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Update from the Committee on Astronomy and Astrophysics

Thomas Greene, CAA Co-Chair

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Disclaimer: These slides represent a personal assessment of the issues discussed by the CAA. This document should not be cited or quoted because the views expressed do not necessarily reflect those of CAA, SSB, BPA, or the NRC.

JUNE 2022 CAA UPDATE

Roles and Responsibilities

- CAA reports to the National Academies Board on Physics and Astronomy (BPA) and the Space Studies Board
- CAA is not the Decadal Survey committee, and it does not set policy for the Survey
- CAA has been focused on implementation of Astro2010 and monitoring ongoing agency projects/programs in recent years
  - We will now focus on the implementation of Astro2020's survey https://nap.nationalacademies.org/catalog/26141/pathways-to-discovery-in-astronomy-and-astrophysics-for-the-2020s
- CAA also writes short reports as needed or charged
  - Roman Space Telescope (in progress)
- Most recent meetings (virtual) were March 21-24, 2022 during Space Science Week plus agency feedback meetings (reported here)

https://www.nationalacademies.org/our-work/committee-on-astronomy-and-astrophysics

Membership

- Thomas Greene, Co-Chair, NASA Ames Research Center
- Christopher McKee, NAS*, Co-Chair, University of California, Berkeley
- William Nielsen Brandt, Pennsylvania State University
- Daniela Calzetti**, NAS, University of Massachusetts
- Ian Dell'Antonio**, Brown University
- Peter Garnavich**, University of Notre Dame
- Anthony Gonzalez**, University of Florida
- Gabriela Gonzalez, NAS, Louisiana State University
- Alyssa A. Goodman, Harvard University
- Shaul Hanany, University of Minnesota
- Elizabeth Hays, NASA Goddard Space Flight Center
- Garth Illingworth**, University of California, Santa Cruz
- Mustapha Ishak-Boushaki**, University Texas at Dallas
- Eamonn Kerins**, University of Manchester
- Christopher S. Kochanek, The Ohio State University
- Quinn M. Konopacky**, University of California, San Diego
- Jeff R. Kuhn, University of Hawaii
- Scott Ransom, National Radio Astronomy Observatory
- Kate Scholberg, NAS, Duke University
- Joseph Silk, Institut d'Astrophysique, NAS
- Alycia J. Weinberger, Carnegie Institution of Washington

- * Member, National Academy of Sciences
- **Temporary members (9/30/2022) to prepare short report for NASA on the Roman Space Telescope

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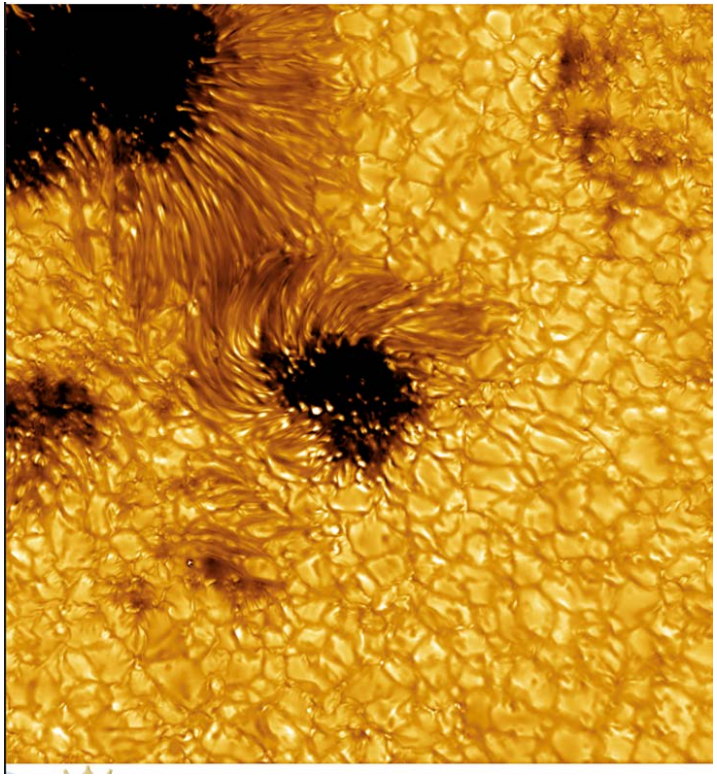
Astronomy & Astrophysics Update

