Status Report on Planning for the Decadal Survey in Astrobiology and Planetary Science 2023-2032

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Space Studies Board

David Smith, a member of my SSB staff, will be the responsible staff officer for this activity

National Academy of Sciences

On March 3, 1863 at the height of the US Civil War, President Abraham Lincoln signed an Act of Congress to create the National Academy of Sciences.

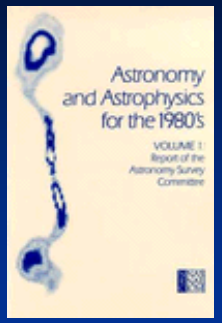
NAS and Astrobiology/Planetary Science

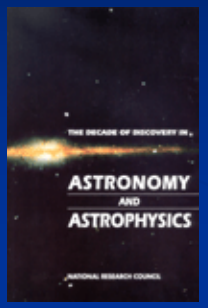
"… the primary scientific goals of this program are immense: a better understanding of the origins of the solar system & the universe, the investigation of the existence of life on other planets, & potentially, an understanding of the origin of life itself."

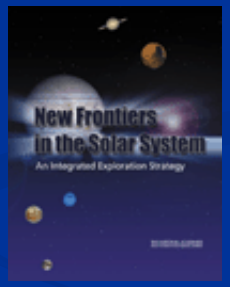
1961 letter from the SSB to NASA Administrator James Webb,

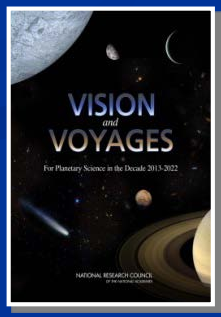
Space Science Decadal Surveys

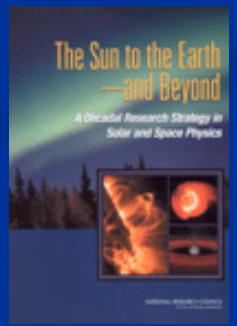
- Astronomy and Astrophysics
  1963, 1973, 1982, 1991, 2001, 2010, (2020)
- Planetary Science
  2003, 2011, (2022)
- Solar and Space Physics
  2003, 2012, (2024)
- Earth Science and Applications from Space
  2007, 2018, (2029)
- Biological and Physical Research in Space
  2011, (2022)











What is a Decadal Survey?

- Assess the current status of an entire scientific discipline
- Defines and prioritizes the key scientific questions that could potentially be addressed in the next decade
- Defines and prioritizes the most important initiatives that might be undertaken to address the most important questions
- Are conducted by the National Academies, independently of sponsoring agencies and organizations
- NASA is required by language in the Authorization Acts of 2005 and 2008 to engage with the National Academies and conduct decadal surveys in all major space science disciplines
- Sponsoring Agencies and Congress view decadal surveys as the formal statement of priority by the US space science community, and have repeatedly stated their intent to give highest priority to the missions identified in the survey

Survey's Goals

- The decadal survey process is aimed at articulating a program for the coming decade that represents as fully as possible the consensus view of the relevant US space science community.
- The distinguishing features of the decadal survey process are inclusiveness and transparency
- In contrast to past decadal surveys, post-2009 surveys place a very strong emphasis on cost and technical realism
- Community participation in all aspects of the decadal survey was strongly encouraged

Typical Ground Rules

- Only missions that had a formal budgetary line were assumed *a priori* to be part of the decadal plan (i.e., not reprioritized), everything else was within scope for prioritization
- Surveys have not, in general, prioritized small missions (e.g., Discovery-class or smaller) or R&A-type activities
- Missions that had been extensively discussed and studied but had not entered Phase A (*e.g.*, EJSM, TSSM, Venus Flagship) were “on the table”

