

# Decadal Survey Planning and other CAA Activities

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Co-Chairs

Committee on Astronomy and Astrophysics (CAA)

*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.*

# CAA Roles

- CAA reports to National Academies Board on Physics and Astronomy (BPA) and Space Studies Board (SSB).
- CAA is not the Decadal Survey committee, and it does not set policy for the Survey. It does help the National Academies and the Agencies think through relevant issues as they generate the statement of task, stimulate and gather community inputs in advance of the Survey, and pave the way into the Survey.
  - Taking into account lessons learned from previous surveys and inputs from Mid-decadal Report (Hewitt et al) and the Survey of Surveys Report (Dressler et al).

Most recent meeting:  
October 24-25 2017

[http://sites.nationalacademies.org/BPA/BPA\\_048755](http://sites.nationalacademies.org/BPA/BPA_048755)

## CAA Members

Marcia J. Rieke (NAS), Co-Chair, University of Arizona  
Steven M. Ritz, Co-Chair, UC Santa Cruz  
Jeremiah K. Darling, University of Colorado, Boulder  
Megan Donahue, Michigan State University  
Thomas Greene, NASA Ames Research Center  
Lee W. Hartmann, University of Michigan  
Vassiliki Kalogera, Northwestern University

Bruce Macintosh, Stanford University  
Christopher F. McKee (NAS), UC Berkeley  
Angela V. Olinto, University of Chicago  
Mark M. Phillips, Carnegie Institution for Science  
James M. Stone, Princeton University  
Alexey Vikhlinin, Harvard-Smithsonian CfA  
Eric M. Wilcots, University of Wisconsin, Madison  
A. Thomas Young (NAE), Lockheed Martin (Ret.)

# Current Timeline Overview

- 2018 January AAS Town Hall
- 2018 March Astro 2020 proposal submitted to Agencies
- Summer/Fall: Science White Paper call issued
- 2018 ≤December Chair selected
- 2019 January AAS Town Hall and other Community outreach activities

Time for complete Survey process through report release: 2 years

# Consultation Group

The Consultation Group (CG) works closely with National Academies staff by assisting with the drafting of the statement of task and prospectus for the next decadal survey of astronomy and astrophysics, Astro2020. The CG will meet primarily by teleconference but will have the option of holding one in-person meeting in Washington, DC. The CG's work is likely to include interaction with the survey's potential federal government sponsors. A well-developed draft of the survey statement of task and prospectus will be made available to the CAA and the survey's potential sponsors. The CG's work will conclude upon the receipt of funding for the survey from the agencies.

- Neta Bahcall, NAS Section 12 Chair
- Alan Dressler, Survey of Surveys Chair, NAS
- Debra Elmegreen, OIR System Study Chair
- Wendy Freedman, BPA member, NAS
- Sarah Gibson, CSSP Co-Chair and SSB XCOM member
- Fiona Harrison, SSB Chair, NAS
- Chryssa Kouveliotou, SSB XCOM member, NAS
- Avi Loeb, BPA Vice-Chair
- Marcia Rieke, CAA Co-Chair, NAS
- Steve Ritz, CAA Co-Chair, BPA member
- David Van Wie, ASEB member, NAE

NAS=National Academy of Sciences  
BPA=Board on Physics and Astronomy  
CSSP=Committee on Solar and Space Physics  
CAA=Committee on Astronomy and Astrophysics  
SSB=Space Studies Board  
ASEB=Aeronautics and Space Engineering Board

# Decadal Survey Preparatory Activities

- The CAA continues to explore which parts of the task could be done before the formal start of the survey in Dec 2018
  - Balance getting work done early versus constraining the Survey chair and process
- Activities underway:
  - Engagement with community via AAS Town Halls and other activities, including “Demystifying the Process” discussions.
  - Consultation Group
- Additional pre-survey activities:
  - Plan to issue a call for Science White Papers, timed so they will be available to the Survey Committee at the start of the process.
    - **DRAFT to be posted in April/May timeframe on the CAA website. Watch for announcements.**
    - **Participation in Science White Papers will not necessarily disqualify authors from service on Survey panels**
  - Meeting of Experts on the Cost and Technical Evaluation (CATE) process, spring 2018, providing some specifics about CATE prior to the start of the Survey.
  - Early-career colleague engagement events and other outreach

# Other Preparatory Studies

Congress has mandated two studies to be completed within the next year on exoplanets and astrobiology.

