NASA's Planetary Science Program Overview

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Presentation to the OPAG

January 13, 2014

Outline

- Planetary Budget
- Status of the next Discovery
- Research & Analysis Status and Plans

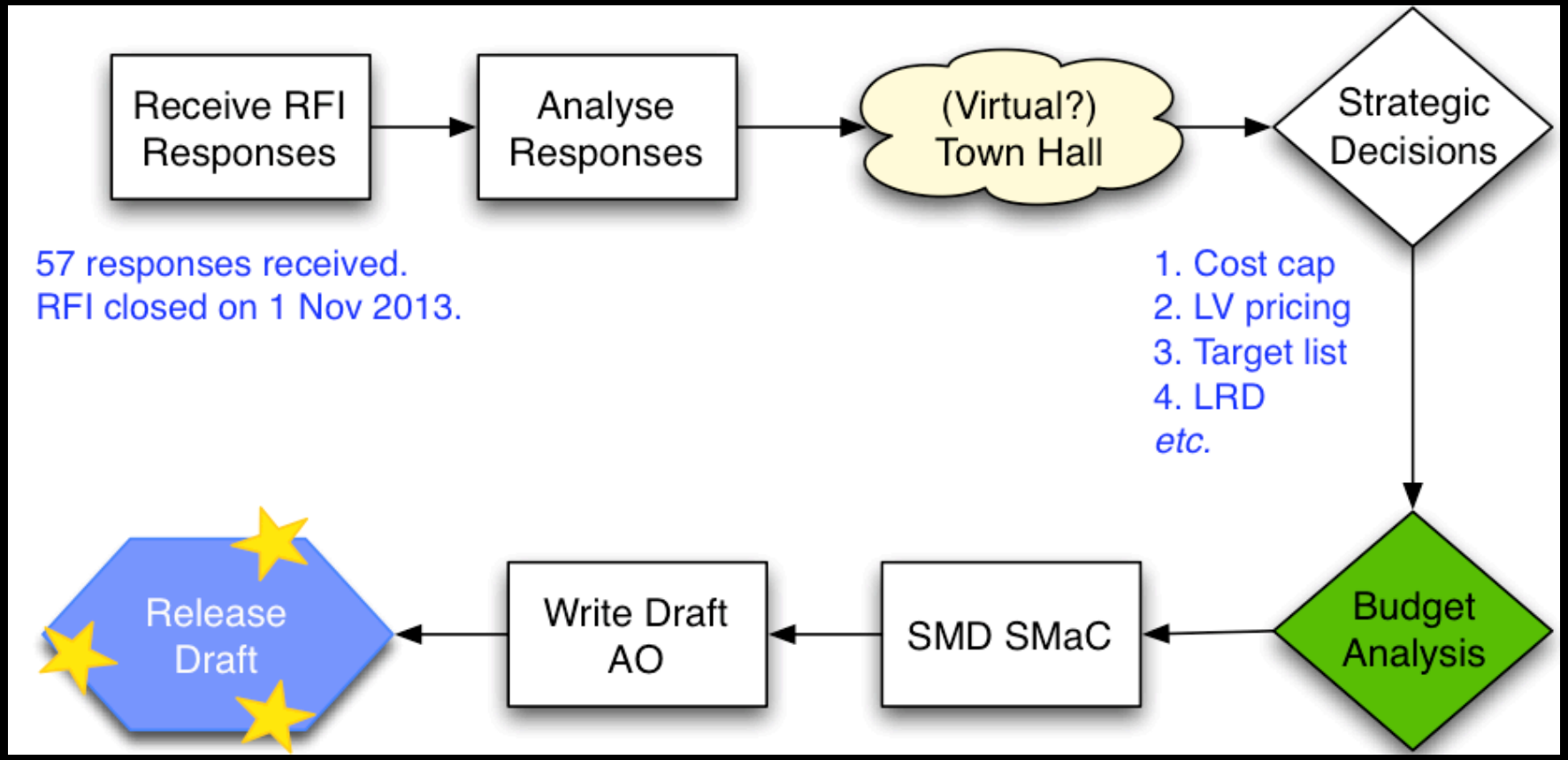
President's FY14 Planetary Science Budget Plus an Approved FY13 Budget

