

Professor Jenny Martin

Science is Male

Presentation to

School of Biological Sciences, University of

Auckland, New Zealand

Friday 12 April 2016

Prof Barbara McClintock 1902-1992

American geneticist

Sole Nobel prize winner Physiol/Medicine 1983

“discovery of mobile genetic elements”

Dame Prof Kathleen Lonsdale FRS

1903-1971

Irish crystallographer

Determined benzene
structure > flat hexagon

Determined structure of
diamond & many others

Established International
Tables of Crystallography

Pacifist

[http://www.rsc.org/chemistryworld/
issues/2003/january/substance.asp](http://www.rsc.org/chemistryworld/issues/2003/january/substance.asp)



Dame Prof Dorothy Hodgkin FRS

1910-1994

English crystallographer
1964 sole Nobel prize
winner in chemistry "*for
determinations by X-ray
techniques of the
structures of important
biochemical substances*"

cholesterol

vitamin B₁₂

penicillin

(later insulin)

Ruby Payne-Scott 1912-1981

Australian physicist

WWII radar research Radioastronomy pioneer

ASIO 'person of interest' 1948-1959:

*“Association with Communist Party,
commitment to international co-operation
among scientists and trade unions”*

Held CSIRO permanent position (until....)

Margaret Hamilton 1936-

US software engineer
NASA Exceptional
Space Act Awardee

Led the effort to build
Apollo 11's onboard
flight software

Credited with coining
the phrase “software
engineer”



And Some Favourite Inventions

Computer program -	Ada Lovelace 1815-1852
Dishwasher –	Josephine Cochrane 1839-1913
Life raft –	Maria Beasley 1847-1904
Medical syringe –	Letitia Geer ?patent 1899
Home solar power –	Maria Telkes 1900-1995
Apgar score –	Virginia Apgar 1909-1974
CCTV –	Marie Van Brittan Brown 1922-1999
Kevlar –	Stephanie Kwolak 1923-2014
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“Science is male”

Responses in an implicit association test reflected a strong association of science with men rather than women.

350,000 self-selecting participants from 66 countries.

60% participants were women, average age 27, 79% had college experience.

