National Aeronautics and Space Administration

Science in the Vision for Space Exploration

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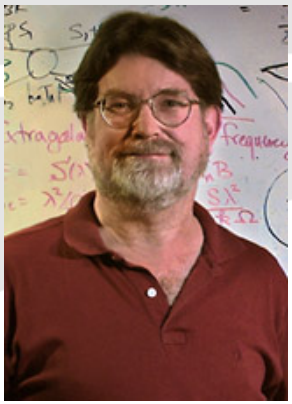
Deputy Associate Administrator for Science

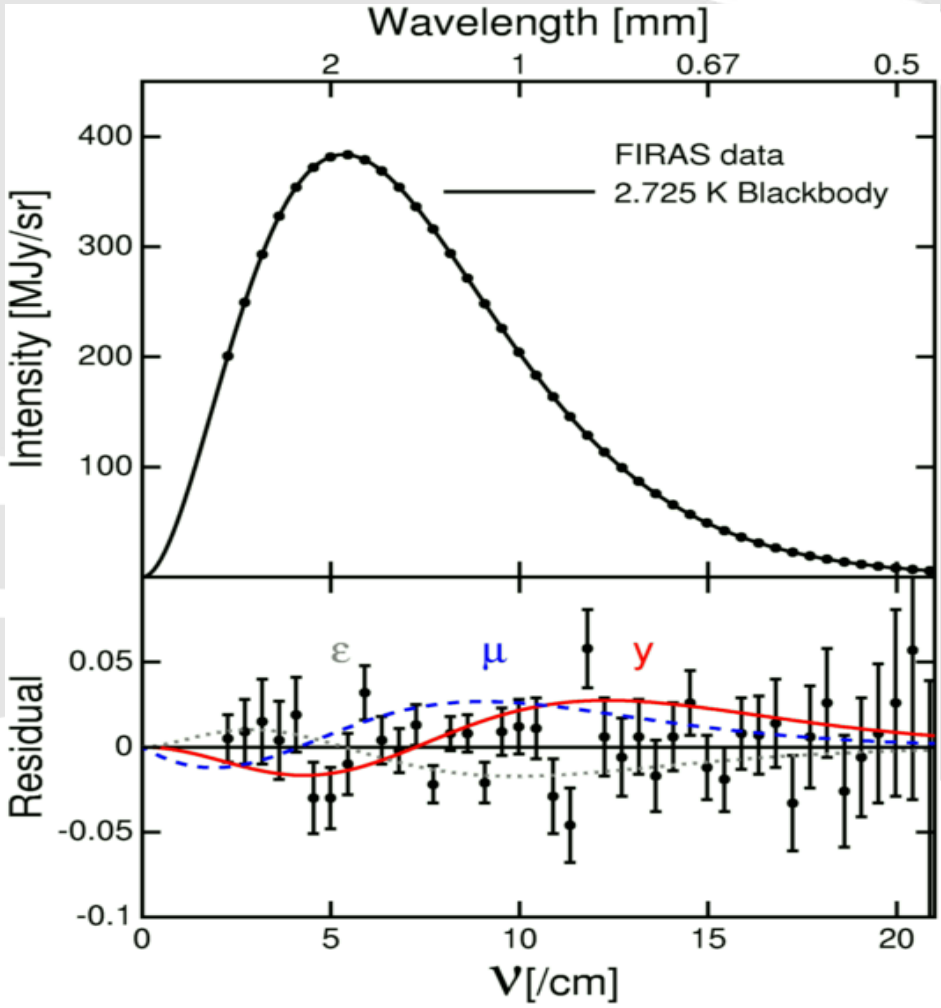
Nobel Prize in Physics
Cosmic Background Explorer (COBE)

"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 Mission Highlights in 2006

NASA Science Mission Launches (CY06-CY14)