* Notional

Planetary Science Division	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
				*			
Planetary Research	$174,087	$192,672	↑ $220,600	$233,300	$229,100	$230,400	$232,200
Lunar Quest	$139,972	$71,845	$17,700 ↓	$0	$0	$0	
Discovery	$172,637	$207,414	↑ $257,900	$268,200	$242,300	$187,500	$215,000
New Frontiers	$143,749	$158,770	↑ $257,500	$297,200	$266,500	$151,000	$126,200
Mars Exploration	$587,041	$369,529	$234,000 ↓	$227,700	$318,400	$504,700	$513,200
Technology	$161,899	$123,434	↑ $150,900	$142,800	$144,700	$154,400	$140,000
Outer Planets	$122,054	$147,836	$79,000 ↓	$45,600	$24,400	$26,400	$26,000
	$1,501,439	**$1,271,500**	**$1,217,600**	**$1,214,800**	**$1,225,400**	**$1,254,400**	**$1,252,600**

- President's FY14 budget contains:
  - NEO observations enhancement of $20M/yr ($40M/yr total)
  - $50M/yr support of DoE PU-238 infrastructure support

Process for Next Discovery AO



Michael H. New, Lead Discovery Program Scientist

Research & Analysis Status and Plans

Timeline: Planetary R&A Restructuring

Past

1995-2010: NRC Report: An Integrated Strategy for the Planetary Sciences

2010: NRC Report: Enabling Foundation for NASA's Earth &Space Science Missions

2010: Community R&A survey 2010

2011: Planetary Decadal Survey

2011: Supporting Research and Technology Working Group of the PSS

2011: R&A Discipline Scientists Retreat

2012: Reorganization of Instrument Development Programs

2012: Planetary Workforce Survey

2013: December 3, 2013: Virtual Town Hall on R&A Restructuring

2014 Early January: Draft ROSES 2014 release for comment

Future

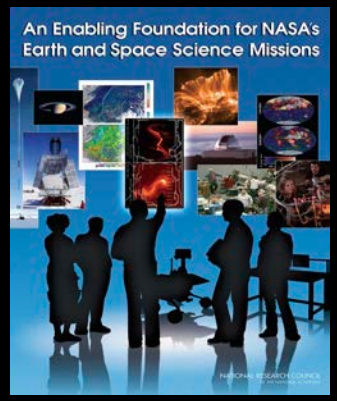
2014 Mid-February: ROSES 2014 release

2014 Early to Mid-March: Pre-proposal Briefing

Findings from the NRC report: An Enabling Foundation for NASA's Earth and Space Science Missions (2010)

- NASA should ensure that SMD mission-enabling activities are linked to the strategic goals of the agency and of SMD.
- NASA's SMD should develop and implement an approach to actively managing its portfolio of mission-enabling activities.
- NASA should increase the number of scientifically and technically capable program officers so that they can devote an appropriate level of attention to the tasks of actively managing the portfolio of research… [we have addressed this concern, but not through reorganization of the portfolio]
- NASA response was in agreement with these recommendations

"By *explicitly* tying the ROSES solicitations…to the SMD Science Plan research objectives, SMD ensures that sponsored research contributes directly and substantially to Agency goals."



In Response to the NRC Report

- PSD requested an assessment of the Planetary R&A program by the Planetary Sciences Subcommittee (PSS) as a Response to the NRC report
  - Ron Greeley (chair) formed SR&T Working Group to perform the review
- Charge:
  - Map PSD mission-enabling activities to the PSD strategic science plan
  - Provide recommendations regarding "active portfolio management”
- The SR&T Working Group used the NRC report as a guide for the study, reviewed the various mission-enabling activities of the Division, held discussions with NASA Program Officers, and solicited comments from the planetary science community

Summary of the Supporting Research and Technology Working Group of the PSS (2011)

- "The SR&T Working Group found that the current Planetary Science Division mission- enabling activities can be mapped clearly to the specific scientific objectives contained in the NASA 2010 Science Plan. However, many of the research and analysis programs overlap. Because the workload on the scientific community and NASA Program officers has increased substantially in the last decade with regard to proposal preparation, review, and implementation, the Planetary Science Division should consider consolidating programs to eliminate overlap as a part of the portfolio management strategy."

- The Working Group recommends that this action should be undertaken as part of a Senior Review of all mission-enabling activities.

