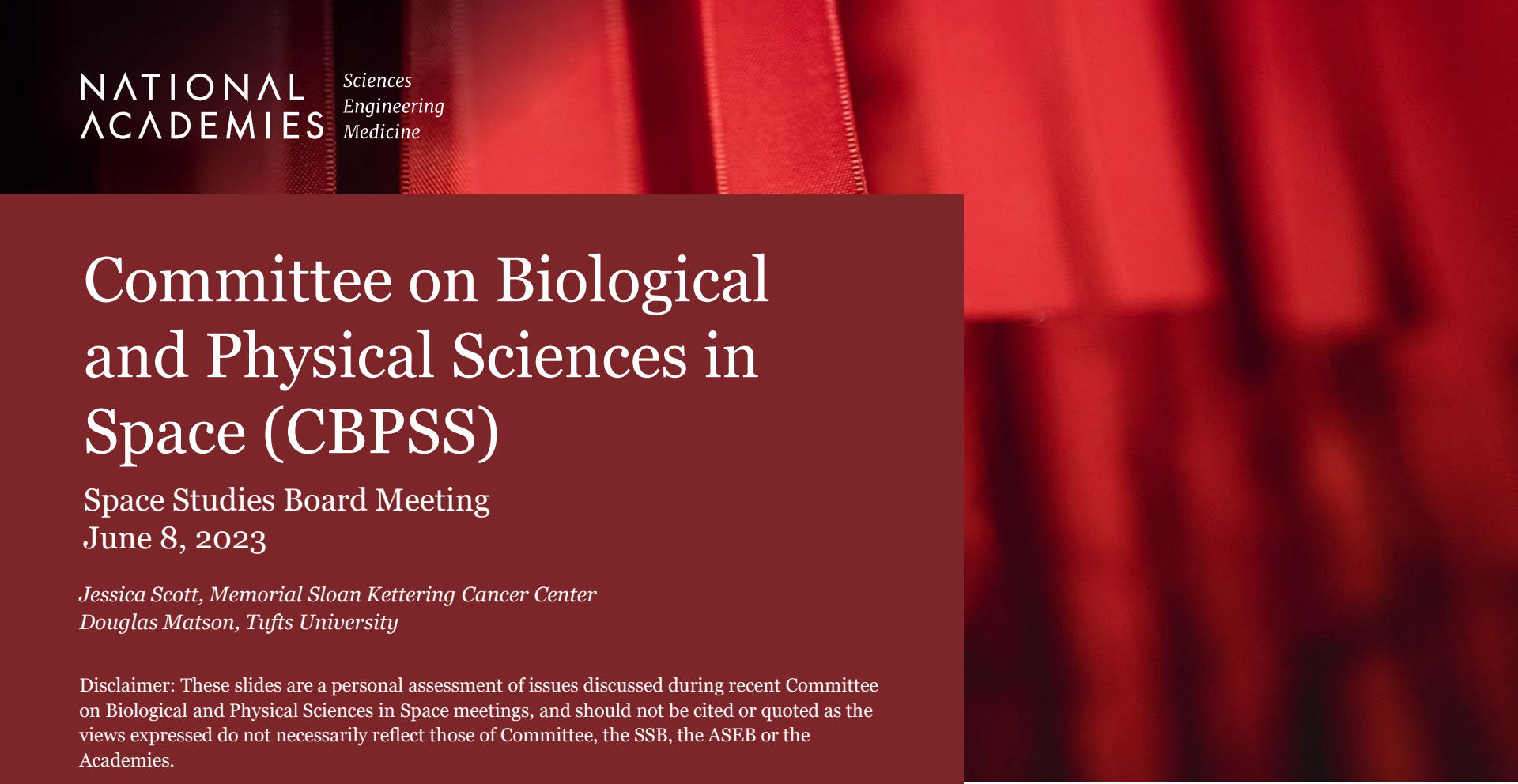

NATIONAL ACADEMIES Sciences Engineering Medicine

Committee on Biological and Physical Sciences in Space (CBPSS)

Space Studies Board Meeting
June 8, 2023

Jessica Scott, Memorial Sloan Kettering Cancer Center
Douglas Matson, Tufts University

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
- Spring Meeting
- National LEO Research And Development Strategy
- Top Level Issues

