

National Aeronautics and Space Administration



Science Mission Directorate

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Science Mission Directorate

NASA's Strategic Goals



Vision for Space Exploration

To advance U.S. scientific, security, and economic interests through a robust space exploration program

NASA's Mission

To pioneer the future in space exploration, scientific discovery, and aeronautics research

Strategic Goals for SMD

- Study Earth from space to advance scientific understanding and meet societal needs.
- Understand the Sun and its effects on Earth and the solar system.
- Advance scientific knowledge of the origin and history of the solar system, the potential for life elsewhere, and the hazards and resources present as humans explore space.
- Discover the origin, structure, evolution, and destiny of the universe, and search for Earth-like planets.

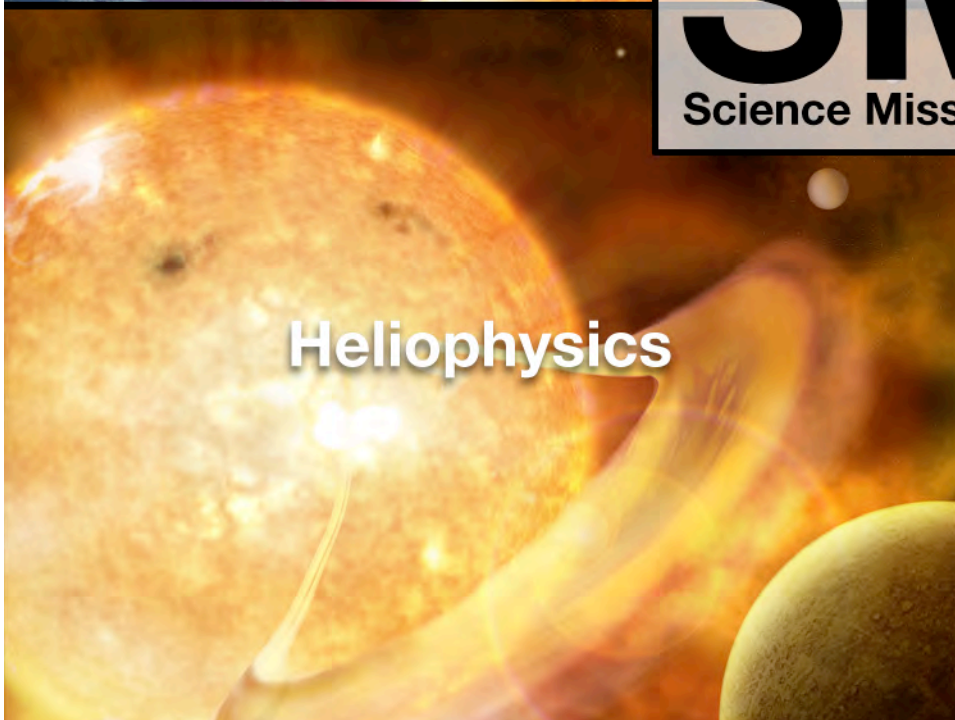


Earth Science



Planetary Science

SMD
Science Mission Directorate



Heliophysics



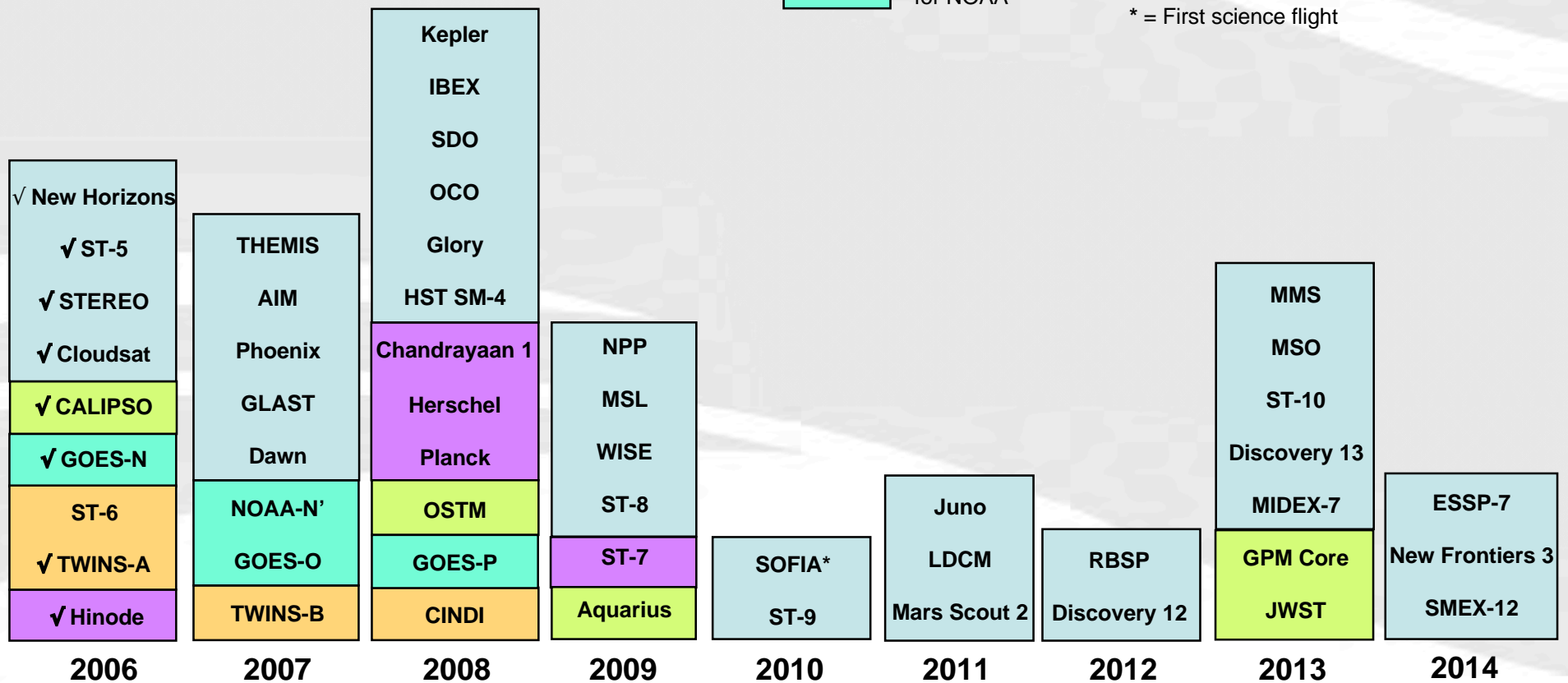
Astrophysics

NASA Science Mission Launches (CY06-CY14)



As of 11/22/06

- NASA Mission on US ELV
- Joint NASA - International Partner Mission
- DoD Mission with Substantial NASA Contribution
- Foreign Mission with Substantial NASA Contribution
- Reimbursable for NOAA
- √ = Successfully launched to date
- * = First science flight



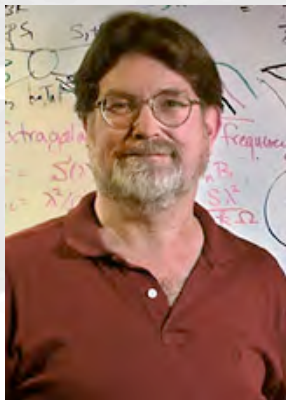
Nobel Prize in Physics Cosmic Background Explorer (COBE)



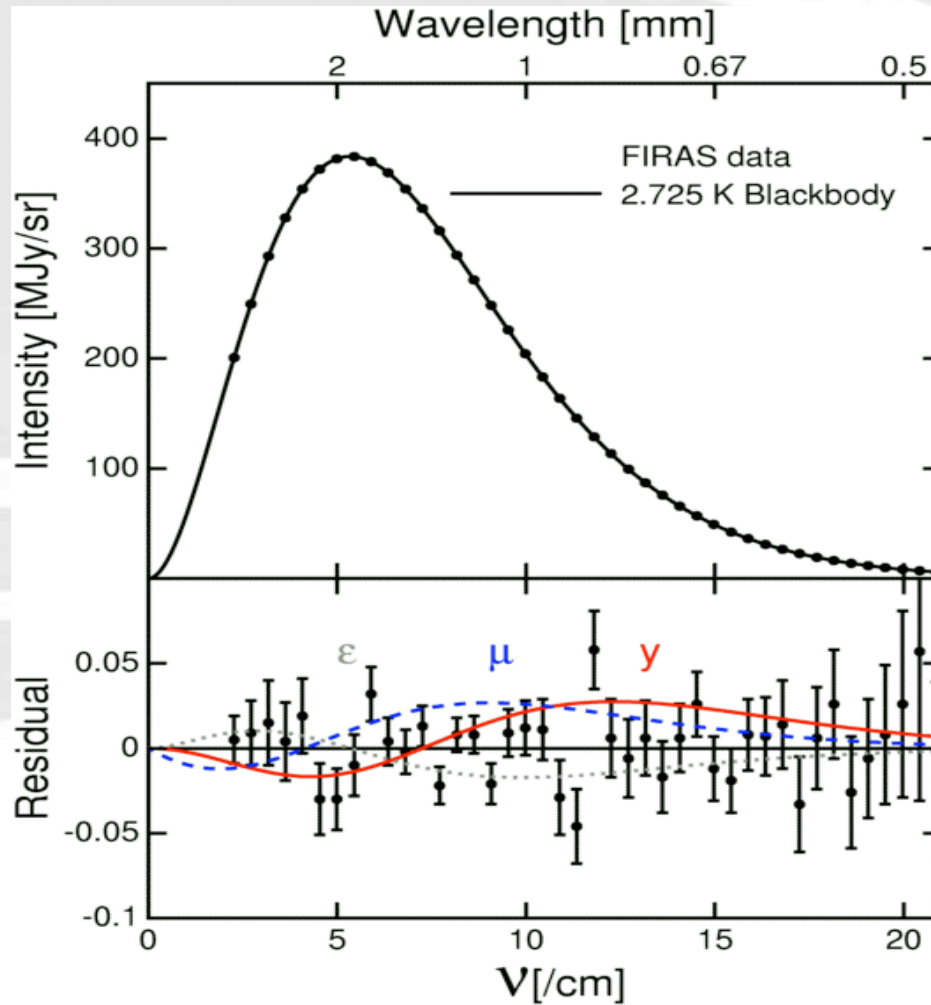
“for their discovery of the blackbody form and anisotropy of the cosmic microwave background radiation”