- These are not decadal surveys themselves but rather will be providing input to the astronomy decadal and the planetary sciences decadal
- These studies are looking at science strategies, not mission choices

Connections between exoplanets and astrobiology will be scoped out by ongoing Academies studies

- Exoplanet Science Strategy (Charbonneau and Gaudi Co-Chairs) underway.

[http://sites.nationalacademies.org/SSB/CurrentProjects/SSB\\_180659](http://sites.nationalacademies.org/SSB/CurrentProjects/SSB_180659)

- Astrobiology Science Strategy for the Search for Life in the Universe (Barbara Sherwood Lollar Chair) also underway

[http://sites.nationalacademies.org/SSB/CurrentProjects/SSB\\_180812](http://sites.nationalacademies.org/SSB/CurrentProjects/SSB_180812)

# Some Ongoing Topics

- How to handle desire for State-of-the-Profession activities before and/or during the survey
  - Good discussion with AAS/AIP Demographics survey expert.
  - A CAA subcommittee is developing a plan.
- Scope of the survey
  - Ground-based GW astronomy: recent neutron star merger highlights that astronomers are deeply engaged with gravitational wave discoveries.
  - Scientific connections outside the formal scope of the Survey.
  - Continued/increasing importance of the international context.
- Engagement with non-federal organizations
- Survey structure and timing of the chair selection
- Engaging early-career colleagues, and other community organizations beyond American Astronomical Society (AAS), especially Divisions of the American Physical Society.

# Main Purposes of the AAS Town Hall

- Demystifying the process (slides in backup).
- Summarize current plans and to invite feedback:
  - Two categories of feedback and inputs:
    - A. Additional lessons you care to share from Astro2010/NWNH
    - B. Thoughts about the possible pre-survey activities, specifically:
      - White paper call
      - CATE discussions/workshops
      - State of the Profession
      - Outreach to younger colleagues
  - What else? All feedback welcome!

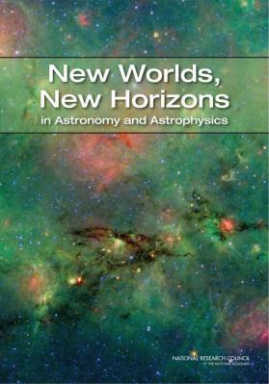


# Other Recent CAA Activities

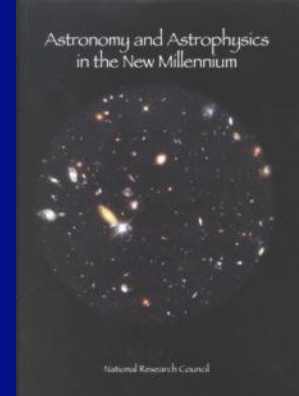
- Report on Small Explorers (SMEX) Opportunities released June 8.
  - A good existence proof that the new Statement of Task works
- An eventful and productive Oct/Nov meeting:
  - Discussions with Agencies on a variety of topics, including Decadal Survey Timing and Scope. Survey preparation is the main ongoing CAA focus.
  - AAS and AIP community demographics survey data and plans
  - Science talk by committee member Vicki Kalogera on GW170817
    - Gravitational wave studies moving from physics experiments to astronomy/astrophysics observatories
- WFIRST Independent External Technical/ Management/Cost Review (WIETR) Report presentation and discussion.
  - See CAA website

# Discussion

# Demystifying the Process



# Recall Decadal Survey History



- **1964: Ground-based Astronomy: A Ten Year Program (Whitford)**  
Recommended building more large optical telescopes including one in Chile  
QSOs had just been discovered
- **1972: Astronomy and Astrophysics for the 1970s (Greenstein)**  
Recommended building the VLA, HST  
Astronomy satellites used to discover X-ray emission from stars
- **1982: Astronomy and Astrophysics for the 1980s (Field)**  
Recommended building the Chandra X-ray satellite  
Many galaxies observed to produce large amounts of IR emission
- **1991: The Decade of Discovery in Astronomy and Astrophysics (Bahcall)**  
Recommended building Spitzer and the Gemini telescopes  
Existence of dark matter demonstrated
- **2001: Astronomy and Astrophysics in the New Millennium (McKee-Taylor)**  
Recommended building JWST, ALMA  
First exo-planets discovered, first evidence of dark energy seen
- **2010: New Worlds, New Horizons in Astronomy and Astrophysics (Blandford)**  
Recommended WFIRST, LSST

