Space Studies Board

Planetary Science Decadal Survey 2009-2011

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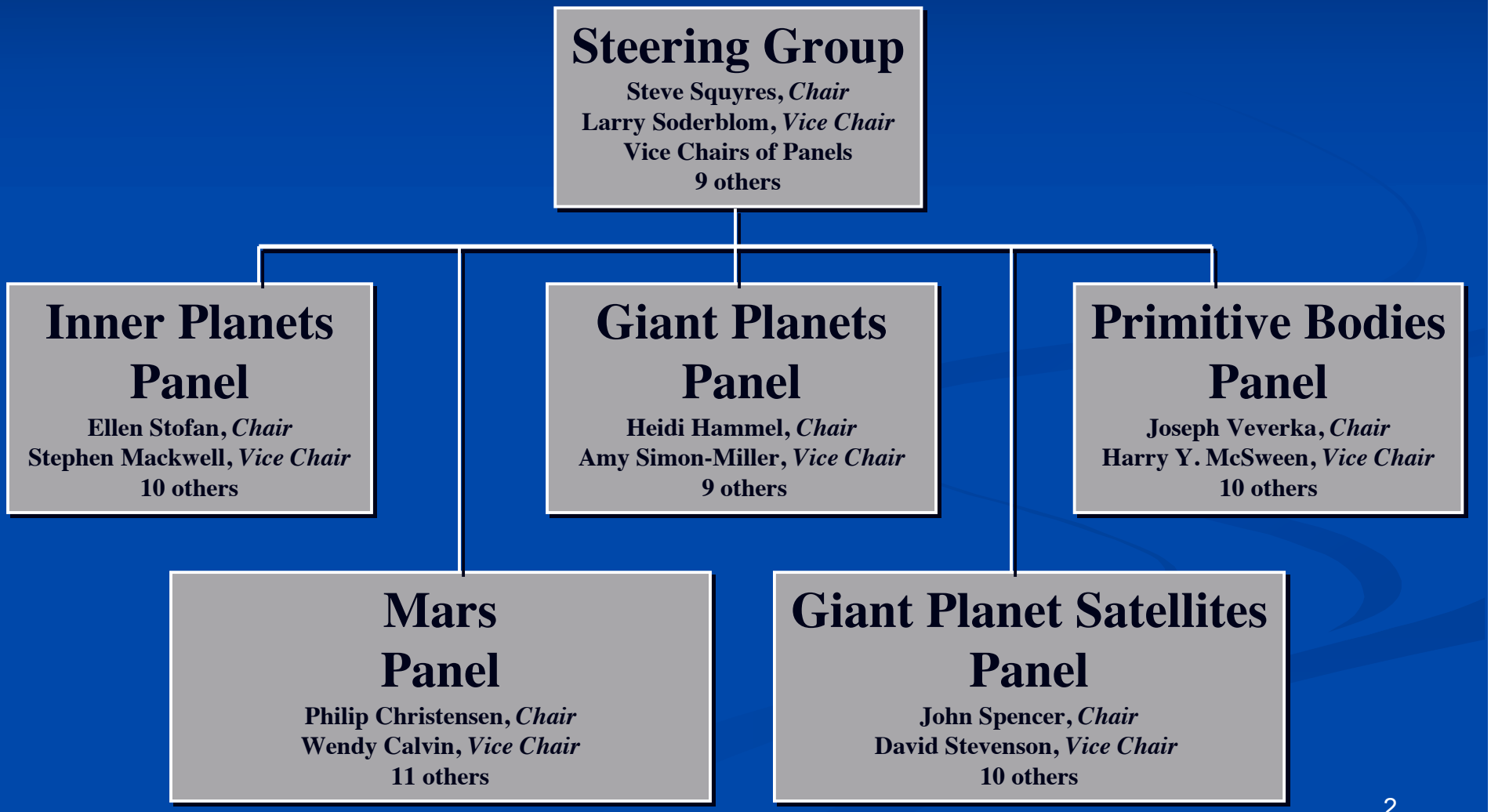
Curation and Analysis Planning Team
for Extraterrestrial Materials