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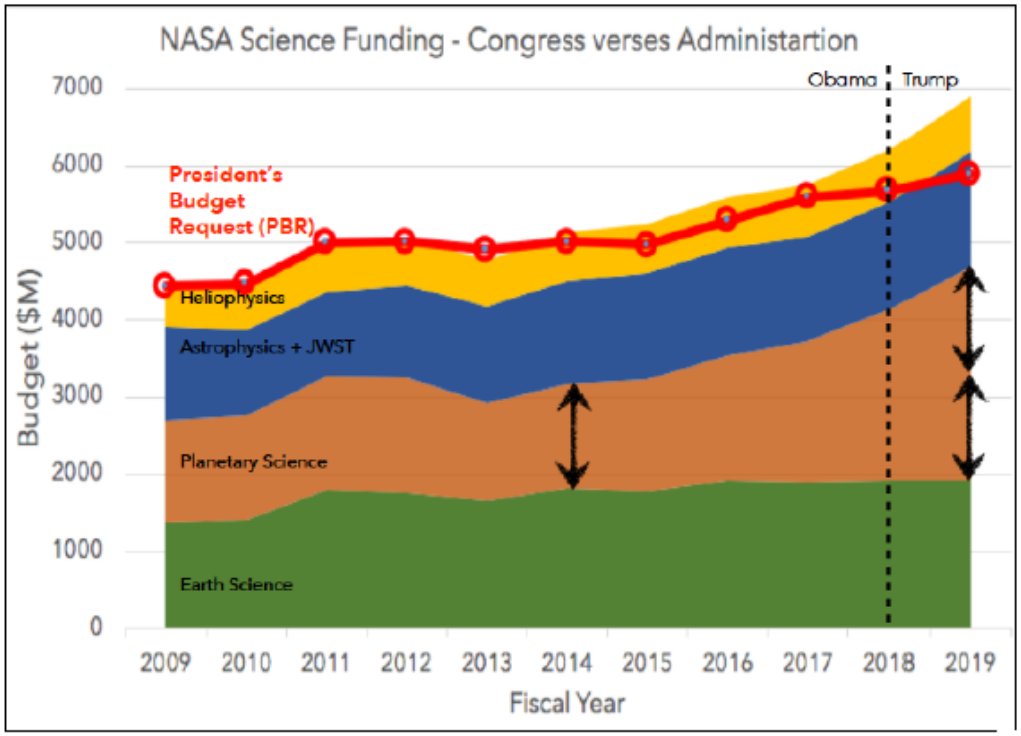
Typical Elements of a Survey Report

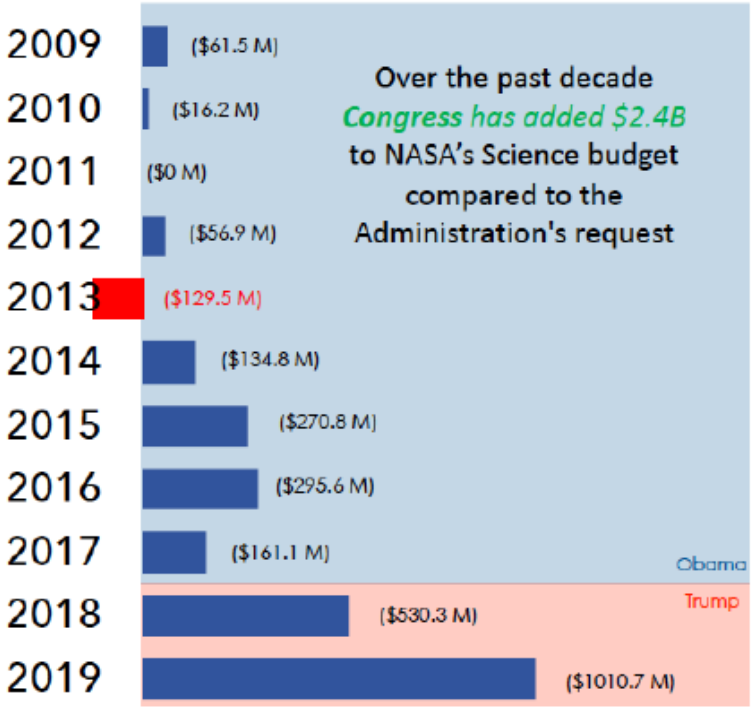
- Overview of relevant discipline
- Broad survey of the current state of knowledge
- Inventory of the top-level science questions
- Recommendations on optimum balance between target bodies, large/medium/small missions, ground versus space, etc.
- Assessment of infrastructure
- Discussion of strategic technology development needs
- Prioritized list of recommended strategic space missions, ground-based facilities and supporting research

PSD's Budget Doubled Since 2014

NASA's *Planetary Science Division budget* has been ***doubled*** in just 5 years (since FY14)



