removed SDSS movie
SDSS3_DR9_flythrough.mov

Meg Urry
Physics Department
Yale University

My Road to Black Holes

(written in galaxies)

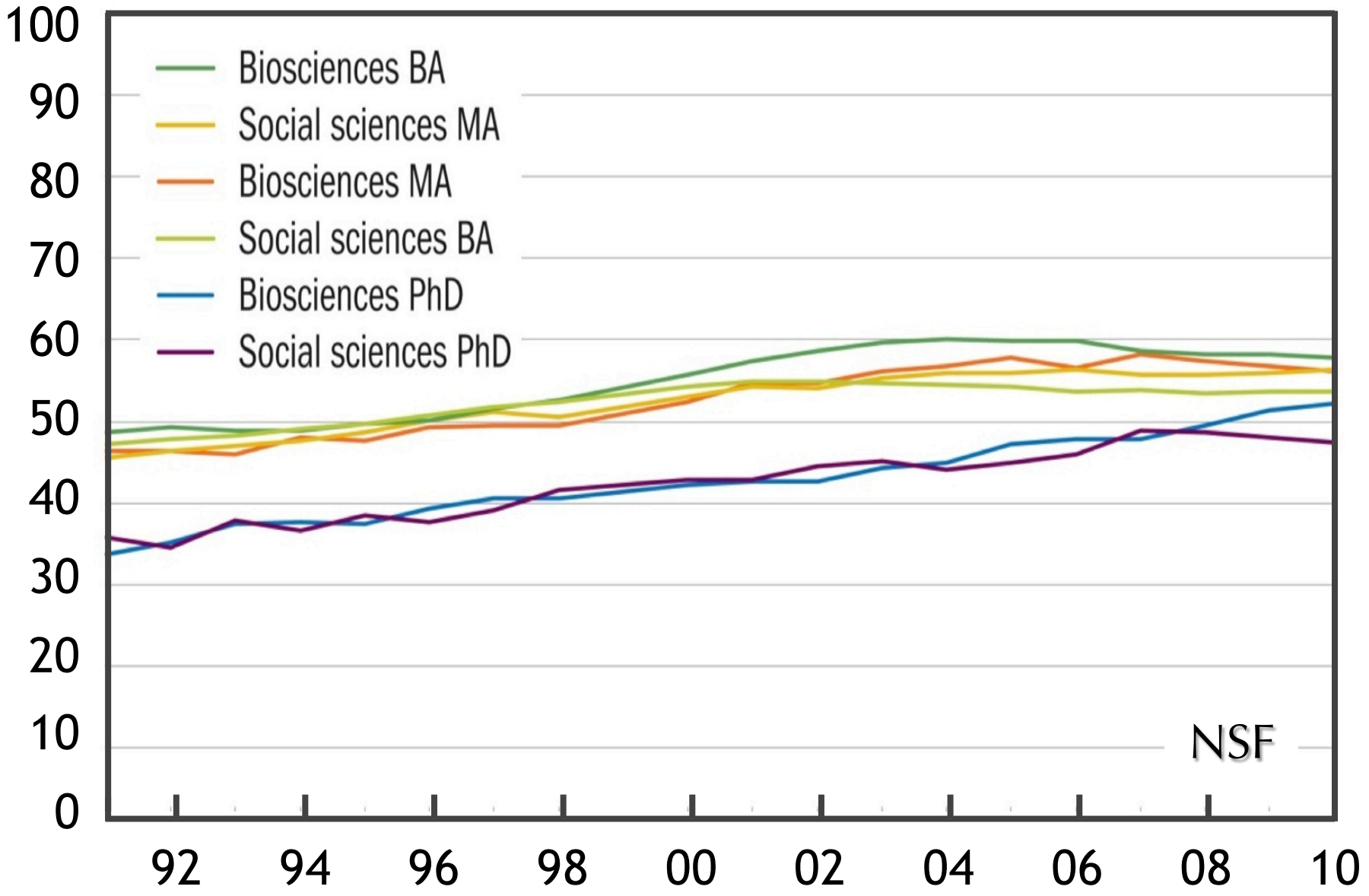
http://writing.galaxyzoo.org/

removed Hubble Ultra-Deep Field image udf.jpeg

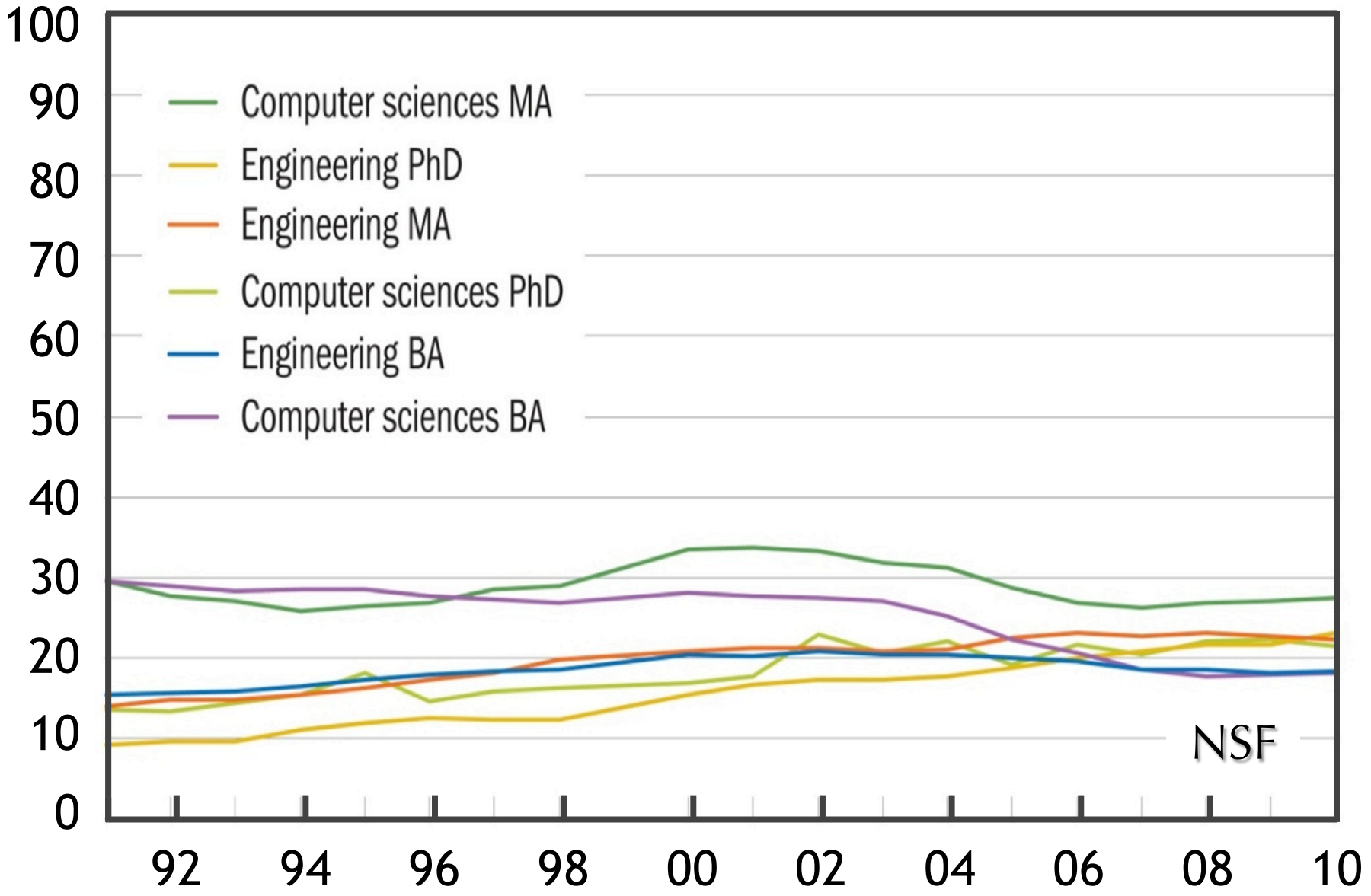
removed Illustris simulation movie
illustris_movie_rot_sub_frame.mp4