Houston, Texas, 6 October, 2009

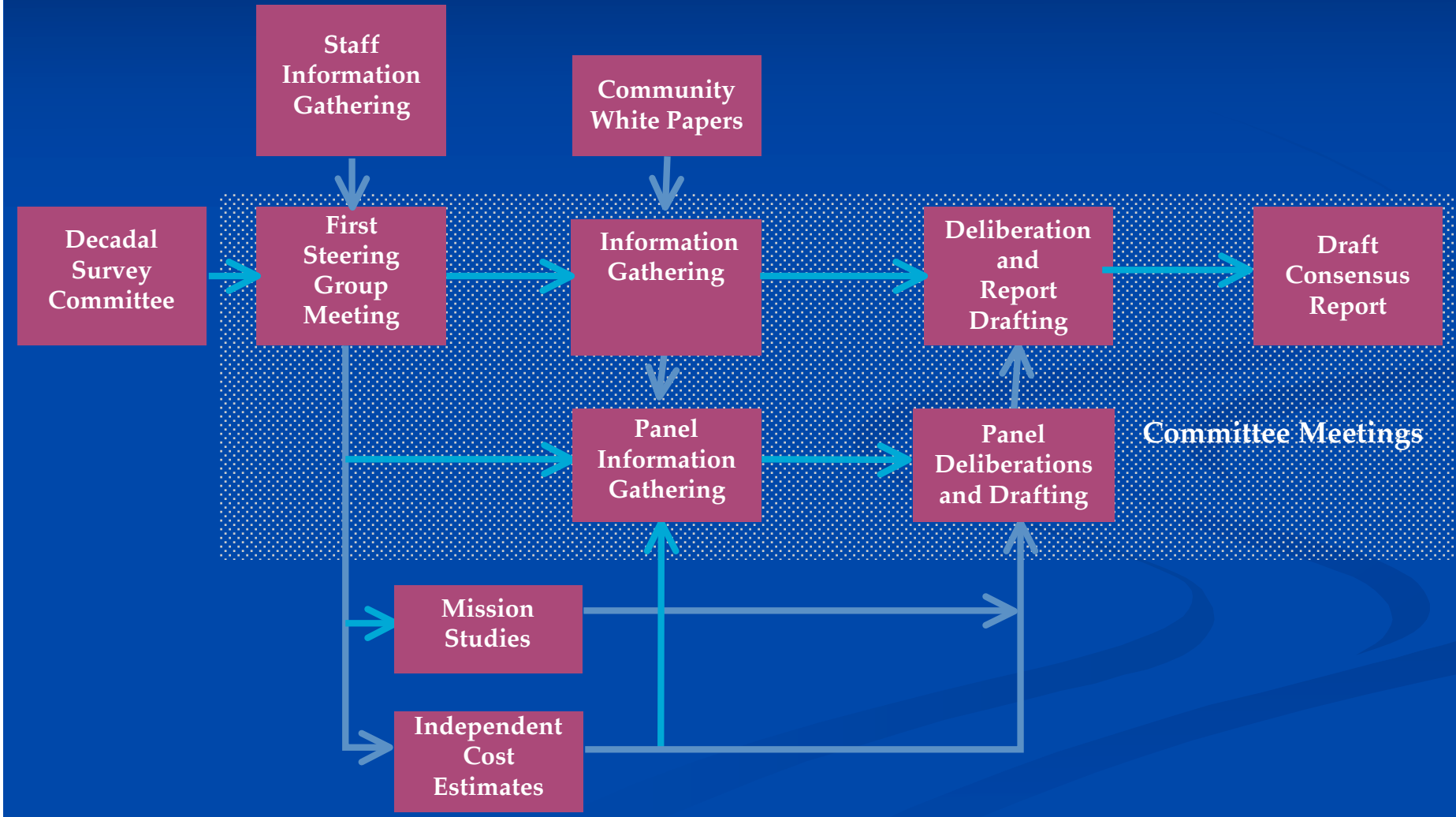
Organization of the Decadal Survey



Overall Schedule 2008-2011

2008		
	4th Quarter	Informal request received, NRC approves initiation, Formal request received, Proposal to NASA.
2009		
	1st Quarter	Funding received, Chair identified, Chair and vice chair appointed
	2nd Quarter	Steering Group appointed, Panels Appointed
	3rd Quarter	Meetings of the Steering Group and Panels begin
	4th Quarter	Panels' period of peak active, Mission Studies Begin, Proposal to NSF, Contract with Independent Cost Estimator
2010		
	1st Quarter	Mission Studies Continue
	2nd Quarter	Final Panel meetings, Panel reports finalized
	2nd-3rd Quarter	Prioritization and drafting of survey report
	4th Quarter	Draft survey report to reviewers, Report revised
2011		
	1st Quarter	Report approved, NASA briefed and report released (prepublication-format)
	3rd Quarter	Printed report released

