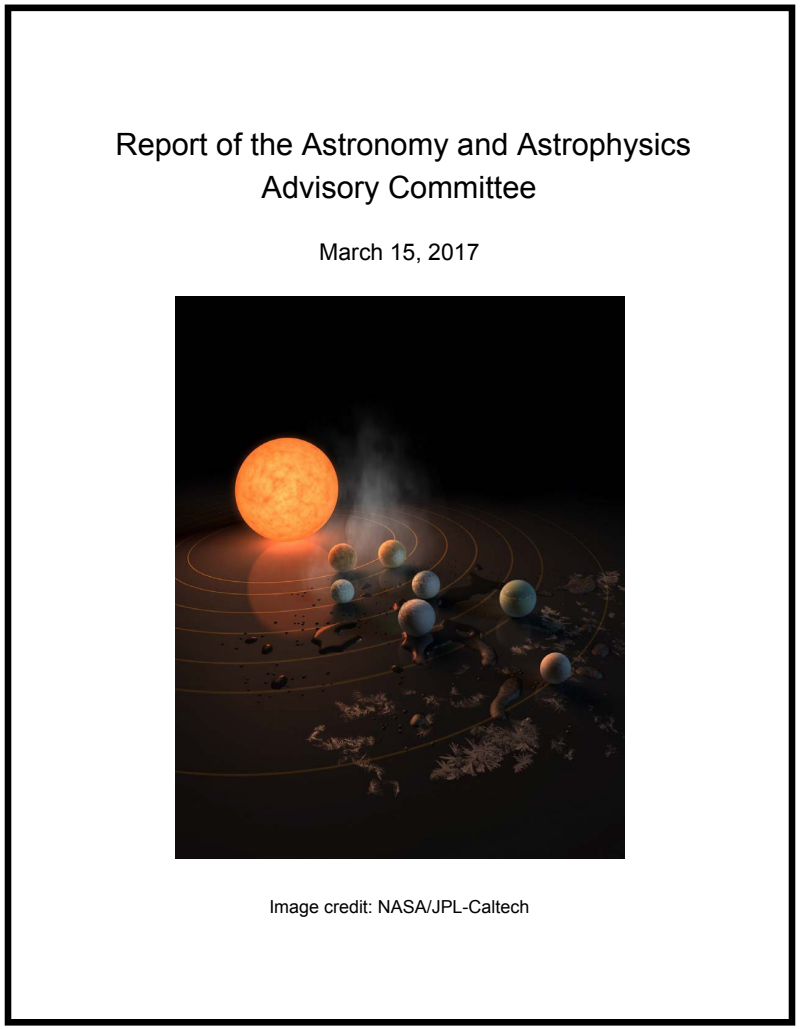
Astronomy and Astrophysics Advisory Committee



Summary of our 2016-2017 Report

(based on a Briefing for CAA)

Buell T. Jannuzi
University of Arizona
Chair, AAAC
June 22, 2017

2016/2017 Committee

Dr. Rachel Bean
Cornell University

Dr. David Hogg
New York University

Dr. Dieter Hartmann
Clemson University

Dr. Klaus Honscheid
Ohio State University

Dr. Buell T. Jannuzi (Chair)
University of Arizona

Dr. Kelsey Johnson
University of Virginia

Dr. Lisa Kaltenegger
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University of California, San Diego

