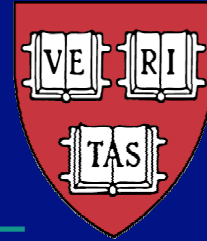


# Diversifying the S&E Workforce: Research University Experience

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## Women in Science and Engineering at Harvard University

*Barbara J. Grosz*

*Higgins Professor of Natural Sciences, DEAS  
Dean of Science, Radcliffe Institute for Advanced  
Study*

# FAS Women Faculty: Tracking of Appointments



	<i>% women total FAS faculty</i>	<i>% women faculty in science &amp; engr</i>
<i>1991-92</i>	<i>17.5</i>	<i>6.9</i>
<i>1998-99</i>	<i>19.2</i>	<i>7.5</i>
<i>1 July 2004</i>	<i>22.7</i>	<i>10.7</i>

# FAS Women Faculty: Tracking of Senior Appointments



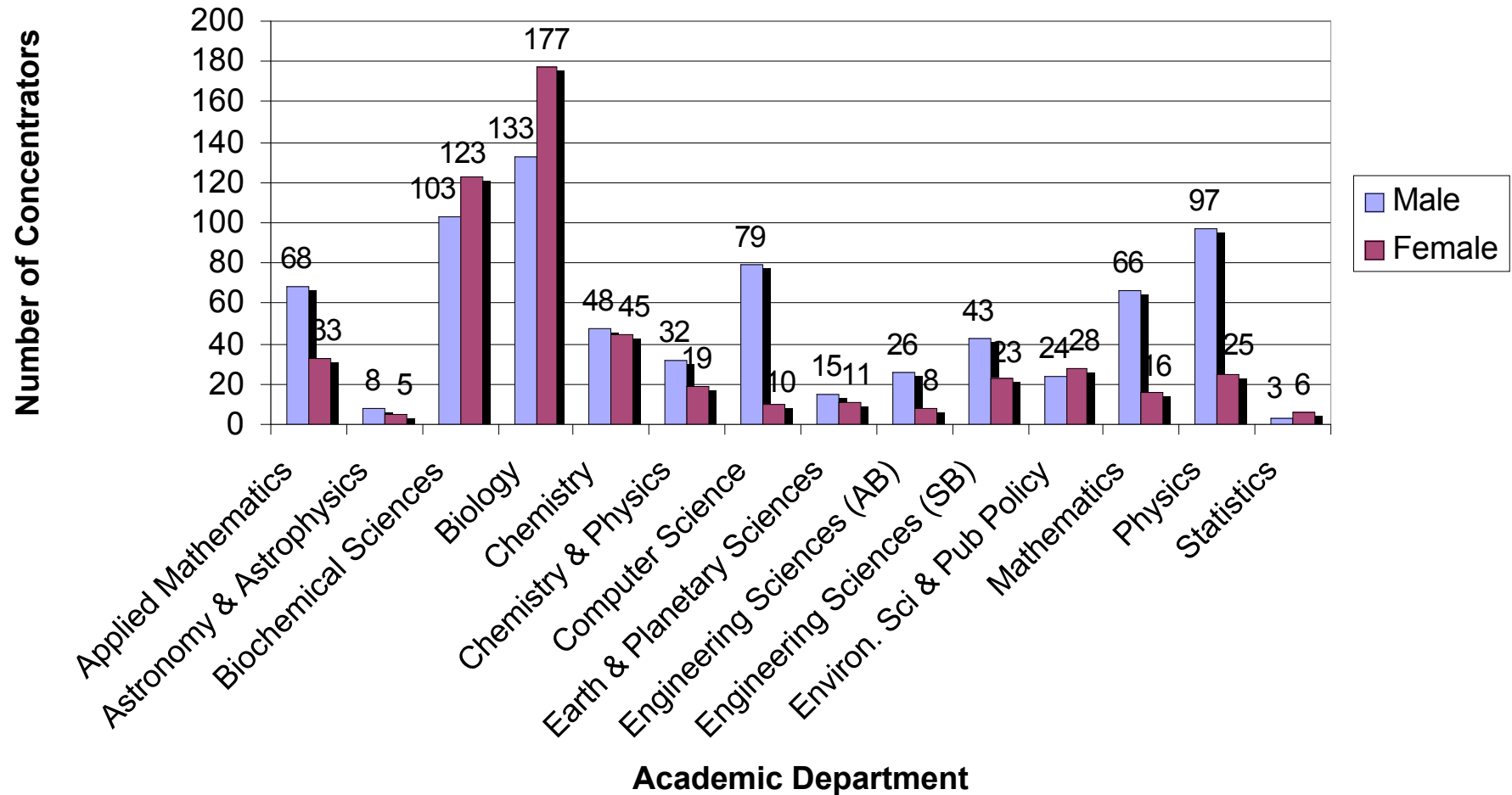
	<i>% women total FAS faculty</i>	<i>% (#) women faculty in science &amp; engr</i>
<i>1991-92</i>	<i>9.5</i>	<i>3.3% (4)</i>
<i>1998-99</i>	<i>13.5</i>	<i>5.5% (7)</i>
<i>1 July 2004 (&amp; 1 Jan. 2005)</i>	<i>18.3</i>	<i>7.8% (13)</i>

