Space Telescope Science Institute

Civility in Science?

STScI Panel on:

"The Encounter Between Self and Other in the Professional World"

Matt Mountain

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Introduction

What was my path to this Panel on “Civility in Science”, and STScI’s support of this “*Hard Science, Soft Skills*” Lecture series?

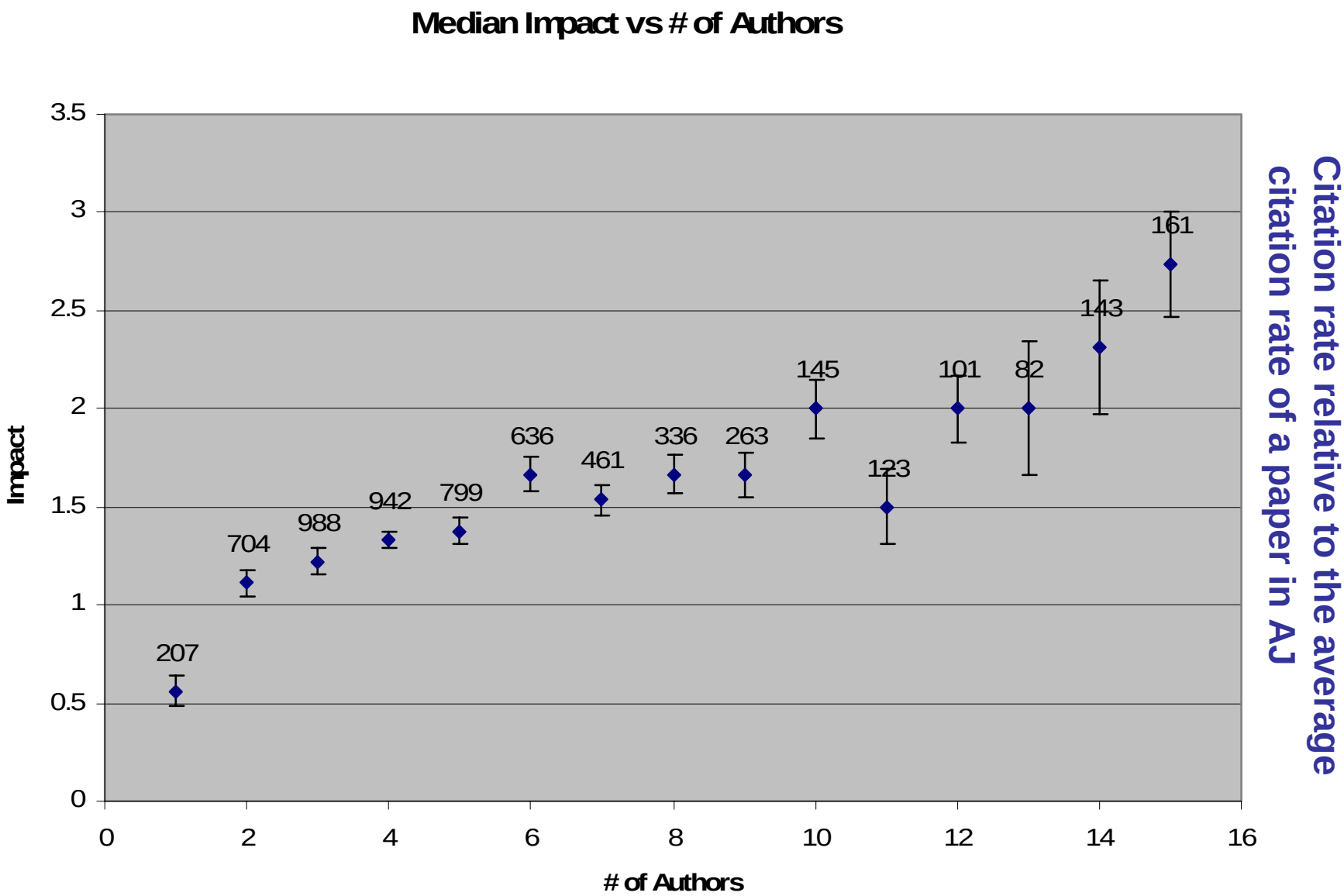
Two contradictory pieces of “data”.

Larry Summers - Remarks on Diversifying the Science & Engineering Workforce

- “So my best guess, to provoke you, of what's behind all of this is that the largest phenomenon, by far, is the general clash between people's legitimate family desires and employers' current desire for high power and high intensity, that in the special case of science and engineering, there are issues of intrinsic aptitude, and particularly of the variability of aptitude, and that those considerations are reinforced by what are in fact lesser factors involving socialization and continuing discrimination.”

http://www.president.harvard.edu/speeches/2005/nber.html

The highest impact papers in Astronomy & Astrophysics in general *require Teams*



From Dennis Crabtree, 2005

1. Why is it as a profession we seem so certain about the attributes required for success in our field?

2. Is past performance a reliable guide for future success in the increasingly complex intellectual, fiscal and cultural environment in which astronomy & astrophysics are now embedded?