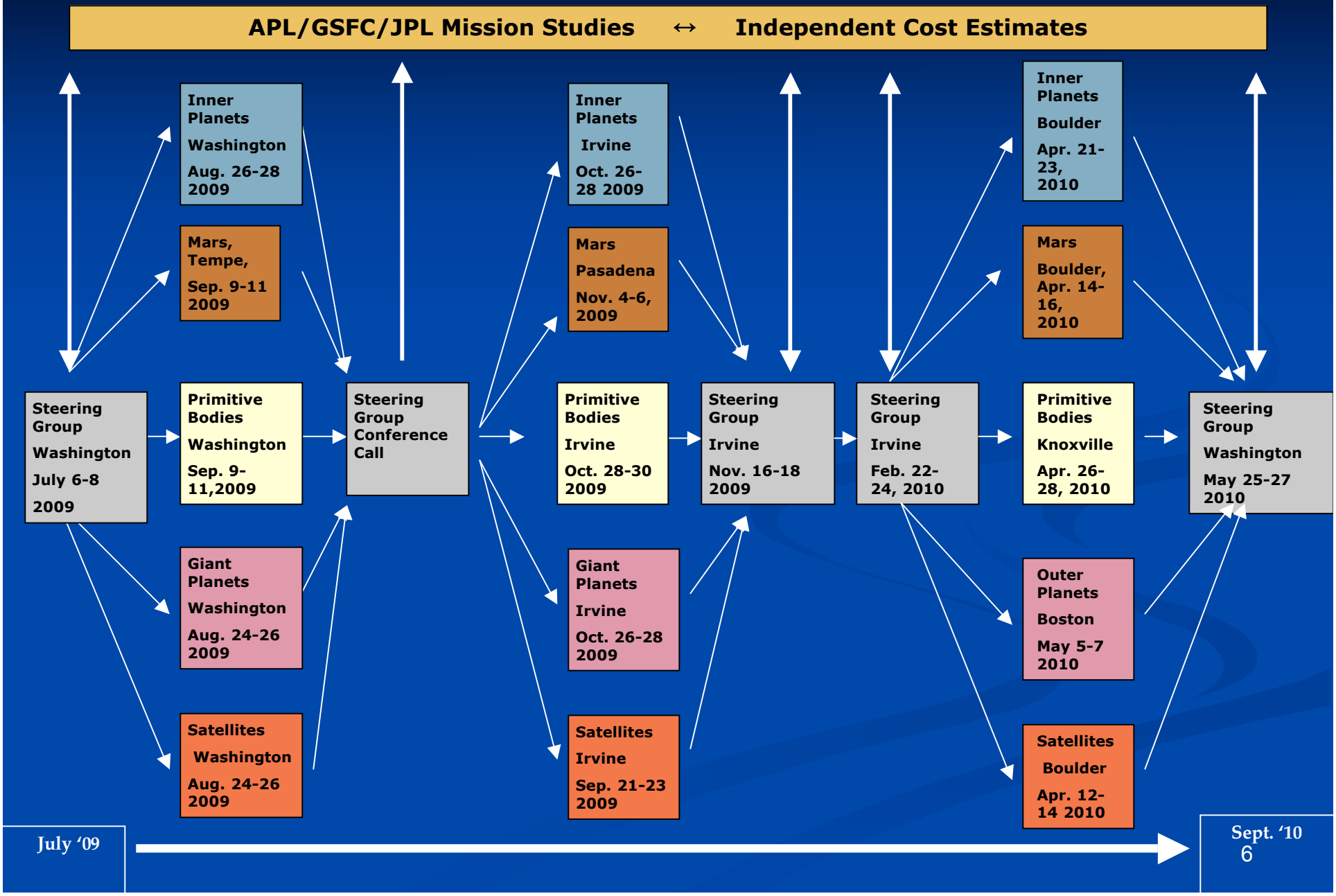
Steering Group/Panel Interactions



Meeting Schedule

Steering Group	Inner Planets	Mars	Primitive Bodies	Giant Planets	Giant Planet Satellites
6-8 July Washington D.C.	26-28 August Washington D.C.	9-11 September Tempe Arizona	9-11 September Washington D.C.	24-26 August Washington D.C.	24-26 August Washington D.C.
16-18 November Irvine California	26-28 October Irvine California	4-6 November Pasadena California	28-30 October Irvine California	26-28 October Irvine California	21-23 September Irvine California
22-24 February Arizona or California	20-22 April Boulder Colorado	14-16 April Boulder Colorado	26-28 April Knoxville Tennessee	5-7 May Boston Massachusetts	12-14 April Boulder Colorado
25-27 May Washington D.C.					

Survey Committee Work Flow



Community Interactions

- Town halls and open meetings have held as early as possible in the process of beginning the decadal survey (e.g., AGU, VEXAG, MEPAG, OPAG, RAS, LPSC, NLSI, CAPTEM, ESSC, EPSC, DPS, and LEAG)
- Additional outreach sessions are planned for AGU, LPSC, and AbSciCon
- Submission of white papers via the decadal survey web site
- Meeting presentations archived at SpacePolicyOnLine.com
- Steering group and panel meetings are being webcast live and archived
- Chairs newsletter and regular bulletins (via, e.g., the PEN and DPS)
- Graduate students recruited as rapporteurs at decadal survey meetings
- Briefings and other interactions with other groups that have overlapping interests (*e.g.*, Astronomy decadal survey and Augustine Commission)

White Papers

- One of the most important ways for members of the science community to participate in the decadal survey is via submission of white papers.
- A total of 199 white papers have been received, with 4935 authors/endorsers.
- White papers are now being assessed in detail by the panels.

Example of assessment process (from the Mars panel)