Annual Congressional funding levels for NASA Science (SMD) by Division

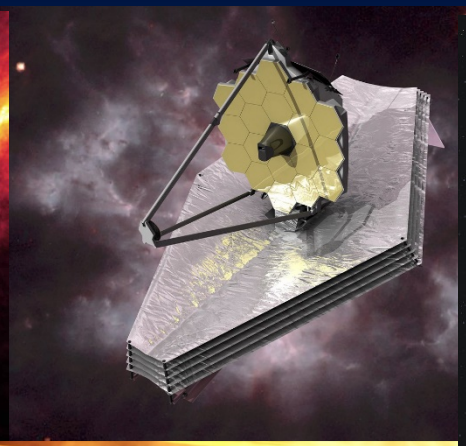


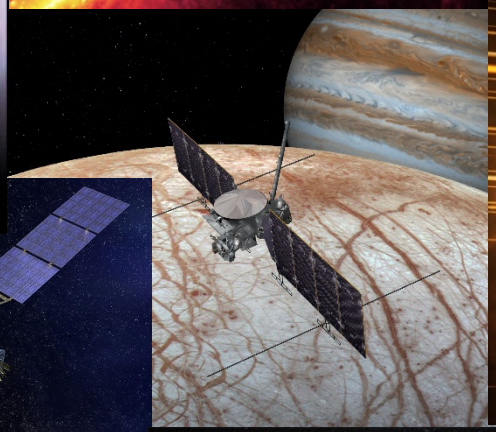
Comparison of annual outcome – enacted versus PBR for NASA's SMD budget

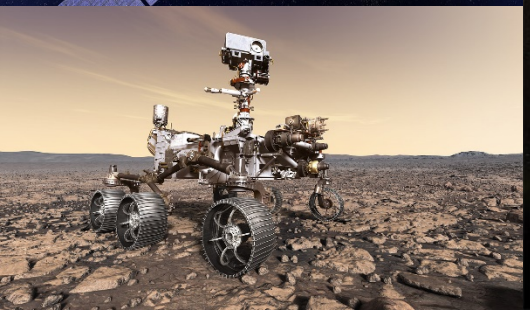
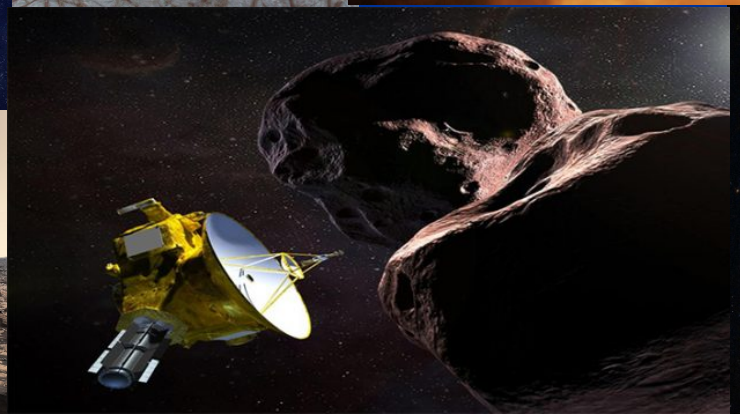
Courtesy Heidi Hammel