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Northwestern University

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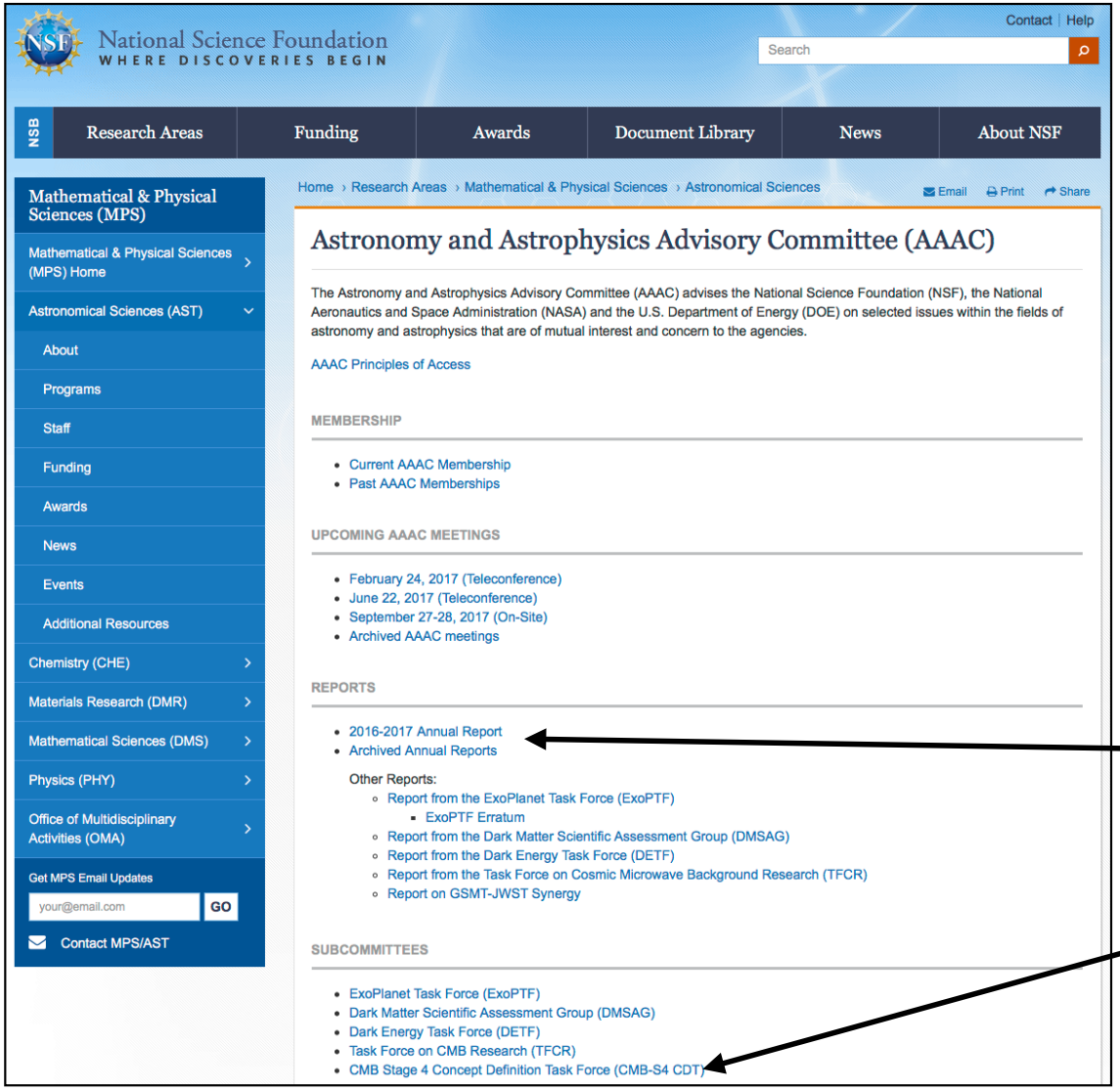


https://www.nsf.gov/mps/ast/aaac.jsp

Current and Past Reports Available

CMB S4 Task Force

Astronomy and Astrophysics Advisory Committee

"The AAAC commends the NSF, NASA, and DOE for their successful efforts, with the support of Congress and the American people, to provide balanced and coordinated investments in basic research and world leading facilities to further the priorities of the National Research Council (NRC) of the National Academies' decadal survey *New Worlds, New Horizons in Astronomy and Astrophysics (NWNH)*. In recent years we have seen tremendous return on past investments, with results including the first direct detection of gravitational waves and the discovery of systems with planets in the habitable zones around distant stars. In this report we provide assessments of the progress made in the prior year toward future discoveries and make recommendations on how to sustain progress towards the goals and priorities of *NWNH*."

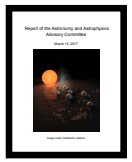
Balancing not trivial

Individual and Group Grants
Operating Facilities, Labs, & Missions
New Initiatives, Facilities, & Missions

Astronomy and Astrophysics Advisory Committee

Even in the face of substantial budget uncertainty, which to some degree is common to any transition year between administrations, we are impressed that all of the agencies have clear plans for the coming year and are working, in close coordination with each other and the community, to achieve balanced programs that should enable progress on the highest priorities of the Decadal Surveys.