- Each white paper is assigned to two panelists, who each provide a ~2 paragraph summary of the paper.
- Panel conducts a series of conference calls to discuss every white paper and decide which of them require further action:
  - Invitations to present at future panel meetings.
  - Incorporation in final report.

Evaluation of Candidate Missions

- Compared to previous decadal surveys, this one will place much greater emphasis on evaluation of the technical maturity and probable costs of candidate missions.
- The panels and the steering group include members who are expert in engineering, project management, and cost estimation.
- Resources are available to do moderate-fidelity (and conservative!) cost estimates for a limited number of high-priority candidate missions.
- The objective is to produce a realistic (i.e., not heavily over-subscribed) set of candidate missions for NASA to carry out in the coming decade.

Fiscal and Technical Realism

A lack of technical and fiscal realism has been a major weakness of past decadal surveys (in planetary science and other disciplines). This decadal survey has adopted a twin-track approach to crafting more robust mission priorities.

Technical support in the form of mission studies will be conducted by three organizations:

- Jet Propulsion Laboratory
- Applied Physics Laboratory
- Goddard Space Flight Center

The NRC will procure independent cost estimates for the missions that have been studied from an outside organization.

Four qualified companies responded to an RFI; the winning contractor has been selected and will be under contract shortly.

First Round of Mission Candidate Studies

- The panels have now identified the first of what will be several sets of mission candidate studies.
- *These studies do not yet include inputs from the white papers!* There will be many future studies based on white paper inputs.

Additional studies assigned once the white papers have been assessed!

