

Committee on Biological and Physical Sciences in Space (CBPSS)

Space Studies Board Meeting
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Disclaimer: These slides are a personal assessment of issues discussed during recent Committee on Biological and Physical Sciences in Space meetings, and should not be cited or quoted as the views expressed do not necessarily reflect those of Committee, the SSB, the ASEB or the Academies.

CBPSS Status

- Membership
- Fall Meeting
- Top Level Issues

Membership

- Douglas M. Matson, Tufts University (co-chair)
- Dava J. Newman, Massachusetts Institute of Technology (co-chair)
- Ajay K. Agrawal, University of Alabama
- Anna C. Balazs, University of Pittsburgh
- Mary L. Bouxsein, Harvard Medical School
- Steven H. Collicott, Purdue University
- Vijay K. Dhir, University of California, Los Angeles
- Alain Karma, Northeastern University
- Mohammad Kassemi, Case Western Reserve University
- Wayne L. Nicholson, University of Florida
- Marylyn D. Ritchie, University of Pennsylvania
- Jessica Scott, Memorial Sloan Kettering Cancer Center
- Jana Stoudemire, Axiom Space

Fall Meeting

- Committee met in hybrid meeting on Oct 19-21, 2022
- Focus on updates from NASA programs and BPS workforce issues
- Also received briefings from programs with synergies with BPS
 - Human Research Program
 - STMD Environmental Control and Life Support Systems
 - STMD Cryogenic Fluid Management
 - Artemis

Fall Meeting — Highlights

- Useful cross-division conversations between NASA speakers
- STMD talks powerfully emphasized necessary role of fundamental BPS research in development of a wide range of required exploration technologies
 - Examples included physics of materials combustion, cryogenic fluid management (CFM), ISRU, ECLSS, microbial and crop management
 - Empirical data is crucial to anchoring models, bridging capability gaps
 - As one example, spending 100s of millions to mature critical CFM technologies alone while still having fundamental knowledge gaps in understanding of fluid physics
 - “The value of our BPS investment cannot be underestimated”
- Hearing from other agencies/divisions on workforce issues was enlightening
 - Different ways of managing research, funding, outreach

Fall Meeting – Highlights

- Workforce Panel 1: **Surveying the current landscape**

Key points:

1. Bureau of Labor Statistics: commercial spaceflight labor needs to be captured in future statistics
2. NASA SMD: increased diversity of funded researchers over past 5 years; aiming to continue this trend
3. NASA STEM engagement: critical need for commercial entities to work together for broader approach to workforce development; focus should also include targeting technical & community colleges

Fall Meeting – Highlights

- Workforce Panel 2: **Lessons and approaches from federal initiatives**

Key points:

1. NIH: unique funding mechanisms for early career, mid career, and late career research that could be beneficial for BPS
2. NSF: unique public private partnership funding mechanisms that could be beneficial for BPS
3. BPS: strong initiatives to enhance training, DEI, and career paths

- AIAA presentation:

Increased diversity of workforce over past 5 years; aiming to continue this trend. Goal for over 1 million STEM program outreach by 2025. Could BPS have similar outreach?

Top Level Issues

- Preparation for BPS Decadal release and stewardship
- Impact of budget issues on program's ability to maintain science cadence
 - Current CERISS and TIDES expanded initiatives dependent on budget increase
 - BPS budget will likely need to cover integration, launch, and operations costs in 2025
 - Limited ground program impacts potential for flight development
 - Lack of fundamental physical sciences funding opportunities
- Focus on LEO research initiatives; need for transition plan for ISS current research to emerging platforms for commercial in LEO, lunar, gateway
- Useful cross-division conversations between NASA speakers
 - Need for further cross-disciplinary research within BPS
 - Need for further strategic collaborations involving internal (e.g., STMD, HRP, Artemis) and external (e.g., NSF, NIH) partners