## Gender Imbalance in Science

Gender and ScienceJ ournal Club


Universitat Pompeu Fabra Barcelona

## Who are we?




Omg! I can't operate. He is my son.



## Percent of web respondents with each score



Click for detailed summary

## OUTLINE

- What is the situation in STEM?
- Why is it happening?
- How to solve it?

Most of students and graduates are women, but the representation declines at further levels that open the way to research careers.



Leaky pipeline

## Leadership

Heads of University


Scientific Boards
■ Men ■ Women


## Pay Gap

Gender Pay Gap


## Funding Gap



Spanish Ministry of Science and Innovation Report (2011):


European Commission


## UPF DTIC



## Sub PI

■ Men ■ Women

## Professor

■ Men ■ Women


## Leadership gap <br> Salary gap <br> Funding gap

## Inborn Cognitive Sex Differences

The literature does not show any empirical evidence that cognitive sex differences may account for gender differences in scientific careers (NAS, 2007)

Meta-analysis of cognitive studies on maths problems, spatial rotations (behavior, fMRI), comparison of levels of sex hormones with task performance.

Girls' underachievement in maths has narrowed in all countries and is on the way to disappearing in most of them (Else-Quest et al., 2010; Sapienza, 2008).

The Darwin Awards: sex differences in idiotic behaviour
BM/ 2014;349 doi: http://dx.doiorg/10.1136/bmj.g7094 (Published 11 December 2014) Cite this as: BMJ 2014:349:g7094


Male and female Darwin Award winners. Line $\mathrm{H}_{0}$ indicates expected percentages under the null hypothesis that males and females are equally idiotic

## That's not how it works



## Gender Stereotypes



Women: To be seen, not heard.


1 wish for ...


## Gender Stereotyping

## Science faculty's subtle gender biases favor male students

Corinne A. Moss-Racusin ${ }^{\text {a,b }}$, John F. Dovidio ${ }^{\text {b }}$, Victoria L. Brescoll ${ }^{\text {c }}$, Mark J. Graham ${ }^{\text {a,d }}$, and Jo Handelsman ${ }^{\text {a,1 }}$ ${ }^{2}$ Department of Molecular, Cellular and Developmental Biology, ${ }^{\text {b }}$ Department of Psychology, ' School of Management, and ${ }^{\text {d }}$ Department of Yale University, New Haven, CT 06520

Edited* by Shirley Tilghman, Princeton University, Princeton, NJ, and approved August 21, 2012 (received for review July 2, 2012)
Despite efforts to recruit and retain more women, a stark gender gender disparity in science (9-11), and that it "is n disparity persists within academic science. Abundant research has
discrimination in these domains" (10). This asser
$\mathrm{N}=127$ faculty members from biology, chemistry and physics rate an applicant for a lab manager position



## Science faculty's subtle gender biases favor male students

Corinne A. Moss-Racusin ${ }^{\text {a,b }}$, John F. Dovidio ${ }^{\text {b }}$, Victoria L. Brescoll ${ }^{\text {c }}$, Mark J. Graham ${ }^{\text {a,d }}$, and Jo Handelsman ${ }^{\text {a,1 }}$<br> Yale University, New Haven, CT 06520<br>Edited* by Shirley Tilghman, Princeton University, Princeton, NJ, and approved August 21, 2012 (received for review July 2, 2012)<br>Despite efforts to recruit and retain more women, a stark gender gender disparity in science (9-11), and that it "is n disparity persists within academic science. Abundant research has discrimination in these domains" (10). This asser

> "Our results revealed that both male and female faculty judged a female student to be less competent and less worthy of being hired than an identical male student, and also offered her a smaller starting salary and less career mentoring."
"Female student was less likely to be hired than the male student because she was perceived as less competent"

# nature <br> geoscience 

Home | Current issue | Comment | Research | Archive ₹ | Authors \& referees $\boldsymbol{\nabla} \mid$ About the journal
home $>$ current issue $>$ letter $\stackrel{\text { abstract }}{ }$

NATURE GEOSCIENCE | LETTER $<$ 昆
Gender differences in recommendation letters for postdoctoral fellowships in geoscience

Kuheli Dutt, Danielle L. Pfaff, Ariel F. Bernstein, Joseph S. Dillard \& Caryn J. Block
Affiliations | Contributions | Corresponding author

Nature Geoscience 9, 805-808 (2016) | doi:10.1038/ngeo2819


Received 30 April 2016 | Accepted 31 August 2016 | Published online 03 October 2016

1,224 recommendation letters, submitted by recommenders from 54 countries, for postdoctoral fellowships in the geosciences over the period 2007-2012.
"Female applicants are only half as likely to receive excellent letters versus good letters compared to male applicants."
$\mathrm{N}=1820$ faculty, postdoctoral fellows, and graduate students from 30 disciplines ( 12 STEM, 18 SocSci/Hum) were asked about their field.

Participants were asked to rate their agreement with four statements concerning what is required for success in their field (e.g., "Being a top scholar of [discipline] requires a special aptitude that just can't be taught")

# Expectations of brilliance underlie gender distributions across 

 academic disciplinesSarah-Jane Leslie et al.

"The extent to which practitioners of a discipline believe that success depends on sheer brilliance is a strong predictor of women's representation in that discipline."
Home $\mid$ News \& Comment $\mid$ Research $\mid$ Careers \& Jobs $\mid$ Current Issue $\mid$ Archive $\mid$ Audio \& Video $\mid$ For Authors
News \& Comment $\geqslant$ News $\geqslant 2016$ ~November $\geqslant$ Article

## Machine-learning algorithm quantifies gender bias in

 astronomyCalculation suggests papers with women first-authors have citation rates pushed down by 10\%.

