Discovery Program Overview
Principles & Objectives

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Discovery Program Executive

February 02, 2006

Discovery Program Goal

Planetary Science Investigations

"… to provide frequent flight opportunities for high quality, high value scientific investigations that can be accomplished under a not to exceed cost cap."

Discovery Program Outcomes

- Advancement in scientific knowledge of planetary system(s)
- Addition of scientific data to PDS archive for all to access
- Announcement of scientific results in peer-reviewed literature, popular media, and scholastic materials to inspire and motivate careers in science, technology & engineering
- Expansion of pool of well qualified Principle Investigators and Program Managers
- Implementation of technology advancements

Discovery Program Science

Discovery Program science encompasses almost all of planetary system(s) science

- Solar System (excluding Mars)
- Search for Extra-solar Planets

Science priorities as expressed in

- The New Age of Exploration / Vision for Space Exploration
- Space Science Strategy / NASA Strategic Plan
- NRC Decadal Surveys (New Frontiers and Astronomy & Astrophysics)
- Roadmaps (Solar System Exploration or Search for Origins)

Science is executed via

- Flyby spacecraft
- Orbiter spacecraft
- Landers
- Sample return missions
- Remote observations from spacecraft
- “Missions of Opportunity”

Discovery Program Science

The broad base of ROSES NRA supported research supplies inspiration

- Planetary Geology and Geophysics
- Cosmochemistry, Origins of Solar Systems
- Planetary Astronomy, Planetary Atmospheres, NEOs (discovery & characterization)

The technology development programs advance instruments to TRL 6

- Planetary Instrument Definition and Development (to TRL 3)
- Mars Instrument Development
- In-Space Propulsion
- Sample Return Laboratory Instruments and Data Analysis

Broad range of investigations

- Solar wind
- Comets
- Asteroids
- Other Inner Planets (excluding Mars)

Data must be archived in Planetary Data System (PDS) or equivalent

Additional research funded through Discovery Data Analysis Program (DDAP)

Discovery Program Science

Community-initiated investigations

- PI-led, science team driven
- Expanded participation through Participating Scientist and, later, Data Analysis Programs

Focused scientific studies

- Frequent access to space enables return to targets within science career lifetimes …
- Allowing generations of advancement through iterative improvements

Complete scientific investigations

- From planning to publishing
- Data delivered to PDS in a usable, standard form within 6 months
- Ancillary data, calibration data, maps, software tools also in PDS

Responsive selection process allows program balance

- Science is evaluated by peers
- AA may select from top-rated science AND technically ready proposals

Basic Highlights

Complete scientific investigations

- All Investigations must support the science themes
  - Solar System Exploration (excluding the study of Mars)
  - Astronomical Search for Origins (the search for extrasolar planetary systems element ONLY)

All investigations must be scoped to fit within the cost cap

- Propose only the science that can be done for the $
- Incorporate appropriate reserves, project management techniques

Free-flyers on ELVs

Must include analysis and publication of data in the peer reviewed scientific literature, delivery of the data to the PDS in proper format, and full E/PO program, funded at 0.25 – 0.5% of the cost (less ELV)

Launch by date - October 01, 2013

Management Principles

All investigations must be single PI-led

- Project Manager must be named in proposal
- Deputy Project Manager is strongly recommended