Astronomy and Astrophysics Advisory Committee



"In particular, we recommend sustaining a balanced and coordinated investment by NSF, NASA, and DOE in the observational, theoretical, and computational research, technology development, and major projects and facilities, that are required to achieve the goals of *NWNH*. This includes the completion of construction, deployment, successful operation, and support of the researchers using the Daniel K. Inouye Solar Telescope (**DKIST**), the James Webb Space Telescope (**JWST**), the Large Synoptic Survey Telescope (**LSST**), and the Wide Field Infrared Survey Telescope (**WFIRST**). More broadly, providing (sometimes in partnership with others) the necessary support of US researchers and our most critical facilities, those identified in *NWNH* and associated reviews and reports, is essential to realizing the full scientific potential of the activities envisaged by *NWNH*."

Balancing not trivial

Individual and Group Grants
Facilities
New Initiatives, Facilities, & Missions

Astronomy and Astrophysics Advisory Committee

An example of moving toward balance are the efforts of NSF/AST to implement the recommendations of the NSF Portfolio Review Committee. We appreciate that NSF/AST is finding creative ways of retaining important capabilities in the System of U.S. O/IR astronomical facilities, while reducing the NSF investment in operations costs. While we would like the rate of reducing the cost to NSF/AST to be more rapid, NSF/AST is doing a good job of dealing with the practical constraints that slow their efforts.

Astronomy and Astrophysics Advisory Committee

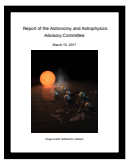
Coordination between the agencies (e.g. for LSST, CMB S4), is essential and they are doing well.

Finding: US agencies are working well together to support the priorities of the astronomy and astrophysics research community, both in collaboration on large managed projects and through coordination of diverse research programs.

Recommendation: We recommend that DOE, NSF, and NASA continue their successful cooperation in Astronomy and Astrophysics.

Astronomy and Astrophysics Advisory Committee

Biggest risks at this point are for projects and initiatives in early or intermediate stages of development/implementation. LSST, WFIRST LISA, & Athena are examples of such programs.



Finding: Major flight and construction programs may be harmed by continued uncertainty in the budget, leading to cost overruns and schedule slips. The AAAC urges that special attention be paid to these programs at the time that the FY 2017 budget is finalized and the FY 2018 budget is formulated.

Recommendation: In formulating their programs for FY 2018, NSF, NASA and DOE should strive to maintain viable research grant programs and preserve the highest priority decadal survey recommended programs.

Astronomy and Astrophysics Advisory Committee

Agencies have continued to work to bring forward previously delayed Decadal Survey Recommendations. We applaud these efforts and hope similar efforts will be possible in the future for priorities that are still awaiting opportunities to be developed.

Finding: The scientific justifications for the GSMT, ACTA, and CCAT continue to be strong and these projects are worthy of eventual support and participation by the federal government if funding opportunities become available to enable supporting one or more of these projects as part of a balanced program of investment by the agencies.

Astronomy and Astrophysics Advisory Committee

CMB-S4 CDT Membership

Julian	Borrill	LBNL/NERSC
John	Carlstrom	Chicago/ANL
Tom	Crawford	Chicago
Mark	Devlin	Penn
Jo	Dunkley	Princeton
Raphael	Flauger	UT Austin
Brenna	Flaugher	FNAL
Shaul	Hanany	Minnesota
Kent	Irwin	Stanford/SLAC
Bill	Jones	Princeton
Brian	Keating	UCSD
John	Kovac	Harvard
Akito	Kusaka	LBNL
Charles	**Lawrence (Chair)**	**JPL**
Adrian	Lee	Berkeley/LBNL
Jeff	McMahon	Michigan
Mike	Niemack	Cornell
Steve	Padin	ANL/Chicago
Clem	Pryke	Minnesota
Suzanne	Staggs	Princeton
Ed	Wollack	GSFC

Dr. Charles Lawrence
Chief Scientist for Astronomy and Physics, JPL, Cal Tech

Finding: The CMB-S4 CDT, a subcommittee of the AAAC created at the request of DOE and NSF, is carrying out a valuable process of determining science and technical requirements to meet the CMB-S4 science goals and to develop a concept, including the technical and mission requirements, for a ground-based CMB-S4 experiment.

Purpose and Charge

The CMB-S4 CDT is asked to develop a concept for implementing a ground-based CMB-S4 experiment. The CDT will take as input the community CMB-S4 Science Book and any further community information as appropriate, and will consider the global landscape of CMB experiments (including ground, balloons, and space).

