



Planetary Science Division Update

*Presentation at the
38th Lunar and Planetary Science Conference*

James L. Green
Director, Planetary Science Division

March 12, 2007

1



Administrative Changes

- Key Civil Servant positions have been filled:
 - James L. Green, Director
 - James Adams, Deputy Director
- Civil servant positions to be filled (were on hold but are now active again!)
 - Discovery Program Executive
 - A Discovery Program Scientist
- Other staff changes and positions filled:
 - Alan Harmon, Detailed from DOE new Program Executive for Radio-isotope Power Systems
 - Kelly Snook, Lunar Science Liaison with ESMD
 - Tom Morgan detailed to GSFC as Senior Scientist for Lunar Exploration

2



Division Activities

- Current Academy reviews:
 - PSD- based on the NASA Authorization 2005
 - Planetary Performance Assessment Committee formed (meetings: Feb. 22, 2007....)
 - How well is PSD addressing the strategies, goals, and priorities outlined in Academy reports
 - COMPLEX - providing guidelines for the selection of candidate missions for the next NF
 - Evaluate NAI's success leading to reshaping the future of astrobiology activity

3



FY07 Budget Implications

What Stayed the Same:

- Discovery 2006 and Mars Scout AO's on track
 - Selected 3 Discovery full-class and 3 Mission of Opportunity (MoO) missions concept studies
 - Selected 2 Mars Scout full-class and 1MoO and 2 MoOs for technology development
- One Mars mission per opportunity
 - Phoenix scheduled for launch in August 2007 and MSL in 2009
- New Frontiers AO #3 no later than 2008
- Moon Mineralogy Mapper (M3), selected as a Discovery MoO, on schedule to launch on the ISRO Chandrayaan-1 spacecraft
- Continues operations of Mars Rovers (Spirit, Opportunity), Odyssey, Mars Express, Mars Reconnaissance Orbiter (MRO), MESSENGER, ASPERA-3, New Horizons, Cassini, and Rosetta

4



FY07 Budget Implications (cont.)

What's Changed:

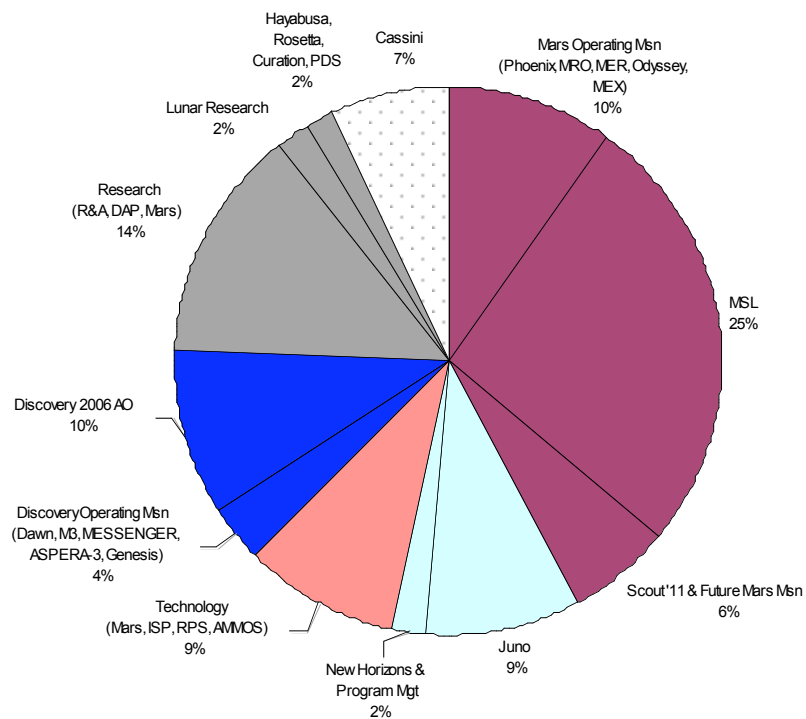
- Funds Dawn for a launch in June 2007
- Funds Juno for a launch in August 2011
- Confirms and provides additional funding for Mars Science Laboratory (MSL) to reduce schedule risk for 2009 launch
- Adds a new Lunar Science Research project to enhance opportunity for lunar scientific discovery
- Funds Outer Planets mission concept studies
- Planetary Research and Analysis (R&A) changes:
 - Provides partial restoration (~\$5.8M) of the 15% cut
- Funds Mars rovers through FY07
- Transfers Deep Space Network to the Space Operations Missions Directorate (SOMD) but kept the navigation tools & systems
- Transfers Near Earth Objects (NEO) to Exploration Systems Mission Directorate (ESMD)