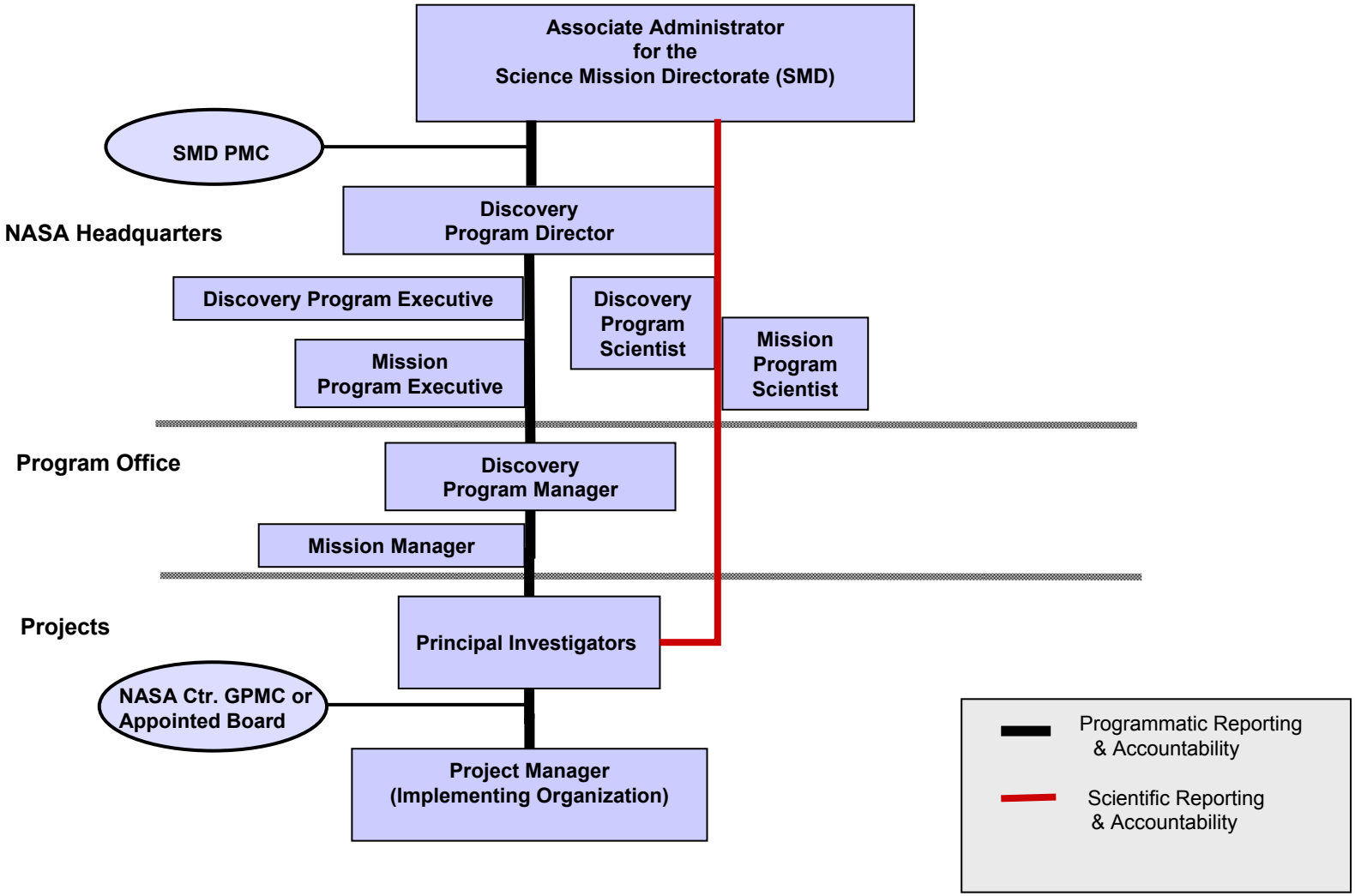
Co-Investigators

- Only those who play a necessary role in the investigation

Appropriate scope

- Include a baseline mission, de-scope options, and performance floor

NASA Program Management



Cost, Risk & Reserve

All investigations must be scoped to fit within the cost cap

- $425 M cost cap (FY06$)
- Propose only the science that can be done for the $$

Investigation must define risk management approach

- Proposal must demonstrate clear understanding of risks
- Discuss role of possible de-scope options

Mission proposals must include adequate reserve

- Your team must decide what that is, based on your risk assessment
- A minimum of 25% reserve required through Phases C & D, and as appropriate in Phase E

Other Financial Information

- Use the NASA New Start Inflation Index, Table B-3
- Contributions are allowed, subject to the limitations in Section 5.9.3
- Total contributions may not exceed 1/3 of the Total Cost

Missions of Opportunity

Scientific investigations of interest to NASA SMD as part of other missions sponsored by non-SMD organizations

$35 M cost cap (FY06$), including reserve

- Phase A, if required, up to $250k (RY$)

Must address planetary science objectives

Must include analysis of data, publication and EPO

Letter of commitment by April 1, 2009

Discovery spacecraft specifically being offered

- Deep Impact Flyby
- Stardust Bus
- Information in DPL

Anticipated Selections

Approximately three Missions could be selected for Concept Studies

- Up to 7 month Phase A
- Up to $1.2M (RY$)

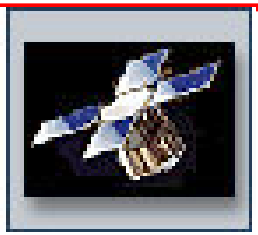
One or more Missions of Opportunity may be selected

- Phase A, if required, up to $250k (RY$)

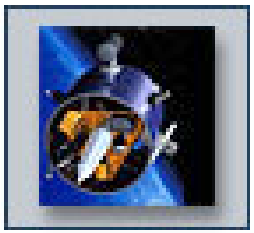
After evaluation of the Phase A Concept Studies, one or two Discovery Missions and possibly one or more MO investigations may continue into Phase B