- James Webb Space Telescope (AANM 2001) launched Dec. 25
  - Very successful launch, deployments, and performance
  - Commissioning is wrapping up, with some science possible this month
- IXPE Explorer launched December 9
- FY 23 NASA budget challenges: Projected budget growth ~1%/yr in real dollars, closeout funding for SOFIA => delay MIDEX, Probe
- DKIST Solar Telescope (AANM 2001) began science operations on February 23
- NSF Rubin Observatory projected to open July 2024, a 22 month delay due to COVID
- NSF budget challenges: 2% increase for FY23 minus inflation despite operations costs for DKIST and soon Rubin
- DOE, NASA, and NSF all continuing actions on Diversity, Equity, and Inclusion

Astronomy & Astrophysics Update



DKIST image of Sun

JWST after release from Ariane 5 upper stage (December 25, 2021)

NASA Response to Astro2020

- Large Mission Study of lessons learned matches elements of Great Observatory Mission and Technology Maturation Plan
- Initiated first stage in planning for decision to begin formulation of next great observatory
- Demographics: NASA has charged NASEM with determining types of data to be collected on proposers
- NASA, NSF, and DOE have established a cross-agency working group to improve coordination among U.S. archive centers
- SOFIA: Removed from 2022 Senior Review; NASA and DLR have agreed to end SOFIA operations no later than September 30
- Probes: Issued community announcements in January and May on planned AO for an Astrophysics Probe Mission. AO release now moved to July 2023 due to funding
- Time Domain Astronomy and Multi Messenger Astrophysics workshop planned for August 2022

Roman Space Telescope Short Report

- Astro 2020: **Finding:** The Roman Space Telescope remains both powerful and necessary for achieving the scientific goals set by *New Worlds, New Horizons* (Astro2010). It will carry out cosmological measurements complementing those of Euclid and Rubin Observatory, and Roman's microlensing survey will probe planetary occurrence over orbital separations not constrained by Kepler or TESS.
- **Conclusion:** The scientific landscape and the Roman Space Telescope's capabilities have changed significantly since it was first envisioned by *New Worlds, New Horizons*, and the currently planned balance of surveys and guest investigator-led observations may not be optimally suited to take advantage of new scientific opportunities.
- **Recommendation:** NASA Astrophysics Division should hold a non-advocate review of the Roman Space Telescope's science program to set the appropriate mix of survey time devoted to the weak lensing, baryon acoustic oscillations, supernovae, and microlensing programs relative to guest investigator-led observing programs during the primary 5 year mission.

NASA charged the CAA to carry out this review. The CAA established the Roman Operations Working Group, which is working to complete its report.

Feedback to Agencies

- NASEM rules prevent rapid written response to agency presentations
- With aid of Colleen Hartman and Greg Mack, instituted open meetings after the Fall meeting and Space Science Week in which we read our comments and then discuss them.
- Opportunity for CAA to press its priorities
- Can take time to develop consensus on controversial topics
  - Increasing diversity while maintaining scientific excellence in the Hubble Fellow program
  - Providing funding for early planning for the Time Domain Astrophysics recommendation in Astro 2020
- Response from agencies has been positive

Discussion

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Thank You!

NSF Response to Astro2020

- Extremely large telescopes (top priority among large "frontier" projects): Cost larger than anything NSF has done before. Considering Environmental Review in partnership with Native Hawaiians. Will assess technical and site readiness of 2 proposals.
- CMB-S4, the next generation cosmic microwave background experiment, joint with DOE (tied for 2nd): In a surprise to the community, needed support at the Antarctic site is reduced or delayed.
- ngVLA (tied for 2nd): A prototype antenna is being fabricated with NSF midscale funds. Costs well understood, ready to begin.
- Cited 6 programs to support students and early career scientists (particularly under-represented minorities)
- Planning underway to implement Astro 2020, but in our view few if any of the recommendations requiring significant funding will be implemented unless the AST budget is increased and the facilities operations funding issue is addressed.

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