- Based on these recommendations PSD started the process to consolidate and reorganize the R&A program in 2012

Government Performance and Results Act/Modernization Act

Agencies are required to:

- Develop five-year strategic plans that must contain a mission statement for the agency as well as long-term, results-oriented goals covering each of its major functions
- Prepare annual performance plans that establish the performance goals for the applicable fiscal year, a brief description of how these goals are to be met, and a description of how these performance goals can be verified
- Prepare annual performance reports that review the agency's success or failure in meeting its targeted performance goals
  - Each year the PSD develops this report and has the PSS review and create grades for each goal showing progress
  - The results are submitted to Congress
- PSD's R&A restructuring *explicitly* uses Agency goals as the top level theme for the new program elements

Guiding Principles in the Restructuring

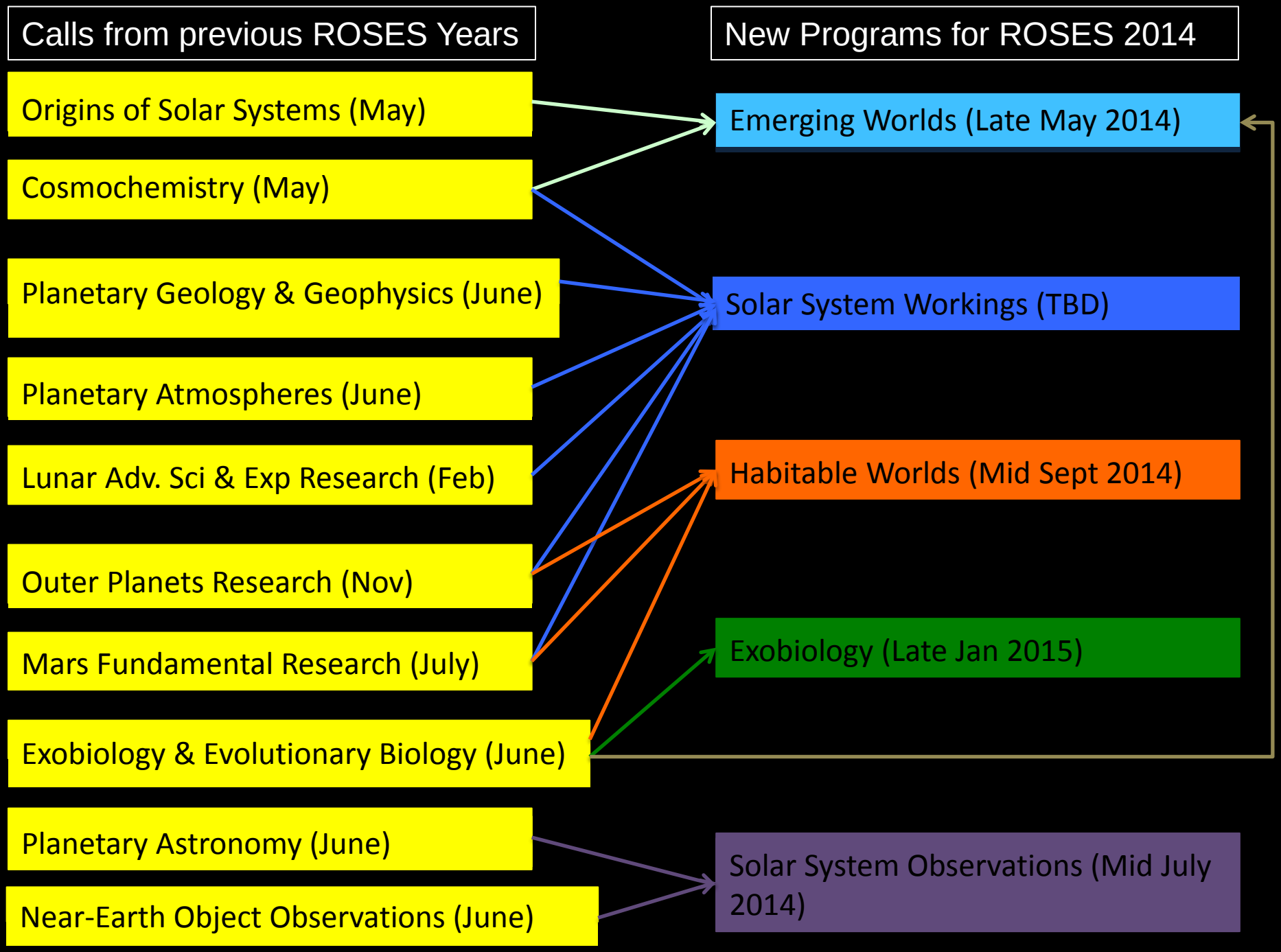
- To make the structure of the R&A program explainable to those outside of NASA.
- To make it easy for those outside of NASA to compute the amount of money spent on grants.
- To reduce the time between proposal submission and award announcement.
- To encourage interdisciplinary research.
- To enable PSD strategic decision making.
- To be more flexible in responding to changing research priorities.
- To reduce overlaps between program elements.