Outcomes







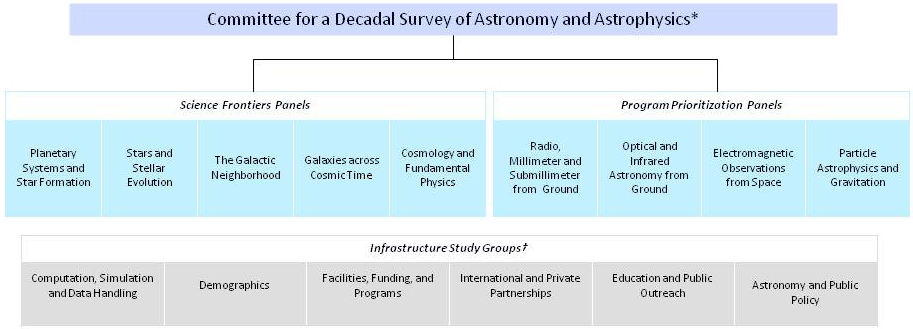




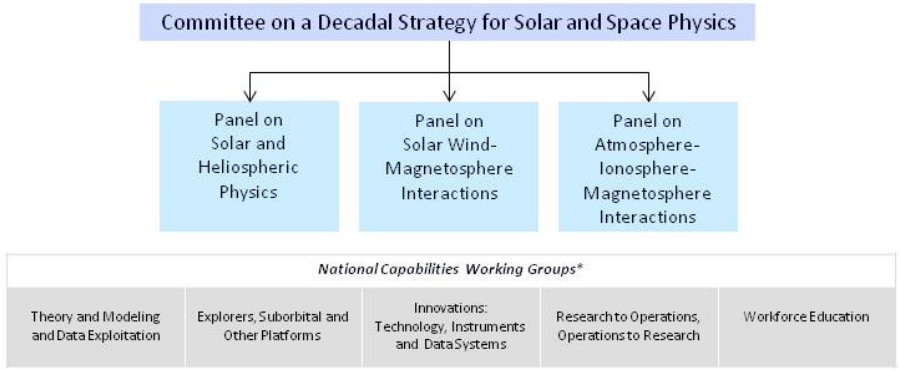

Organizing Meeting

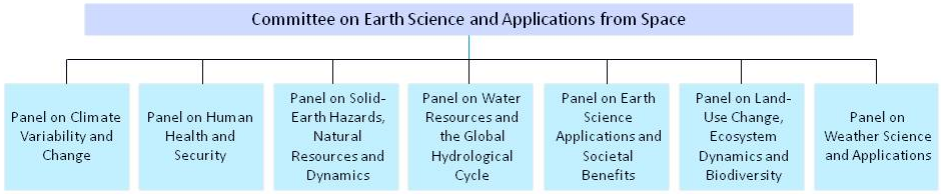
Organized by CAPS and held at the Caltech on 10-12 September, 2019. Goal of meeting was to provide input to NASA, NSF and National Academies on organization and scope of the decadal survey. Items discussed:

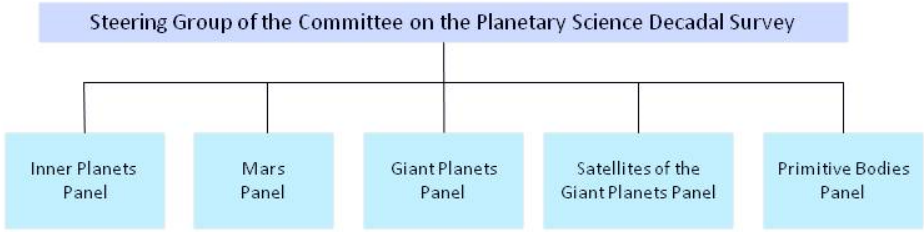
- Perspectives from NASA, NSF, ESA and JAXA
- Input from LEAG, MAPSIT, MEPAG, OPAG, SBAG and VEXAG
- Lessons learned from previous decadal surveys
- Survey organization, including discussion of panels structured by destinations, scientific themes or both?
- Community outreach and inclusion
- White papers, including timing, scope and format

No Two Surveys Are the Same









Notional Schedule for Decadal Survey

9/2019	Organizing meeting and town hall at EPSC-DPS
10/2019	Draft statement of task received from NASA
11/2019	LPI launches white paper proposal web site*
12/2019	Decadal Survey town hall at AGU meeting
~12/2019	National Academies adopts Statement of Task
~1/2020	Proposals submitted to NASA and NSF and funded
	First of a series of community/early-career webinars
~2/2020	White paper submission website opens
~3/2020	Town hall and early-career event at LPSC
Spring ‘20	Deadline for submission of white papers
Spring ‘20	Survey committee and panel meetings begin
Summer ‘21	First complete draft of survey report assembled
Late-Winter	Survey report released at LPSC

Thank You

Additional information about:
the Space Studies Board's Decadal Surveys
http://sites.nationalacademies.org/SSB/SSB_052297

The Space Studies Board
http://sites.nationalacademies.org/SSB/index.htm

LPI white paper proposal site
https://www.lpi.usra.edu/decadal_whitepaper_proposals/

BACKUP

Early-Career Event at LPSC

Sunday, March 15, from 10:00 a.m. to noon
Woodlands Waterway Marriott Hotel and Convention Center.