removed galaxy merger simulation
IntGalQT.m4v

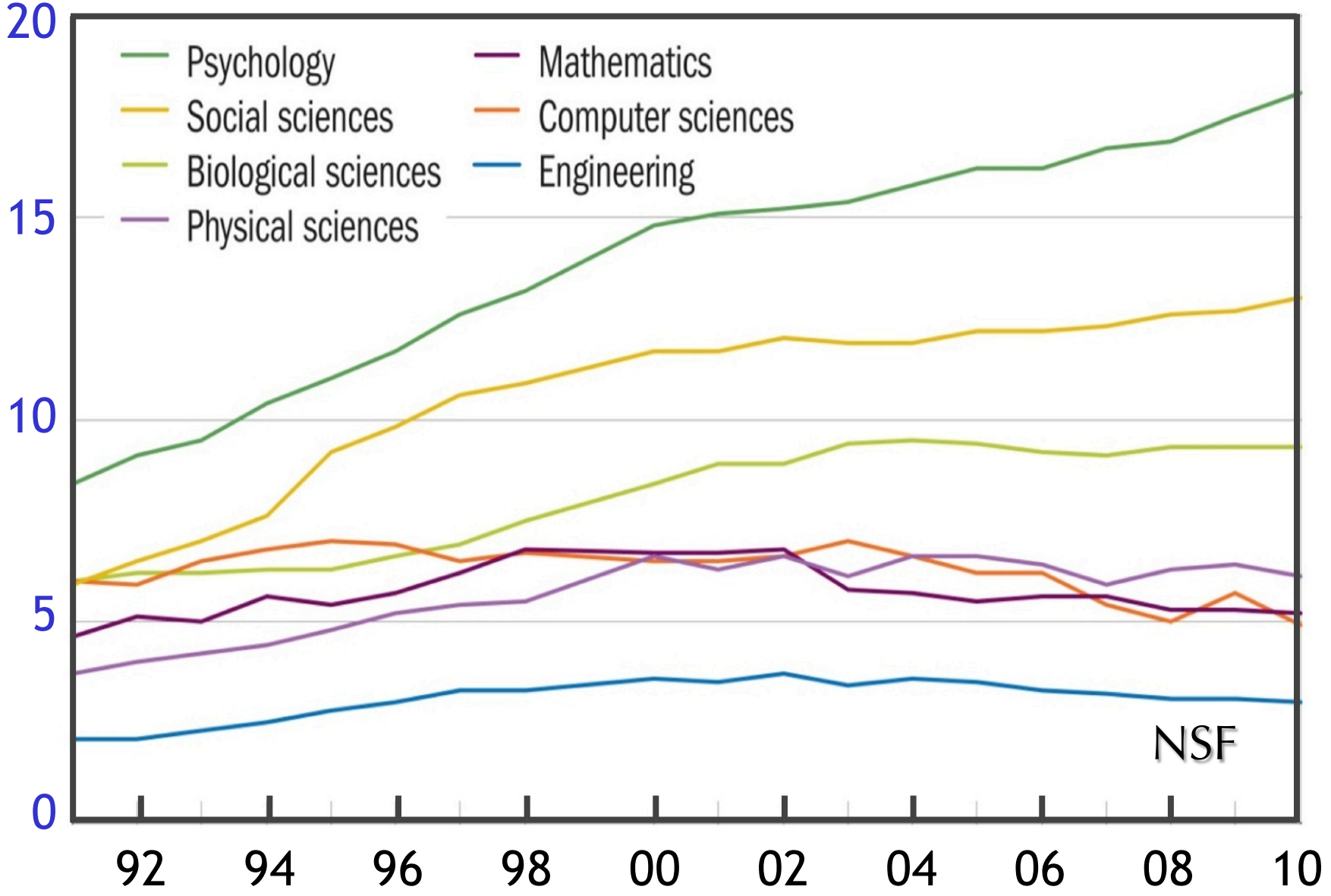
Percent degrees to Women 1991-2010



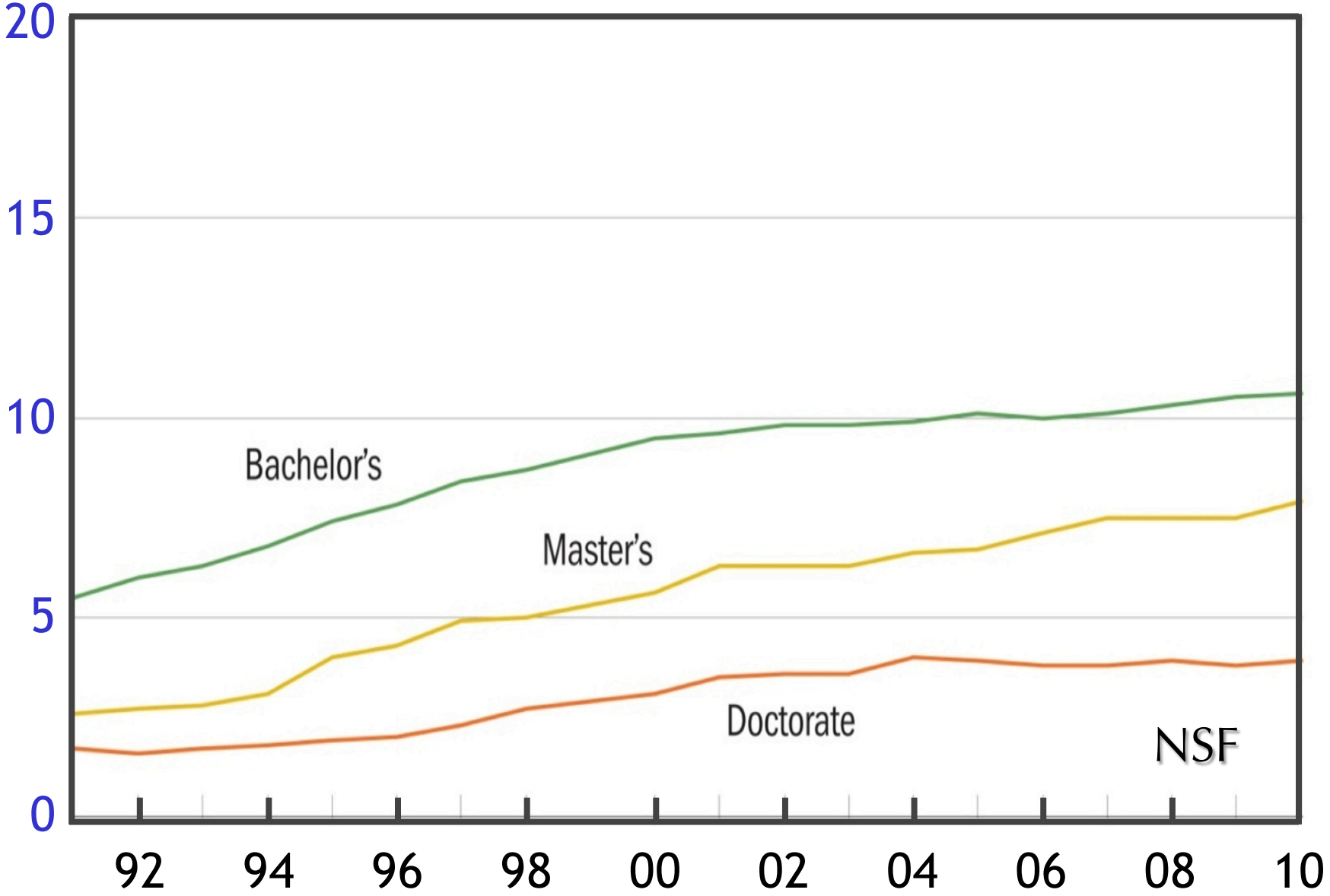
Percent degrees to Women 1991-2010