- To provide bridge funding, where appropriate, to cover funding gaps resulting from this restructuring
- This program restructuring will be revenue neutral; removing overlap will not decrease the budget

New Core Research Programs Defined

The five new core programs are aligned with PSD's goals/objectives.

How did the Sun's family of planets, satellites, and minor bodies form and evolve?	Emerging Worlds
How do the chemical and physical processes active in our solar system operate, interact and evolve?	Solar System Workings
What are the characteristics of the solar system that lead to habitable environments?	Habitable Worlds
How did life originate and evolve here on Earth and can that guide our search for life elsewhere?	Exobiology
What are characteristics of planetary objects and environments that pose threats to, or offer potential resources for, humans as we expand our presence into the solar system?	Solar System Observations


Calls from previous ROSES Years
New Programs for ROSES 2014
Origins of Solar Systems (May)
Cosmochemistry (May)
Planetary Geology & Geophysics (June)
Planetary Atmospheres (June)
Lunar Adv. Sci & Exp Research (Feb)
Outer Planets Research (Nov)
Mars Fundamental Research (July)
Exobiology & Evolutionary Biology (June)
Planetary Astronomy (June)
Near-Earth Object Observations (June)
Emerging Worlds (Late May 2014)
Solar System Workings (TBD)
Habitable Worlds (Mid Sept 2014)
Exobiology (Late Jan 2015)
Solar System Observations (Mid July 2014)

Calls from previous ROSES Years	New Programs for ROSES 2014
Lunar Adv. Sci & Exp Research	Lunar Data Analysis Program
A very small component of all DAPS	Planetary Data Archiving, Restoration, and Tools (PDART)
Planetary Geology & Geophysics	
Moon, Mars Analog Mission Activities	Planetary Science & Technology from Analog Research (PSTAR)
Astrobio Sci & Tech for Exploring Planets	
Origins of Solar Systems	Exoplanets
Planetary Atmospheres	

Reorganization at a glance

- ROSES13 has 20 calls; ROSES14 will have 17 calls with 8 that remain the same
- All calls address division science goals supporting NASA's strategic plan
- Strategic programs are more narrow in scope and address certain strategic needs
- Focused programs are narrow in scope and limited in time. They may be called for only one year or several, but not indefinitely.

Core Research	Strategic	Focused
Emerging Worlds	PDART (data archiving, tools)	ETIPS (emerging topics)
Solar System Workings	PSTAR (analogues)	LDAP (lunar data analysis)
Habitable Worlds	Exoplanets (joint with Astro)	CDAP
Exobiology	PMDAP	
Solar System Observations	LARS	
Core Technology	MDAP	
MatISSE	Planetary Protection	
PICASSO	NAI (not solicited in ROSES)	
Planetary Major Equipment	SSERVI (not solicited in ROSES)	

New program
Not solicited in ROSES 2014
Unchanged

Next Steps

- Virtual Town Hall provided an opportunity for the community to ask questions and indicate concerns relative to implementation
- PSD analysis underway:
  - Optimizing due dates: Evaluating detailed impact of due dates that could effect a break in funding
  - Looking at mitigation strategies: Altering due dates, making more selections from ROSES 13, bridge funding, etc.
- Provide draft of all changed ROSES 14 Calls in early January for community feed-back though the NASA advisory structure (AGs -> PSS)
- Final amended calls issued throughout the year starting with the initial release of ROSES 14

“Senior” Reviews of the new R&A Program

- PSS Review:
  - Draft language for new program elements will be made publically available before the January 22 meeting of the Planetary Science Subcommittee
  - Community can provide feed back up through Assessment Groups
  - AG Chairs present feedback to PSD management and program officers at PSS meeting
- Peer Panel Review:
  - At the conclusion of the Peer Review Panels, each panel will evaluate how the new program element was implemented
  - Provide feedback to the Discipline Scientist

