Call for action on Diversity and Inclusion in Academia

The Dual-Anonymous review for Hubble Space Telescope

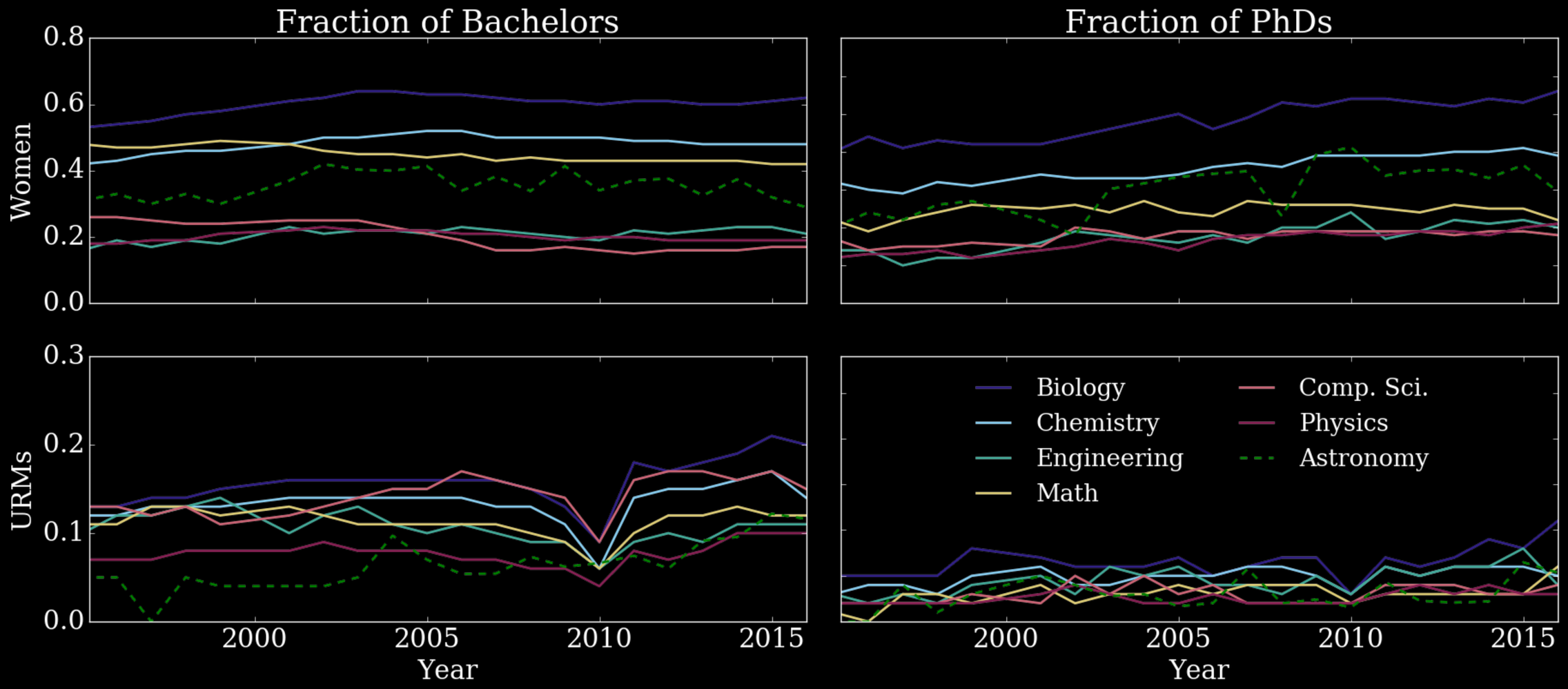
Dr. Lou Strolger, Observatory Scientist, Space Telescope Science Institute

THE STATUS OF WOMEN AND MINORITIES IN THE US, 2016

51% of US population are women

39% of US population are part of a racial or ethnic minority

32% of US population are underrepresented minorities (URMs) in STEM[1]



[1] Less than 13% of STEM Bachelors degrees (2014), National Action Council for Minorities in Engineering.