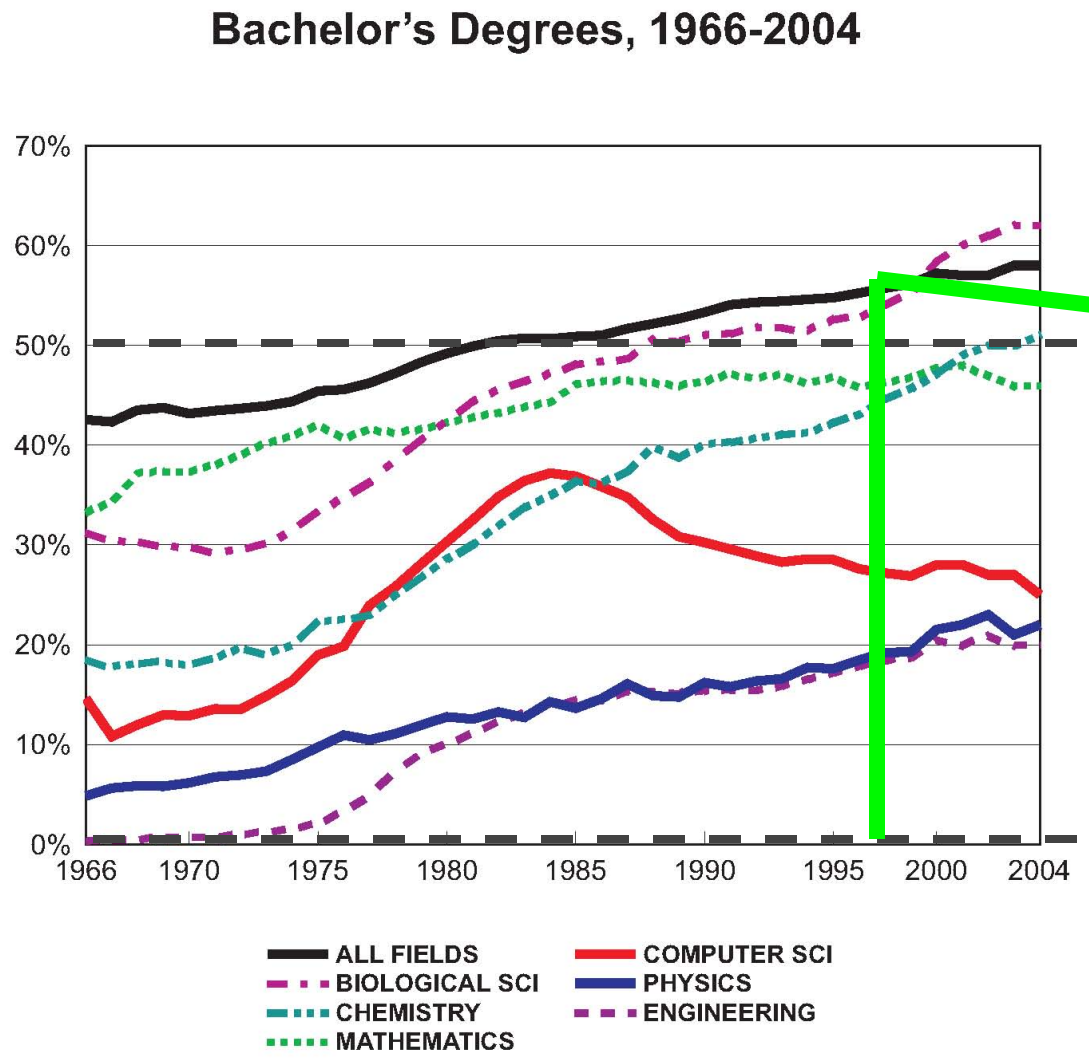
Percent Bachelor's degrees to URM Women 1991-2010



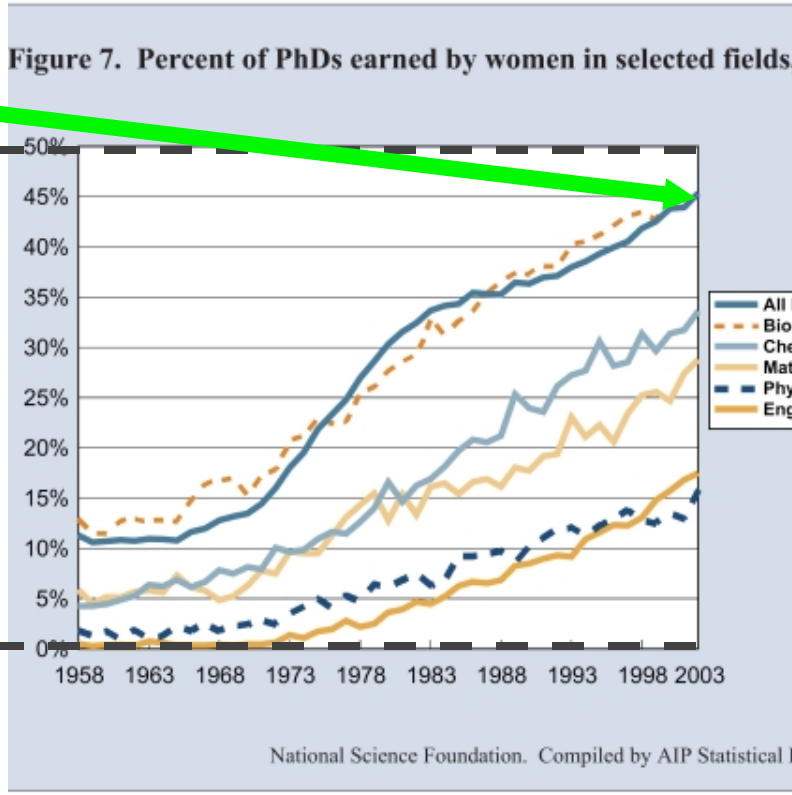
Percent STEM degrees to URM Women 1991-2010