NOIs are due March 6, 2006

Discovery
10 Missions and Counting

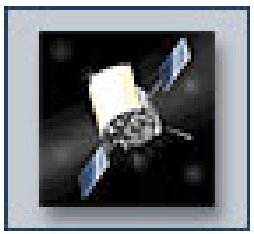


NEAR
Successfully orbited and landed on an asteroid

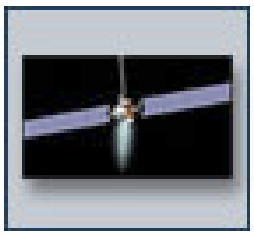


Lunar Prospector
Provided detailed maps of Moon's surface

Genesis
Successfully captured solar wind and returned samples to Earth



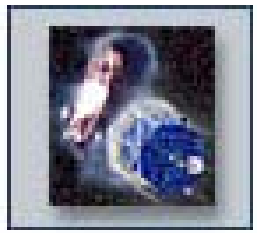
MESSENGER
Launched August '04 to arrive on orbit at Mercury March 2011



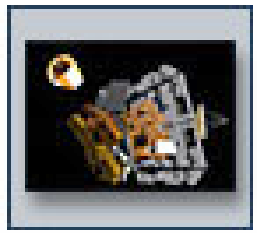
Dawn
Mission to Ceres and Vesta. Under development.

Mars Pathfinder
Successfully landed and roved on Mars

Stardust
Successfully flew though comet's tail and returned samples to Earth



CONTOUR
Mission to comet. Lost during flight.



Deep Impact
Successfully impacted surface of comet to remotely sample interior.

Kepler
Will search for extra-solar planets. Under development.

Heritage of Success!

