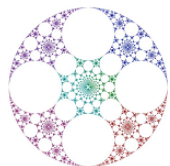


how we can make science more awesome

dr jess wade
imperial college london
1st june 2017

<https://goo.gl/Qiarj1>



WISDOM

Women In the Security Domain (and) Or Mathematics

// why are you here?



Belgium

Belgian university tells female students to wear 'low-cut' tops to graduation ceremony

Email with suggested dress code from the Brussels Free University's medicine faculty condemned as sexist

moi vous
'arrière du

raison pour vous aider à revêtir la toge
(prêtée par l'ULB). Vous êtes
nombreux, soyez donc à l'heure.

D'un point de vue esthétique, il est
préférable que les jeunes femmes
revêtent une robe ou une jupe ainsi
qu'un joli décolleté et les hommes, un
costume. Bien entendu, mesdames,
cette consigne n'est pas obligatoire.

// why am I here?



Juno Committee

The Departmental Juno Transparency and Opportunity Committee was established in 2007 to implement the [Institute of Physics' Juno Code of practice](#) which aims to support best practice for all staff with particular attention to putting in place practical actions to address the under representation of women in university physics. The Committee is also guided by the [Athena Swan Charter](#). The Department was awarded Juno Championship status and the Athena Silver Swan award in 2009, this was renewed in 2012. The Head of Department and the Heads of Group have endorsed an ongoing action plan.

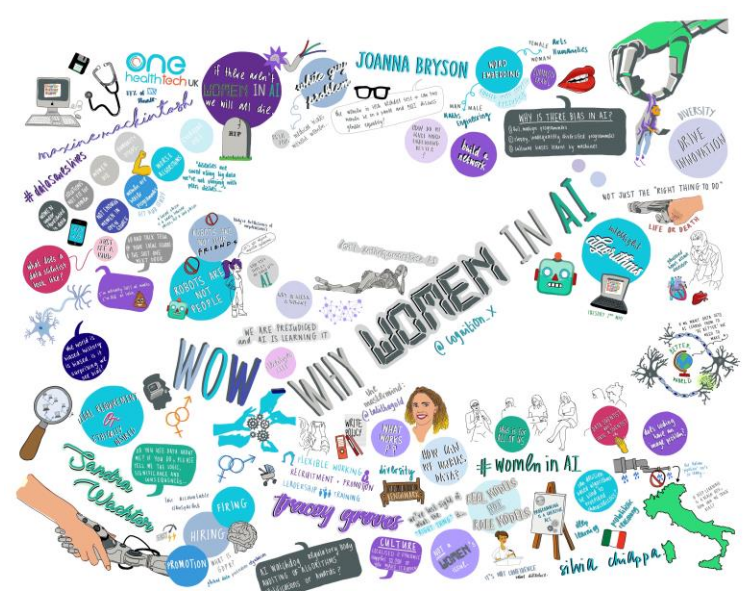
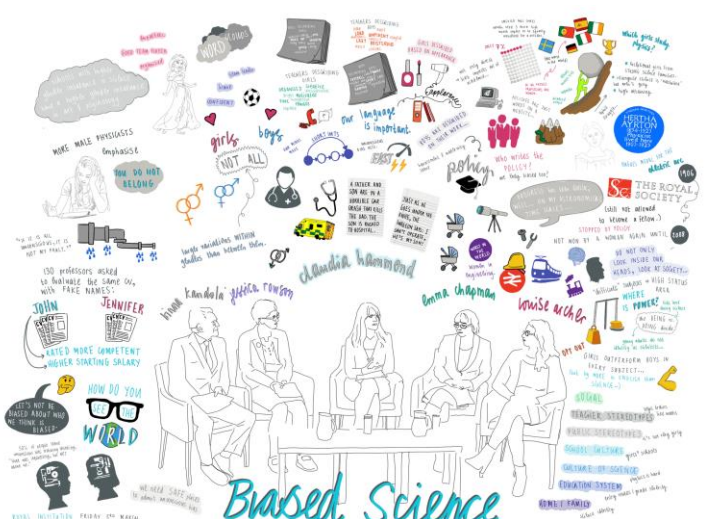


Groups > Women in Physics Group > Group prize

Jocelyn Bell Burnell Medal and Prize (previously the Very Early Career Female Physicist Award)

Institute of Physics Jocelyn Bell Burnell Medal and Prize for the very early career female physicist of the year 2017.



