

Excerpts

Vision and Voyages

For Planetary Science in the Decade 2013-2022

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Committee Organization



Inputs From The Community

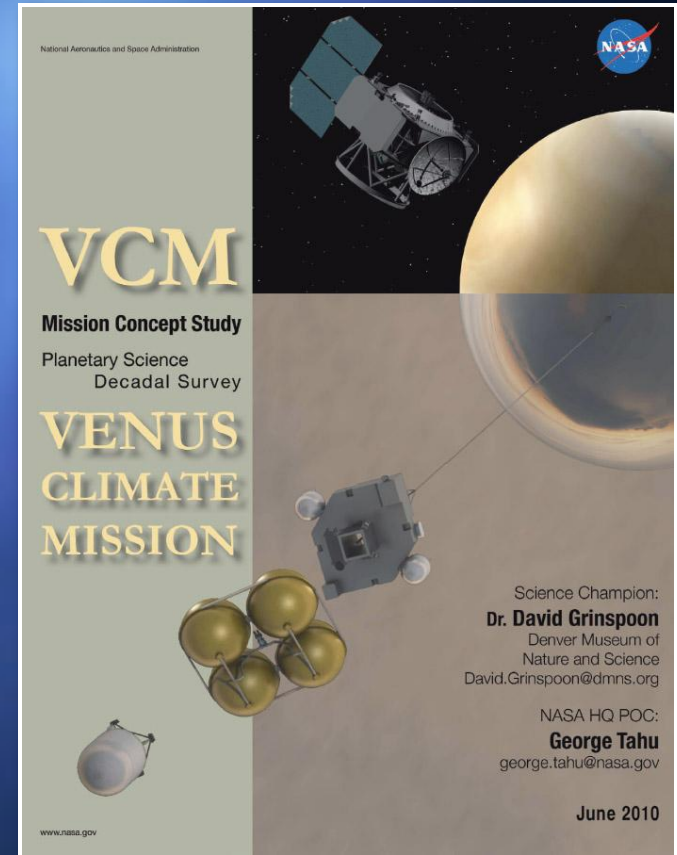
- The goal of the decadal survey is to seek out the community's views, and build a consensus around those views.
- More than a dozen town hall meetings were held: AGU (twice), LPSC (twice), DPS (twice), EPSC, RAS, AbSciCon, NLSI, LEAG, VEXAG, OPAG, MEPAG, CAPTEM, etc.
- The community submitted 199 white papers with 1669 individual authors and endorsers.
- The white papers were the main input to the decadal process, and many white paper authors were invited to present at panel meetings.
- Open sessions of meetings were webcast and put online.
- Draft report was reviewed by 18 peer reviewers.

Crosscutting Themes

- The community inputs led to identification of three Crosscutting Themes for planetary science:
 - Building New Worlds: Understanding solar system beginnings
 - Planetary Habitats: Searching for the requirements for life
 - Workings of Solar Systems: Revealing planetary processes through time
- The report expands on these themes, identifying key scientific questions for each.
- Science is the driver: the studied mission concepts represent ways to deliver that science

Mission Studies

- Based on the science identified via white papers and other community inputs, 25 mission candidates were chosen for detailed study.
- Studies were performed by APL, GSFC, and JPL. Each study team included at least one science representative from the appropriate panel.
- The studies involved considerable time and effort. All study reports have been posted on the Web and are included in the decadal survey report.

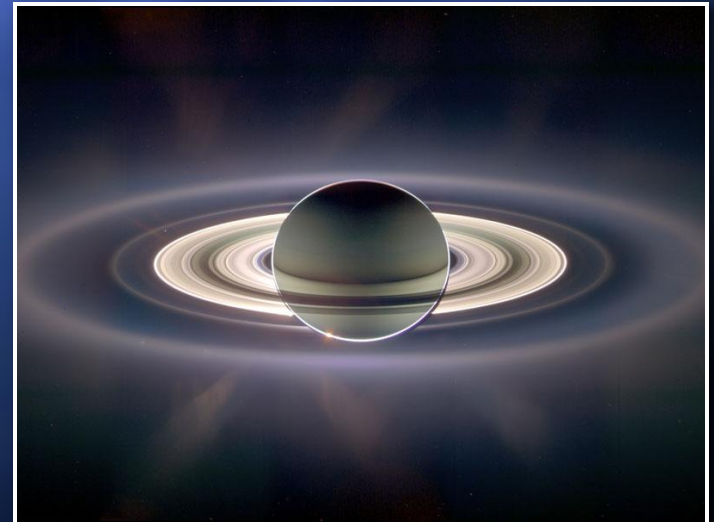
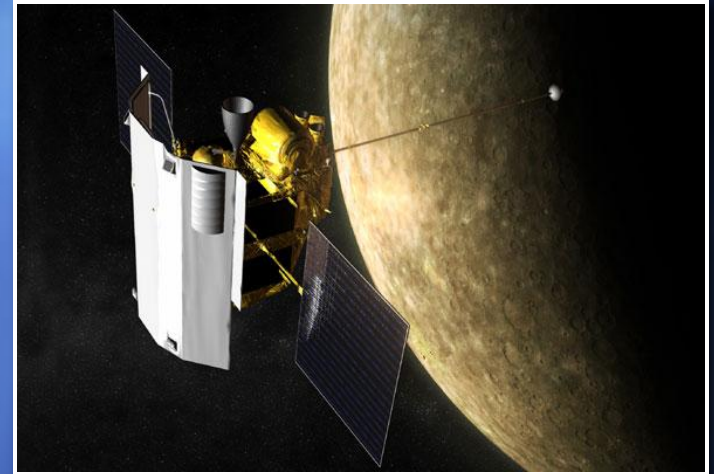