5



Planetary Science Division

FY08 Budget, Total \$1320M (included "Simplified" Full Cost)



6



Current Mission Status

- Mars: MRO, MER-1, MER-2, Mars Odyssey
 - *Upcoming Launches*: MSL and Phoenix
- Discovery: MESSENGER, Deep Impact, Stardust
 - *Upcoming Launch*: Dawn
- Lunar Science Research Project
 - *Upcoming Launch & Extended Mission*: LRO
- New Frontiers: New Horizons
 - *Upcoming Launch*: Juno
- Flagships: Cassini/Huygens at Saturn
 - *Upcoming Launch*: Mars Science Laboratory (MSL)
- International: Mars Express, Venus Express, Rosetta, Hayabusa, and ExoMars
 - *Upcoming Launch*: Moon Mineralogy Mapper - Chandrayan



Planetary Mission Future Events

2007	2008	2009	2010	2011	2012	2013	2014	2015
Feb 28, NH @ Jupiter	Jan. 14 MESSENGER @ Mercury		LRO Science Mission	March 3 MESSENGER @ Mercury				
June 5, MESSENGER @ Venus	Chandrayan	MSL		Juno	Discovery			Discovery
Dawn	Oct. 6 MESSENGER @ Mercury	Sept. 29 MESSENGER @ Mercury		Discovery			New Frontiers 3	July NH @ Pluto/Charon
Phoenix	LRO-LCROSS			Mars Scout 2				Summer Dawn @ Ceres
	Phoenix Lands			Fall Dawn @ Vesta		MSO		

- Planetary Division launches (green)
- Planetary mission events (red)
- Exploration Systems Mission Directorate (blue)



Discovery Selections

- Selected 3 full missions and 3 Missions of Opportunity on October 31st
- Missions received \$1.2M to conduct concept studies (Phase-A) over a 7 month period
- NASA may choose one or more missions to continue
 - If selected to continue: cost cap is \$425M.
- MOO will receive \$250K to refine concept
 - If selected to continue: cost cap at \$35M.

9



Selected Phase-A Full Missions

- **GRAIL: Gravity Recovery and Interior Laboratory - Maria Zuber (PI), MIT** — Produce a uniform, global, high-quality gravity field mapping of the Moon that will allow for unprecedented modeling of its internal structure and thermal history.
- **OSIRIS: Origins Spectral Interpretation, Resource Identification, and Security - Michael Drake (PI), University of Arizona** — Survey asteroid 1999 RQ36 and provide return of uncontaminated surface sample to Earth.
- **Vesper: Venus Chemistry and Dynamics Orbiter - Gordon Chin (PI), NASA GFSC** — Advance our understanding of the atmospheric composition and dynamics of Venus, especially its photochemistry.

10



Mission of Opportunity

- **DIXI: Deep Impact eXtended Investigation of Comets - Michael A'Hearn (PI), University of Maryland** — Uses the existing *Deep Impact* spacecraft for an extended flyby mission to a second comet, Boethin, that will return data advancing our understanding of the nature of comet nuclei.
- **EPOCH: Extrasolar Planet Observations and Characterization - L. Drake Deming (PI), NASA GSFC** — Observations using *Deep Impact's* High Resolution Imager will either lead to the discovery of additional low mass (down to one Earth-mass) planets or will set limits on the existence of such planets that will be useful for constraining theories of planet formation.
- **Stardust NExT: A Mission of Opportunity to complete the exploration of Tempel 1 - Joseph Veverka (PI), Cornell University** — Uses the *Stardust* spacecraft to perform an extended flyby mission to comet Tempel 1 which will provide the first look at the changes to a comet nucleus after a perihelion passage.