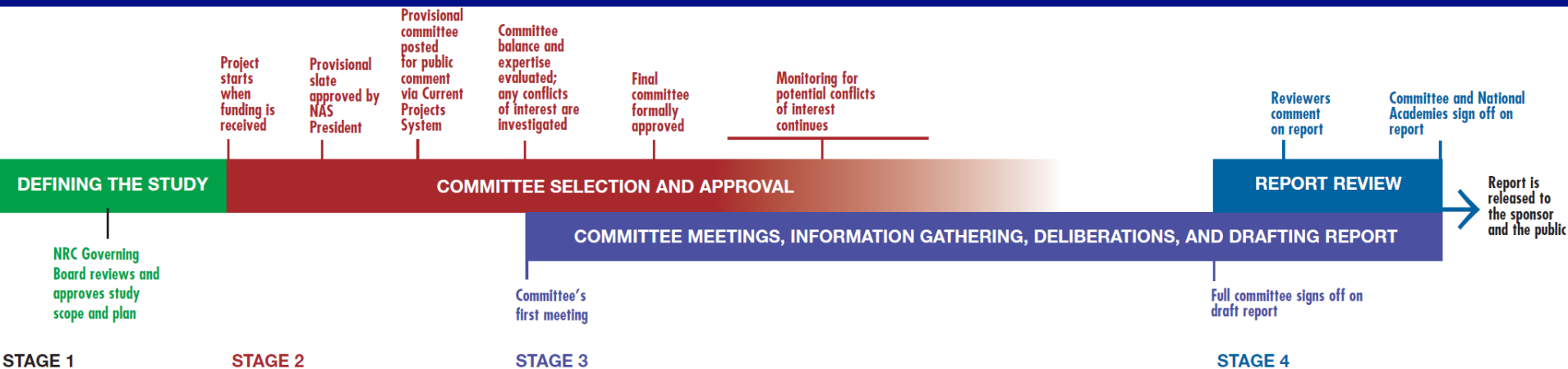


# Who Charters and Uses the Survey?

- Congress and three federal agencies that fund astronomy (eg., NASA Astrophysics, NSF Division of Astronomical Sciences, DOE High Energy Physics) are the groups that rely on Decadal Surveys for science and activity guidance
- Congress can (and has) passed laws that define some Survey work such as the requirement for independent cost and technical evaluation
- The three agencies fund the Survey and negotiate the Statement of Task and report due date with the National Academies

# A Decadal Survey is a National Academies Report

A survey follows a process designed to ensure independence and objectivity. The review process checks that conclusions and recommendations are supported by the committee's information gathering and deliberations.



from <http://www.nationalacademies.org/studyprocess>

***Reports have been successful because astronomers have made choices and prioritized so federal agencies and Congress have clear guidance.***

# Survey Committee Selection

- First step is selection of the chair who will work with the Academies staff to select an executive committee
- The chair and executive committee define the panel structure followed by selection of survey committee and panel members
- Follow academy procedures to reduce and balance biases
- Ensure the needed expertise across disciplines and diversity, including types and sizes of institutions, geographic distribution, gender, traditionally under-represented groups, career stage, funding sources,....
- Conflicts of interest (not in the financial sense which rarely affect astronomy decisions but in the “promoting a project” sense) considered very carefully

# Example from NWNH: Task and Charge

## Negotiated by NRC\* with Agencies

- The Committee on Astro2010 will survey the field of space- and ground-based astronomy and astrophysics, recommending priorities for the most important scientific and technical activities of the decade 2010-2020. The principal goals of the study will be to carry out an assessment of activities in astronomy and astrophysics, including both new and previously identified concepts, and to prepare a concise report that will be addressed to the agencies supporting the field, the Congressional committees with jurisdiction over those agencies, the scientific community, and the public.