# Hypothetically speaking: senior offers 1997-98 to 2003-04



<i>If proportion of senior science hires that were female had been</i>	<i>women would now be the following proportion of senior science faculty (cf. current 7.8%)</i>
<i>100%</i>	<i>32%</i>
<i>50%</i>	<i>19%</i>
<i>30% life sciences 18% physical sciences</i>	<i>11%</i>

## 2004-2005 Undergraduate Concentrators by Department and Gender



# Some Recent Statistical Studies

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Compensation: no statistically significant difference between the salaries of male and female faculty.

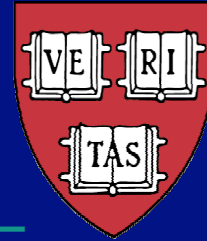
- *Status as an internal vs. external hire predict largest variations*
- *45% of male faculty, and 69% of female faculty in science (but not other areas) are internal promotions*
- *“Believable” outside offers influence (though not among factors studied)*

Tenure rates

Pipeline benchmarking

# Statistical Studies: Pipeline

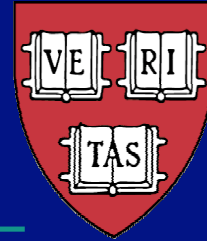
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## Pipeline benchmarking 1:

- *Comparison of fraction of female junior faculty with fraction of PhDs 1992-97 for Harvard and nationally (cf. Princeton's study).*
- *April 2004: Astronomy, Physics, and Statistics had no junior faculty women; all other science department faculties "mirror applicant pool" .*
- *Good news: Departments of Statistics, Physics now have female junior faculty; Astronomy will in 2005-06.*

# Statistical Studies: Pipeline Not so Rosy



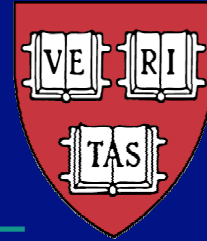
## Pipeline benchmarking 2:

- *News not all good: senior offers data (1997-2004)*
  - *Life sciences:*
    - *17% offers and 11% new appointments to women*
    - *30-40% Ph.D.'s and ~30% junior faculty are women*
  - *Physical sciences:*
    - *13% offers and 13% appointments to women*
    - *10-20% Ph.D.'s (junior faculty %s diverse)*
  - *New senior women: 50% offers and 66% appointments were internal promotions. Note; 9/13 current senior women internal promotions.*



# Recruitment, Retention, & Faculty Development

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## Outreach Fund (1996 - 2004):

- *12 women, 3 minorities.*
- *2003 renewed; expanded to include junior faculty.*

## Support for career and family:

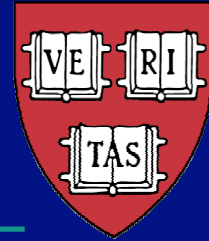
- *Teaching relief, delay of tenure clock*
- *Junior faculty leave (not science, not economics)*
- *FAS Dependent Care Fund: support attendance at conferences and other important professional development events.*

## Overhaul of FAS appointments process

## Radcliffe Institute for Advanced Study activities

# Recruitment, Retention, & Faculty Development

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## Radcliffe Institute for Advanced Study

- *Fellows clusters: astrophysics (5 women, 2 men), theoretical computer science (4 men, 2 women, 2 women “short-term visitors”).*
- *Mathematics fellows*
- *Increasing efforts to identify women for all other science activities*
  - *Symposia speakers*
  - *Exploratory seminars participant lists*