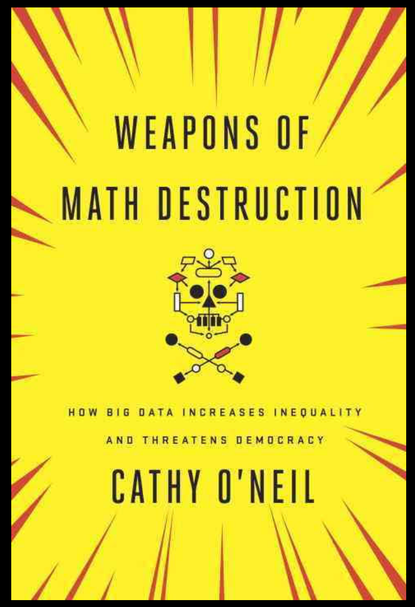
[2] Sources: US Census (2014), Integrated Postsecondary Education Data System Completion Survey by Race

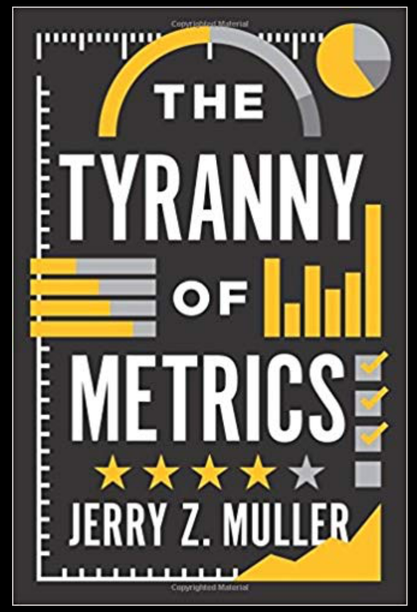
HOW TO TAKE ACTION: EVALUATE YOUR ENVIRONMENT

- Equality vs. fairness (or equity)
  - *What inequitable policies, behaviors, practices or designs exists?*

- Weapons of Math Destruction and the Tyranny of Metrics
  - *Time-saving, resources saving, statistical models often hurt disadvantaged people, by design.*

- Value actions which work to improve environment
  - *performance, promotion, and tenure, pro-design.*