## Scope

- NASA, NSF, DOE
- Remote observing of cosmos, theory, physics, computation and simulation, laboratory astrophysics, solar astronomy (excluding space missions), and technology development
- Activities and infrastructure (broadly defined)
- Balance
- Partnerships: international, private, state .....

\*Now called the National Academies



# NWNH: Survey Overview

## Some features of Astro2010

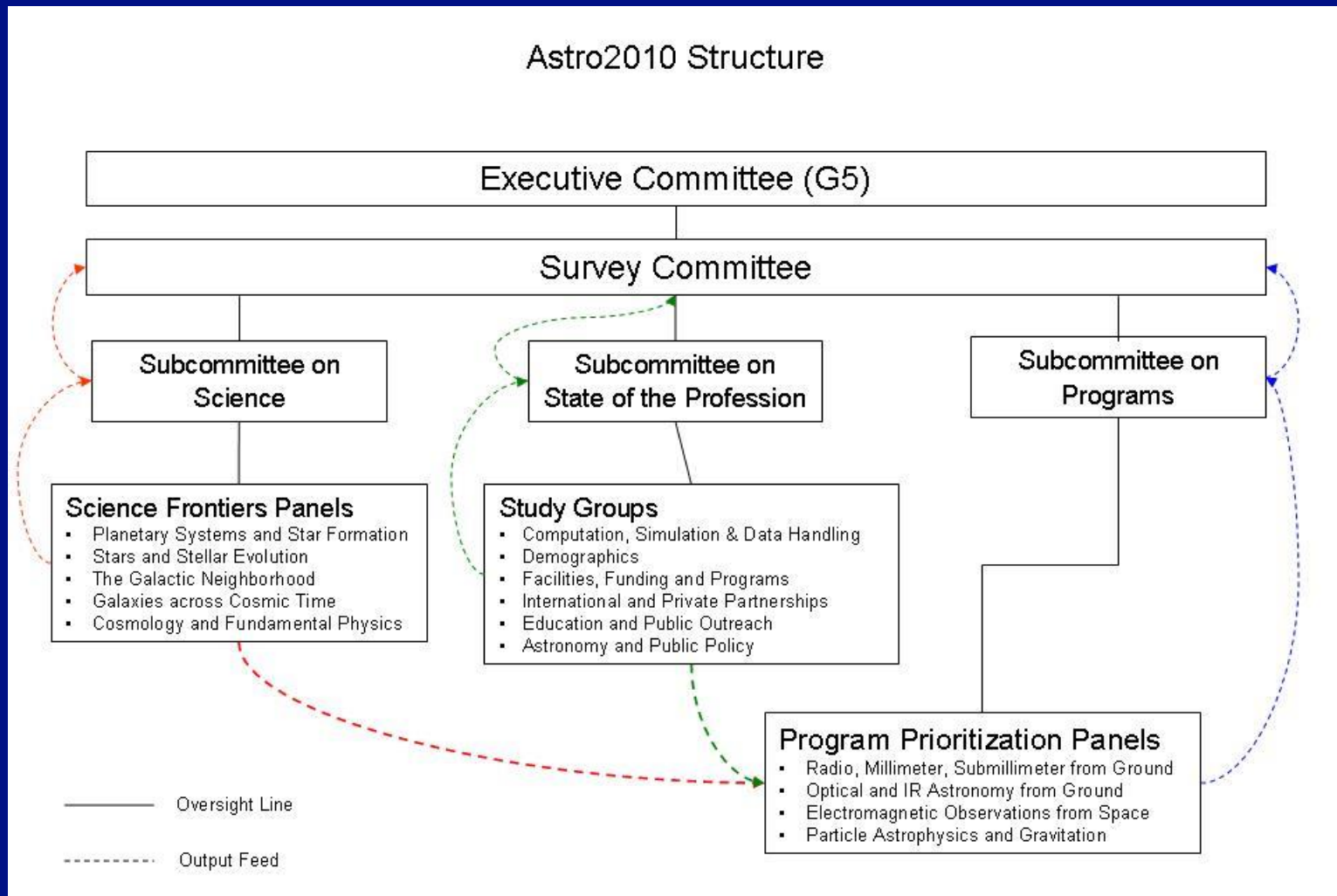
Significant community input to process via white papers and presentations to panels

Include unstarted projects from 2001's AANM

Improved assessment of technical readiness and risk, and cost drivers

Changing economic political background and increased international and private collaboration