11



Ices, Oceans, and Fire: Satellites of the Outer Solar System

- Purpose is to bring together researchers to share their work in the broader context of common processes and unique properties shaping the satellites of the outer solar system
- The goal of the conference is to promote cross fertilization of research among small communities focused on specific satellites
- Papers in special issue of JGR-Planets
- August 13-15 in Boulder, CO

<http://www.lpi.usra.edu/meetings/icysat2007/home.shtml>

12



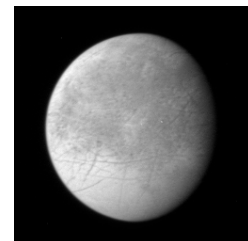
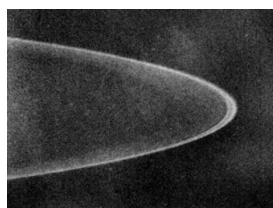
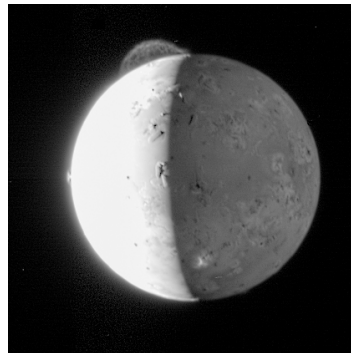
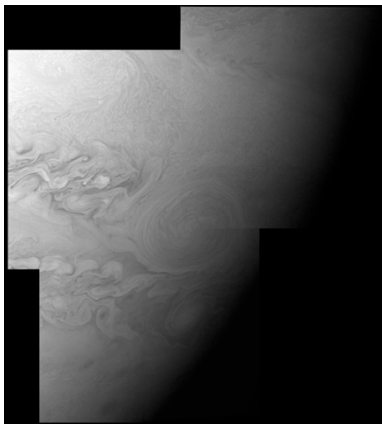
Discovery at 15: Looking Backward Looking Forward

- Open to the scientific community
- All former Discovery Principal Investigators, Project Managers, and Education/Public Outreach Leads
- Session include:
 - Invited talks
 - Contributed posters on mission concepts and new technologies
- September 19-20, 2007 in Huntsville, AL

13



Congratulations to the New Horizons Team!



Jupiter Encounter Observations

14



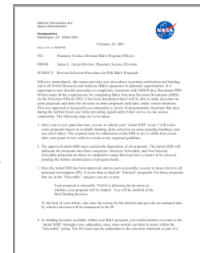
PSD R&A Program

ROSES 2007 Released on February 16, 2007

15



New PSD R&A Policy



- Issued February 20, 2007 - effective immediately
 - Applies to all PSD R&A elements in ROSES
- Rapid notification and funding procedure
 - Within four weeks of the review panel I expect to sign an “initial Selection Decision Document” or SDD - within 2 weeks goal!
 - Proposals are in “Selected, Selectable, Not Selected” categories
 - Selectable proposals are those in competitive range that may have a chance to be selected pending identification of funds
 - Letters issued to all with Selected proposals funded
 - As funding becomes available/identified a new addendum is added to the SDD and signed then those proposals in the Selectable range are funded
 - With final budget authority, letters sent to the selectable but deferred category are notified of their non-selection

16



PSD R&A Program for ROSES 2006

	ROSES 2006 Program Element	Due	Selection Date
C.09	Cassini Data Analysis	4/25/06	12/15/06
C.08	Outer Planets Research	4/28/06	1/31/07
C.10	Discovery Data Analysis	4/28/06	11/22/06
C.04	Planetary Geology and Geophysics	5/5/06	3/6/07
C.02	Cosmochemistry	5/19/06	1/9/07
C.12	Mars Fundamental Research	5/24/06	Next Week
C.05	Planetary Astronomy	6/2/06	3/9/07
E.03	Origins of Solar Systems	6/2/06	1/17/07
C.06	Near Earth Object Observations	6/9/06	Next Week
C.07	Planetary Atmospheres	6/16/06	10/24/04
C.03	Sample Return Laboratory Instruments and Data Analysis	6/30/06	2/20/07
C.15	Mars Reconnaissance Orbiter Participating Scientists	6/30/06	12/1/06
C.16	MESSENGER Mission Participating Scientists	7/7/06	3/6/07
C.19	Planetary Protection Research	8/4/06	2/20/07
C.11	Mars Data Analysis	8/11/06	April
C.17	Planetary Instrument Definition and Development	8/18/06	Next Week
C.25	Stardust Sample Analysis	1/19/07	April
C.18	Astrobiology: Exobiology and Evolutionary Biology	3/15/07	July