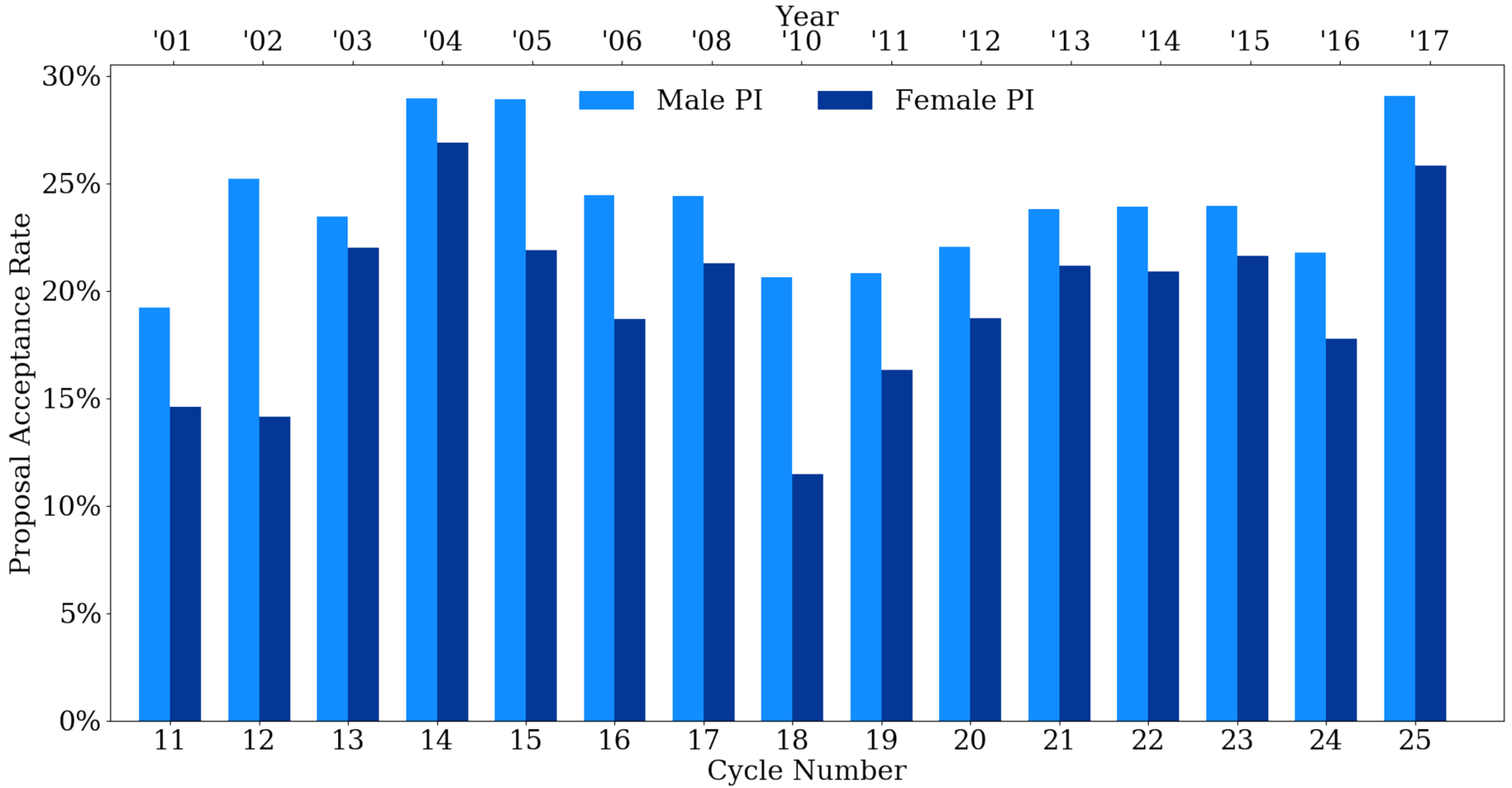
The Hubble Space Telescope Peer Review

Most allocation of telescope time in the community is done through a peer review process

- Each year STScI receives >1000 proposals from scientific community, only a few hundred will be awarded.
- Panel of experts evaluate proposals largely on scientific merit, technical feasibility and responsible use are other important aspects
- Panel makes recommendations to the STScI Director based on a ranked priorities on what to allocate for the upcoming cycle