DRAFT ROSES 2014 Table of Contents

V4 TOC FOR APPENDIX C. PLANETARY SCIENCE RESEARCH PROGRAM

NASA PLANETARY RESEARCH AND DATA ANALYSIS PROGRAMS ($M)

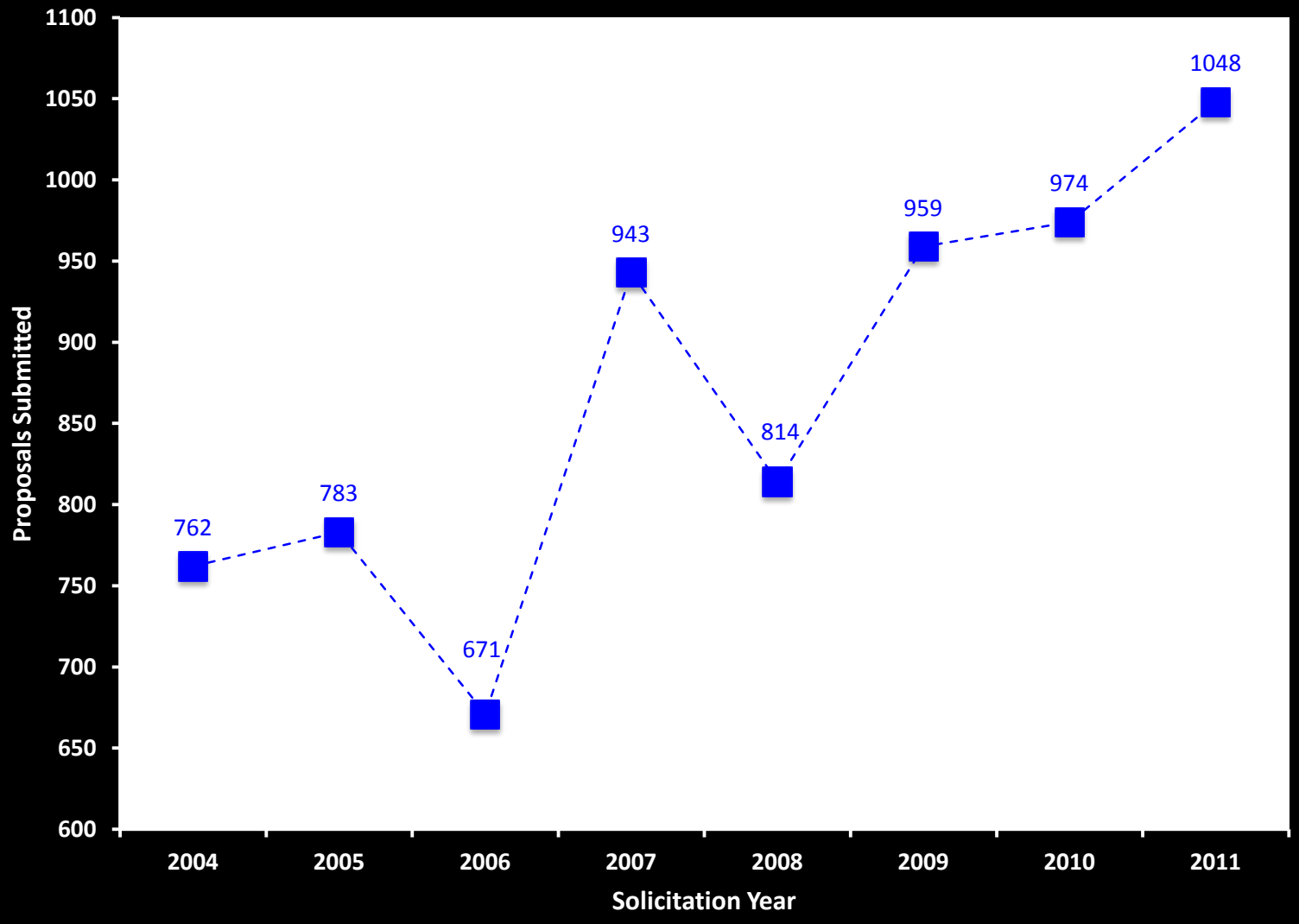
Appropriated funds released

PROGRAM	FY10	FY 11	FY 12	FY13	Target FY14
AstroCuration	4.473	5.509	5.807	5.700	6.260
Near-Earth Objects	5.800	7.848	20.425	20.500	40.500
Planetary Data System	10.120	11.504	13.609	13.267	13.200
Cassini Data Analysis (CDAP)	4.035	5.527	5.870	5.500	5.000
Outer Planets Research (OPR)	7.922	11.998	10.007	9.420	10.500
Mars Fundamental Research Program	7.091	7.601	8.767	9.390	9.500
Mars Data Analysis Program (MDAP)	7.737	8.375	9.073	8.680	9.500
Mars Phoenix DAP	0.000	1.093	0.490	0.000	0.000
Sample Ret Lab Inst & Data Anlys (SRLIDAP now LARS)	3.947	10.693	8.312	9.000	8.400
Discovery Data Analysis (DDAP now PMDAP)	2.094	2.516	2.921	2.620	3.400
Messenger Participating Scientist Program	1.146	2.240	2.090	2.150	1.200
DAWN Participating Scientist Program	0.555	1.670	1.559	0.720	0.000
Planetary Geology & Geophysics (PGG)	10.044	12.116	10.760	11.270	10.900
Cosmochemistry (COSMO)	11.670	12.331	15.121	14.880	12.600
Planetary Astronomy (PAST)	9.963	9.045	9.030	8.310	8.960
Planetary Atmospheres (PATM)	8.753	8.915	8.190	7.900	7.230
Planetary Major Equipment	1.253	1.89	2.585	1.300	1.680
Planetary Instrument Def & Dev (PIDDP)	10.086	8.503	5.634	7.400	3.000
Origins of the Solar System (ORIGINS)	5.267	5.272	7.118	6.790	4.610
Planetary Protection	3.190	2.512	2.600	2.800	2.700
Astrobio Sci & Tech for Expl Planets (ASTEP)	6.157	9.530	7.550	7.000	11.560