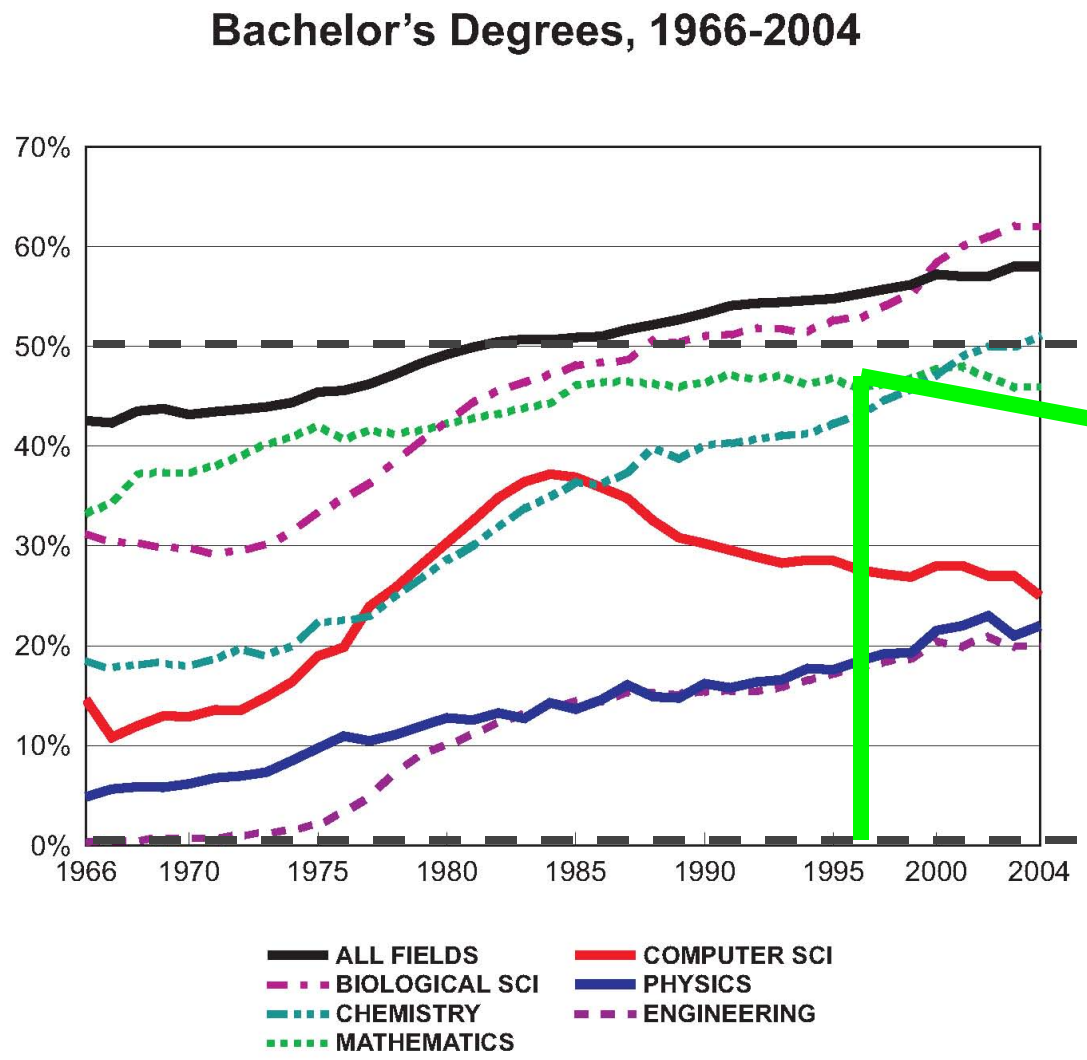
Attrition between B.S. and Ph.D. degrees



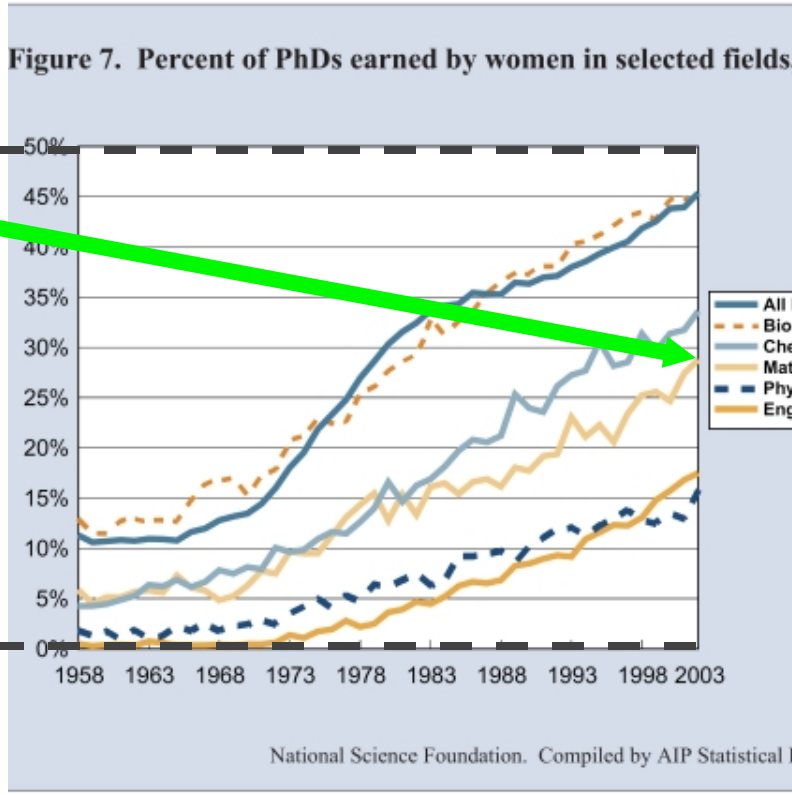
56% → 45% All fields



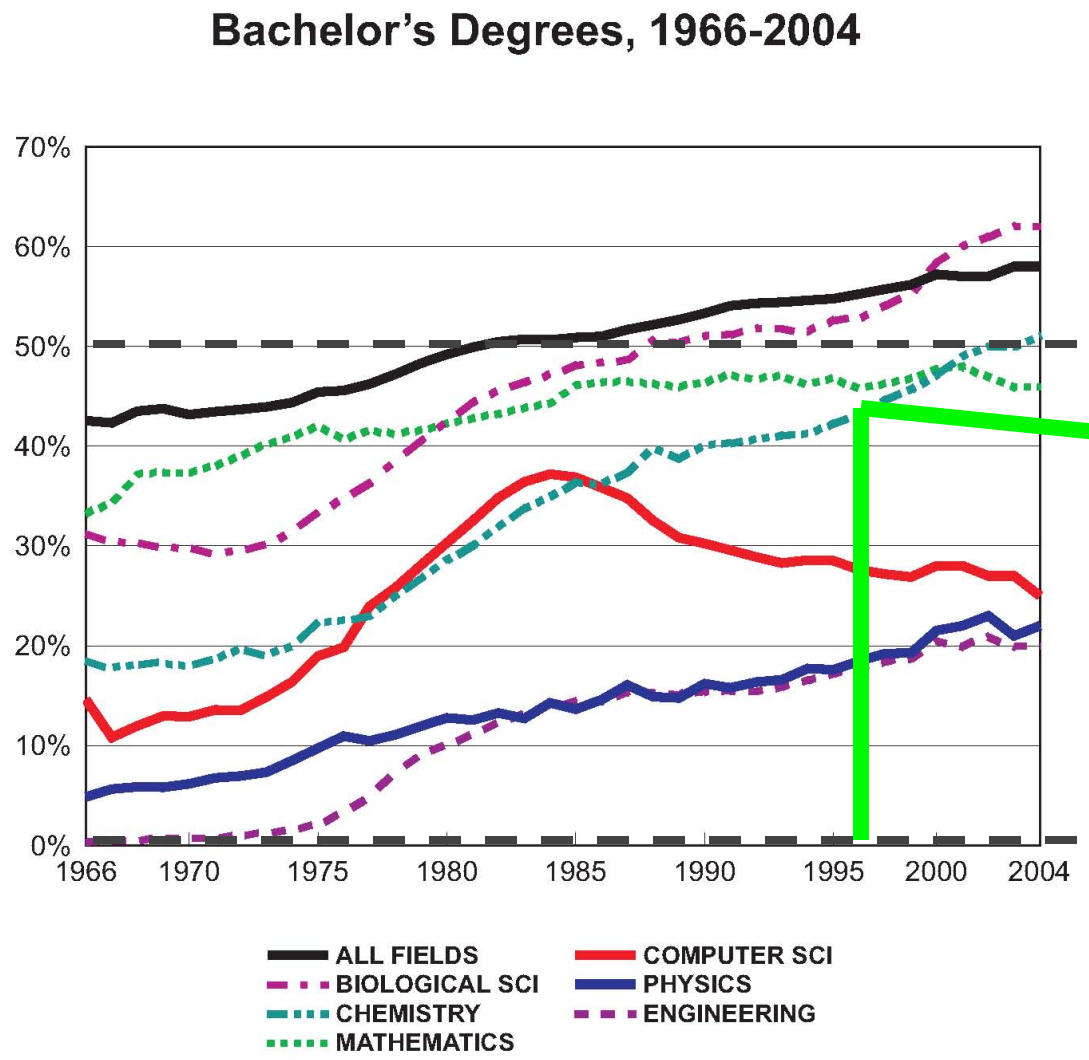
Attrition between B.S. and Ph.D. degrees