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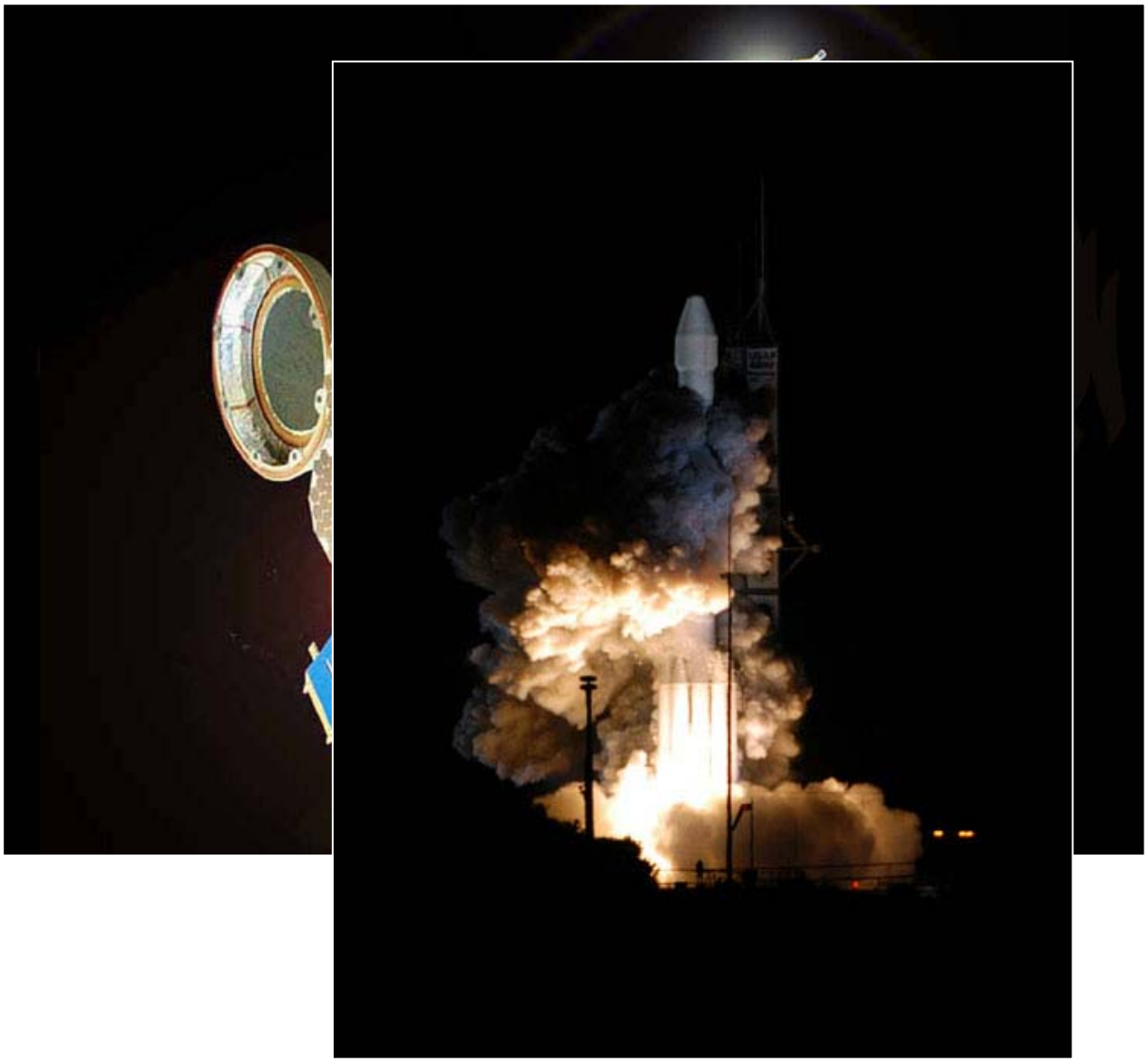
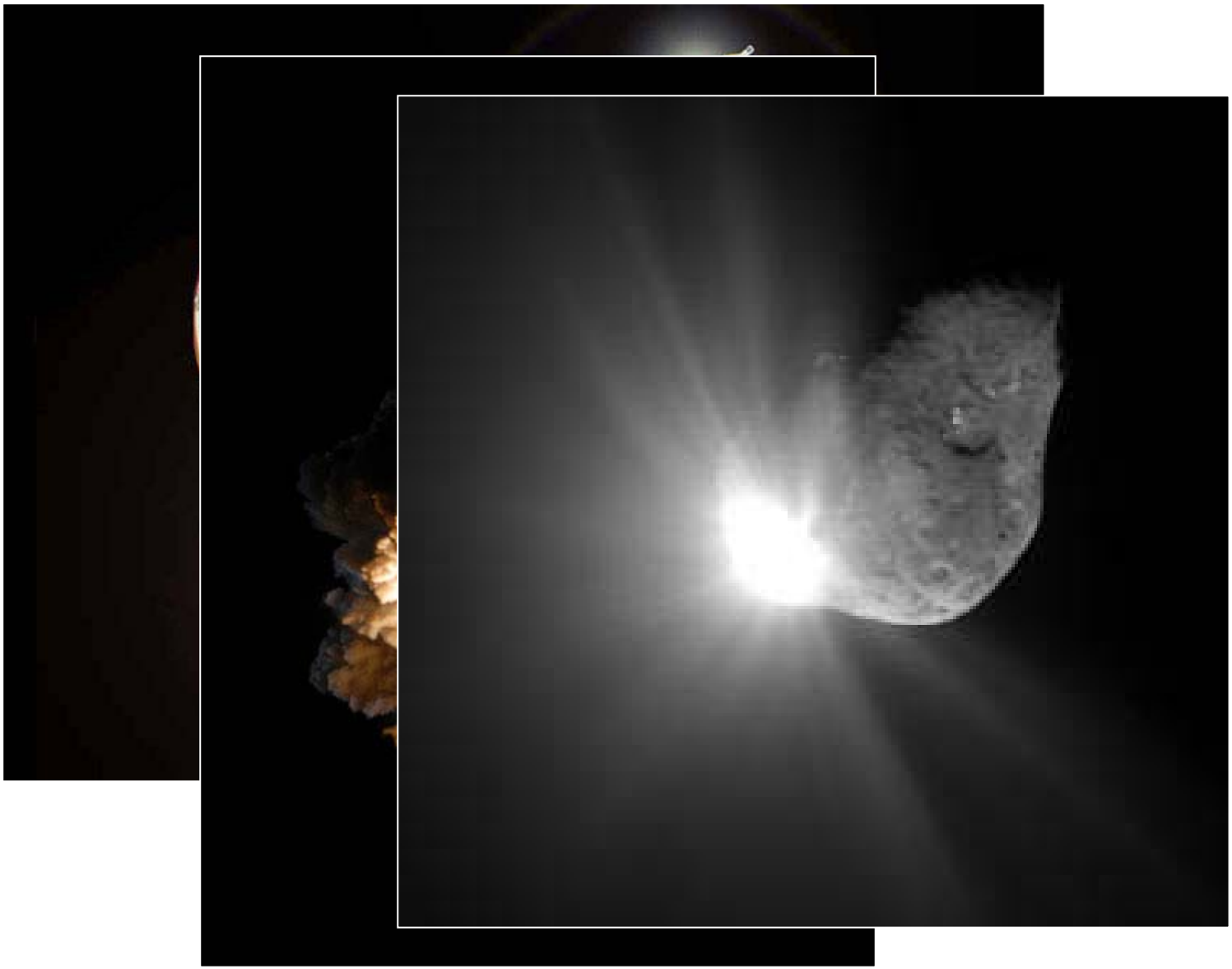


Heritage of Success!



Heritage of Success!

We're looking for
The next Good Mission
To add to the Family

Good Luck!

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….is usually made by those who receive it!