Astrobiology Inst Development (ASTID)	6.805	7.684	5.755	3.910	3.210
National Astrobiology Institute (NAI)	19.875	20.790	22.189	23.430	21.370
Exobiology/Evolutionary Biology (EXO)	14.744	16.52	14.802	14.700	12.570
Planetary R&A (misc)	13.201	3.307	4.530	6.850	8.400
Venus Express	1.080	1.056	1.080	1.000	0.000
NLSI & Solar System Exploration Research Virtual Institute	11.535	13.859	9.291	11.000	10.000
Lunar Advanced Science & Exploration Research (LASER)	4.325	6.878	7.418	10.049	8.200
Moon and Mars Analog Mission Activities	0.714	0.580	0.711	0.700	0.300
Planetary Science US Particpating Investigator Program	0.752	0.712	0.305	0.000	0.000
Neo-Wise/NEO	1.800	0.660	0.276	0.000	1.500
Mars Multi-Mission DA & Data Products	1.126	0.274	0.270	0.218	0.250
Mars Instrument Development Prog (MIDP)	2.677	1.051	0.000	0.000	0.000
New Horizons at Jupiter Data Analysis Program	1.234	1.188	0.000	0.000	0.000
Lunar Reconaissance Orbiter Participating Scientist (LRO PSP)	1.290	0.866	0.000	0.000	0.000
Hayabusa Participating Scientist Program	0.259	0.304	0.000	0.000	0.000
MER Participating Scientist Program	4.172	0.000	0.000	0.000	0.000
GRAIL Guest Scientist Program			0.750	0.570	0.237
LADEE Guest Investigator Program					0.460
MAVEN Participating Scientist Program					0.790
MatISSE				5.870	6.000
PICASSO					6.000
Outer Planets Supporting Research (1 Year, non-recurring)			22.500		
Total R&A Budget	**206.892**	**222.417**	**247.396**	**232.894**	**249.987**
Overall Planetary Budget	**1,364.400**	**1,446.180**	**1500.000**	**1188.685**	**TBD**
R&A as % of Budget	15.2%	15.4%	16.5%	19.6%	