Initial Mission Study Candidates

Architecture Studies

- Mercury lander (APL)
- Venus near-surface mobile explorer (GSFC)
- Mars 2018 skycrane capabilities (JPL)
- Uranus system (APL)
- Neptune/Triton (JPL)
- Enceladus flyby/sample return (JPL)

Full Mission Studies

- Mars trace-gas orbiter (GSFC)
- Titan lake lander (JPL)

Other Studies

- NEO Target Assessment: Identify top 10 most accessible NEOs and investigate flyby options for the top three. (JPL)

Independent Cost Estimates

- JPL's Mars trace gas orbiter
- APL's Comet surface sample return

It's Not Just Missions

Beyond describing a prioritized set of NASA planetary missions, the survey report will address several other issues:

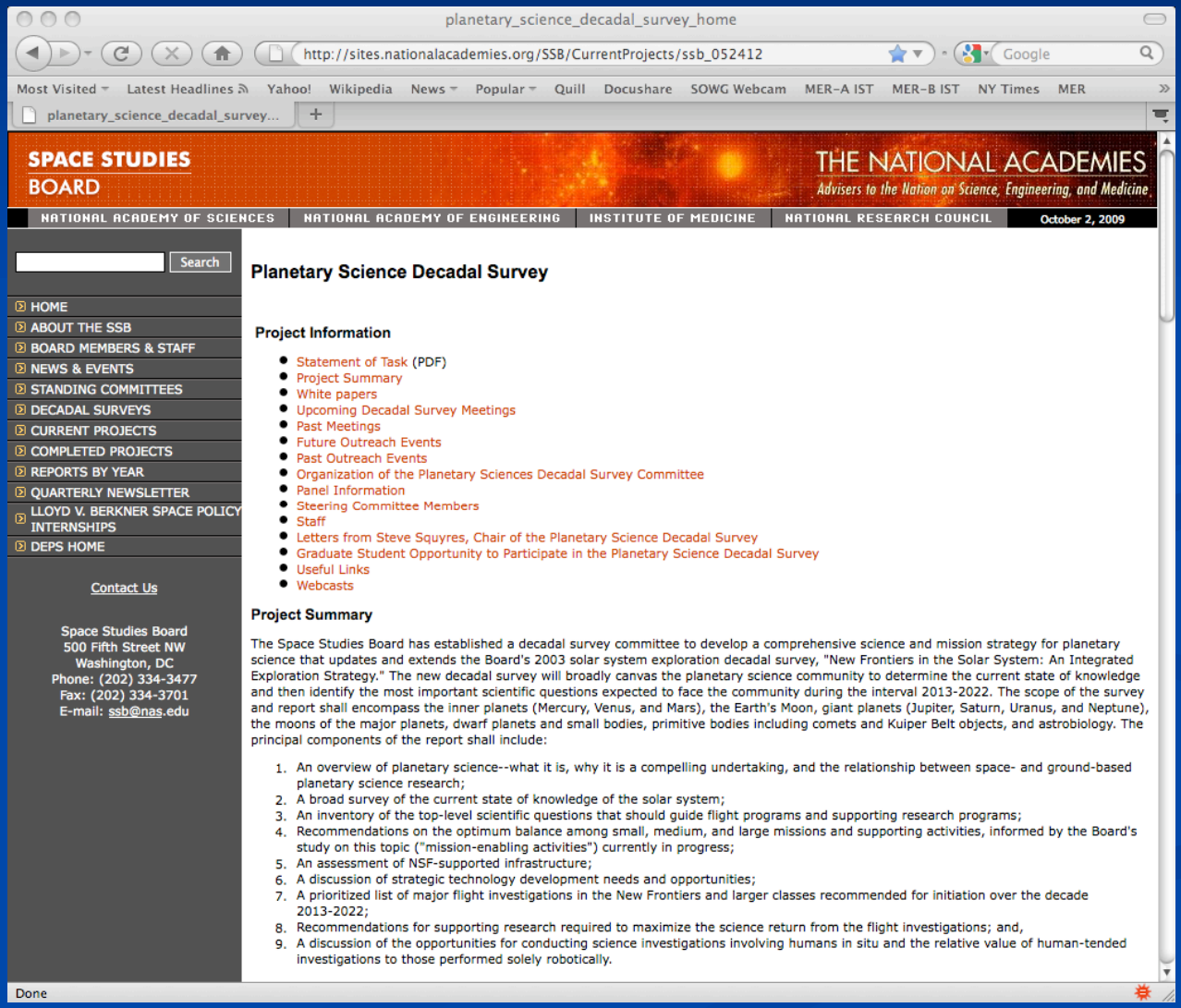
- NSF-funded ground-based telescopes and other facilities
- NASA-funded facilities
- Technology development for future NASA planetary missions
- The NASA and NSF planetary R&A programs
- Education
- Public Outreach

