Statement by
The Planetary Society

before the

Committee on Science, Space and Technology’s
Subcommittee on Space
U.S. House of Representatives

Hearing: NASA’s FY2015 Budget Request

The Planetary Society has serious concerns for the future of NASA’s Planetary Science Division as proposed in the FY2015 NASA budget request. For the third year in a row, the White House has proposed cuts to the program that will ensure the decline of planetary exploration over the course of this decade. The core recommendation of the National Academy’s planetary science decadal survey—the crucial balance of small, medium, and flagship missions, combined with steady research and technology funding—is not supported by this request, which is nearly $220 million below the recommended $1.5 billion per year needed to implement a program consistent with the intent of the decadal survey.

NASA’s Planetary Science program has a clear direction provided by the Visions and Voyages Planetary Science Decadal Survey and has maintained a productive, successful, and unprecedented program of exploration throughout the past decade. The Curiosity rover is approaching the base of a 18,000-foot Martian mountain; the Cassini spacecraft has captured sunlight glinting off methane lakes on Saturn’s moon Titan; New Horizons will fly by Pluto next year for the first time in human history. These are highly engaging, exciting, and compelling events delivered by NASA’s planetary program. They inspire generation after generation of students and the public to embrace science and engineering. They dramatically demonstrate the United States’ engineering and scientific prowess. But despite this, the White House has proposed cuts year after year that threaten the health of this program.

Previous congressional actions have mitigated the losses to planetary science that would have come about had the White House’s original requests in FY2013 and FY2014 been enacted. But even with these partial restorations, the United States’ scientific exploration of the solar system is approaching a nadir not seen since the 1980s. The number of new missions launching during the period covered by the current decadal survey has dropped by half compared to the previous decade [see Tables 1 & 2]. When the Cassini spacecraft at Saturn and the Juno mission at Jupiter end their missions in 2017, there will be no NASA missions exploring the outer planets for the first time since the 1970s. Decades of hard-earned capability and engineering know-how will be placed at risk just as Europe, India, Russia, and China are committing to solar system exploration.
Even if a new mission to the outer planets were selected tomorrow, the United States would still face a minimum six-year gap. The “fade to black” predicted by respected NASA veterans Bobby Braun and Noel Hinners¹ has come to pass. The question facing NASA and the Congress is how long they choose to make this period last.

The Administration’s budget proposal ensures a long period of darkness. Based on statements within the budget document, the number of new planetary science missions in development dwindles to two (Mars 2020 and the next small-class Discovery mission) by 2016, the lowest level in decades [Figure 1]. While NASA officials have stated their intention to increase the cadence of the Discovery missions by the end of the decade, the budget makes no commitment to this effect. It also suspends one of the major components of a balanced planetary program: the medium-class “New Frontiers” mission line. If this occurs, exactly zero of the competitively-selected medium-class missions recommended by the decadal survey for 2013 - 2022 will be implemented. This represents a notable change in policy, as all previous budgets anticipated a new New Frontiers opportunity in 2016.

The House NASA Authorization bill (H.R. 2687) passed by the House Science, Space, and Technology Committee last July contains a clear policy (section 321) that would mitigate the length of this downturn, particularly by calling for NASA to return to the decadal recommendations of a Discovery-class mission every two years and a New Frontiers-class mission twice per decade. We strongly support section 321.

The Administration did take a tentative step towards a mission to explore Europa, which would help address the lack of outer planets exploration. Europa, the moon of Jupiter with a vast liquid water ocean, is a destination long sought by the scientific community. It ranked as the most important flagship mission in the first decadal survey and the second-most important in the current decadal survey. Last year’s discovery of likely water plumes erupting from Europa’s south pole only served to increase the moon’s scientific importance. These plumes significantly lower the cost of performing initial analysis of Europa’s water, as a spacecraft could far more easily fly through and collect plume samples instead of landing and boring through a thick ice sheet.