Learn about surveys, engage with experts, ask questions.

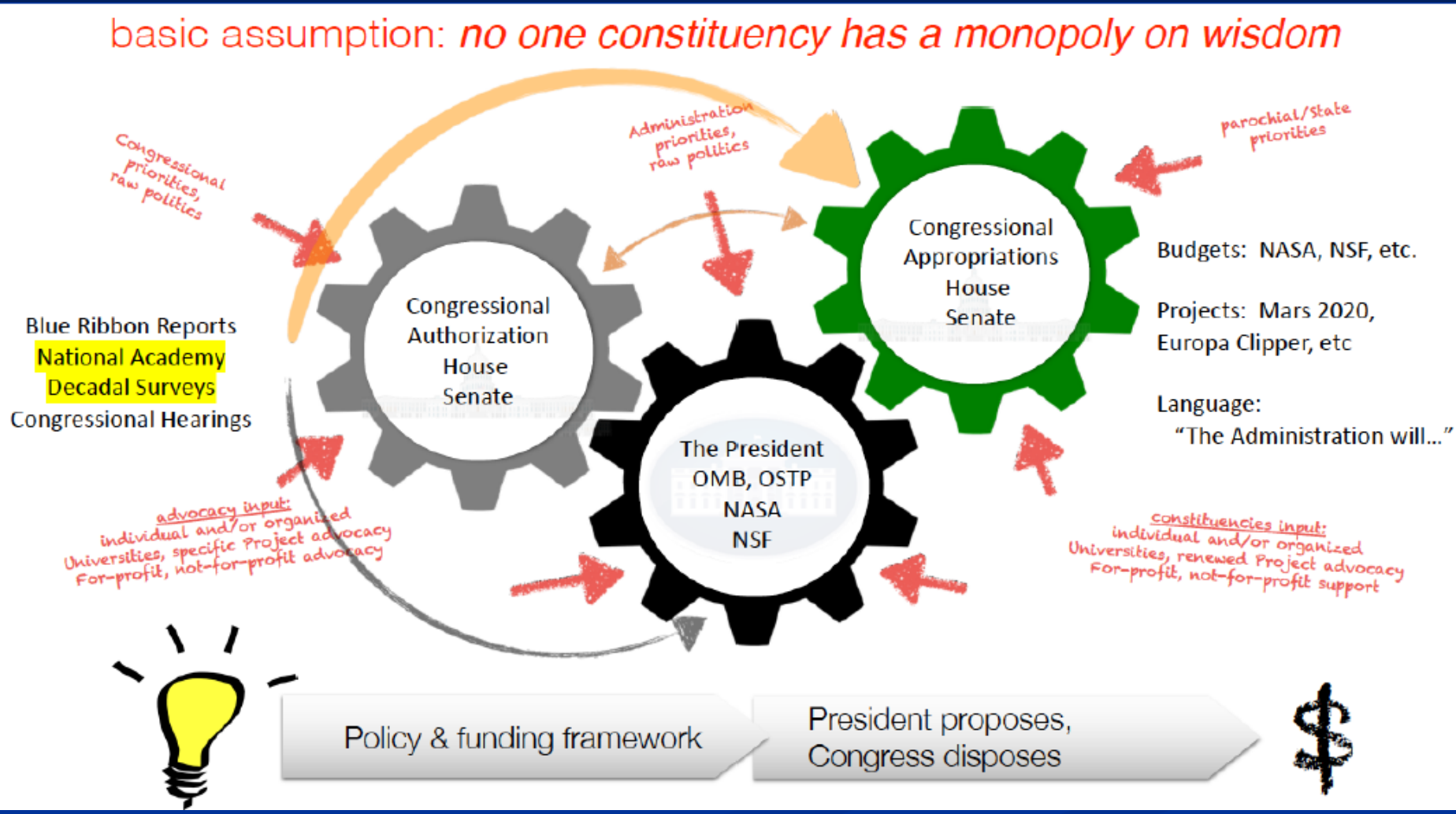
Free registration at http://sgiz.mobi/s3/Early-Career-Event

Note: LPSC registration NOT required to participate

How is a Survey Conducted?