[illegible]

outline

school

undergrad

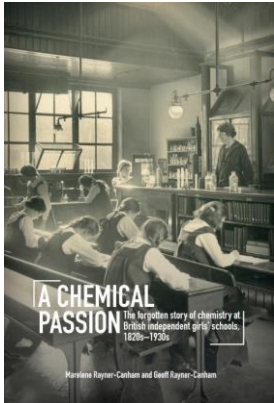
postgrad

imperial
activity

what we
can
(all)
learn

//girls in science + the hadow report

17 men + 4 women

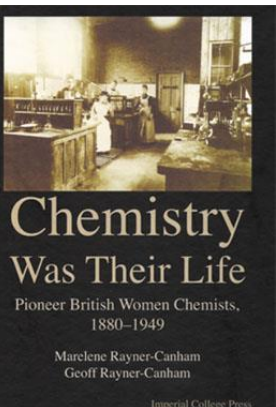


“one of the most important aims of the training, fitting girls for the duties of motherhood and for work in the home, has been unduly observed by the academic trend”

“The materially lessened amount of hæmoglobin in the woman's blood after puberty is significant: hæmoglobin is the agent of internal respiration, the oxygen carrier of the system; and oxygen is the great liberator of energy. It is therefore evident that the male is the better prepared for a more abundant liberation of energy with less exhaustion or fatigue.”

“It appears to be generally recognised that girls in general are not so strong physically as boys and are more highly strung and liable to nervous strain. Moreover, medical statistics seem to indicate that there is a higher percentage among girl pupils of cases of anaemia, spinal curvature, defective eyesight, and minor physical defects.”

“A special reason is the comparative lack in girls of an attitude of scepticism and curiosity which gives the best approach to Natural Science. Girls have, however, an aptitude for the Biological Sciences, in which they are helped by their greater diligence and neatness; they excel in subjects which require descriptive powers and a capacity for comprehending elaborate classification.”



// girls in physics

most important things:



- appoint a **gender champion** in senior leadership
- outline, implement and advertise a **plan**
- use **data** and **evidence**: compare your school to national average, look at different subjects, options, sets
- train teachers in **unconscious bias**
- **language lessons** – feedback, expectations, careers
- rethink your **science clubs**
- **give guidance** on options, careers advice, psche on how to get most out of options evening
- increase **students' awareness** and engagement in biases around them



least important things:

- stem enrichment activities- 5 years of data from 300 schools - <https://phys.org/news/2016-12-stem-enrichment-impact-results.html>
 - % on fsm
- say conventional physics isn't for girls / make physics 'girly'
 - i.e. engineering degrees are not requiring a-level physics (!)
 - "change their course entry requirements rather than "begging" schoolgirls to study physics"

Reports

The Institute has published several reports investigating the gender imbalance of physics A-level and on issues around equality of education.



Improving Gender Balance - Reflections on the impact of interventions in schools (2017) Findings from the Improving Gender Balance and Drayson pilot projects and recommendations for good practice

Improving Gender Balance - Results and recommendations from the IOP's work in schools (2017) A summary of the Improving Gender Balance and Drayson pilot projects, ahead of the full report launch in March 2017

Opening Doors: A guide to good practice in countering gender stereotyping in schools (2015) Case studies and key recommendations of how schools can explore equality issues across the whole school.

Closing Doors: Exploring gender and subject choice in schools (2013) An exploration of national data on progression to A-level in selected subjects, including physics. The report draws attention to the gender imbalances that exist on A-level courses.