Mission Prioritization

- Criteria
 - Science return per dollar
 - **Programmatic balance**
 - Technological readiness
 - Availability of appropriate trajectories
- Process
 - All priorities and recommendations were guided strongly by community inputs.
 - **Prioritization within the subject area of each panel was done by the panel.**
 - Cross-panel prioritization was done by the steering group.
 - All priorities and recommendations were arrived at by achieving strong consensus.

Ongoing and Approved Missions

- *Continue missions in development, and missions in flight subject to senior review.*
- Discovery:
 - MESSENGER (in flight)
 - Dawn (in flight)
 - Kepler (in flight)
 - GRAIL (in development)
- New Frontiers:
 - NF-1: New Horizons (in flight)
 - NF-2: Juno (in development)
 - **NF-3: TBD (to be selected soon)**
- Others:
 - Cassini (in flight)
 - ODY/MRO/MER (in flight)
 - MSL/MAVEN (in development)
 - LADEE (in development)



Research and Analysis Program

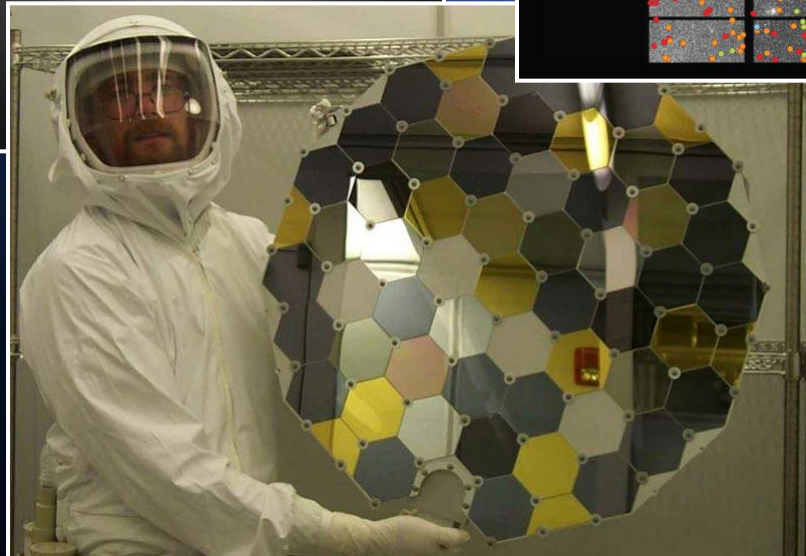
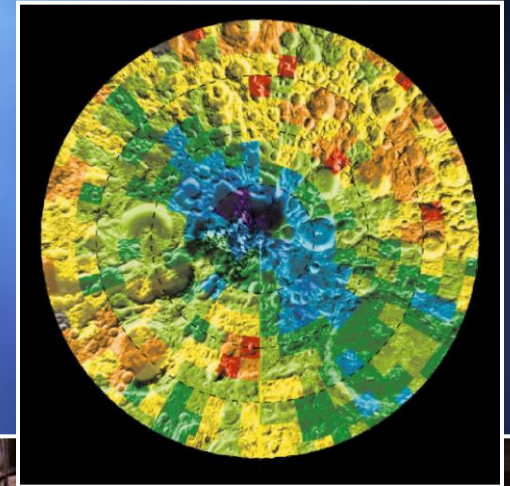
- *Increase the NASA planetary R&A budget by 5% above the total finally approved FY'11 expenditures in the first year, and then by 1.5% above inflation each successive year.*
- All subsequent recommendations are consistent with this funding increase.