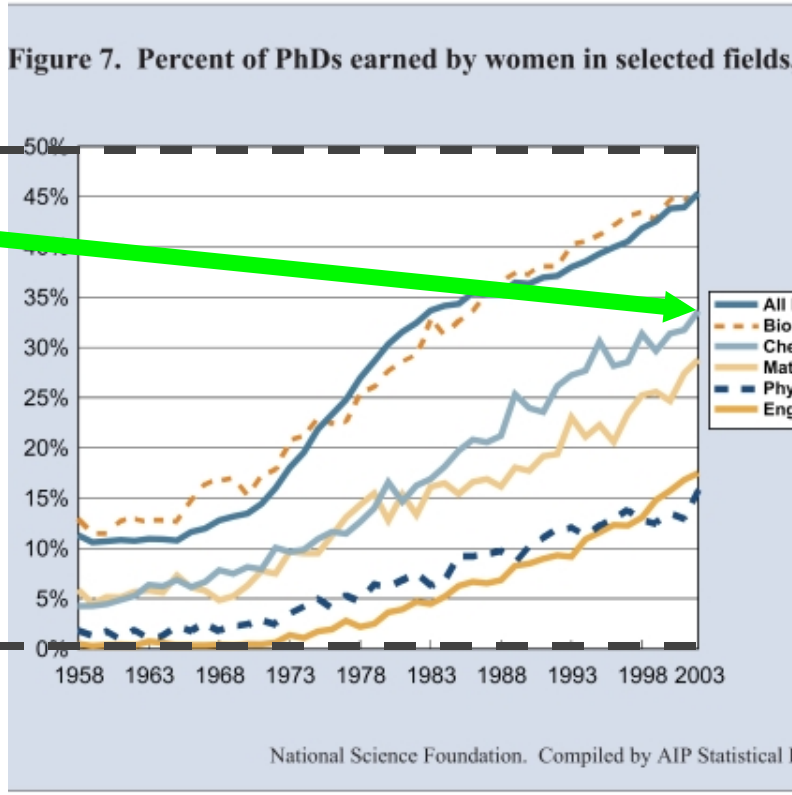
47% → 28% Math



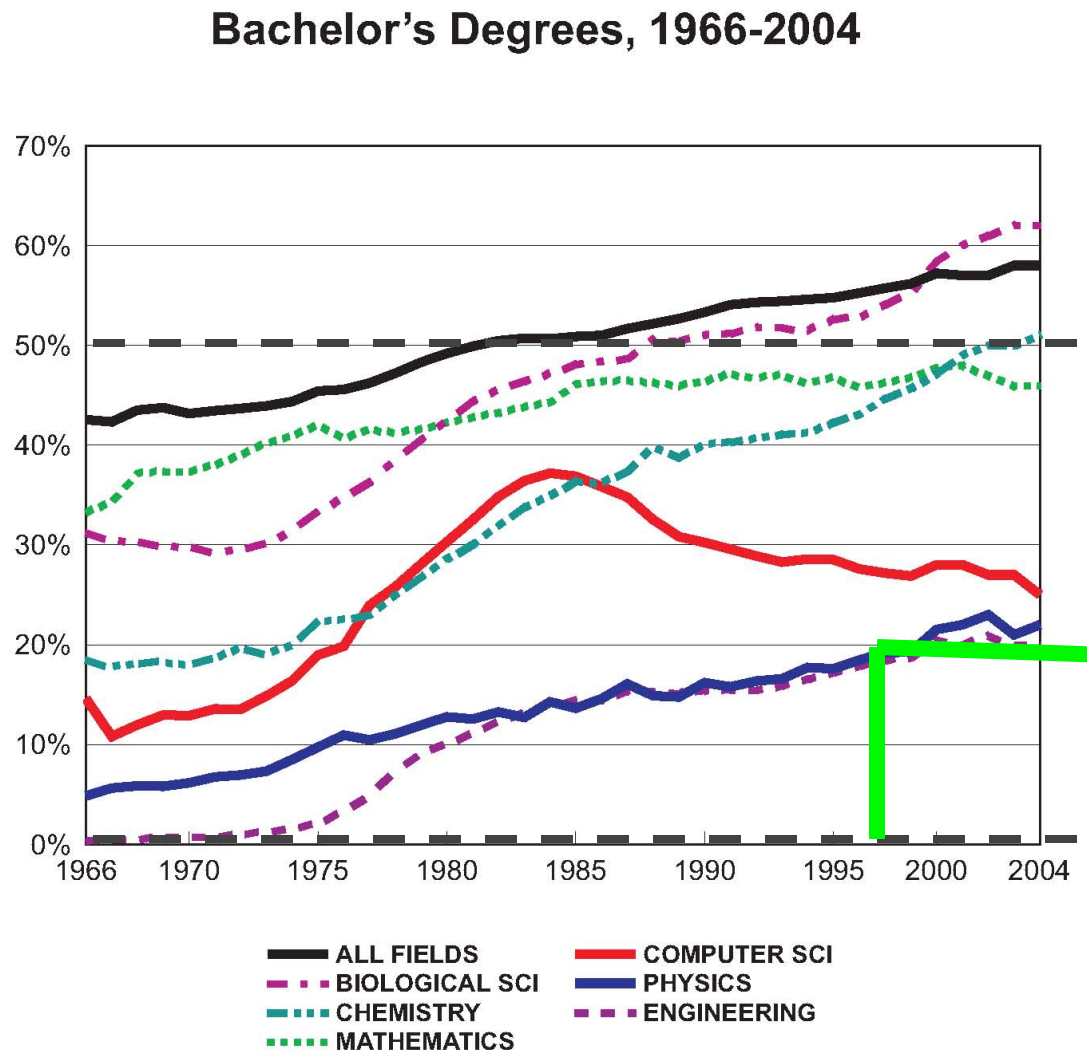
Attrition between B.S. and Ph.D. degrees



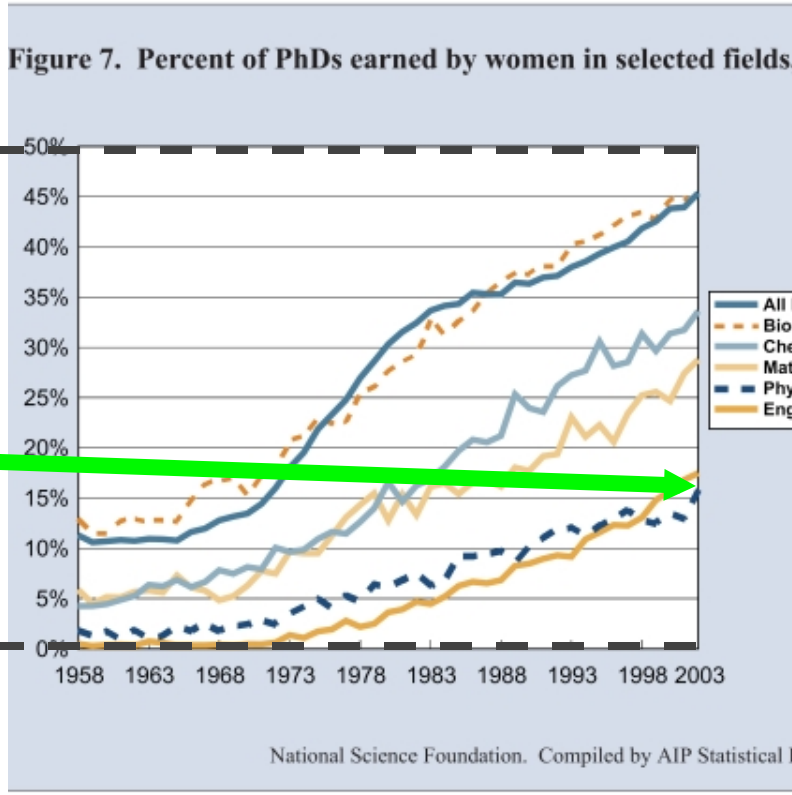
43% → 33% Chemistry



Attrition between B.S. and Ph.D. degrees



19% → 15% Physics



Why Diversity?