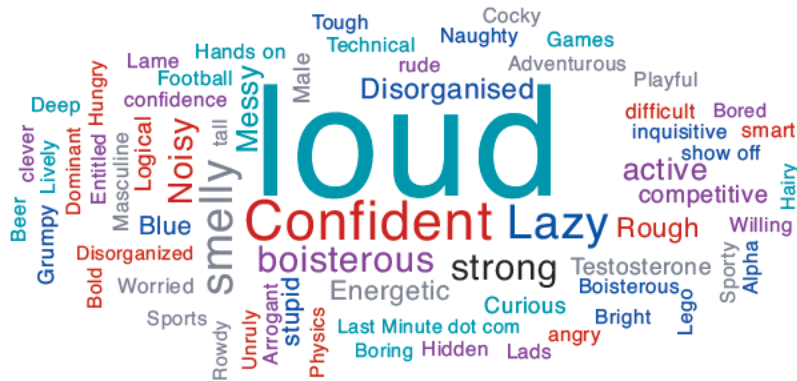
It's Different for Girls: The influence of schools (2012) uses data from the National Pupil Database to explore how uptake by girls onto A level physics courses varies in different types of schools.

Girls into Physics: Action research (2009) is the evaluation report from our 2008 school-based action research programme, including recommendations for classroom practice.

Girls in the Physics Classroom: A review of the research on girls' participation in physics (2006) a summary of the existing research on girls' participation in physics, highlighting common threads and suggesting effective strategies.

// language stereotyping

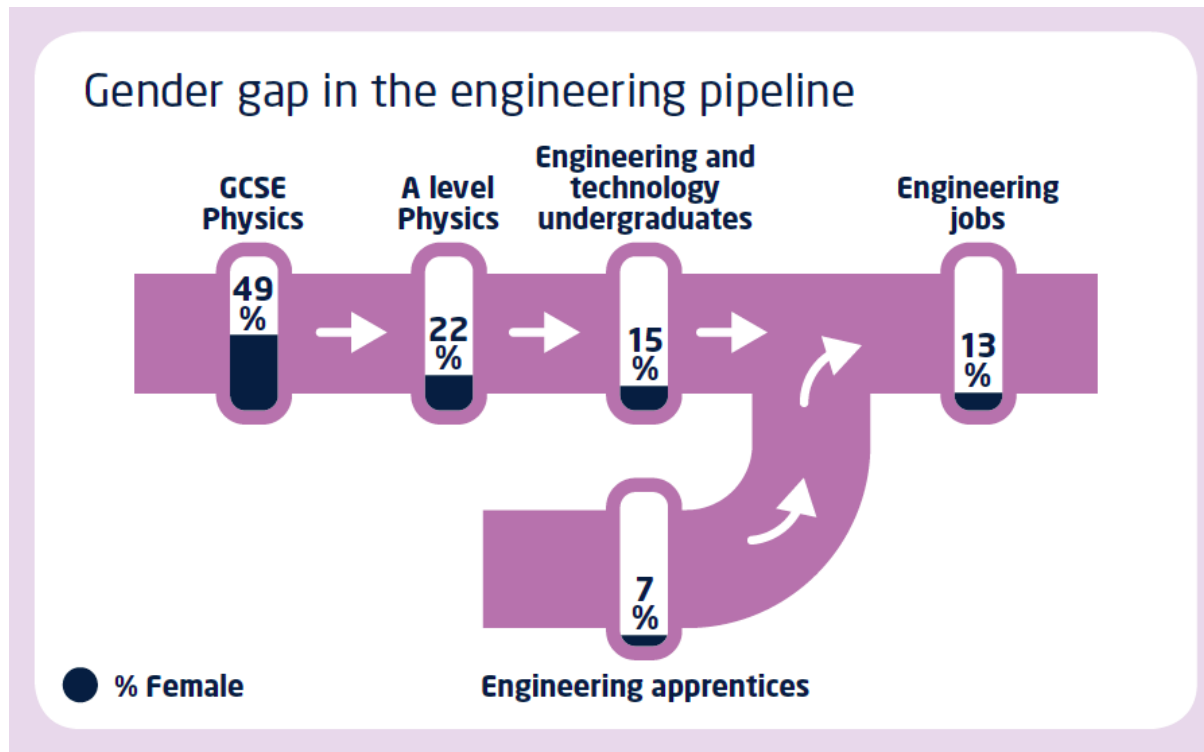
Give me three words you would associate with boys



Give me three words you would associate with girls



http://www.iop.org/publications/iop/2017/file_69171.pdf



// what do we do to the ‘pipeline’?