John C. Mather
NASA Goddard



George F. Smoot
Univ. Calif. Berkeley



Science Directorate Highlights in 2006



This page linked to associated video of highlights
Click Here for video or cut and past this link into your
browser:

http://anon.nasa-global.edgesuite.net/qt.nasa-global/exploration/2nd_exp_conf_01_ScienceMissionDirectorateDeputyAA_DrCHartman.mov

Mars Reconnaissance Orbiter Image of Victoria Crater

Opportunity

"Cape Verde"

"Duck Bay"

"Cabo Frio"



Role of SMD & Planetary Science Division in Lunar Exploration



- SMD is responsible for effectively coordinating the science goals and strategy of the Lunar Precursor and Robotic Program (LPRP) Program
- Lunar Reconnaissance Orbiter (LRO) data sets will be archived in the Planetary Data System and available to the community starting 6 months after the end of prime mission.
- Where opportunities arise, SMD incorporates exploration enabling science on flight missions (e.g., radiation and aeroshell instruments on Mars Science Laboratory)
- As funds can be identified, SMD & ESMD plan to initiate a joint Lunar Data Analysis Program
- The Discovery and New Frontiers Programs both currently provide opportunities for the science community to propose missions to accomplish lunar science investigations (e.g., Moon Mineralogy Mapper on India's Chandrayaan-1)
- Lunar Sortie Science Opportunities -- ROSES-2006 solicits concept study proposals for potential science investigations that could be deployed by lunar astronauts during sorties to the moon late in the next decade. Proposals were due on October 27, 2006.

National Research Council Study on Scientific Context for Exploration of the Moon



Interim Report -- Prioritized Lunar Science Goals for Early Phases of the Vision for Space Exploration:

1. Fundamental Solar System Science

- Characterize and date the impact flux (early and recent) of the inner solar system.
- Determine the internal structure and composition of a differentiated planetary body.
- Determine the compositional diversity (lateral and vertical) of the ancient crust formed by a differentiated planetary body.
- Characterize the volatile compounds of polar regions on an airless body and determine their importance for the history of volatiles in the solar system.

2. Planetary Processes

- Determine the time scales and compositional and physical diversity of volcanic processes.
- Characterize the cratering process on a scale relevant to planets.
- Constrain processes involved in regolith evolution and decipher ancient environments from regolith samples.
- Understand processes involved with the atmosphere (exosphere) of airless bodies in the inner solar system.

3. Other Opportunities (additional information is required for these)

- Utilize data from the Moon to characterize Earth's early history.
- Determine the utility of the Moon for astrophysics observations.
- Determine the utility of the Moon as a platform for observations of Earth.
- Determine the utility of the Moon as a platform for observations of solar-terrestrial processes.

NASA Advisory Council Lunar Science Workshop



- The Science Committee of the NAC announced a workshop, associated with the Lunar Exploration Architecture to take place Feb 27, 28 and March 1, 2007 in Tempe AZ
- Will solicit from the community information relevant to planning the Science Architecture and activities associated with Lunar Exploration within the framework of the Vision for Space Exploration.
- The sessions will focus on:
 - 1) Defining the key objectives of science associated with, or enabled by lunar exploration;
 - 2) Discussing implementation to achieve the objectives;
 - 3) Prioritizing objectives within the framework of the emerging lunar architecture.
- Will solicit white papers and posters
- Open to the public up to the limits of the available space
- More information at <http://www.infonetic.com/tis/lea/>