Data from David Miller

Reported in Science 22 May 2015

Using the Harvard Implicit Association gender/science test

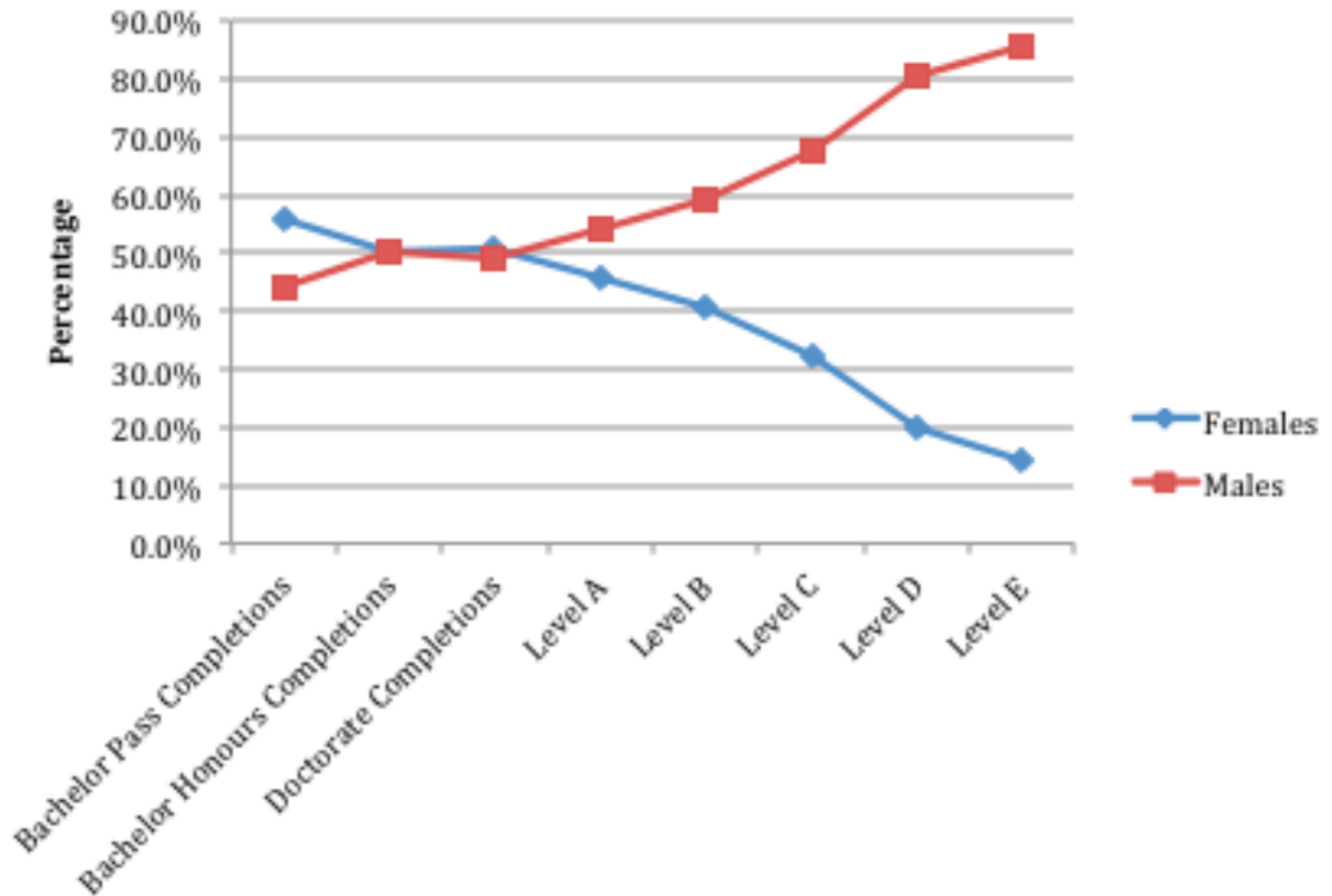
<http://news.sciencemag.org/social-sciences/2015/05/science-still-seen-male-profession-according-international-study-gender-bias>

Girls are better at science than boys


	Total number		VHA		HA	
	Yr11	Yr12	#	%	#	%
Biology						
Males	5634	5009	603	12.04	1674	33.42
Females	11191	10407	1748	16.8	4209	40.44
All	16825	15416	2351	15.25	5883	38.16
Chemistry						
Males	5035	4880	782	16.02	1652	33.85
Females	5739	5320	942	17.71	2082	39.14
All	10774	10200	1724	16.9	3734	36.61
Physics						
Males	5563	5562	875	15.73	1709	30.73
Females	2324	2136	539	25.23	813	38.06
All	7887	7698	1414	18.37	2522	32.76

Men and women graduates enter the workforce in about equal numbers, men have a nine times greater chance of reaching executive level than women (CEW, 2009, 2)

Bell S & Yates L
“Women in the
Scientific
Research
Workforce:
Identifying and
sustaining the
diversity
advantage”
ARC Linkage
project
2011-2014
(LP110200480)
University of
Melbourne



Source: DIISRTE Higher Education Statistics Collection, customised data, 2011



Attrition of women from the scientific professions impacts negatively on productivity and, through the consequent failure to achieve diversity, limits innovation

(Bell et al 2009; Hewlett et al 2008; NAS 2007)

Why do women leave?