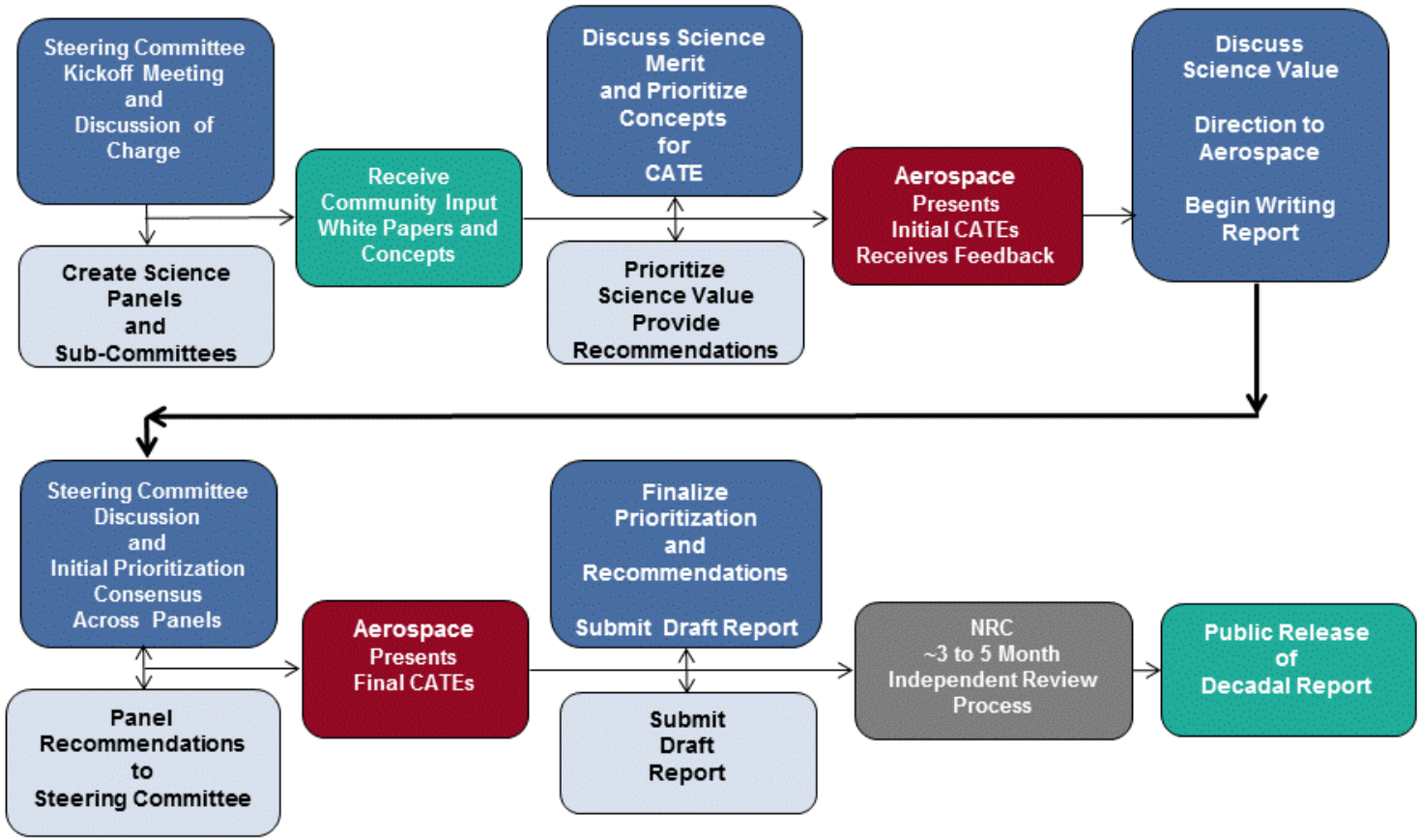
- A large group of experts selected and appointed by the National Academies—typically a steering group in overall charge and a series of supporting panels
- Specific actions taken to engage the community — an effort to achieve diverse inputs via a host of outreach mechanisms
- Supporting studies of promising mission concepts identified by NASA and, independently, by the Survey Committee
- An independent assessment of the technical, fiscal, and schedule realism of ground- and space-based facilities recommended
- A rigorous review conducted by outside experts selected by the National Academies