- Excellence of science
- Fairness/justice
- It's a great life!
  - Taxpayers support science, so should benefit equally
- Health of science profession
  - More scientifically literate (broad) public
  - $\Rightarrow$ more public support of science
- Workforce needs

Why do women and other under-represented groups lag behind parity?

- Statistical career disparities
  - *Long 2001, Sonnert & Holton 1996, Egan & Bendick 1994, Tesch et al. 1995, MIT Report+*
- *Not* ability, interest, effort
  - *Seymour & Hewitt 1990s, Xie & Shauman 2003, NRC's 2006 "Beyond Bias and Barriers" study*

persistence in science not correlated with ability

- *Not* family issues
- *Not* conscious discrimination, overt prejudice

Why do women and other under-represented groups lag behind parity?

- "Gender schemas" *Virginia Valian, Why So Slow? The Advancement of Women (1998)*
  - Lower expectations for women
  - Uneven evaluation ("unconscious bias")
    Wenneras & Wold 1997, Paludi & Bauer 1983, Budden+ 2008, Moss-Racusin+ 2012
  - Accumulation of disadvantage

➔ *Tilted playing field*

We are not objective

Biernat, Manis & Nelson 1991 – height
Porter & Geis 1981 – leaders at table
Butler & Geis 1990, Geis+ – speaker/leader evaluation
Dovidio et al. 1988 – eye gaze

Uneven Evaluation

- *Heilman et al. 2004* – rating asst. VPs

Women can be friendly or competent, not both

- *Norton, Vandello & Darley 2004* – rating resumes for construction job
- *Uhlman & Cohen 2005* – shifting criteria and (non)objectivity

Uneven Evaluation

"Indeed, by defining merit in a manner tailored to the idiosyncratic strengths of an applicant of the desired gender, *evaluators who practice gender discrimination may feel especially convinced that their selected candidate is the obvious and objective choice."*

Uhlman & Cohen 2005

Uneven Evaluation

"Indeed, by defining merit in a manner tailored to the idiosyncratic strengths of an applicant of the desired gender, *evaluators who practice gender discrimination may feel especially convinced that their selected candidate is the obvious and objective choice."*

Valian annotated bibliography: http://www.hunter.cuny.edu/genderequity/repository/files/equity-materials/annobib.pdf

Moss-Raucusin, Handelsman, et al. 2012 PNAS

- 63 male, 64 female science faculty
  - physics, chemistry, biology
  - 6 research universities: 3 private, 3 public
- CV of graduating senior looking for job as lab manager – "John" or "Jennifer"
- Both men and women:
  - See the male candidate as more competent
  - Were more likely to hire and mentor him
  - Starting salaries ~ $30k for him, $26k for her

Are you objective?

Mahzarin Banaji: implicit.harvard.edu

∴ Playing field not level

But tilt can be leveled - *consciously*

~~11~~ 12 Steps to Success for Outsiders

1. Work hard (at something you love)
2. Do interesting, high impact work
3. (If) uneven playing field – don't be discouraged
4. Reject "lower standards"
5. Mentor up, down, and sideways
6. Network w other outsiders, take turns leading
7. Use your first & last names
8. Prepare an "elevator speech"
9. Practice confidence after brushing
10. Give great talks
11. Own your ambition
12. Watch our for sexual harassment

Conference for Undergraduate Women in Physics at Yale (CUWPY)

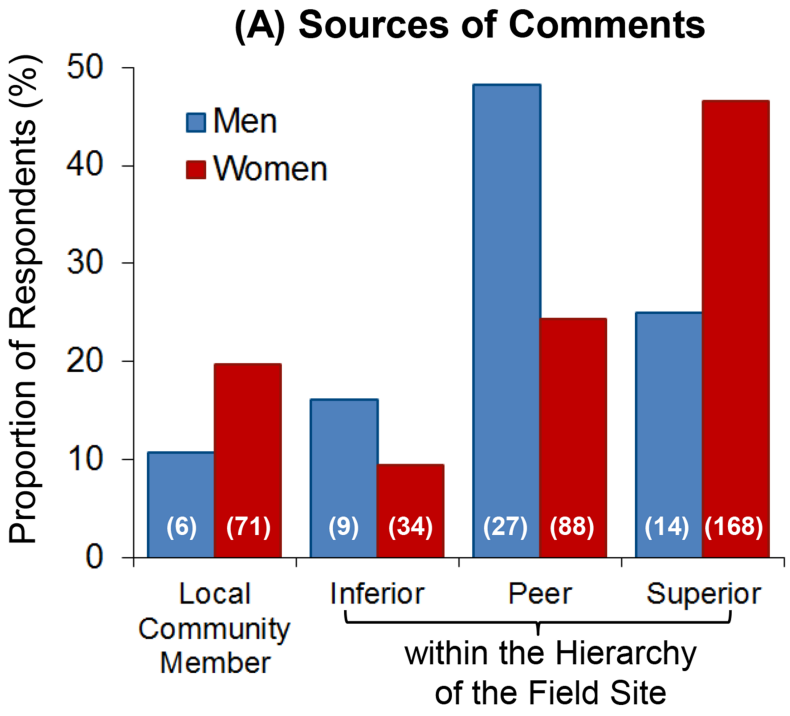
Back-up slides

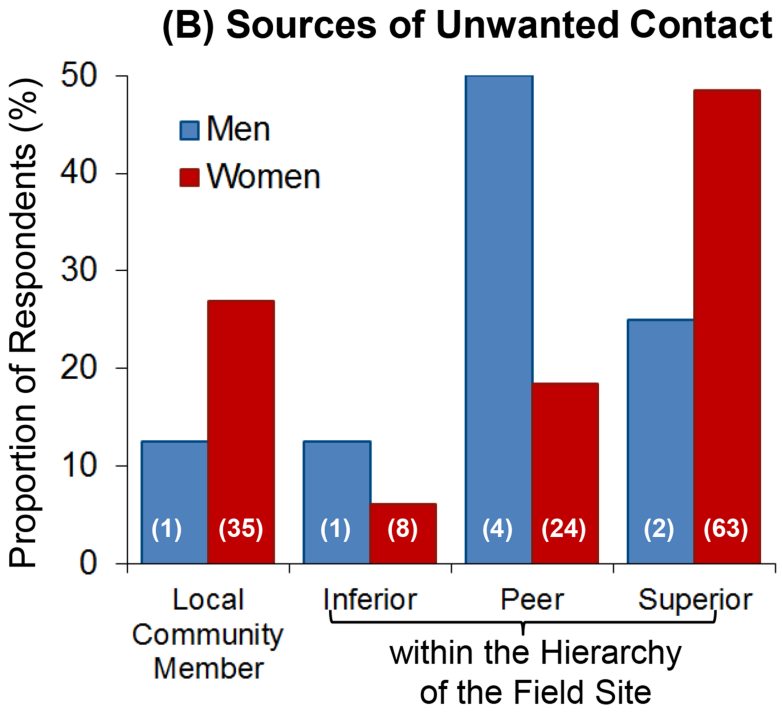
			Respondent's Status at Time of Experience*		
Experienced	**Gender**	**All**	**Trainee**	**Employee**	**Faculty**
		% (N)	**% (N)**	**% (N)**	**% (N)**
Harassment	Women	71% (361/512)	84% (305)	12% (42)	2% (8)
	Men	41% (56/138)	68% (38)	20% (11)	13% (7)
Assault	Women	26% (131/504)	86% (113)	11% (14)	2% (3)
	Men	6% (8/133)	75% (6)	0% (0)	25% (2)