Sharon Bell “Women in the Science Research Workforce” 2015

The 5 biases pushing women out of STEM

Williams, Phillips, Hall, HBR 2015 – study of women's experiences (60 interviews, 557 surveys)

- 1. Prove it again**
- 2. The tightrope**
- 3. The maternal wall**
- 4. Tug-of-war**
- 5. Isolation**

Other reasons women leave (not exhaustive)

- Sexism and harassment; stereotype threat; gendered stereotypes
 - Having to prove themselves over and over again
- Intimidation, bullying, “hostile/adversarial/toxic” work environment
 - Supervisors that become competitors and block progress
 - Conscious and unconscious bias; “death by 1000 cuts”
 - Normalised discriminatory behaviours, the male gaze
- Feeling of “not belonging”, “being isolated”, “not fitting in”, having to challenge “male-centric leadership models”
 - Lack of confidence; impostor syndrome – women don’t apply for jobs, promotions, fellowships when same qualified men do etc.....
 - Primary carer responsibilities; societal pressures; unpaid work
- Lack of senior female role models; conferences with few women
 - Lack of mentoring, sponsorship, encouragement and support
 - Committee burden for those who do succeed
 - Increasingly casualised workforce

Gendered stereotypes

In a patriarchal society:

- Men are leaders; active; agentic
- Men valued for what they do

- Women adorn/care for children
- Women are “property” of men; passive
- Women valued for what they look like and their relationship to men

Unconscious bias

Unconscious bias

Profs rate men ~15% higher than women

Harvard study showed that the same CV for a student intending to go on to postgraduate research was:

Rated lower for competence

Rated lower for hireability

Rated lower for starting salary (\$4K or 15% less)

Rated lower for amount of mentoring offered

By men and women faculty

.....if the applicant's name was Jennifer not John

Moss-Racusin et al PNAS (2012)

Bad hiring decisions favour men

- When employers have to choose between a man and a woman with **equal qualifications** for a maths task, expect selection would be equal (1:1)
- Employers chose the woman about 35% of the time and the man about 65% of the time (1:2).
- In the same study, where qualifications differed, **selection of the wrong candidate (the one with poorer credentials) was associated strongly with gender bias.**
- Reuben et al PNAS 2014; Curt Rice 2014



The male gaze

Sexism and harassment



In the European Union,

75%

of women in management and higher professional positions have experienced some sort of sexual harassment in the workplace in their lifetimes.

progress.unwomen.org
#WomensProgress2015



gender balance fail

Jan 2016

Organiser wants to address gender balance at a life sciences (biotech) party. “Adding females changes the dynamic.”

Hires models in short black dresses
as cocktail waitresses

... had tried hiring male models as well - for gender equality. But “It was really awkward”

It's awkward for women scientists too.....



June 1 2015 “Help, My advisor won’t stop looking down my shirt”

—Bothered

The screenshot shows the top portion of the Science Careers website. At the top left is the Science logo. To its right are links for AAAS.ORG, FEEDBACK, HELP, and LIBRARIANS. A search bar contains the text "All Science Journals" and has a search button and an "ADVANCED" link. Below this is a red navigation bar with links for NEWS, SCIENCE JOURNALS, CAREERS (highlighted), MULTIMEDIA, and COLLECTIONS. On the right of this bar are links for ALERTS, ACCESS RIGHTS, SIGN IN, and JOIN / SUBSCRIBE. Below the red bar is a dark red banner for "Science Careers From the journal Science" with links for Help, Meetings & Events, About Science Careers, and Contact. A dark grey navigation bar contains links for Career Magazine (highlighted), My Science Career, Find A Job, Graduate Programs, Tools & Tips, Forum, and For Employers. Below this is a dark grey bar with links for Issues & Perspectives, Career Advice, The Job Market, Career Profiles, Life & Career, and Diversity Issues. At the bottom of the screenshot, a breadcrumb trail reads: Science Home > Science Careers > Career Magazine > Previous Issues > 2015 > June 01.

Dear Bothered

the kind of behavior you mention is common in the workplace.

I don't mean to suggest that leering is appropriate workplace behavior—it isn't—but it is human and up to a point, I think, forgivable.