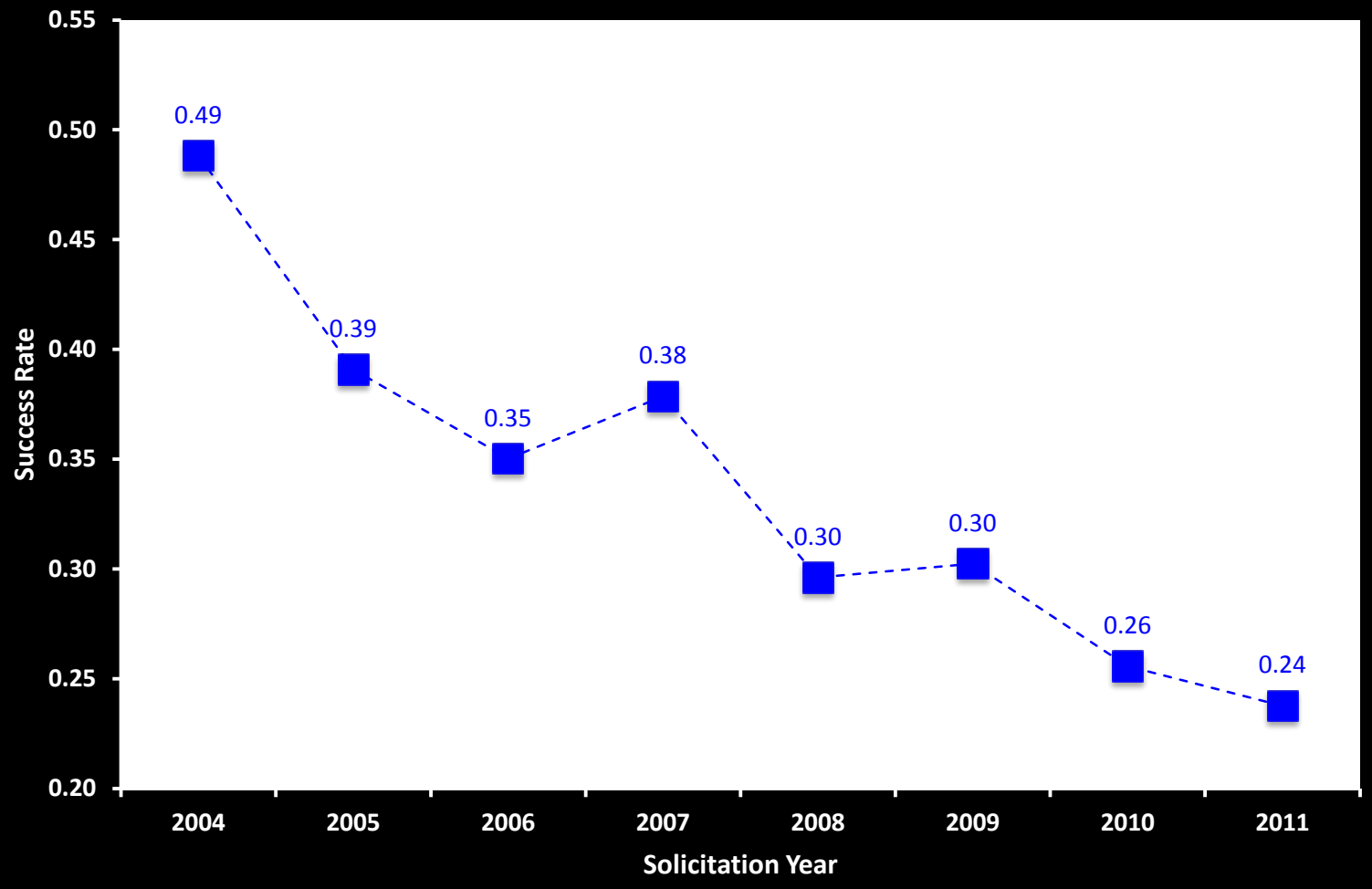
Overall Program Analysis

- All data presented here are for those solicitations that will make up the new core solicitations of Emerging Worlds, Solar System Workings, Habitability, Exobiology, and Planetary Observations.
  - Cosmochemistry (COS), Exobiology & Evolutionary Biology (EXO), Origins of Solar Systems (OSS), Mars Fundamental Research (MFR), Outer Planets Research (OPR), Planetary Atmospheres (PATM), Planetary Astronomy (PAST), Near Earth Object Observations (NEOO), Planetary Geology and Geophysics (PGG), and Lunar Advanced Science and Exploration Research (LASER).