Inga Vesper

04 November 2016


Suffering in science


Young, talented and fed-up: scientists tell their stories
Scientists starting labs say that they are under

Researchers analysed 200,000 papers in 5 journals from 1950 to 2015.

First, they trained a machine-learning algorithm to accurately calculate the citations for each paper first-authored by a man using as many non-gender-related factors as possible. Then, they unleashed their algorithm on the papers with female first authors.
"This set of papers (from 1985 onwards) had actually received around 6\% fewer citations than their male-authored counterparts. But the algorithm predicted that the papers should have got 4\% more citations than did those authored by men."

## Silencing and isolation

Not being seen, heard, read, cited, invited.

## nature

Gender matters: A call to commission more women writers

Daniel Conley \& Johanna Stadmark

## We found that the proportion of

 women commissioned to write Nature News \& Views articles was much lower than the proportion of women scientists overall:female authorship was
$17.3 \%$ for the biological and chemical sciences, $8.1 \%$ for physical sciences and $3.8 \%$ for Earth and environmental sciences. However, the pool of women scientists in these disciplines was significantly higher than the proportion of female authorship at $32 \%, 16 \%$ and $20 \%$, respectively.

## http://biaswatchneuro.com/

## Symposia on Memory

Organizers: Nicolas Brunel, Sandro Romani \& Alex Roxin
Funded by: Simons Foundation, HHMI Janelia Research Campus
Invited speaker gender ratio: 2 Women : 23 Men (8\%)
Estimated* base rate of females in the field: 34\%

BCBT2016 - Barcelona cognition, brain and technology summer school
Organizers: Paul Verschure, Andreas
Engel and Anna Mura
Funded by: EU projects socSMCs
Invited speaker gender ratio: 1 Woman : 17 Men (6\%)
Estimated* base rate of females in the field: 24\%

# Survey of Academic Field Exper Report Harassment and Assault 

Kathryn B. H. Clancy ${ }^{1 *}$, Robin G. Nelson ${ }^{2}$, Julienne N. Rut

1 University of Illinois, Urbana-Champaign, Department of Anthropology, Urbana, Illinois, Unit Saratoga Springs, New York, United States of America, 3 University of Illinois, Chicago, Depal United States of America, $\mathbf{4}$ Harvard University, Department of Human Evolutionary Biology, C

Internet-based survey of field scientists ( $N=666$ ) to characterize these experiences.

Have you ever personally experienced:
■ Inappropriate sexual remarks ■ comments about physical beauty
■ cognitive sex differences
■ or other jokes?

Have you ever experienced - physical sexual harassment

■ unwanted sexual contact
■ or sexual contact in which you could not or did not give consent?

## Survey of Academic Field Experiences (SAFE): Trainees Report Harassment and Assault

Kathryn B. H. Clancy ${ }^{1 *}$, Robin G. Nelson ${ }^{2}$, Julienne N. Rutherford ${ }^{3}$, Katie Hinde ${ }^{4}$<br>1 University of Illinois, Urbana-Champaign, Department of Anthropology, Urbana, Illinois, United States of America, 2 Skidmore College, Department of Anthropology, Saratoga Springs, New York, United States of America, 3 University of Illinois, Chicago, Department of Women, Children, and Family Health Science, Chicago, Illinois, United States of America, 4 Harvard University, Department of Human Evolutionary Biology, Cambridge, Massachusetts, United States of America



## Gendered Division of Labor



## Why do we Entertain this?


boys toys

(8. Because boys don't cuddle and girls don't build?
(Photos taken instore at The Entertainer, Bluewater, Kent, March 2013)
$\qquad$ Sign the petition: www.lettoysbetoys.org.uk

Family-or-science dilemma (women have to choose, men don't)

## 2-10 times




CARING


White Paper on the Position of Women in Science in Spain, 2010


## Intersectional Feminism



## The field starts taking the problem seriously



Science and gender
Gender stereotypes prevent women from attaining full recognition of their research careers.

## Science

## Gender

 inequality in scienceHow should a better gender balance be achieved?

By Andrew M. Penner

## National Institutes of Health addresses the science of diversity

## Hannah A. Valantine ${ }^{\mathrm{a}, 1}$ and Francis S. Collins ${ }^{\text {b }}$

${ }^{\text {a }}$ Chief Officer for Scientific Workforce Diversity, US National Institutes of Health, Bethesda, MD 20814; and ${ }^{\text {b }}$ Director, US National Institutes of Health, Bethesda, MD 20814


## What Can We Do?

## Individual

- Set yourself objective criteria before evaluating someone's work.
- Let's listen to women more.
- Let's support women in small things.
- Say NO to sexism.
- Cite women.
https://anneslist.net/


## Collective

- Discuss about this problem with your colleagues/students.
- Increase awareness.
- Report gender imbalances on meetings or committees (www.biaswatchneuro.com).
- Make protocols/information about sexual harassment available. (https://www.upf.edu/upfigualtat/)


## IMPORTANT READS

## Copmpinterintseris <br> WHY SO <br> SLOW?

HE ADVANCEMENT OF WOMF
Virginia Valian
"Compelliwg."

- Witalle Aneiek, Hzw Yorw Times



## REBECCA M. IORDAN-YOUNG

BRAINSTORM


THE FLAWS IN

THE sciencror

SEX DIFFERENCES

## Gender and Science Journal Club

feminist.jc.upf@gmail.com


Pallabi Sengupta pallabi.sengupta@ upf.edu


Elisa Ruiz Tada elisa.ruiz@upf.edu


Cristina Ionna Galusca cristina.galusca @upf.edu


Irene Torres irene.torres@upf. edu


Mohit Hemchandra Adhikari mohit.adhikari@ upf.edu

Gender and Science Journal Club

## Next Meeting on $13^{\text {th }}$ Dec, 2016.