I suggest you put up with it....

web.archive.org/web/20150601150626/http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2015_06_01/caredit.a1500140

Recent High Profile Professorial Sexual Harassment/Misconduct

- Geoff Marcey, astronomer, Berkeley – resigned Oct 2015
- Jason Lieb, molecular biologist, U Chicago – resigned Feb 2016
- Brian Richmond, paleonthropologist, Yale – under investigation
- Christian Ott, astrophysicist - currently suspended from Caltech
- Handling of each case criticised
- “By turning a blind eye, senior colleagues are accessories to what is happening”
- Social Media campaign

Biophysical Society Code of Conduct, Anti-Harassment Policy

ADOPTED BY BPS COUNCIL
NOVEMBER 2015

Message from the President

There has been much in the media lately about the disrespect and harassment that exists in society at large, as well as within the scientific community. As scientists, we know that scientific discourse cannot take place in an environment that does not respect others.

The Biophysical Society Council recently met and unanimously reconfirmed its commitment to diversity and respectful treatment of all at any event or activity the Society sponsors. To that end, the Council approved a code of conduct that all participants at BPS-sponsored events must follow. The code is printed in its entirety below and will also be posted on the Society's website. It is 2016—harassment cannot be tolerated.

—*Edward Egelman*, President



Primary carer responsibilities

Societal pressures

Unpaid work

UN WOMEN: Challenging societal norms

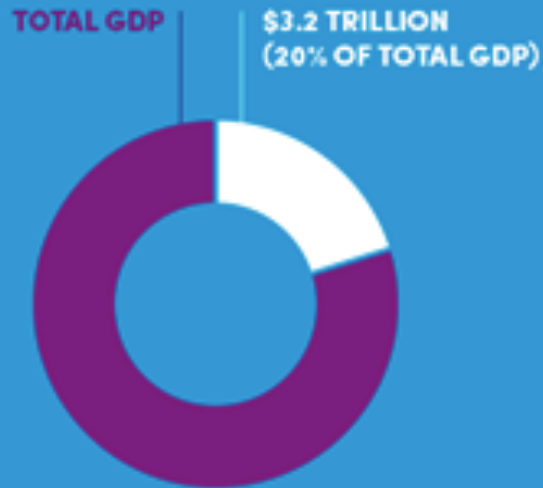
PROGRESS OF THE WORLD'S WOMEN 2015 - 2016