A University is not outside, but inside the general social fabric of a given era. . . . [It is] an expression of the age.[101]

101.Abraham Flexner, *Universities: American, English, German* (New York: Oxford University Press, 1930), 3–4, as quoted in Kerr, *Uses of the University*, 3

We [Space Scientists] have our foundations in two distinct "social" traditions …

- Traditionally, observing with a major telescope was the preserve of astronomers whose heritage consisted of lonely nights, perseverance, and an assumption of the unique "added value" a skilled observer brings to the whole process. In addition, there was a considerable degree of *"self worth"* associated with observing successfully with *"a cantankerous machine,"*[1] tinged with a not-insignificant element of romanticism [2].

[1] McCray, 2003

[2] Roy & Mountain, 2005

The “Mega Buck” Physics Laboratory

The first “Get Acquainted Tea” for wives of newcomers to the Lawrence Radiation Laboratory in Berkeley, 1961. The three women on the left are standing in their husbands’ rank order at the lab. Reproduced with kind permission of the Lawrence Berkeley National Laboratory.

The Postwar Suburbanization of American Physics
David Kaiser, American Quarterly 56, 4 (2004)

In class, status, and self-image, [the American intellectual] has become more solidly middle class, a man at a desk, married, with children, living in a respectable suburb. C. Wright Mills, *White Collar*, 1951

Forty years on, a lot has changed in our attitudes, approaches and in society as a whole.

However as scientists, we still cling to a few traditions…

Is scientific debate really verbal hand-to-hand combat?

Prime Minister's Question Time

Does this produce the right results?

The greatest problem with communication is the belief that it has occurred (Bertram Russell)

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Lisa Randall: Warped view of the universe

Extract from The Education Guardian interview, June 2005
http://education.guardian.co.uk/higher/profile/story/0,11109,1510700,00.htm

‘She was the first woman to win tenure in the physics departments of all three east coast universities.

She refuses to get involved in personalities, but dismisses both MIT and Princeton as "unhelpful working environments" and was less than impressed when Larry Summers, Harvard's president, suggested at the beginning of the year that there were fewer women scientists because of innate differences between the sexes. "Though he's always been extremely complimentary about my work," she adds.’

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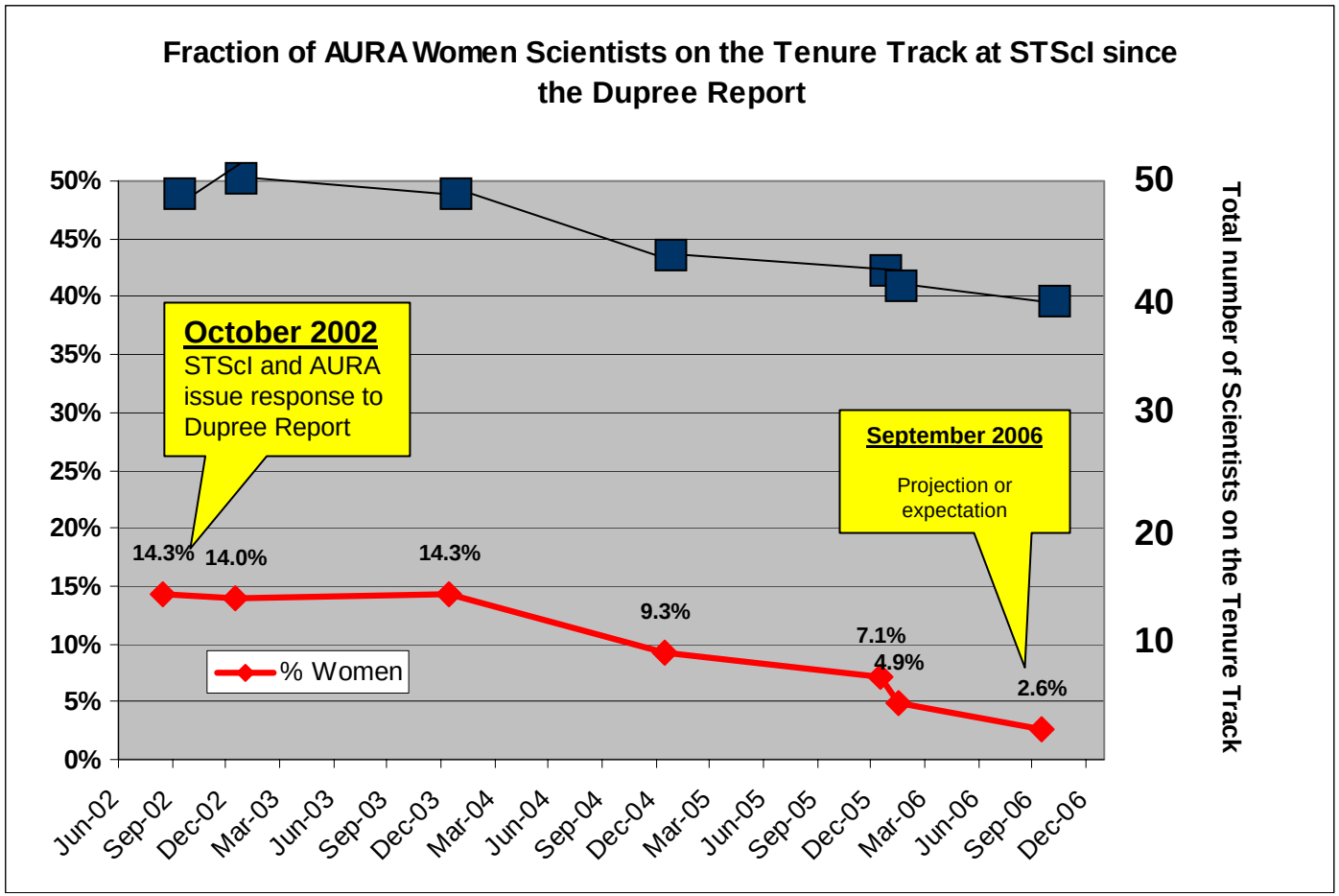