*Not all respondents provided an answer to these questions.

doi:10.1371/journal.pone.0102172.t002

Clancy et al. 2014, PLOS One, DOI: 10.1371/journal.pone.0102172

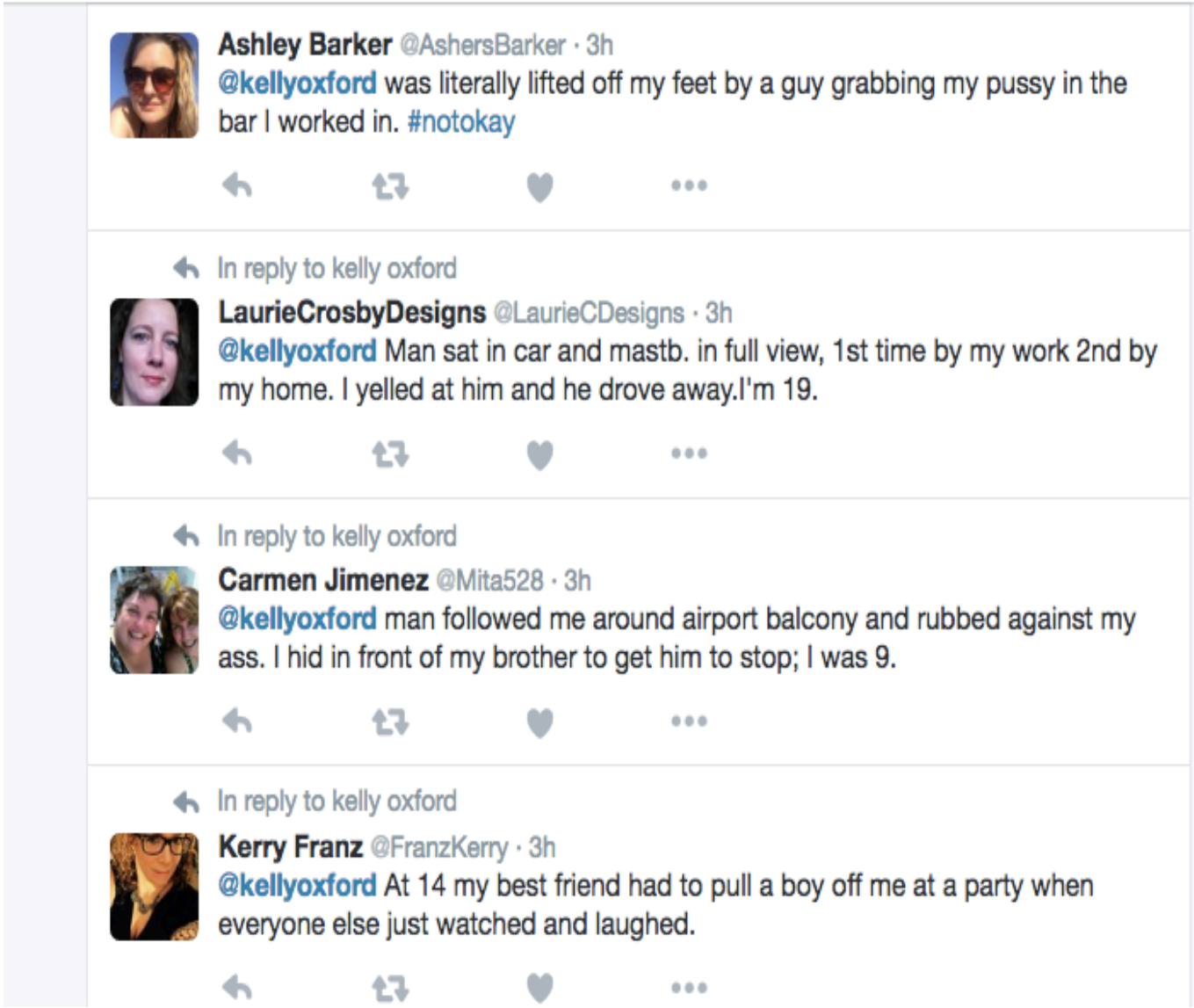




Clancy et al. 2014, PLOS One, DOI: 10.1371/journal.pone.0102172

10+ Million Tweets

@kellyoxford 10/8/16 – *trigger warning*



Ashley Barker @AshersBarker · 3h
@kellyoxford was literally lifted off my feet by a guy grabbing my pussy in the bar I worked in. #notokay

In reply to kelly oxford

LaurieCrosbyDesigns @LaurieCDesigns · 3h
@kellyoxford Man sat in car and mastb. in full view, 1st time by my work 2nd by my home. I yelled at him and he drove away.I'm 19.

In reply to kelly oxford

Carmen Jimenez @Mita528 · 3h
@kellyoxford man followed me around airport balcony and rubbed against my ass. I hid in front of my brother to get him to stop; I was 9.

In reply to kelly oxford

Kerry Franz @FranzKerry · 3h
@kellyoxford At 14 my best friend had to pull a boy off me at a party when everyone else just watched and laughed.

If It's Unwanted, It's Harassment.

It is AAS policy that all participants in Society activities will enjoy an environment free from all forms of discrimination, harassment, and retaliation.

If you experience or witness such behavior at this meeting, call 1-202-688-1993 to report the date, time, location, nature of the incident, and persons involved. Be sure to identify yourself and leave a call-back number; we will not follow up anonymous tips.

Complaints will be treated seriously and investigated promptly; confidentiality will be honored as far as possible as long as others' rights are not compromised.

Read the complete AAS Anti-Harassment Policy at **aas.org/harassment**

AMERICAN ASTRONOMICAL SOCIETY

Enhancing and sharing humanity's scientific understanding of the universe since 1899.

Professional Society Policies on Harassment

aas.org/policies/anti-harassment-policy (2008)

aas.org/about/policies/aas-ethics-statement (2010)

aas.org/files/aas_ethics_statement_majrev5.0.pdf (2016)

stopharassment.agu.org/

harassment.agu.org/files/2016/08/26Sept_Draft-Principles-for-Addressing-Harassment_Workshop-Recommendation.pdf

Anti-harassment policy

aas.org/policies/anti-harassment-policy:

[It is AAS policy that] all participants in Society activities will enjoy an environment free from…discrimination, harassment and retaliation. …[The] AAS is dedicated to … equality of opportunity and treatment… regardless of *gender, gender identity or expression, race, color, national or ethnic origin, religion or religious belief, age, marital status, sexual orientation, disabilities, veteran status, or any other reason not related to scientific merit*. Harassment, sexual or otherwise, is a form of misconduct that undermines the integrity of Society meetings. Violators of this policy will be subject to discipline.

Previous Ethics Statement *2 pp*

We believe the advancement of astronomy requires that we provide ethical guidelines for AAS members and… for anyone involved in professional astronomical activities.