TRANSFORMING ECONOMIES, REALIZING RIGHTS



27th April 2015

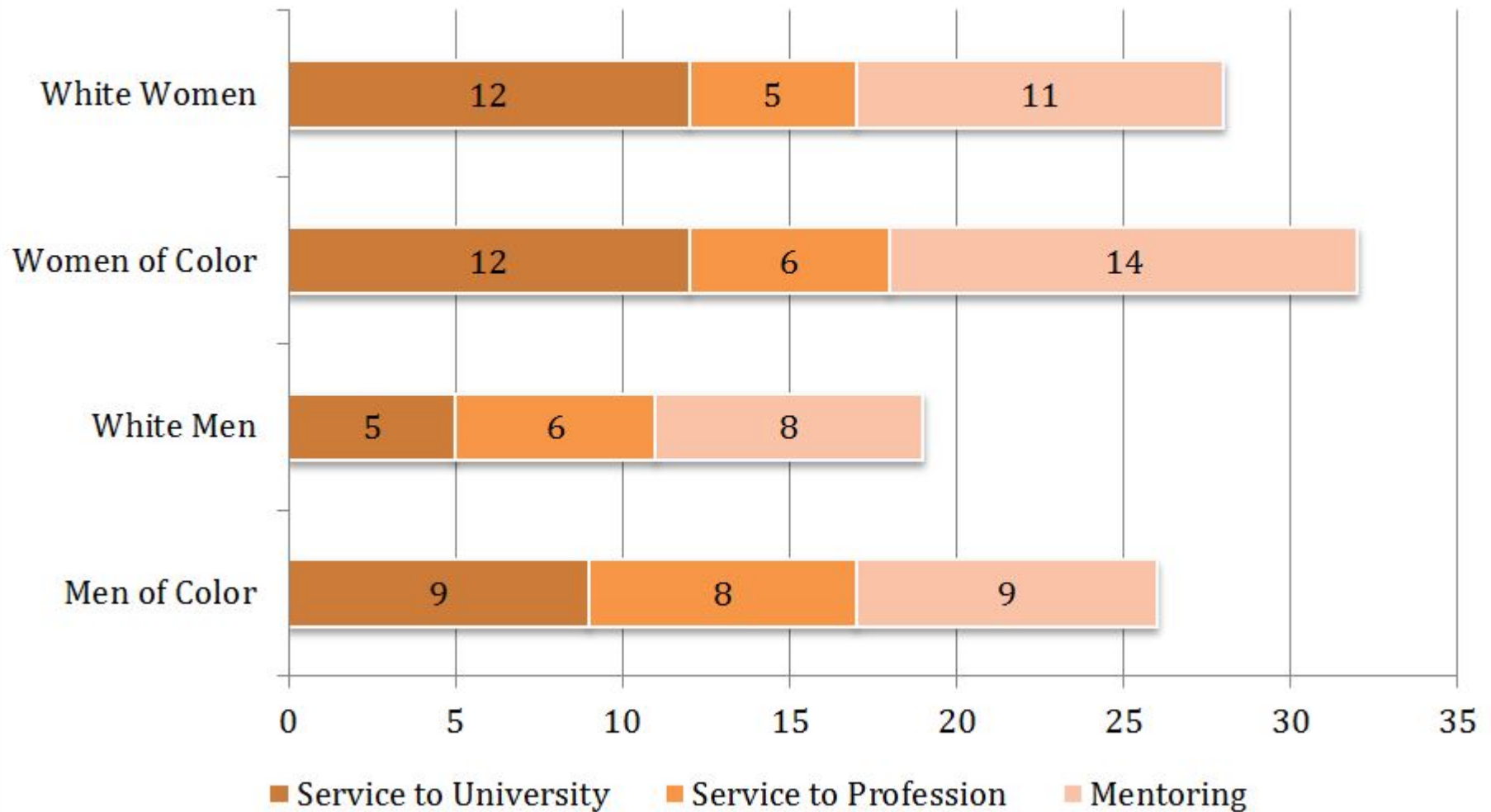
<http://progress.unwomen.org/en/2015/>



In the U.S., the total value of unpaid care for children in 2012 was an estimated **\$3.2 trillion**, approximately **20% of total GDP**.

Weekly Hours Associate Professors Spend on Service and Mentoring by Race and Gender

Source: UMass Work-Life Study



○ <https://www.insidehighered.com/advice/2015/06/26/essay-diversity-issues-and-midcareer-faculty-members>



conferences with few/no invited
women speakers

lack of positive role models

CONVENTION HIGHLIGHTS



LESSONS IN LEADERSHIP
General Stanley A. McChrystal,
Former Commander of U.S. and
International Forces in Afghanistan



POLITICAL POLARIZATION: PROSPECTS FOR PROGRESS

Jake Tapper, Chief Washington
Correspondent, CNN and anchor of the CNN
weekday television show "The Lead
with Jake Tapper"

A/E INDUSTRY'S FOREMOST POLICY AND POLITICAL LOBBYING EVENT

NEW SUPER SESSIONS

THE P3 CHALLENGE FOR A/E FIRMS

ENGINEERING OPPORTUNITIES WITH
SMART CITIES AND SMART CARS

HOT MARKETS IN COMMERCIAL DEVELOPMENT

WORKFORCE OF THE FUTURE:
TALENT AND DIVERSITY CHALLENGES



ENGINEERING EXCELLENCE AWARDS GALA



NEW LOCATION

ACEC's 2015 Annual Convention
& Legislative Summit will be
held at the historic **Marriott
Wardman Park**, a superior
convention hotel with larger and
more flexible meeting space that
can accommodate our growing
needs. The hotel is located
minutes from the National Zoo,
the National Cathedral, Embassy
Row, and the vibrant Adams
Morgan neighborhood, with
funky shops, ethnic restaurants,
and active nightlife.



