WOMEN IN SCIENCE: WHY STILL SO FEW?
BARRIERS AND SOLUTIONS

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FEMALE SCIENTISTS

- **Caroline Herschel** (1750 – 1848): astronomy, first woman to discover a comet, first British woman to get paid for her scientific work.
- **Mary Anning** (1799 – 1847): fossil hunter, anatomy, geology, paleontology.
- **Lise Meitner** (1878 – 1968): math, physics, did atomic research, discovered “nuclear fission.”
Irène Curie-Joliot (1897 – 1956): chemistry, discovered artificial radioactivity. Won Nobel Prize in chemistry (making Marie Curie and her daughter Irène the first parent-child couple to have independently won Nobels.)


Dorothy Hodgkin (1910 – 1994): chemistry, determined the structures of penicillin, vitamin B12 and insulin.

Rosalind Franklin (1920 – 1958): physical chemistry, made X-ray images of DNA which led to Watson and Crick’s finding of the double helix.
Women comprise 47% of the total U.S. workforce, but only 24% of workers in STEM fields.

Women represent more than half of bachelor’s degrees but only 46% of doctorates.

Women represent 25% of bachelor’s degrees awarded in STEM fields.

The percentage of women recipients of a doctorate in STEM disciplines is 27%.

1/5 of Ph.Ds in physics are awarded to women; only about ½ of those women are American.
Of all physics professors, only 14% are women.

Generally, women representation in academia decreases with rank in STEM: 44% of assistant professors; 38% of associate professors; 21% of full professors.

The absence of women in STEM fields is progressive and persistent.

Women will drop out after their Ph.D. or coming up for tenure.
There is also a discrepancy in salaries for women in STEM: in psychology women make 87% of men’s salary; they make 83% of men’s salary in biology/life sciences; 87% of men’s salary in mathematics and 81% of men’s salary in social sciences.
WHY SHOULD WE CARE?

- The problem isn’t new.
- Equity in opportunities.
- Gender filter = missed contributions
- Diversity of knowledges
- Pool of applicants
**EXPLANATIONS**

- **Individual-level explanations:**
  biological/genetic differences + human capital + socialization

- **Social/structural-level explanations:**
  - Structural, cultural, social barriers.
  - Work/science are gendered institutional structures.
  - Gendered cultures/structures = masculinized expectations on scientists.
Social/structural-level explanations (cont’d)

- Historical setting of the institution of academe.
- Numbers matter: number of female academics and mentors.
- Disciplinary norms are gendered with characteristics often associated with men and masculinity.
- Harmful practices dictate scientists to adopt a gendered work style at the expense of others.
- Socialization supports these norms and practices but presented as a gender neutrality ideal.
- Women participate in the reproduction gendered barriers by accepting gender bias as normal.
Structural-level explanations (cont’d)

- How does the reproduction of gendered barriers happen?
  Three ways in which women internalize norms in STEM disciplines: distancing themselves from women who do femininity; distancing from feminine practices; distancing by denying gender inequality.
Women adopt gendered practices to try and become “one of the boys”. Hint: it doesn’t help them.

Beware of the Impostor Syndrome!

Perceptions of women in STEM disciplines and internalizing gendered structures.
CONSEQUENCES (cont’d)

- Decisions about childbearing and family life: less than half of tenured female faculty are married with children.
- Parenthood penalty still in place...for women, not for men: married mothers of young children 35% less likely to get tenure-track jobs.
- Family formation and academic career still opposed: the rigid academic structure doesn’t offer women a ‘right’ time to have children.
Marginalization of women scientists translates into real inequities and negative consequences: salary, lab space, awards, resources, etc.

STEM disciplines still being viewed as gender-neutral meritocracies participates in the social reproduction of the issue.
SOLUTIONS

- Recognize the issue

- What do women want? Create a level playing field, retribution, remuneration and recognition.

- The dangers of Individual-level solutions: “lean in”, dress better, negotiate better, change your voice, build a thick-skin, and other self-improvement techniques.
Institutional macro-level solutions:

- (Re)Enforcement of existing anti-discrimination laws (e.g. gender equity in pay).
- Assignment/nomination of women to science advisory boards, editorial boards of science journals, science policy positions.
- Eliminate the motherhood penalty with 4 interventions:
  1. Better/more child-care options
  2. Effective dual-career policies
  3. Childbirth accommodation
  4. Compliance with Title IX
Other institutional macro-level solutions:
- Climate studies
- Institutional Diversity reports
- Research on current practices and policies
- Toolkits for best practices (hiring, mentoring, evaluation)
Institutional micro-level solutions:

- Positive reinforcement and encouragement (mentoring, role models)
- Strengthening our curriculum
- Eliminate sexist language and imagery in printed materials
- Do not tolerate sexist language or behavior in the classroom
- Openly acknowledge the political nature of scientific inquiry
- Talk, blog, share experiences
- Write each other recommendations on LinkedIn, Academia.edu
- Help each other with CV writing
- Supportively and gently correct each other when experiencing IS