// undergraduate

science
degrees
are 'hard'

exam
stress

casual
sexism

nss
surveys

Mental health

Number of university dropouts due to mental health problems trebles

Data shows record 1,180 students who experienced mental ill health left courses early in 2014-15, up 210% from 2009-10

News > UK > Home News

Young women 'significantly more likely' to report symptoms of anxiety and depression than young men

Charities warn high number of young women working in low-paid and insecure jobs having 'terrible impact' on their wellbeing

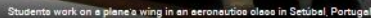
May Bulman | @maybulman | Friday 14 April 2017 22:38 BST | [4](#) comments

<http://www.independent.co.uk/news/uk/home-news/young-women-anxious-depression-mental-health-ons-young-womens-trust-a7683861.html>

<https://www.theguardian.com/society/2017/may/23/number-university-dropouts-due-to-mental-health-problems-trebles>

The Atlantic

Magazine ✓

PSYCHOLOGICAL AND
COGNITIVE SCIENCES

// develop resilience

Resilience Toolkit

A Physicist's Guide to Building
and Maintaining Wellbeing



Why might you need to think about your resilience and wellbeing?

Your working life
becomes more
challenging despite
improved income
or progression

You work in
a discipline that
is demanding and
contains many
unknowns

Your ambition
to do well means
pushing yourself hard
and developing
new skills

You may
encounter difficult
people who are
stressful to
work with

You're
uncertain about
what comes next
in your career

You worry
that you aren't
good enough to
pursue your career
or qualification

You might
face uncertainty
working on a
fixed contract

Some career
paths in physics are
competitive to follow, so
you are likely to
face rejection

// it's a very real problem



For Female Astronomers, Sexual Harassment Is a Constant Nightmare



by Olivia Gordon
APR 7 2016

Earlier this year, famous Berkeley astronomer Geoff Marcy was found to have sexually harassed his students for years

https://broadly.vice.com/en_us/article/youre-targeted-sexually-how-female-astronomers-are-being-hounded-out-of-work

// leaving after PhD

1. the characteristics of academic careers are unappealing
2. the impediments they will encounter are disproportionate
3. the sacrifices they will have to make are great