But the White House requests a mere $15 million to study a low-cost Europa mission concept, despite having received over $140 million in the past two years to advance the Europa Clipper concept mission from the Jet Propulsion Laboratory and the Applied Physics Laboratory, which had already reduced the cost of a major scientific mission by over 50% from the original decadal concept. To reduce it further, as NASA has indicated, raises serious questions of the scientific return possible from such a mission. We are all for cost-savings, but we must ensure that this once-in-a-generation opportunity to explore Europa achieves the preponderance of scientific goals as defined in the decadal survey, and sufficiently moves forward our understanding of Europa to the point where NASA could subsequently attempt a landing on the surface.

The timing for the Europa mission, not mentioned in the FY2015 request but stated by NASA officials as “mid-2020s,” is also a concern. Again, we support the language in the House Science Committee’s draft NASA authorization bill (Sec 321), which sets a goal for NASA of a 2021 launch of a major Europa mission.

The Administration’s budget deserves praise for funding continued operations for several existing planetary science missions, notably the popular Curiosity rover on Mars and the long-lived Cassini orbiter at Saturn. Additionally, the request provides adequate funding to maintain the Department of Energy’s Plutonium-238 infrastructure and restart program, which is crucial to continued access to destinations where solar power is unfeasible. We strongly support these decisions, and urge Congress to do so as well.

But the budget proposal does place the continued operation of two functioning planetary spacecraft at risk. Both the Opportunity rover and the Lunar Reconnaissance Orbiter are zeroed out in the base proposal, moved instead to the President’s Opportunity, Growth, and Security Initiative. The Planetary Society believes in maximizing taxpayer value for NASA assets by continuing operations as long as missions remain scientifically valuable. We fully expect the upcoming senior review at NASA to validate the scientific returns of both missions, and strongly recommend that both continue operations whether or not the OGSI is passed.

The major NASA achievements in planetary exploration slated for FY2015—Curiosity at Mt. Sharp, New Horizons at Pluto, Dawn orbiting Ceres—represent what’s great about the country. They are bold feats of engineering and scientific prowess. They are optimistic, each one faced immense challenges that were overcome by careful thought and planning. They engage the public with their bold feats of discovery. They are also all initiatives from the previous Presidential administration.

Spacecraft take time to design, build, and fly. We are not so much concerned for the health of the current set of missions (Opportunity and LRO are notable exceptions) so much as we are concerned for the health of the program going forward. NASA already faces the biggest gap in solar system exploration in decades, and has dropped its launch rate for this decade by half, but this can still change. Wise action by the Congress and a receptive Administration can embrace planetary science for what it is: a unique and hard-earned capability that is worth a small investment—$1.5 billion per year, less than 9% of NASA’s total budget—to maintain a peerless program of exploration that inspires the country.
Addendum

Table 1. Missions launched/launching during Decadal Survey timespan of 2013 - 2022:

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Projected launch rate: 0.6 missions per year.

Table 2. Missions launched during the previous Decadal Survey timespan of 2003 - 2012:

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<th>Year</th>
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Launch rate: 1.2 missions per year.
Figure 1: Funding level of NASA’s Planetary Science Division from 2003 – 2019, adjusted for inflation and displaying the number of missions planned to be in development according to NASA Budget requests during this period. The average budget for 2003 - 2013 is $1.5 billion per year. Modifications to the budget have been made to preserve programmatic consistency. Note that by the end of the decade the Division is working on only two new missions while maintaining an aging set of spacecraft, and funding Pu-238 development, scientific research, NEO detection, and instruments on foreign missions. Raw data and methods are available at [http://planetary.org/planetary-funding-chart](http://planetary.org/planetary-funding-chart)

Note: funding projections suggest that the Discovery 14 mission could begin development in FY18 or FY19, though this is unstated in the budget request and therefore not represented here.

The Planetary Society has inspired millions of people to explore other worlds and seek other life. Today, its international membership of over 40,000 individuals makes the non-governmental Planetary Society the largest space interest group in the world. Carl Sagan, Bruce Murray and Louis Friedman founded the Planetary Society in 1980. Bill Nye, a long time member of the Planetary Society's Board, serves as CEO.

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