Federal Budget Process

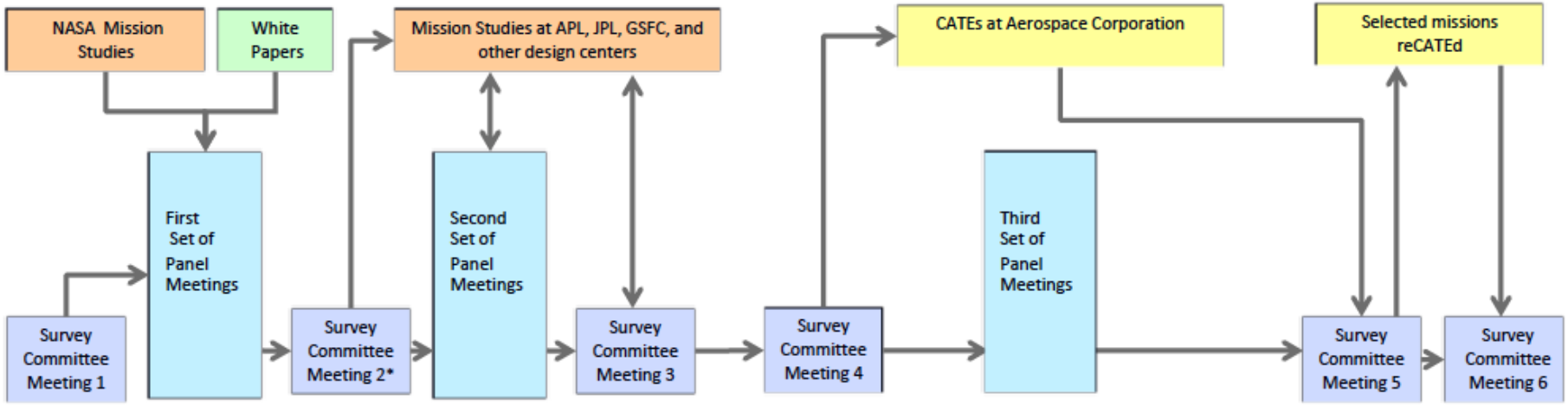


Courtesy Heidi Hammel

Steps in a Typical Survey



Timeline for Second PSDS



July 2009	August 2009	September 2009	October 2009	November 2009	December 2009	January 2010	February 2010	March 2010	April 2010	May 2010	June 2010	July 2010	August 2010	September 2010
7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Months														

Panels formulate science goals and begin to define potential mission concepts based on prior NASA-planning activities and community white papers. Advocates for key mission concepts and other activities are invited to make presentations at panel meetings.

Panels nominate most promising mission concepts for technical studies at design centers. Panel-appointed "science champions " work with their design team to ensure fidelity to the science goals of each mission concept. In some cases, rapid mission architecture studies are followed by more detailed point-design studies.

Mission design reports inform panels as to the technical realism and likely cost of the initial list of priority mission concepts. Panels down-select missions and report back to survey committee.

Panel-nominated mission concepts are assessed by the survey committee, and most, if not all, were forwarded to Aerospace Corporation for independent cost and technical evaluation (CATE). When in doubt, the survey committee deferred to the panels as to the relative priorities within the respective panels areas of responsibility.

Results of Aerospace Corporation's CATEs are briefed to the survey committee, and the CATE reports are forwarded to their respective nominating panels. In two cases, CATEd missions were descoped by their nominating panel and re-CATEd. The survey committee determined the relative priorities between the panel-nominated missions.

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White Paper Specifications

White papers should be consistent with the following guidelines:

- May not be more than 7 pages in length, single spaced, including all figures, tables, references and appendices. Papers can include web links to other documents among the references;
- Should include a cover page (beyond the 7-page limit) containing the title of the white paper, the primary author's name, phone number, institution, and email address, and a list of co-authors with their respective institutions;
- Use a 12-pt font with 1-inch margins on all sides of the document;
- Papers in Microsoft Word (.doc), Adobe Acrobat (.pdf) formats will be accepted. No other formats will be accepted; and
- White paper file sizes should be as small as possible. White papers larger than 50 Mb in size cannot be accepted, and files much smaller than this are encouraged. For file management purposes, please compress your figures as much as possible. You can provide hyperlinks to higher resolution versions of illustrations if you wish."