Membership

- Douglas M. Matson, Tufts University (co-chair)
- *Jessica Scott, Memorial Sloan Kettering Cancer Center (co-chair)*
- Ajay K. Agrawal, University of Alabama
- Anna C. Balazs, University of Pittsburgh
- Steven H. Collicott, Purdue University
- Vijay K. Dhir, University of California, Los Angeles
- *Dennis E. Discher, University of Pennsylvania*
- Mohammad Kassemi, Case Western Reserve University
- *Anna-Lisa Paul, University of Florida*
- *Clayton A. Simien, University of Alabama at Birmingham*
- Jana Stoudemire, Axiom Space

Spring Meeting

- Committee met during Space Science Week over March 27-29, 2023
- Received standard update from NASA BPS
- Meeting topics focused on:
  - NASA's lunar science program
  - Research opportunities in LEO
  - Workforce development

NASA BPS Update

- New leadership in SMD and BPS
- Speaker: Diane Malarik, Acting Division Director
- Key Points from Speaker:
  - Search for new director ongoing since Craig Kundrot's retirement in January 2023
  - Waiting for decadal release for BPS scientific direction
  - ISSNL full utilization of allocation constrains BPS science
  - Current budget profile limits BPS on multiple fronts
  - CERISS and TIDES initiatives and quantum research delayed
  - BPS expected to cover costs previously assumed by ISS Program post-transition from ISS

Lunar Science Panel

- **Joint Session with CAPS**

- Speakers:
  - Joel Kearns, Deputy Associate Administrator for Exploration
  - Sarah Noble, Program Scientist (Planetary Science)
  - Kevin Sato, Program Scientist for Exploration (BPS)

Lunar Science Panel

- Key Points from Speakers:
  - Lunar exploration and discovery program includes humans as critical component to execute deliverables
  - Lunar science strategy report outlines leveraging the lunar surface as a platform for other opportunities beyond the moon
  - Development of technologies will be critical for conduct of scientific research on lunar surface that is not possible in low Earth orbit
  - Strong engagement with commercial providers using public-private partnership model to support sustainable lunar economy, lunar science

Research Opportunities in LEO Panel

Speakers:

- Ray Lugo, CASIS
- Danilo Tagle, NIH
- Nicole Wagner, LambdaVision

Key Points from Speakers:

- LEO provides unique opportunities for researchers and ground-based companies to leverage the microgravity environment for experiments to unlock new discoveries
- Understanding the role and interactions of NASA and commercial spaceflight companies will be important to continued opportunities
- Focus on lowering barriers to engage in LEO research and identifying future commercial opportunities for establishing a sustainable LEO economy

Workforce Development Panels

Early Career Investigators

Speakers:

- Yu-Chien (Alice) Chien, University of California, Irvine
- Andrea Henle, Carthage College
- Aleksandra Radlińska, The Pennsylvania State University
- Stefano Sacanna, New York University

Key Points from Speakers :

- NASA funding critical for research funding and development of workforce
- Additional funding need to engage undergraduate students from non-tier 1 institutions

Workforce Development Panels

Space Workforce 2030 Pledge

Speakers:

- Marty Whelan, Aerospace Corporation
- Bill Kindred, Blue Origin
- Neela Rajendra, JPL

Key Points from Speakers :

- Strong commitment from many commercial companies to increase diversity
- Women working in aerospace industries still face many challenges

National LEO Research And Development Strategy

- Released on March 31, 2023
- Produced by the LEO Science And Technology Interagency Working Group out of the National Science and Technology Council
  - Participating agencies include NASA, NSF, DOE, HHS, and DoD
- Notable recommendations:
  - Establish a LEO National Laboratory
  - Lower barriers for market space-based R&D
  - Build a strong workforce for space-based R&D by supporting STEM education and research initiatives

Top Level Issues

- Current budget profile limits BPS on multiple fronts
  - CERISS and TIDES initiatives and quantum research delayed
  - BPS expected to cover costs previously assumed by ISS Program
  - Slower implementation of decadal recommendations
  - Delayed development of new research facilities for transition to CLDs
- NASA lunar science programs (Artemis, Gateway) present an opportunity for BPS to collaborate with other SMD divisions and NASA directorates (e.g. STMD)
- ISSNL full utilization of allocation constrains BPS science
- Role of public-private partnerships in developing BPS research infrastructure on commercial LEO destinations
- Industry and government showing interest in space workforce starting right at the K-12 level
  - NASA funding can play a pivotal role for BPS early career researchers
  - Academia has key role to play in BPS research done in LEO