Summary

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

Our Web Site

http://sites.nationalacademies.org/SSB/CurrentProjects/ssb_052412



Extra

New Frontiers in the Solar System

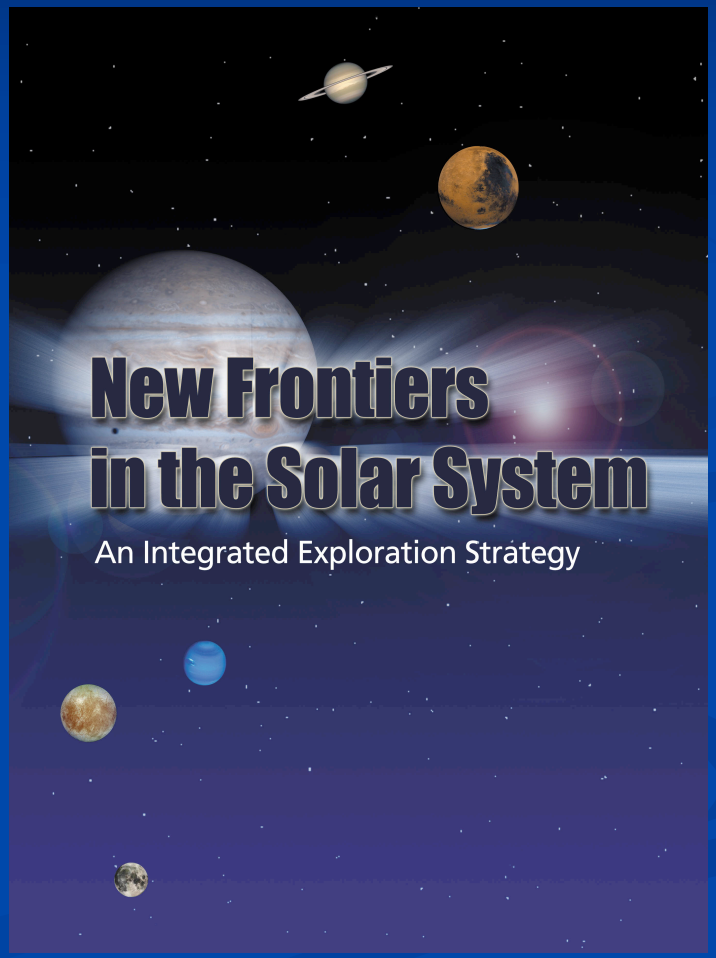
Origin NASA request

Purpose To define for solar system exploration a decadal science and mission strategy, akin to those drafted by the astronomy and astrophysics communities for the last 40 years

Study Group Steering group of 15 supported by 45 others on six panels (plus 200+ authors of white papers)

Study period 7/01 to 7/02

Final Report Issued 2003



What is a Decadal Survey?

- Once every ten years, at the request of NASA and the National Science Foundation, the National Research Council carries out a "decadal survey" for planetary science.
- The decadal survey is the primary scientific input that NASA will use to design its future program of planetary exploration.

What will the Survey Address?

- Overview of planetary science and current state of knowledge
- List of the key scientific questions
- Assessment of NSF-funded infrastructure (e.g., ground-based telescopes)
- Recommendations on NASA program balance:
  - Mix of mission targets
  - Mix of mission sizes
  - Research activities
- Prioritized list of New Frontiers and flagship missions for the next decade
- Opportunities for human exploration to address key scientific questions
- Recommendations for NASA-funded research activities
- Recommendations for technology development

Statement of Task

- Decadal survey activities are governed by a "statement of task", available at the decadal survey web site.
- The statement of task was provided by NASA and NSF, with input from the White House Office of Management and Budget.
- The statement of task for this decadal survey places a strong emphasis on identifying a suite of missions that can be carried out in full by NASA using the funding projected to be available.
- The list of candidate missions must not be intentionally oversubscribed.

