Astrobiology as a Natural Cradle to Nurture Diversity in Intellectual Scope and Workforce Composition

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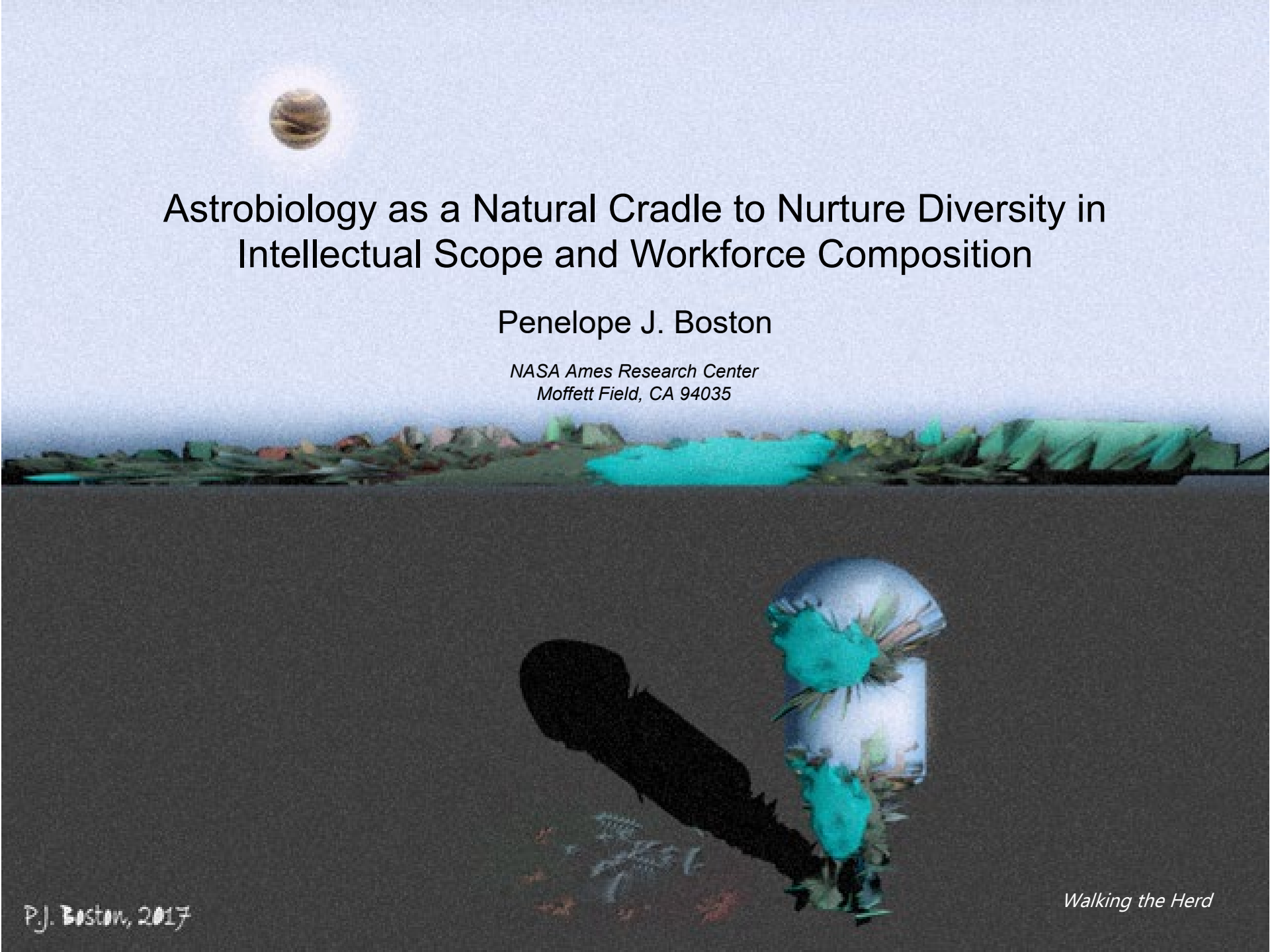

Walking the Herd

My caveats and bases of insight:

- My discussion today is not a representation of NASA's official views.
- I am not a professional in fields pertaining directly EDIA (D&I).
- I come from a multi-cultural family spread across the world.
- I had early direct personal experience with the disabilities community.
- I am a woman in science of a generation where that was not just a rarity but a peculiarity.
- I taught at an MSI for 16 years, headed up several Title IX classroom initiatives.
- Supervised and advised native American and disabled students including autism and Asperger's Syndrome spectrum individuals.
- Served as Director of the NASA Astrobiology Institute for 3 years.
- Invited by the community to be the Executive Sponsor of the Ames Disability Advocates advisory group.