Technology Development

- Technology development is fundamental to a vigorous and sustainable program of planetary exploration.
- *A planetary exploration technology development program should be established, and carefully protected from incursions on its resources.*
- *This program should be funded at 6-8% of the total NASA Planetary Science Division budget.*
- All recommendations are consistent with this level of technology funding.

The Discovery Program

- The Discovery Program has produced spectacular and cost-effective science, and can continue to do so well into the future.

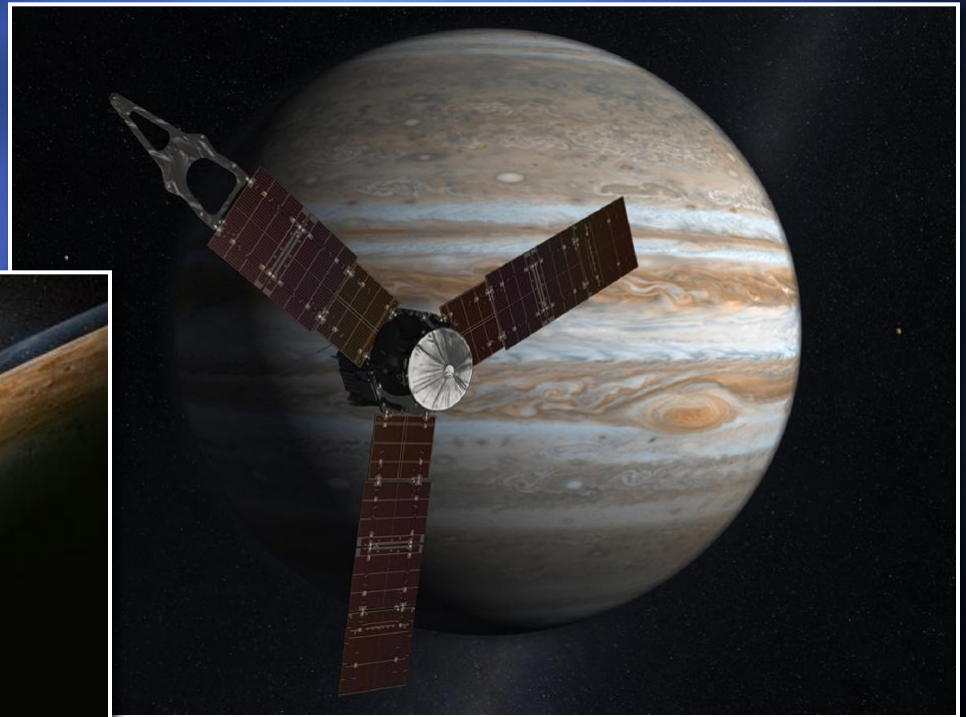


The Discovery Program

- *Continue the Discovery program at its current funding level, adjusted for inflation, with a cost cap per mission also adjusted for inflation (i.e., to \$500 million FY'15).*
- *Assure a regular, predictable, and rapid (≤ 24 -month) cadence of Discovery AOs and selections.*
- No recommendations are made for Discovery mission priorities; this is left to the AO and peer review process.

The New Frontiers Program

- New Frontiers missions can address high priority and technically complex science goals that are beyond the capabilities of Discovery missions.



The New Frontiers Program

- The New Frontiers program of PI-led strategic missions has been a success, and should continue.
- *Change the New Frontiers cost cap to \$1.0 billion FY'15, excluding launch vehicle costs.*
- *Select New Frontiers missions NF-4 and NF-5 in the decade 2013-2022.*

New Frontiers 4 Selection

- Select NF-4 from among:
 - *Comet Surface Sample Return*
 - *Lunar South Pole-Aitken Basin Sample Return*
 - *Saturn Probe*
 - *Trojan Tour and Rendezvous*
 - *Venus In Situ Explorer*
- No relative priorities among these are assigned.
- Also studied:
 - *Venus Tessera Lander*
 - *Venus Mobile Explorer*
- If the selected NF-3 mission addresses the goals of one of these, remove that one from the list.