Steering Group

- Steven W. Squyres, Cornell University, *Chair*
- Laurence A. Soderblom, U.S. Geological Survey, *Vice Chair*
- Wendy M. Calvin, University of Nevada, Reno
- Dale Cruikshank, NASA Ames Research Center
- Pascale Ehrenfreund, George Washington University and Leiden Institute of Chemistry
- G. Scott Hubbard, Stanford University
- Wesley T. Huntress, Jr., Carnegie Institution of Washington
- Margaret G. Kivelson, University of California, Los Angeles
- B. Gentry Lee, Jet Propulsion Laboratory
- Jane Luu, Massachusetts Institute of Technology, Lincoln Laboratory
- Stephen Mackwell, Lunar and Planetary Institute
- Ralph L. McNutt, Jr., Johns Hopkins University, Applied Physics Laboratory
- Harry Y. McSween, Jr., University of Tennessee, Knoxville
- Amy Simon-Miller, NASA Goddard Space Flight Center
- David J. Stevenson, California Institute of Technology
- A. Thomas Young, Lockheed Martin Corporation (Retired)

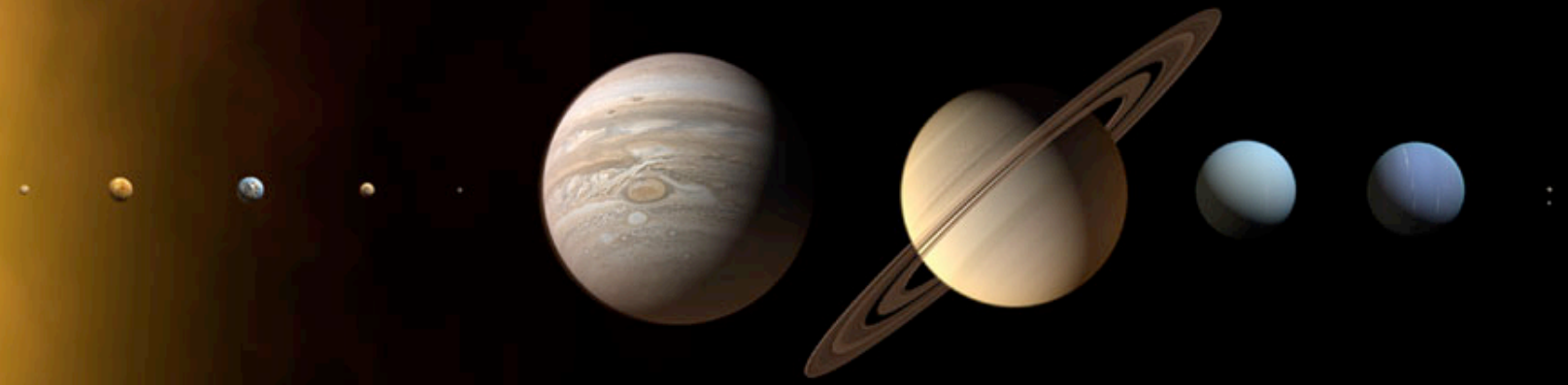
NASA's Mission Portfolio

- NASA currently has three main classes of planetary missions:
  - Discovery (least expensive)
  - New Frontiers (more expensive)
  - Flagship (very expensive)
- Discovery missions will not be identified or prioritized by the decadal survey. This job is left to the AO and peer review process. Candidate science for the Discovery program will be identified.
- Prioritized lists of New Frontiers and Flagship missions will be identified and presented.
- A recommendation will be made regarding the appropriate balance among these classes of missions.

What's In and What's Out

- Only missions that have Congressionally approved new start are assumed *a priori* to be "off the table."part of the decadal plan.
- Missions that have been extensively discussed and studied but do not yet have a new start (*e.g.*, Europa Orbiter, International Lunar Network, various future Mars missions) are "on the table.".
- NASA views the Decadal Survey as the formal statement of priority by the US planetary science community, and has stated their intent to give highest priority to the missions identified in the survey.

The Moon and Mars



Missions to the Moon and Mars will be considered on an equ
basis with all other missions. No "set aside" for Moon or Mar
exploration will be assumed a priori.

The End Game

- Draft report will be written in the middle of next year
- Report will undergo rigorous external peer review, per NRC policies and standards
- Once revised and approved, report will be released, and briefed widely:
  - NASA
  - NSF
  - Office of Management and Budget
  - Congress