Aerospace
Mathematics
Propulsion
Planetary Geology
Astronomy
Astrobiology
Physics
Chemistry
Robotics
Materials
Biology

We start by trying to know about life on Earth,
(biology)

and understand conditions on other planets,
(planetary science)

then try to map life stuff onto planet stuff.
(astrobiology)

Thus, AB and PS are inextricably bound.
But, PS can ignore AB while AB cannot ignore PS.

Overarching Observations:

- Nature of astrobiology is so intrinsically interdisciplinary that it has been a perfect cradle to nurture a diverse community in both intellectual style, background, and personal human characteristics.

- Astrobiology is younger (in some senses) than Planetary Science as a legitimate field of inquiry.

- Both are paradigm-changing fields that emerged courtesy of major technological advances.

- Both have helped to greatly advance Earth science, introducing comparative study.

- Good intentions at the grass roots level are critical but insufficient alone.

- Legal and institutional commitment to EDIA are critical but insufficient alone.

- Working steadily towards diversity from both ends of the spectrum is essential for success!

- Patience is a virtue. It takes time and persistence to keep pushing on EDIA issues.

- Unspoken messages of inclusion are extremely effective, many studies show this.

- Valuable templates stem from direct trials, not “gut feelings” by those of us in the profession.

- We must pay direct attention to research within the EDIA scholarly community and find ways to address what they find.

e.g. Subtle phenomena that impede EDIA, e.g. Significantly smaller collegial network of women scientists compared to their male counterparts in a large tier 1 research university located somewhere in the Midwest (Falci & Watanabe, 2020).

- *80+ Diversity in the Workplace Statistics You Should Know* (Reiners, 2020-21).

- *Journal of Women and Minorities in Science and Engineering.*

Lessons Learned:

1) Develop a comprehensive diversity plan that includes the implementing managers from the very beginning!

2) Make diversity and inclusion (D&I) data available on an on-going basis to allow planning and tracking of continued progress.

3) Empower individual scientists and mid-level managers to develop and enact D&I improvements from the grassroots levels

4) set milestones and track advancement toward D&I goals allowing for adjustment in plans as the JPL and national diversity and inclusion landscape continues to evolve.

5) Don't naively think that you are inventing EDIA from scratch. There are studies that help sort out what is actually effective. (Pedulla, ed. 2020, *What Works? Evidence-Based Ideas to Increase Diversity, Equity, and Inclusion in the Workplace*).

Disabilities, Differently Abled, Invisible Disabilities

- Visible and self-identified physical and mental disabilities come in many forms.
- Invisible disabilities are often not self-identified out of fear of negative career consequences.
- Each requires some workplace accommodations that are spelled out in the Americans with Disabilities Act of 1990.
- Simply being in compliance with the letter of the law is only the first step in integrating disabled employees into the workplace.
- Wealth of experience about how to welcome the disabled and provide the best chance for them to use their talents (Matt & Butterfield, 2006; Vezzali & Capozza, 2011; Kulkarni et al, 2016).
- Differently abled people have perspectives that can be especially valuable to a field like astrobiology where experiencing the world differently may be an asset to the actual science itself.

Where Do We Go From Here?

- NASA is trying very hard.
- Newly added core value of diversity is extremely important. Words do matter a great deal.
- The advisory groups at Centers and HQ and JPL/APL are invaluable, they must be nurtured and enhanced where THEY see fit.
- ODEO offices are not enough alone.
- Ames is trying a new idea, designated an Ames Inclusion Champion.
- How do we encourage diversity in proposing teams? Box-checking tokenism is the LAST thing that we want to encourage.
- I believe that EDIA and educational commitment belong directly within the research community itself, it is the only path to true buy-in in our daily practices.