17



Recent Signed off Selections

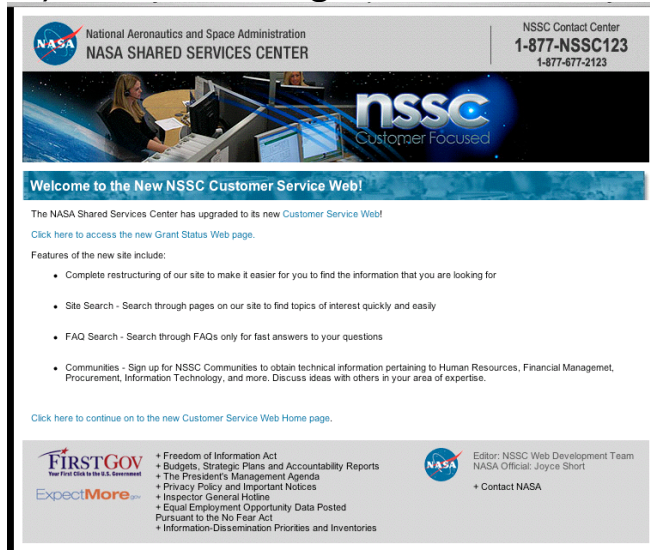
- Planetary Geology & Geophysics - **Normal Selection**
 - Proposals due May 5, 2006
 - Peer Review Panel in July 30 - August 4, 2006
 - Decision Document signed March 6, 2007
 - 49 selected; 52 declined (49% selection rate)
 - Average grant size: \$67K/year
- MESSENGER Participating Scientist Program - **New Rules**
 - Proposals due July 7, 2006
 - Peer Review Panel in November 7-9, 2006
 - Decision Document signed March 6, 2007
 - 20 selected; 6 selectable; 26 declined (38-50% selection rate)
 - Average grant size: \$78K/year

18



Grant Processing Status

- Check the NASA Shared Services Center (NSSC) website for grant status



<http://www.nssc.nasa.gov/grantstatus>

19



<http://www.nssc.nasa.gov/grantstatus>

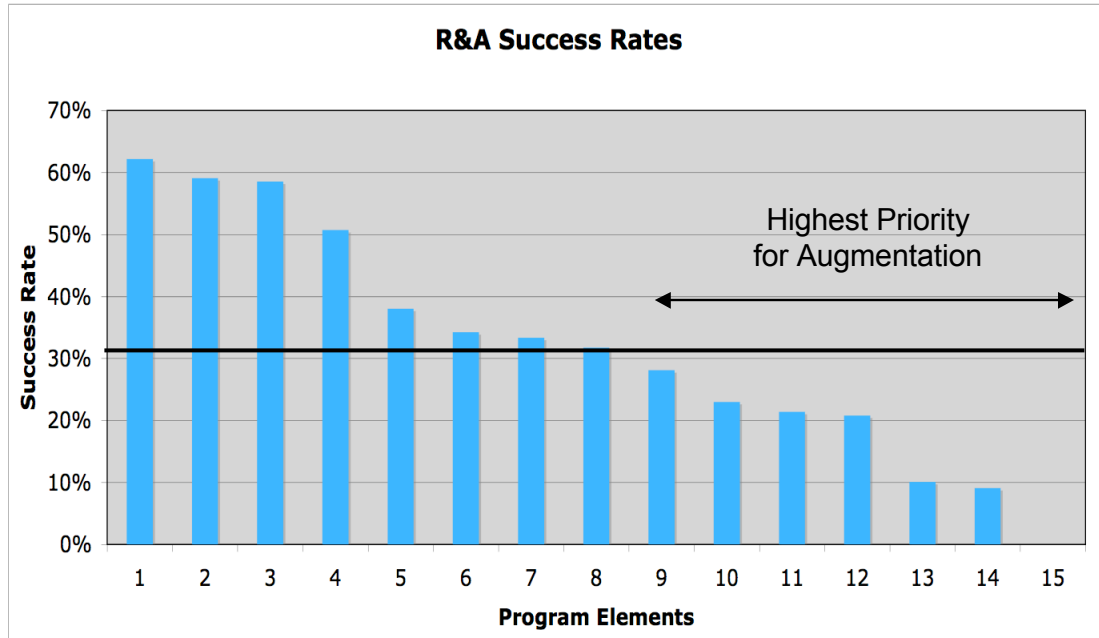


PI Name
 Technical Officer
 Grant Number
 Program/Center
 Proposal Title
 Institution