As of 2/20/07

NASA Mission on US ELV

Joint NASA - International Partner Mission

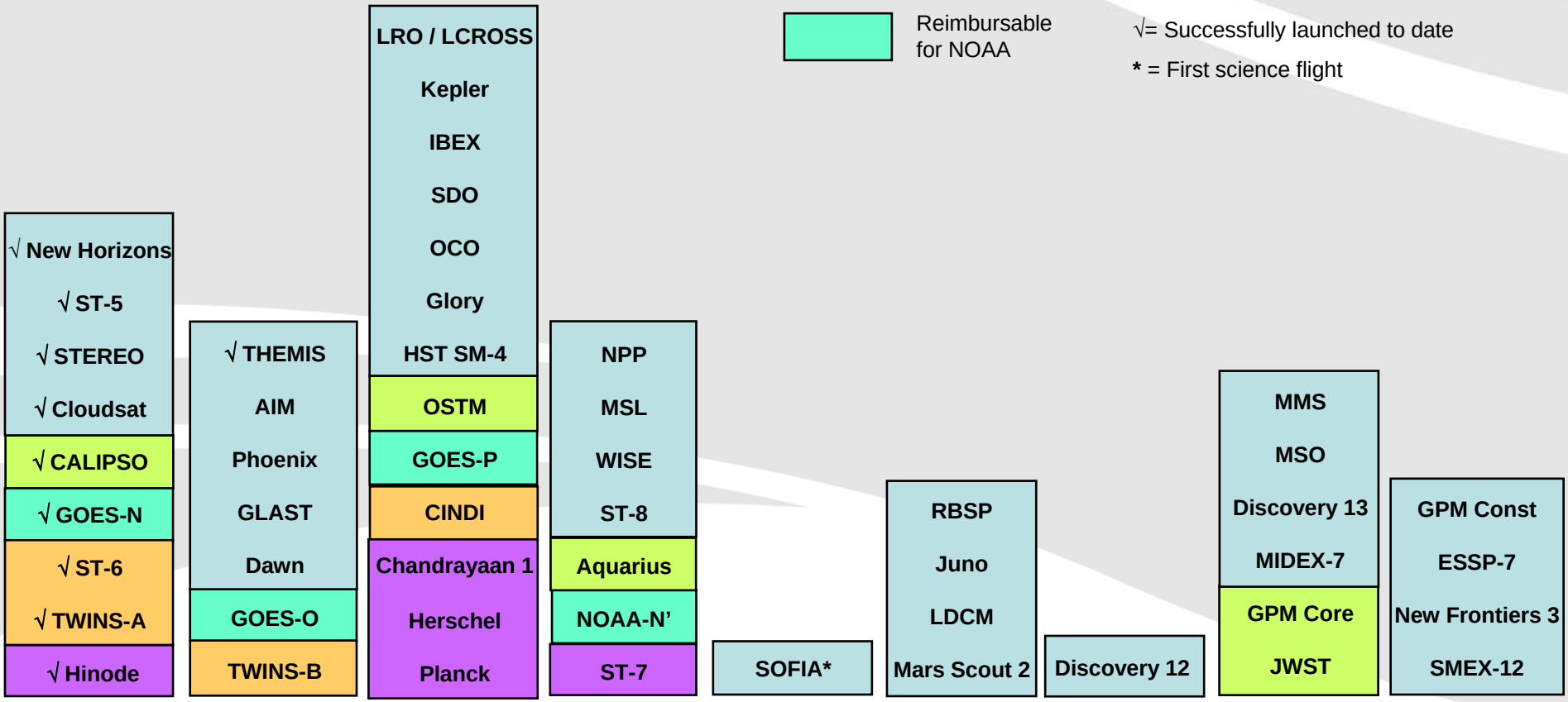
DoD Mission with Substantial NASA Contribution

International Mission with Substantial NASA Contribution

Reimbursable for NOAA

√= Successfully launched to date

***** = First science flight



Science and Human Exploration: Approach

"Science in the space exploration vision is both *enabling* and *enabled*."

-- President's Commission on Implementation of US Space Exploration Policy

Enabling:

Planetary Science - Identifying hazards and resources

Heliophysics - Space weather

Enabled: We are now asking the questions:

"What will we do at these places that we could not previously have planned to do?"

"Will the science activities enabled by the human exploration program and identified as compelling by the science community have greater or lesser priority than activities previously planned by SMD?"

Science and Human Exploration: Actions

- LRO data sets will be archived in the PDS starting 6 months after end of prime mission.
- NASA commissioned NRC Study: Scientific Context for Exploration of the Moon
- The Discovery and New Frontiers Programs currently provide opportunities for the science community to propose lunar science investigations
- Lunar Sortie Science Opportunities -- Proposals received Oct 2006 being peer reviewed; selections expected in the Spring.
- Lunar Science Research Project begins in FY08 funds:
  - Lunar science through R&A programs
    - LASER Program
    - LRO Participating Scientist program
  - Extended mission operation of LRO and continued scientific analysis and archiving of the data.
  - Upgrades to PDS to handle LRO data volumes
  - Potential MoO's and technology development

Lunar Advanced Science and Exploration Research (LASER)

- LASER R&A appears in ROSES 2007 and supports:
  a) Basic Lunar Science
  b) Exploration Lunar Science (Applied)
  c) Data Analysis
  d) Lunar Data Restoration
  - ✓ *No selection quotas for (a)-(d)*
  - ✓ *Proposals that span the Basic(a)-Exploration(b) science continuum encouraged*
- Funding ~ $2-3M/year (Co-Funded: SMD-ESMD)
- Seeking 1, 2, or 3 year proposals
- LRO Participating Scientist will be a separate call

SMD & ESMD Working Together

- Where opportunities arise, SMD incorporates human exploration enabling science on flight missions
- SMD and science community representatives are actively engaged with ESMD as members of working groups and planning teams:
  - Lunar Architecture Team
  - Outpost Science Exploration Working Group
  - Lunar Architecture & Applied Science Working Group
  - Engagement of Heliophysics and ESMD on: space weather, radiation observations, modeling, operations concepts for deep space human exploration, etc
- Joint Mars Steering Group established to develop advanced planning and architectures for human exploration of Mars
  - Reference Mars architecture will inform Lunar architecture development

How NASA Will Use This Workshop

- Potential science objectives and investigation concepts will inform upcoming NASA solicitations for "investigation concepts" and technology development
- Areas of science will inform priorities for LASER-funded research and analysis selections.
- Areas of science will drive design science investigations (Outpost SEWG) used to inform architecture choices.
- Potential large missions will be considered for prioritization by Decadal Surveys.
- Start of a continuing process

Thank you and questions welcomed!