EXCITING AND LIVELY SPOUSE/GUEST PROGRAM

Enjoy an entertaining (and delicious!)
presentation by Doron Petersan, the
two-time winner of Food Network's
"Cupcake Wars" - then reduce the guilt

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19
20

Cubistcrystal "show me the policy"

PLOS Comp Biol "10 simple rules to achieve conference speaker gender balance"

Crystal29	% women
Delegates	36%
Invited speakers	46%
Selected speakers	34%
All speakers	39%
Program committee	33%
Chairs	35%



What can we do?

Two quotes that might change the world:

- “If we don't actively and intentionally set out to include women, we will unintentionally exclude them” Elizabeth Broderick, Australia's Sex Discrimination Commissioner
- “Let's not pretend that there aren't already established norms that advantage men. Men invented the system. Men largely run the system. Men need to change the system.” Gordon Cairns (champion of change)

What can people in power do?

- Support female colleagues – listen, sponsor, support shadow, coach
- Ensure recruitment ads don't alienate
- Look at appointment/promotion process
- Disrupt stereotypes
 - eg include diversity contribn in award/promotion criteria
 - eg Publish rates of pay
 - eg Evaluate Demerit along with Merit

What can men do?

- A powerful, decent man is one who cares about sharing power and sharing leadership:
- Take the panel/conference pledge
- **Become informed about women's issues & equality**
- Treat women with courtesy, dignity, respect, trust
- Call out sexism, harassment, discrimination and bias
- **Listen to women and believe them; Give women a voice**
- Ask for flexible work arrangements, shorter working days, parental leave, spend more time with your family
- **Lean in at home – share unpaid work - clean the toilet, do shopping/laundry, plan family events, share childcare, pack lunches, cook the meals, organise the plumber, pay the bills, do the tax forms.....**
- Take notes/pour coffee/serve drinks at meetings

See cubistcrystal post "but what can I do"

What can professional societies do?

- Collect and analyse data (membership, committees, invitations)
- Post data and gender equity policies on-line
- Talk to women members, ask what would help them
- Develop conference gender equity policy
- Develop anti-harassment policy

What can individuals do?

Recognise that we all have biases

Learn about your own (Harvard implicit association test)

Do something about discrimination

Speak up - call out inappropriate behaviour, unconscious bias, gender stereotyping

When there are few women, ask why

“The standard you walk past, is the standard you accept”
David Morrison, Chief of Army, Male Champion of Change

Assess “Relative to Opportunity”

Be informed: find out and implement institutional anti-harassment policy

What we all need to succeed....

- A safe, supportive, inclusive environment
- Respect of our colleagues
- Opportunity to achieve and progress
(eg invitations to speak, equality in grant/paper reviews)
- Positive role models
- Sponsors
- Family friendly workplace
- Work-Life Balance

Summary

- Diversity is strength
- **Privilege works against diversity** – privilege is invisible, unearned advantage conveyed by society eg white, male, heterosexual
- Science is gender neutral – our biases are male
- **Be aware of your own biases (Harvard Implicit Association online test)**
- Challenge the status quo
- **Don't tolerate sexism, harassment, bullying**
- When there are few women - ask why
- **Define dept values - then recruit, reward on those**
- Make the world a better place; where everyone has an equal chance to excel

More Info and Ideas (not exhaustive)

- Athena Swan UK <http://www.athenaswan.org.uk/>
- Male champion of change website
- “Lean In” – Sheryl Sandberg (COO Facebook)
- “6 Steps to Gender Equality” Curt Rice <http://curt-rice.com/>
- Diversity Council of Australia website
- UN Women website
- “Thinking, Fast and Slow” Daniel Kahneman
- AAS Early&Mid Career researcher forum “Gender Equity” Michelle Dunstone, Bob Williamson
- Workplace Gender Equality Agency www.wgea.gov.au
- Women’s Agenda website
- NHMRC women in health sciences committee website
- Annabel Crabb “The wife drought”
- Why Science is Sexist, Nicola Gaston