- Conduct toward others
- Research
- Publication and authorship
- Peer review
- Conflicts of interest

New Ethics Statement *25 pp*

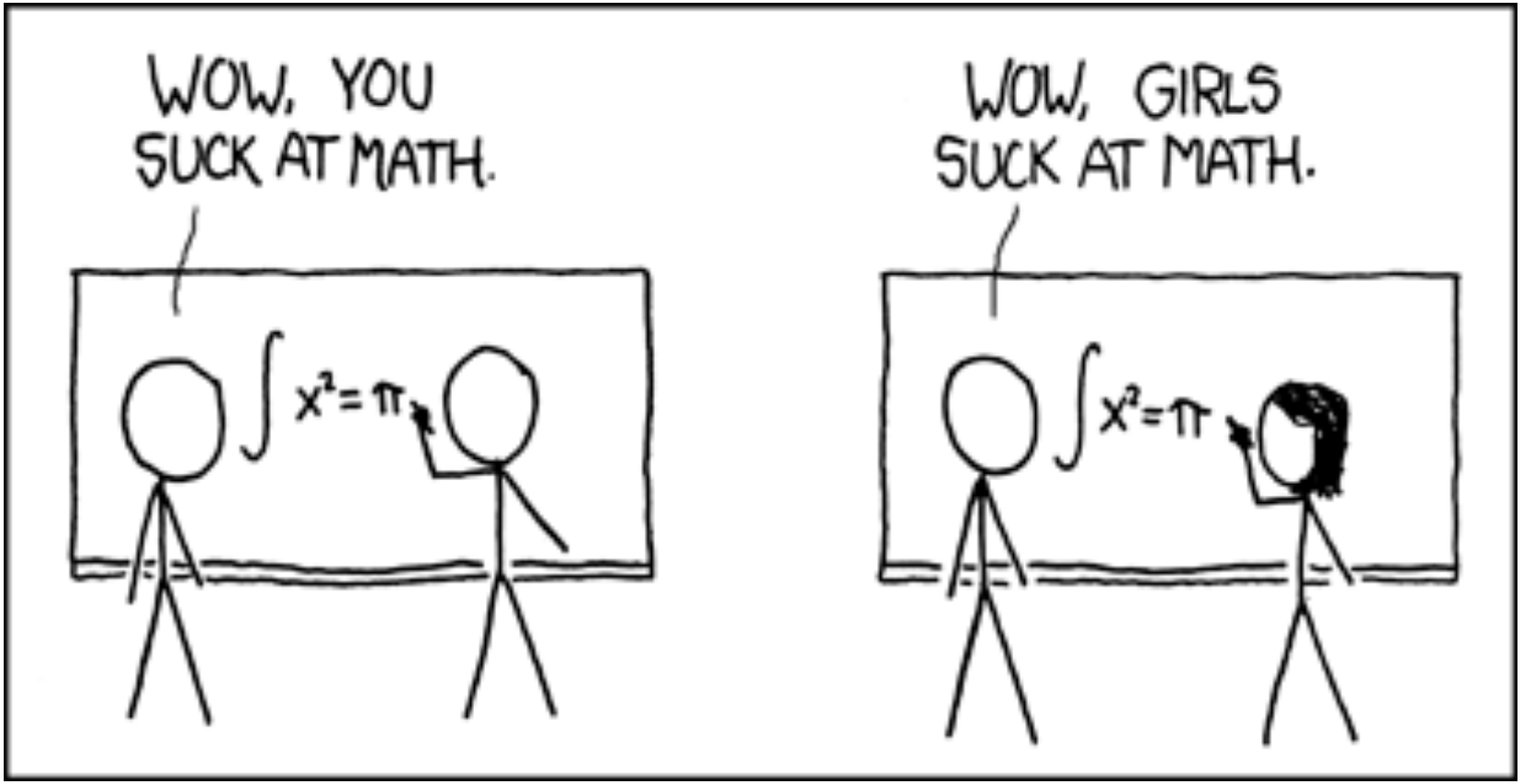
Preamble:

- [AAS members "share an interest in promoting and advancing the astronomical sciences." Specific standards may be debated but "having no widely agreed upon community standards for responsible scientific, educational and research conduct would be irresponsible…"
- "This AAS Code of Ethics is presented as a set of guidelines and best practices for professional behavior, including participation in AAS-sponsored activities (e.g., meetings, publications, Society governance, etc.) and in other astronomical activities (e.g., research, education, publishing, peer review, etc.)… [A] process to guide the resolution of suspected breaches is also an important component of the AAS Code of Ethics."
- Stakeholders: "universities, research institutions, associations, funding agencies, collaborations, individuals, etc. [Each] bears responsibility for upholding a set of common scientific, educational and ethical standards and for assigning consequences when these standards are breached. The AAS is only one of these stakeholders. In many cases of ethical breach, the AAS is not the entity where primary jurisdiction for investigative or corrective measures resides. The AAS has neither the personnel, financial or technical resources, nor the oversight authority to accept the responsibility for investigating and adjudicating suspected breaches of ethics that are the rightful jurisdiction and responsibility of other community stakeholders."
- The AAS "has a responsibility to [set] the norms for professional behavior of its members and thereby within the astronomical sciences."

New Ethics Statement

- 13x longer
- Addresses conduct towards others and in research
- Investigation defaults to primary entity (often not AAS)
- Establishes Code of Ethics Committee
- Process for complaint, investigation, sanctions, appeal
- Explicitly addresses harassment, including sexual harassment (defined) and bullying
- Repeats previous content on research, publication, conflict of interest
- (*12 pp)* Adds detailed process for handling complaints (jurisdiction, filing, confidentiality, investigation, sanctions, appeal)

Sanbonmatsu, Akimoto & Gibson 1994 (Evaluation of failing students)



XKCD wisdom at xkcd.com

Women lack math ability …

- STEREOTYPE THREAT: performing below ability because of expectations
- Example: "hard" math test
  - Men: 25/100
  - Women: 10/100
  - *Gender gap in math?*
- "This test has been designed to be gender neutral"
  - Women: 20/100
  - Men: 20/100
- Important for minority students

Coaching (Mentoring)

Tony DeCicco, U.S. women's soccer coach
Boston Globe, June 18, 1999

When job searches are gender-blind …

blind audition…

…works for orchestras, writers, abstracts, resumes …

See story of Munich Philharmonic trombonist (Abby Conant)

There aren't any good women to hire?

- Jane Doe
- John Doe
- Keisha Doe
- Jamal Doe

(Research shows name strongly affects success of resume, even among psychologists who are well aware of gender schemas.)

2006 NAS Study: *Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering*

1. Statistics (U.S.)
2. **Learning and performance**

   → ***No intrinsic difference could possibly lead to observed gender gap***
3. Persistence and Attrition
4. Evaluation of success *implicit bias*
5. Strategies that work
   - Undergraduate *Carnegie Mellon*
   - Hiring faculty *U. Washington toolkit*
   - Training women faculty *CoaCH*
   - ADVANCE *CRLT players*
6. Institutional structures, career paths
7. Recommendations

Letters of Recommendation

- *Trix & Penska 2003* – letters for a prestigious medical fellowship
  - Length
  - Specificity
  - Superlatives v. "grindstone" adjectives
  - Doubt
  - Explicit mention of gender, personality, family
  - (Tenure letters: women re women)

Reasons for Disparities?

- Not family "Do Babies Matter?" *Mason & Goulden 2002*
  - Women w/o children not more successful
  - Many women in other demanding fields
  - Countries w strong support systems (e.g., Scandinavia) have few women in physics
  - Academic careers flexible: *become a professor, have a family!*
- *In Praise of Daycare, 2009 January STATUS newsletter*

5 Steps for Leaders

1. Learn about bias www.hunter.cuny.edu/genderequity/equityMaterials/Feb2008/annobib.pdf implicit.harvard.edu

   Beyond Bias and Barriers (NRC Study)
2. Do job ***searches*** *UW hiring kit*
3. Validate women speakers, job candidates, colleagues *Introductions, appointments*
4. Mentor
5. Equate diversity with excellence