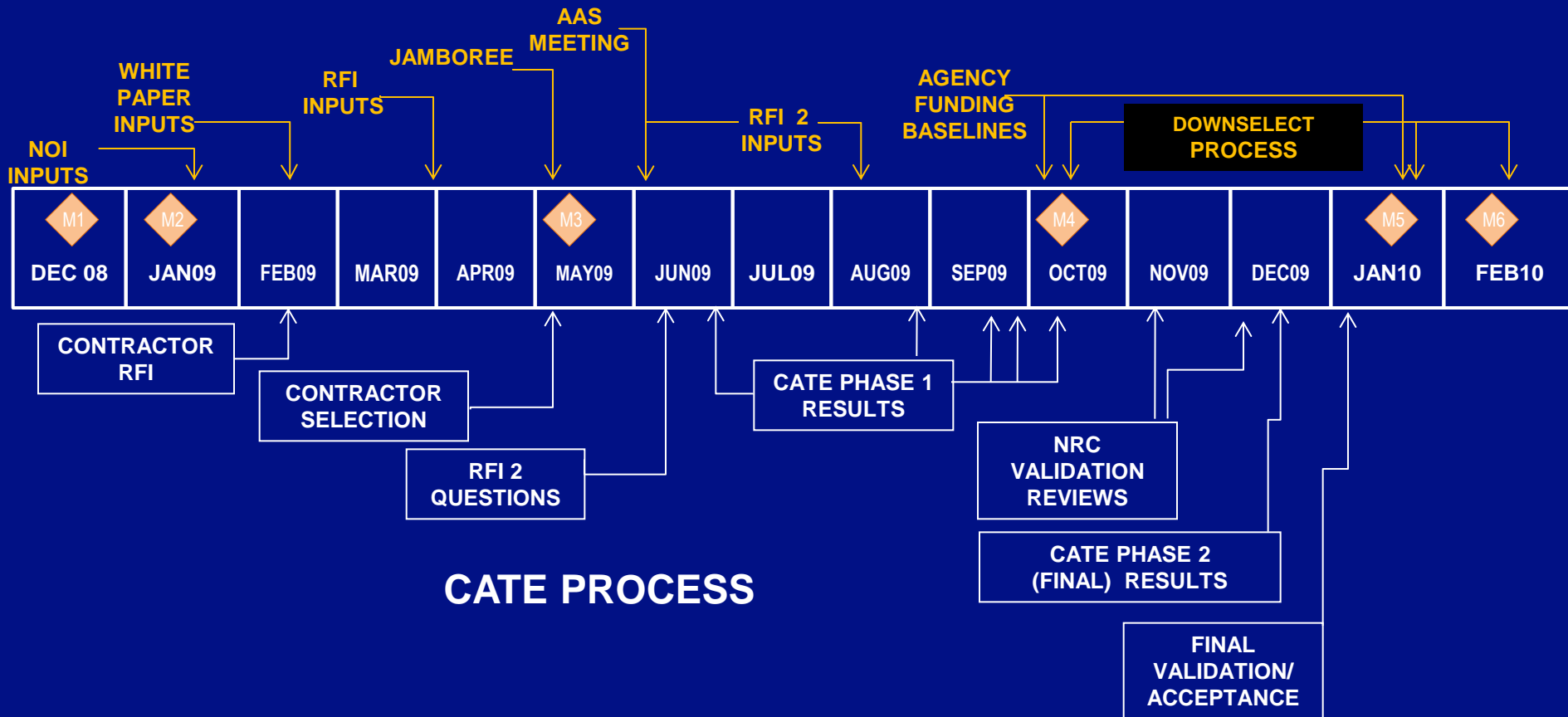
# Astro2010 Structure



Astro2020 structure TBD now.

# Astro 2010 Committee Process

Astro2020 process not yet defined.



*DATA GATHERING AND EVALUATION PROCESS FLOW*

# Astro2020 Givens

- Adhere to National Academies policies and procedures as well as the negotiated Statement of Task
- A science-driven process that defines priorities for federal funding of astronomy
- Independent, with minimization of biases
- Strive to be inclusive and involve as diverse a population of astronomers as possible consistent with the needs for scientific and technical expertise