20



Overview of R&A Awards



- Success rate = Awarded / Total number of proposals
- FY07 Provides partial restoration of the 15% cut (~\$5.8M)

21



Top Priority R&A Programs for Additional Funding

- Astrobiology: Exobiology & Evol. Biology
- Astrobiology Science & Technical Inst. Dev.
- Mars Data Analysis
- Mars Fundamental Research
- Outer Planets Research
- Planetary Instrument Definition & Development
- Planetary Protection Research

- Augmentation rules:
 - Astrobiology will have special consideration
 - Intent will be to fund all “Excellent Proposals”

22



Early Career Fellows in Planetary Science

Name	Institution	Title	Sponsoring Program
David O'Brien	Planetary Science Institute	Exploring the Collisional and Dynamical Implications of Current Outer Planet Migration Models	PG&G
Chris Okubo	University of Arizona	Numerical Analysis and Mapping of Volatile Migration Pathways In Equatorial Layered Sedimentary Deposits On Mars	MDAP
Lori Fenton	Arizona State University	Recent Climate Shifts, Circulation Patterns, and Climate-driven Erosion Recorded in the Morphology of Southern Hemisphere Sand Dunes	MDAP
Rebecca Williams	Smithsonian Institution	Assessing the Preservation of Fluvial Pathways in the Terrestrial Geologic Record: Analogs for the Investigation of Martian Raised Channels	MFRP
Michelle Miniti	Arizona State University	Making Mars: Experimental investigation of linkages between Martian mantle and Martian crustal lithologies	MFRP
Justin Haggerty	Los Alamos National Laboratory	Investigating Thorium Enhancements and Pyroclastic Deposits on the Moon: Implications for the Abundance and Distribution of Thorium in the Lunar Crust and Mantle	DDAP
Olivier Barnouin-Jha	Johns Hopkins University Applied Physics Lab	Crater shape and surface roughness on 433 Eros from improvements in topography	DDAP
David Brain	University of California Berkeley	Atmospheric Energy Deposition at Mars, Venus, and Extrasolar Planets from Solar Energetic Particle Events	PATM
Lynn Carter	Smithsonian Institution	Searching for Regolith on Asteroids Using Radar Polarimetry	PAST
Ken (KC) Hansen	University of Michigan	Balancing Solar Wind Control, Internal Plasma Sources and Rotational Effects: Structure and Dynamics of the Jovian magnetosphere	OPRP
Jonathan Fortney	NASA Ames Research Center	A Consistent Evolutionary History for Jupiter and Saturn	OPRP
Andrew Dombard	Johns Hopkins University Applied Physics Lab	Investigating the Effect of Remnant Impact Heat on Icy Crater Topography	OPRP

Selections from ROSES 2006 call

23



R&A Meet and Greet

- For proposers who are just starting out
- Where: Harbor Club
- When: Tuesday, Noon - 1pm
- Why: R&A Program Scientists will be available to answer you questions and address your concerns.

24



PSD R&A Program for ROSES 2007

- Astrobiology: Exobiology And Evolutionary Biology (pending)
 - Astrobiology Science & Technology Instrument Development & Mission Concept (pending)
 - Astrobiology Science And Technology For Exploring Planets
 - Cassini Data Analysis
 - Cosmochemistry
 - Discovery Data Analysis
 - Early Career Fellowships
 - In-Space Propulsion (pending)
 - • **Lunar Advanced Science and Exploration Research ***
[Near Earth Object Observations --- Funded by ESMD -- to be release in ROSES 2007]
 - • **New Horizons at Jupiter Data Analysis ***
Origins of the Solar System
Outer Planets Research
 - • **Participating Scientist Program *** [Not posted yet]
Planetary Astronomy
Planetary Atmospheres
Planetary Geology And Geophysics
Planetary Instrument Definition And Development
Planetary Major Equipment
Planetary Protection Research
Mars Data Analysis
Mars Fundamental Research
Mars Instrument Development
Mars Technology Project (pending)
Sample Return Laboratory Instruments & Data Analysis
- * New PSD R&A elements 25