Specifically, the CDT is asked to deliver:

- The Science Requirements and their rationale
- Measurement and Technical Requirements derived from the Science Requirements
- Project Strawman Concept
- Options and Alternatives (prioritized to the extent possible) for:
    - Concept design (e.g. sites, telescopes, detectors)
    - Concept staging and schedule
    - Collaboration and Data models and interfaces
- R&D development needed, with priorities, to demonstrate technical readiness
- Cost ranges for the strawman concept, including explanations for how they were developed.

The CDT should provide a report on the Science and Measurement Requirements to the AAAC by June 2017 and a final report to AAAC by October 2017 for consideration. In accordance with Federal Advisory Committee Act (FACA) rules, the reports will be discussed and approved by the AAAC before formal transmittal to the agencies.

We appreciate your effort in establishing this subcommittee. Its deliberations and recommendations will inform the agencies on a concept for the CMB-S4 and contribute to the agencies' planning activities. The formation of the CDT does not imply any commitment by the agencies to specific funding or project status for CMB-S4.

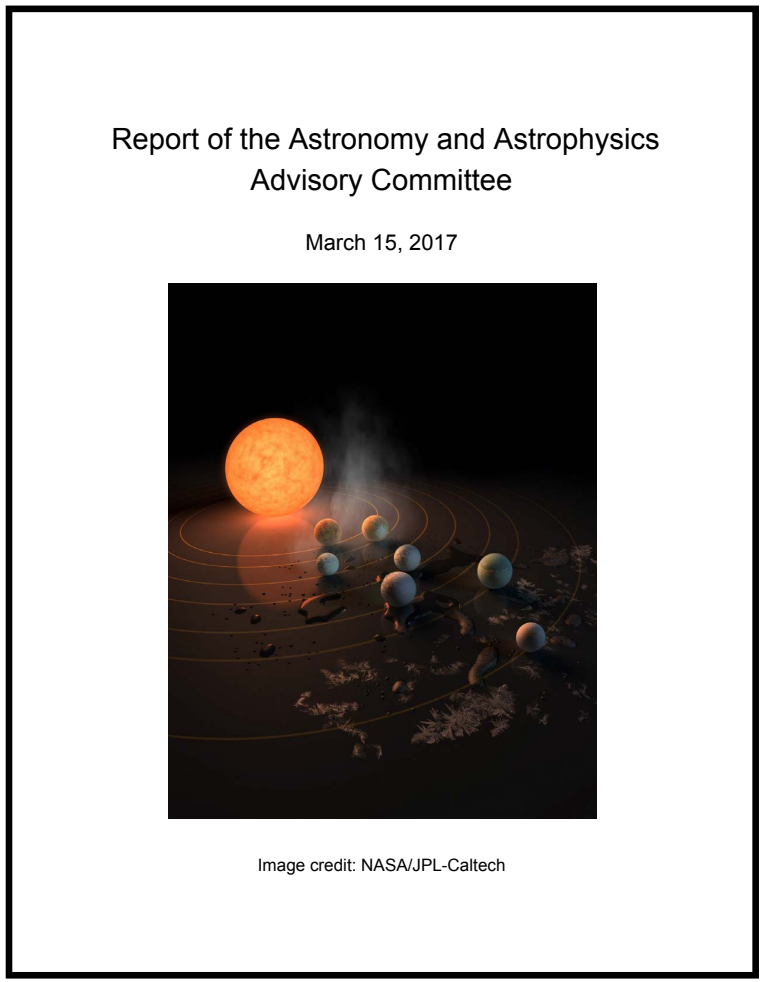
Astronomy and Astrophysics Advisory Committee

Finding: There is broad participation by members of the astronomy and astrophysics community, with agency support, in developing ideas for future experiments, missions, and programs to be undertaken in the coming decades, with the goal of producing well developed and well costed ideas and concepts to be considered by the 2020 decadal survey.

Recommendation: The AAAC supports the continued exploration, with the support of the agencies, into future directions and experiments, missions, and programs to be considered for support by the 2020 decadal survey.

Recommendation: The AAAC recommends that the agencies work with the National Academies to ensure a timely beginning to the next decadal survey, along with updates to the structure as recommended by *NWNH-AMA*.

Astronomy and Astrophysics Advisory Committee



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Thank you