# The Fellows Experience

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*“Radcliffe fellowship afforded me the opportunity to focus on research I may not have been able to do otherwise...my Radcliffe fellowship allowed me to think of science from a different perspective. ”*

*Omowunmi Sadik, Chemistry, SUNY, Binghamton*

*“I will remember this past semester as the most enlightening time in my entire career.”*

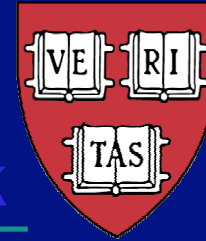
*Anne Brunet, Genetics, Stanford Medical School*

*“I know of no other institute that provides its fellows or visitors with such an intimate access to such a wide array of scholars. Listening to an insightful talk on an interesting topic and being able to meet the speaker and ask further questions seems to be a unique resource.”*

*Oded Goldreich, Computer Science, Weizmann Institute of Science*

# Radcliffe Institute for Advanced Studies

(Anne Brunet)



Support for the work

Exceptional environment

Expanding horizons

New ideas

Emulation

**Women role models**

**Friends**





**Senam Okudzeto**



**Junot Diaz**



**Sandra Chapman**



**Dana Ron**



**Salil Vadhan**



**Eli Ben-Sasson**



**Paula Hammond**



**Irene Winter**



**Reuel Rogers**

# Some personal observations: Faculty



Individual responsibility, champions, accountability

- *throughout appointments processes*
- *at all levels: president, deans, search & dept. chairs*  
*ex: role played by Dean of Physical Sciences*

Constant vigilance:

- *Broad Institute example*
- *Not ill will, but not paying attention*

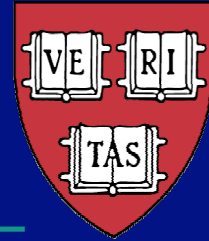
What really matters — compensation:

- *Internal promotion vs. external hire*
- *Believable outside offers*

Small numbers and isolation, water on rock  
“invisibility”

# Some personal observations: Radcliffe

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## Constant vigilance

- *Computational Biology Symposium S'2003*
- *Designing Biology S'2005 (vs. F'2004 nanotech)*

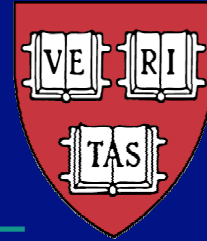
## Science is a social activity:

- *Collaborations, co-authorship*
- *Research groups, labs*



# Some personal observations: Students

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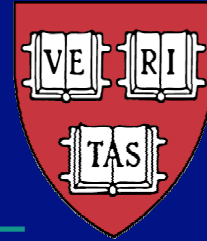
## Role models (not the same as mentors)

- *Curious Minds* (Brockman, 2004)
  - 6 women: 4 psych/anthro, 1 evo. bio, 1 physicist
  - 21 men: 4 psych/anthro, 1 evo. bio, 4 molecular biologists, 5 physicists/chemists, 4 engineers, 1 mathematician, 2 writer/philosophers
- *mimics vs. rebels*



# Some personal observations: Students

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## Study groups: inclusive/exclusive

- *“They said I could join, but never told me when they were meeting.”*

## Expectations

- *It’s ok to leave to play baseball, but not to go to a meeting on women’s careers in science.*
- *If you’re not in the lab 7x18...*

# Time for change?

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“I am not an advocate for frequent changes in laws and constitutions. But laws and institutions must go hand in hand with the progress of the human mind. As that becomes more developed, more enlightened, as new discoveries are made, new truths discovered and manners and opinions change, with the change of circumstances, institutions must advance also to keep pace with the times. We might as well require a man to wear still the coat which fitted him when a boy as civilized society to remain ever under the regimen of their barbarous ancestors.”

*Thomas Jefferson letter to Samuel Kercheval, 1816  
from Jefferson Memorial chamber inscription*

# Shared Challenges: Searching for Underlying Causes

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## Re-think evaluation criteria: faculty

- *Capture future potential to contribute to the academy and sciences*
- *Not (just) proxies for 'science is all of life'*

## Encouraging science education

- *Inclusive "teamwork"*
- *Mentorship programs (e.g., CRA-W)*

## Pipeline studies, Analysis:

- *Understand roots of the declining numbers*
- *Understand what's required for doing the best science*

## Image (vs. reality?)