacturing processes.
Hobbies: Going to the zoo, photography and gardening
Pets: 2 rabbits - Bubble and Socks
Favourite Subjects at School: Math and Science
Favourite Toy: Mecano

**Ed the Electrical Engineer** (Shanghai, China)
Job: To design electronic circuits.

**Matthew the Materials Engineer** (Paris, France)
Job: To understand the properties of materials and researching, defining, designing and developing new materials.
Research Area: New biomaterials that may be able to monitor the human body to detect illness.
Past Projects: Produced new materials for space shuttles, biomedical implants and the automotive industry.
Hobbies: Swimming, watching cricket and painting
Pets: Turtle called Jean Paul
Favourite Subjects at School: Maths, Chemistry and Design & Technology
Favourite Toy: Lego

**Chloe the Chemical Engineer** (Sydney, Australia)
Job: Designing and developing processes to turn raw materials into products.
Research Area: Developing new methods for safe nuclear energy production.
Past Projects: Manufacturing new pharmaceutical products, and making biodegradable plastic packaging.
Hobbies: Surfing, playing the sax, road tripping, and volunteering
Pets: Aria (collie dog), Pokey (hedgehog), Albert (tortoise)
Favourite Subjects at School: Biology, Chemistry and ICT
Favourite Toy: Playstation

What kind of Engineer will you be?
Top-Down & Bottom-Up
My first impression in 2014 was that Athena SWAN data issues left unchecked could derail our work.

My conclusion in 2016 is that bottom up and top down combined can move mountains .......... and build bridges 😊
"I'm impressed by the technology on display but even more so the passionate, intelligent people interacting with kids."

"Thank you for an incredible day learning and having so much fun."

"Thanks for a fab afternoon inspiring my little horrors!"
Explore STEM for Girls
http://www.stemexplore.co.uk/
The World Needs More Women Computer Scientists

Women in Computing at Sheffield
http://wow.group.shef.ac.uk/
"THE EXCITING THING ABOUT BIOENGINEERING IS WORKING IN MULTIDISCIPLINARY TEAMS ALL TRYING TO IMPROVE PEOPLE’S LIVES."

CLAIRE JOHNSON
"I use multi-scale modelling, using engineering to solve medical problems."

XINSHAN LI
“IN PRIMARY SCHOOL I MET ASTRONAUT HELEN SHARMAN, THAT WAS THE TURNING POINT WHERE I GOT EXCITED ABOUT SCIENCE AND ENGINEERING.

KATY GREATBATCH
"I have a family and children and I'm still doing engineering, and being successful at it."

JOSEPHINE LAWAL
Summary – what’s worked & why

- Faculty Director and team in Place with appropriate resources
- Enthusiastic champions in every department
- Regular meetings with key themes
- Enthusiastic students given opportunities
- Talking!
- Task and Finish Groups have enabled new strategies to be put in place
Bad working practice adversely affects females; good working practice benefits all.

@TUOSWomenEng
@SheffUniEng
@EngWomen