Number of Proposals



Aggregate Selection Rates



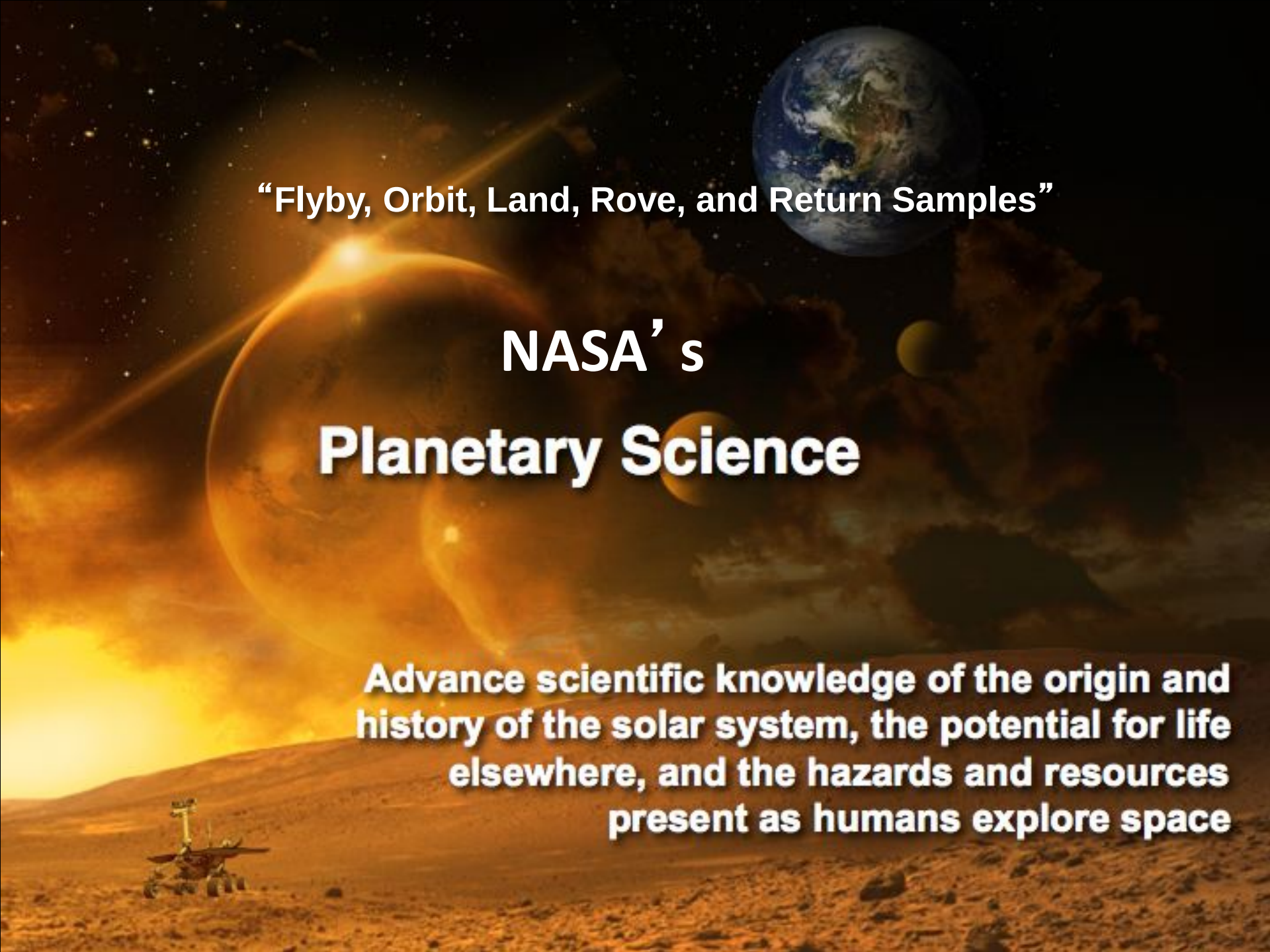
Summary

During last decade:

- R&A budget has been increasing
- Proposal pressure has been increasing dramatically
- Declining selection rates due to increasing proposal pressure
- Smaller effect of increased grant duration

Current:

- R&A Restructuring creates simpler more easily explained and analyzed program structure
- Eliminates carving up of the Solar System (Mars vs. Outer Planets vs. Moon vs. Rest-of-Solar System)


"Flyby, Orbit, Land, Rove, and Return Samples"
NASA's
Planetary Science
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