New Frontiers 5 Selection

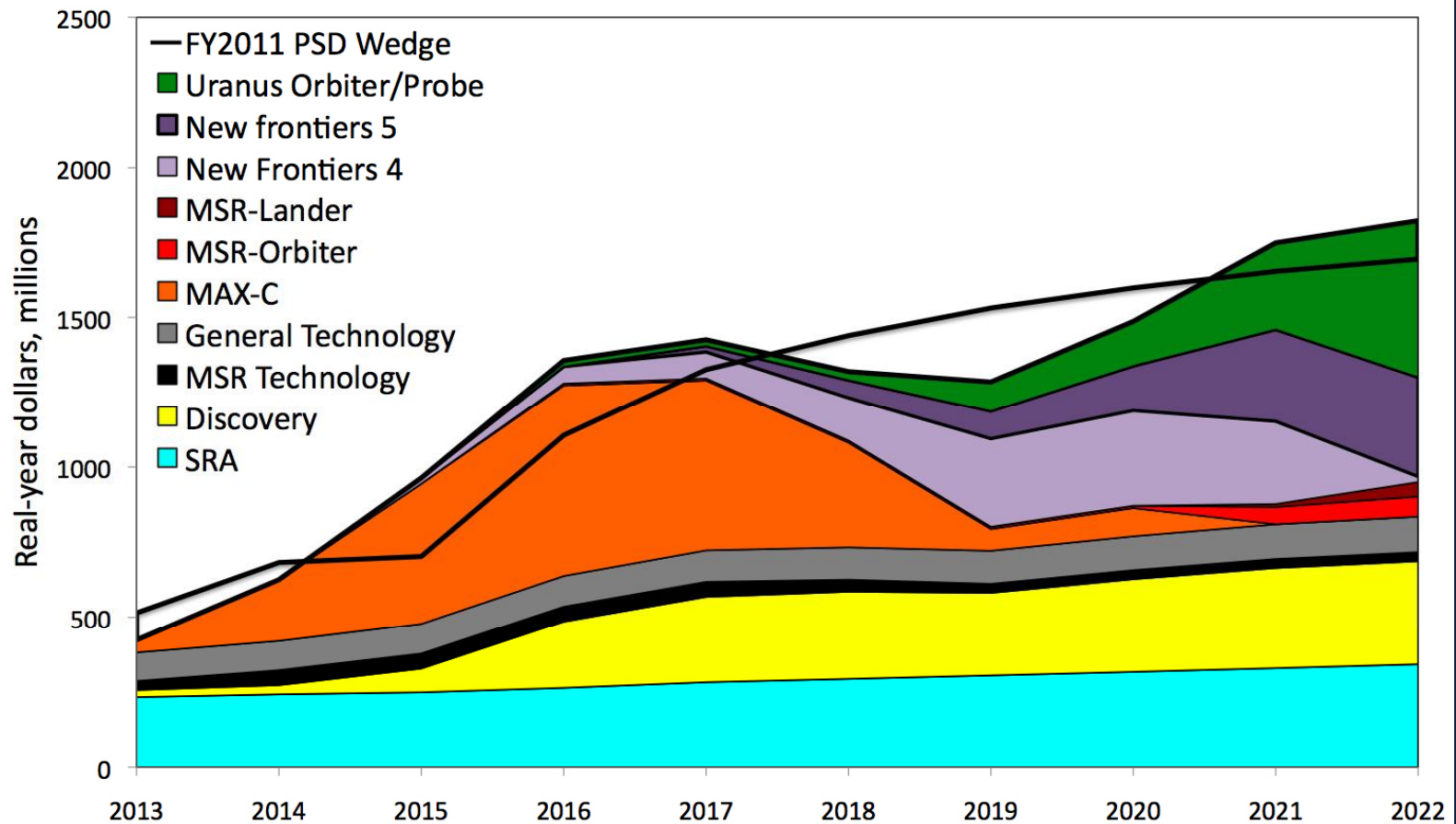
- For NF-5:
 - *The remaining candidates from NF-4*
 - *Io Observer*
 - *Lunar Geophysical Network*
- Again, no relative priorities are assigned.

Flagship Missions

(in priority order)

1. Begin NASA/ESA Mars Sample Return campaign:
Descoped Mars Astrobiology Explorer-Cacher (MAX-C)
2. Detailed investigation of a probable ocean in the outer solar system: *Descoped Jupiter Europa Orbiter (JEO)*
3. First in-depth exploration of an Ice Giant planet: *Uranus Orbiter and Probe*
4. Either *Enceladus Orbiter* or *Venus Climate Mission* (no relative priorities assigned)

The Cost-Constrained Program



If Less Funding Is Available...

- Descope or delay Flagship missions.
- Slip New Frontiers and/or Discovery missions only if adjustments to Flagship missions cannot solve the problem.
- Place high priority on preserving R&A and technology development funding.

The background of the cover is a deep space scene. In the top left, a large, grey, cratered celestial body (likely a moon or planet) is partially visible. In the top center, a small, dark, cratered sphere (likely a moon) is shown. In the top right, a thin crescent moon is visible. In the center, the title "VISION and VOYAGES" is displayed. Below the title, the text "For Planetary Science in the Decade 2013-2022" is written. In the lower center, the word "draft" is written in a stylized font. In the lower right, a large, yellow, ringed planet (Saturn) is partially visible. In the lower left, a bright comet with a long tail is shown. The overall scene is set against a dark, star-filled background.

VISION *and* VOYAGES

For Planetary Science in the Decade 2013-2022

draft

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