

Planetary Science Strategy for Technology Investment

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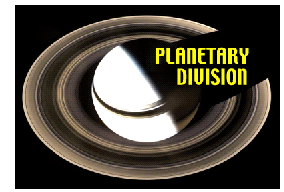
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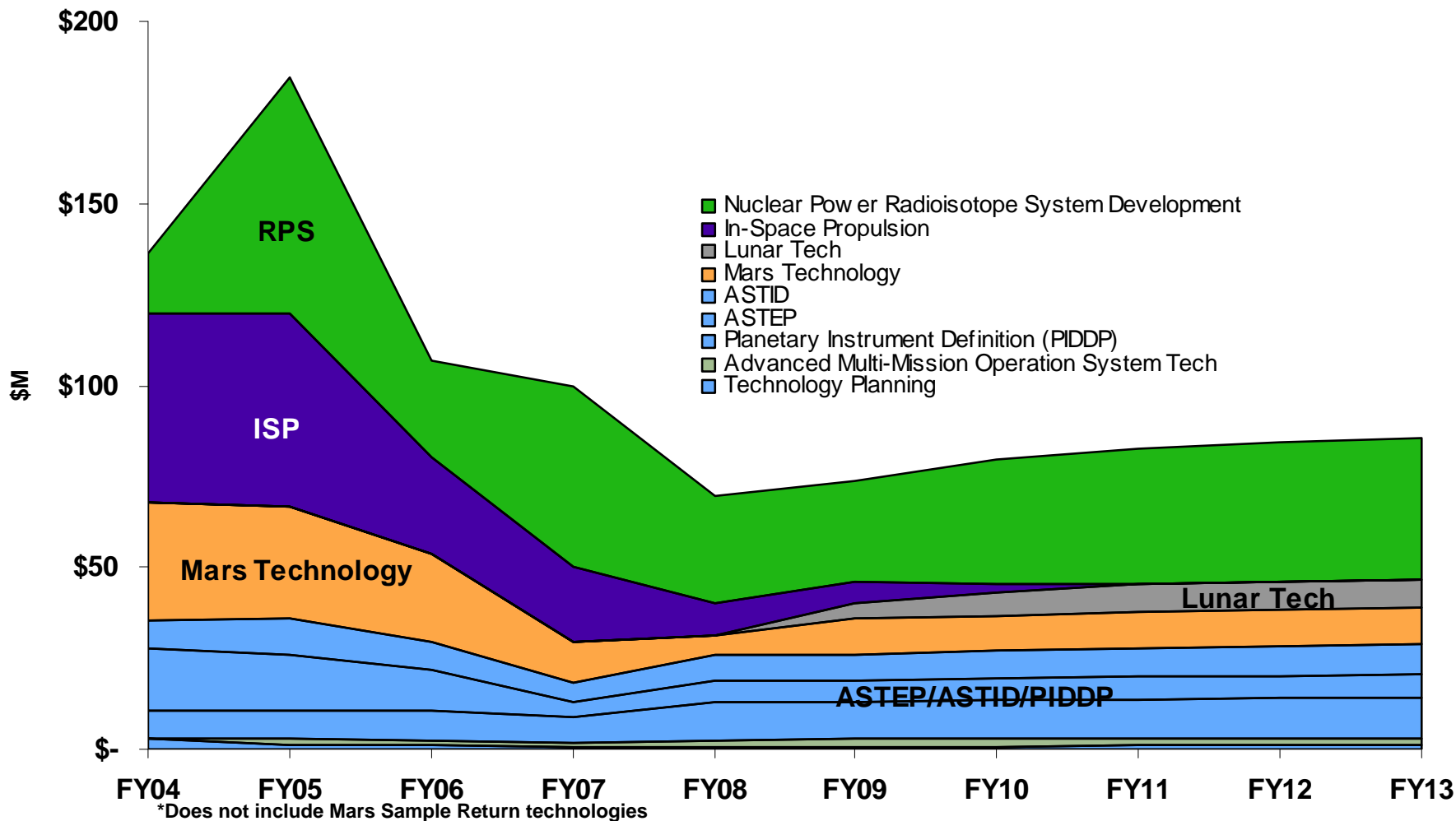
Planetary Science Agenda



- Maintain a Healthy Mars Exploration Program
- Continue remarkable Discovery and New Frontiers Programs
- Prepare for our next Flagship mission
 - Outer Planets Flagship
 - Mars Sample Return
- Emphasize sample return from all targets
- Expand Lunar science and use Lunar Missions as a “tech demo space.”



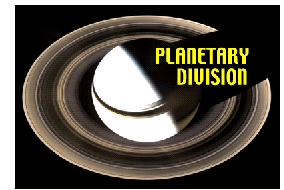
Planetary Technology Budget



Limited Resources Demands Adoption of a Technology Pull Strategy



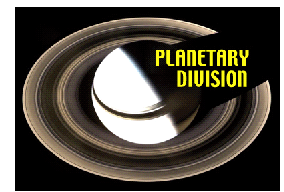
Adjusting Investment Strategies



- Finish what's been started
 - If the need remains demonstrated
- Create Flight Opportunities
 - To push the investment to TRL 7
 - Lack of NMP creates challenge and opportunities
- Most Planetary Science opportunities will be on competed missions for the foreseeable future
 - Examining ways to relieve the “competition risk”
 - Possible Step 1 BYE for PSD Defined Tech. Identified in the AO



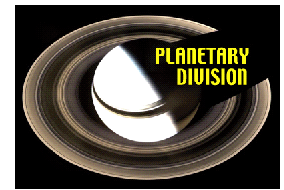
Planetary Science Tech Emphasis



- Radio Isotope Power Systems
 - Advanced Stirling Cycle Generator
 - Small Surface RPS Units (~70Watts)
- Propulsion Systems
 - Lightweight High Thrust
 - Advanced Chemical
 - Ion Propulsion
- Aerocapture
- Pinpoint Landing Systems
- Seismometers & Heat Flow Instruments
- Optical Communications
- Fault Protection and Management



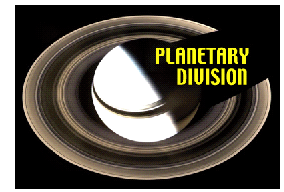
Pulling Technology



- Encourage Infusion into Competed Missions
- Discovery AO 2009 -- Possible GFE ASRG for Mission Enabling Approaches
 - DSMCE studies will identify possible category 1 class science that is enabled by ASRG on a Discovery budget
 - 9 studies awarded from 40 proposals for a range of missions to the inner solar system (Venus), the Lunar surface, small bodies, and outer planet moons
 - Studies will report results in December 2008, and provide guidance to the ASRG development specifications to ensure multi-mission capability
- New Frontiers-3 AO 2008 -- Cost Sharing for Advanced Chemical and Ion Propulsion
- LADEE -- Possible Flight Opportunity for Optical Communications Demonstration
- Lunar Geophysical Network Landers
 - Examining Potential of Small Surface RPS
 - Pinpoint Landing System Demonstrations



Future is Good



- Short on resources but non-trivial budget
- Actively pursuing technology pull
 - Technology research efforts must demonstrate mission need
- Need to finish what we've started
- As current efforts reach TRL 6/7, more longer term investments can be made