all consuming nature of academia

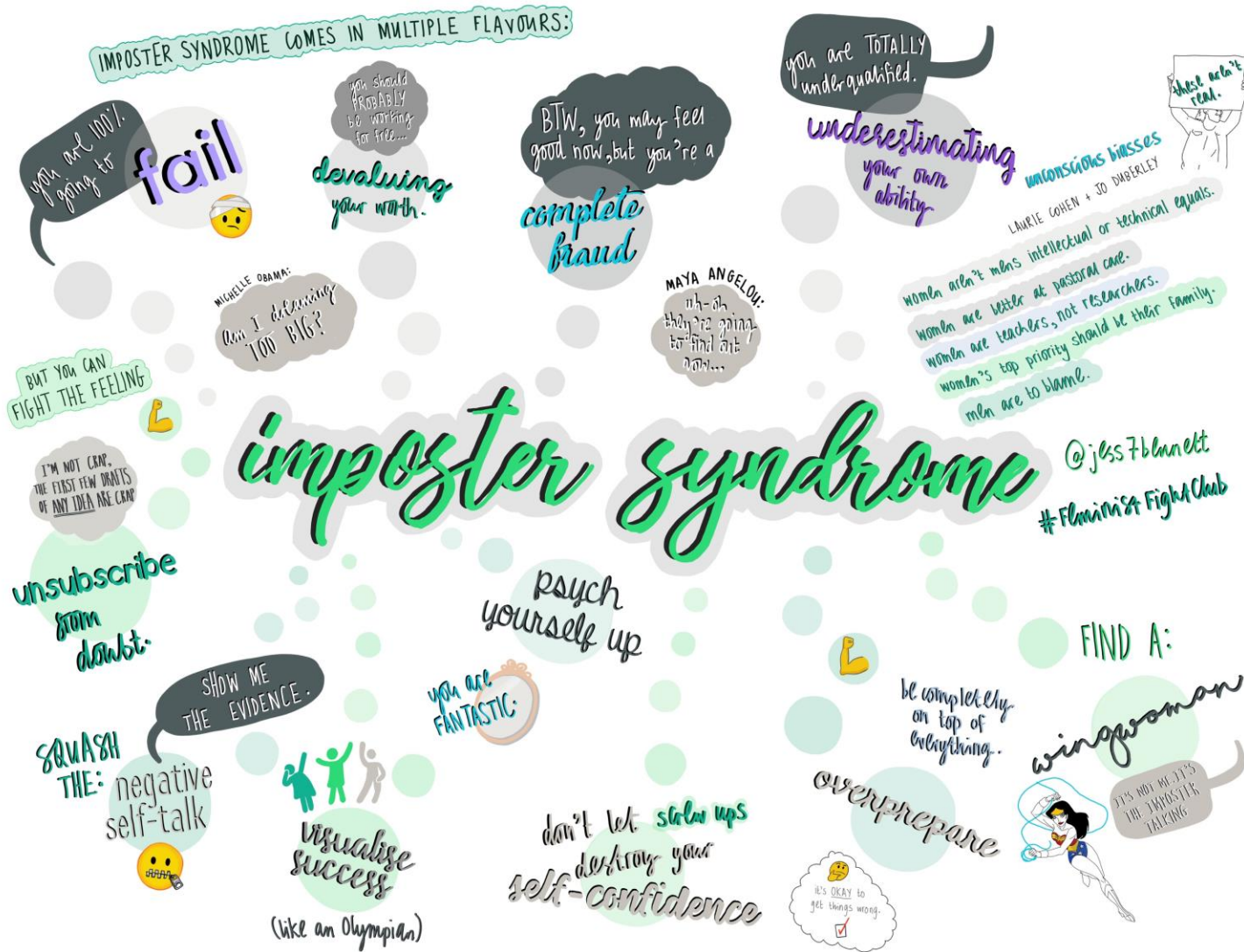
- “women more than men see great sacrifice as a prerequisite for success” (2012)
- nature of role models- masculine characteristics, such as aggression and competitiveness, without families/ children
- spend longer on admin activities (less likely to say no, institutional norms) (2017)

<https://www.theguardian.com/higher-education-network/blog/2012/may/24/why-women-leave-academia>

<http://physicsworld.com/cws/article/news/2017/may/23/female-academics-do-more-admin-than-their-male-colleagues>

Five unconscious biases that hold back female researchers

1. Women aren't men's intellectual or technical equals
2. Women are better at pastoral care
3. Women are teachers, not researchers
4. Women's top priority is – or should be – family
5. Men are to blame



// what do we do at imperial

athena swan:

- founding member in 2005
- first institutional award in 2006
- first departmental awards in 2009
- all 21 departments applied in 2017

recruitment:

- know your pool
- targeting job adverts
- awareness of language <http://gender-decoder.katmatfield.com/>

ongoing activity :

- annual women @ imperial week
- have your say harassment & bullying reporting
- annual athena lecture
- unconscious bias training
- research around bias in student surveys/ nss
- research around experience of bme staff and students

training

- for postdocs & pgr students
- women development courses, springboard

parents & maternity

- parents networks
- nurseries on all main campuses
- childcare vouchers for all volunteers
- return to work plan pre-maternity leave
- short-term funding to accommodate for grants that overlap with maternity leave

// what can we learn

- look at **history** (waterloo bridge, chemistry)
- this is **not unique** to **science**
- you are **not alone**
- **shouting loudly** will **not solve anything**
- **everyone is biased** (+ science is biased + the people who write the rules are biased)
- machines and robots are **learning our biases**
- this will not be solved by women alone **#menasallies**
- women (> men) benefit from **mentors**
- women **do not** all benefit from **high-achieving role models**
- recognise all **contributions** (REF, TEF, pastoral, admin)
- get women **talking about science**, not about gender
- collect **data** (mckinsey)
- **re-consider** stem **enrichment** activities
- **do not exhaust yourself** reinventing the wheel

<https://goo.gl/Qiarj1>

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