"The Space Telescope Science Institute has a heritage of leadership in addressing issues of gender equity for our staff and the astronomy community. We are committed to continuing that heritage, and we are grateful for the advice of the AURA review committee in helping us define constructive solutions to these problems. We commit to pursuing their recommendations with very high priority"

STScI, October 2002

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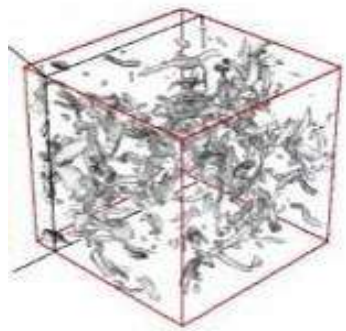
Science Paradigms I of 2

J. Gray, Microsoft & A.Szalay, JHU

- Thousand years ago:
  science was **empirical**
    describing natural phenomena
- Last few hundred years:
  theoretical branch
    using models, generalizations
- Last few decades:
  a **computational** branch
    simulating complex phenomena
- Today:
  data exploration (eScience)
  unify theory, experiment, and simulation
  using data management and statistics
  - Data captured by instruments
    Or generated by simulator
  - Processed by software
  - Scientist analyzes database / files

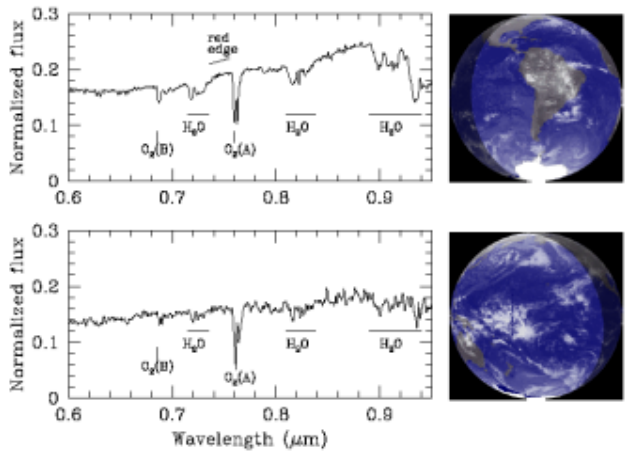
$$\left(\frac{\dot{a}}{a}\right)^2 = \frac{4\pi G\rho}{3} - \mathrm{K}\frac{c^2}{a^2}$$



Science Paradigms 2 of 2
S. Seager, Carnegie DTM

"Its clear that observations of exoplanets will always be in the astronomy domain (in terms of pushing technology) but it is also clear that for big advances to be made in exoplanet characterization that Earth and Planetary Sciences need to be involved.

In particular I think the tough problems will be solved by the next generation of exoplanetary scientists – those comfortable with astronomy-type data and also with all the details of physics and chemistry of planetary science."



'Earth shine' by reflection off the Moon measured at Apache Point

Surprise and sociology in multi-disciplinary sciences – Charles Townes, 1993

Nobel Laureate for Physics, 1964

- "Ordinary reasoning might argue that [scientific] productivity must depend on intelligence…there is a lot more to science than intelligence.

  There are a lot of other personal and social characteristics – and perhaps accidents -- that count. Surroundings count, the place where you are, work habits, attitudes, ability to carry through an idea and so on. It's a very complex business…"

C. Townes, Proceedings of the International Astronomical Union Symposium, 158, held at the Women's College, University of Sydney, Australia, 11-15 January, 1993

Attributes for 21st Century Scientist?

- Active, receptive communicator
- Versatile, adaptable
- Intelligent, skeptical

I don't think any of us today believe this ensemble of attributes can be preferentially (or even statistically) associated with any one gender, race or class…..

***To flourish*, these attributes require a system or framework where people can actually be heard, and where criticism is an respectful process** [rather than an emotional battle ground.]

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These attributes can only be effectively mediated through civility