Gender-correlated Systematics in HST Proposal Selection

I. N. Reid 2014, PASP, 126, 923



average 5% gap

Other potential for bias

gender disparity gap

Various other inequities due to conscious and unconscious identity biases

The dual-anonymous peer review for Hubble Space Telescope

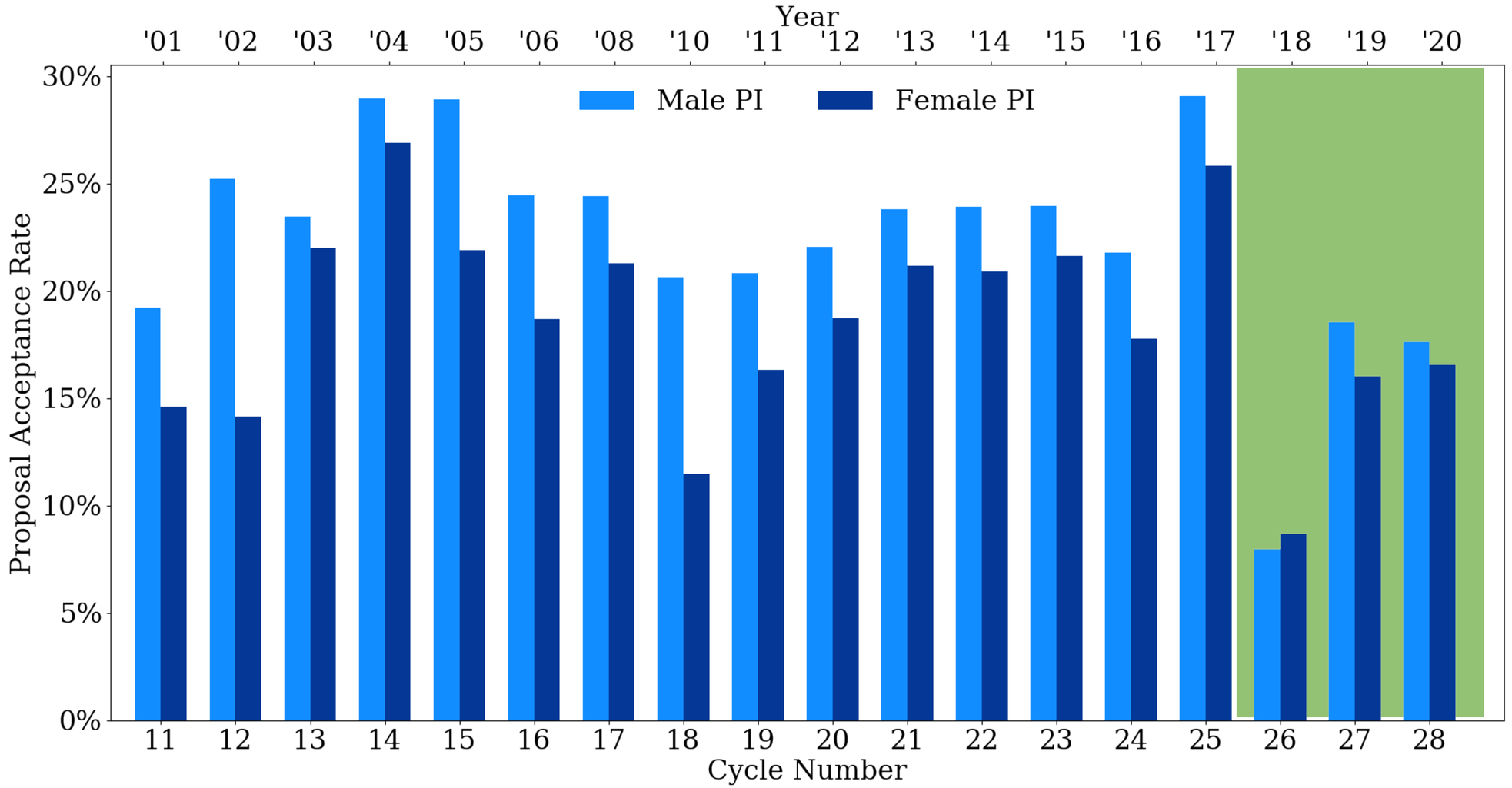
Reviewers consider proposals solely on the **scientific merit** of what's proposed

- Proposers exclude names and affiliations in their proposals, including in figures, website references, etc.
- Reviewers do not spend time attempting to identify the proposers or the teams. In discussion leading up to the scientific ranking, do not make guesses on identities, insinuate the likely identities, or instigate discussion on team's experience.

Levelers are present to insure the discussion focuses on scientific merits of the proposals

Team expertise and background are evaluated after the proposal rankings, and are not used to re-rank.

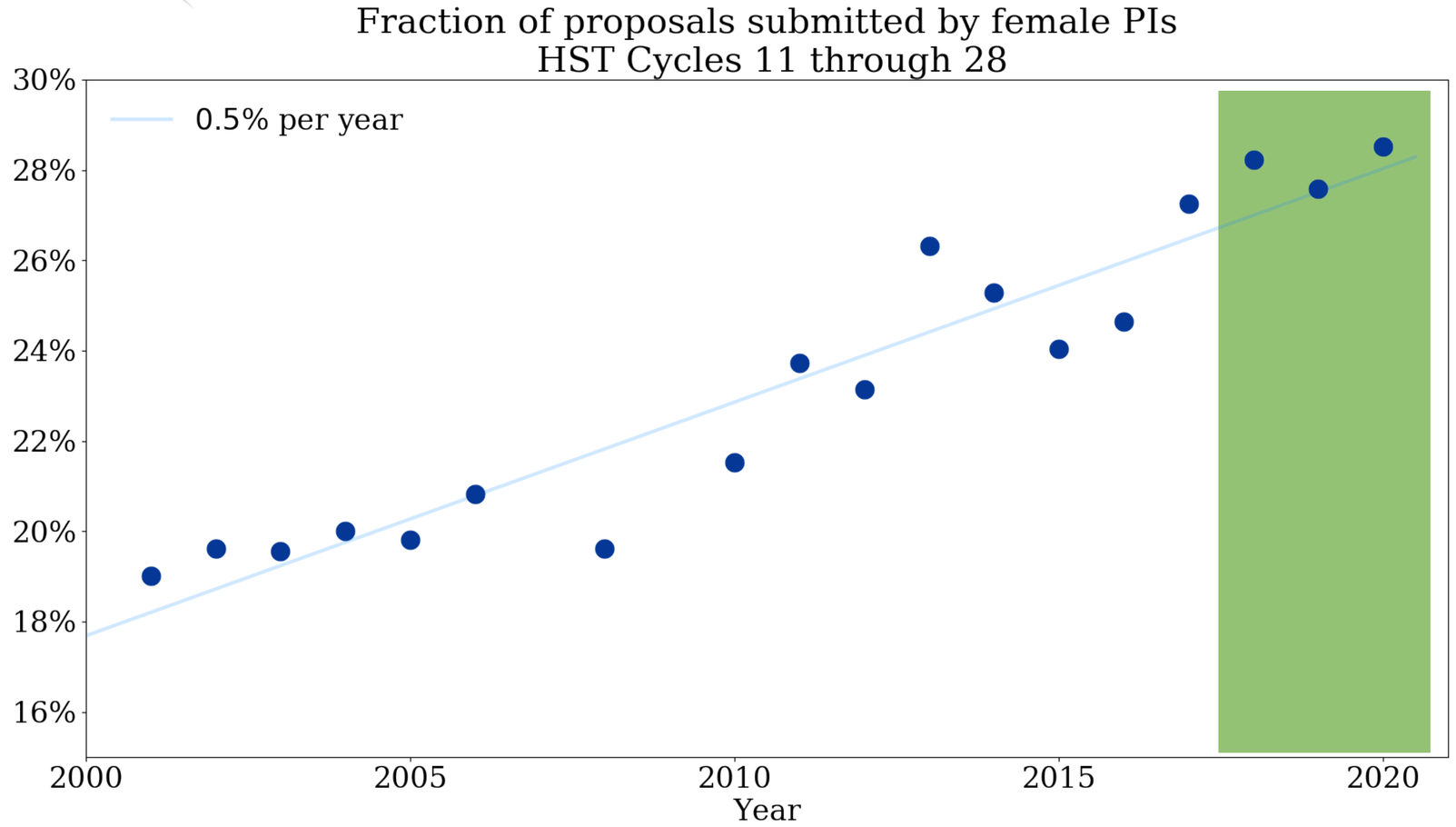
Impact of the Dual-Anonymous Review: Decreasing the Gap in Gender Bias



average
5% gap

average
1% gap

Impact of the Dual-Anonymous Review: Enticing New Proposers



Number of PIs awarded programs for their first time	
Cycle 28	55
Cycle 27	51
Cycle 26	6
Cycle 25	21
Cycle 24	5

A NEW DIRECTION IN RESOURCE ALLOCATION

National Aeronautics and
Space Administration

Headquarters
Washington, DC 20546-0001

June 7, 2019

To: Distribution (Astrophysics GO Leads)
From: SMD/Director of Astrophysics
Re: Dual Anonymous Peer Reviews for Astrophysics GO Programs

In June 2018, the Space Telescope Science Institute (STScI) conducted a dual anonymous peer review for Cycle 26 of the Hubble General Observer (GO) program[1]. The dual anonymous peer review addresses many issues of implicit bias. STScI's implementation of dual anonymous peer review was successful in Cycle 26. During June 2019, STScI will be conducting the Hubble Cycle 27 peer review, again using the dual anonymous process. STScI and NASA will review the Cycle 27 experience and outcomes to assess the dual anonymous practice.

In the absence of any contra-indications from the Hubble Cycle 27 peer review, I am directing all NASA Astrophysics GO programs to use dual anonymous peer reviews beginning in CY 2020.

In order to provide all NASA Astrophysics GO program leads with the benefit of STScI's experience, STScI will host a workshop in Fall 2019 to share their practices, lessons learned, and extant documentation with all other missions.

If you have any questions, please address them to your HQ Program Scientist or to me.

Paul Hertz
Director, Astrophysics Missions
Science Mission Directorate

STScI Peer Review

- Dual-anonymous peer review appears to be working in reducing gap in gender bias. It is also enticing new proposers.
- Developing machine learning tools to further reduce bias in reviewer selection and expertise to proposals.
- Working on tools to help proposers craft their proposals anonymously
- Looking forward to utilizing dual-anonymous policies and machine learning tools in the James Webb Space Telescope peer reviews.

Dr. Lou Strolger

Science Mission Office

Space Telescope Science Insitute

strolger@stsci.edu