

Obama Tries to Kill Space Exploration, Again

by Marsha Freeman

For each of the past four years, the Obama Administration has proposed a new and innovative way to destroy NASA's capabilities to carry out a long-term and inspiring space program, demoralizing space scientists and engineers, and the American public. The April 10 roll-out of the Administration's proposed FY 14 budget for the space agency was no exception.

Each year, Congress has rebelled, but has only approved holding actions—reversing the most drastic cuts and program cancellations, but not providing enough funding for NASA to be able to actually implement the programs the Congress itself has mandated. As NASA's capabilities decline, and demoralization opens the way for clinically insane proposals, such as one-way human trips to Mars, the nation is losing its distinctly American optimism to create the future.

In previous attempts, the White House has proposed cancellation of the Constellation program for deep-space exploration, decimation of the highly-successful unmanned Mars exploration program, and this year, proposes to send astronauts on a high-risk mission to an asteroid, for no good reason. It really is past time to decide if we want to have a space program, or not.

"It's All We Can Afford"

In 2010, President Obama, upon the self-serving advice of former Apollo astronaut Buzz Aldrin, announced that there was no need to go back to the Moon, because we've "been there; done that." Instead, to find some manned exploration mis-

sion which was not the Moon, NASA proposed to send astronauts on a multi-month mission into radiation-soaked deep space in the 2020s, to study an asteroid (which has been, and is being, done already by radiation-hardened robotic spacecraft). This proposal gained no traction on Capitol Hill, within NASA, in the scientific community, or internationally. But this year, the Administration decided it could not even afford such a (senseless) mission to an asteroid, and has come up with a "cheaper" alternative closer to home—the Asteroid Retrieval Mission, to move a near-Earth asteroid into an orbit around the Moon, and then send astronauts there. In May, NASA Administrator Charles Bolden stated directly that given the projected flat NASA budget, the original concept was impractical.

In truth, in the current financial crisis, even this "cheaper" version of a manned asteroid mission is something NASA cannot afford. At a June 18 forum, NASA officials stressed that they were counting on the American "public," companies, universities, international partners, and anyone with a telescope, to identify candidate asteroids, and design systems to capture and redirect them. "We aren't the only player" in space exploration, stated private-space booster, NASA Deputy Administrator, Lori Garver.

This willingness to shrink the national patrimony of decades of science and engineering expertise, and hope "citizens" will fill in the gaps is a stunning abdication of space leadership. As lunar scientist Paul Spudis

aptly described it: "we sit amongst the smoldering ruins of a once-great space program." Is "what we can afford" what will define our future in space?

What Is the Mission?

Bill Gerstenmaier, NASA Associate Administrator for Human Exploration and Operations Mission Directorate, presented the fundamentals, and challenges, of the Asteroid Retrieval Mission (ARM) during a series of presentations in mid-April. The Administration's NASA FY14 budget requests more than \$100 million to start planning a mission, whose final cost no one can even guess. The three mission segments are: 1) to detect and characterize a candidate asteroid; 2) a robotic rendezvous, capture, and redirection of the target, to a stable retrograde orbit around the Moon; and, 3) a crewed mission to obtain a sample for return to Earth. If it sounds easy, he warned, do not be fooled.

The first step, is to find a 5-7 meter, 500–1,000 metric ton asteroid as a target. Objects this small, many scientists have explained, are difficult to find, especially if of a nonreflective, dark complexion. Finding a right-sized asteroid (anything larger would require more energy to move than this mission allows, and could wreak havoc on Earth, should things not go according to plan) is a significant challenge. Speaking to the NASA Advisory Council, Gerstenmaier said the search could just turn up a discarded upper stage of a Saturn IB rocket, which was mistaken for an asteroid, in 2002.

But finding a target is only the beginning.

The asteroid's spin rate, composition, and trajectory must be appropriate. David Korsmeyer, from NASA Ames Research Center, described the challenge of intercepting a candidate asteroid to the *San Jose Mercury News*, as "a multivariable math game," akin to catching a baseball while on a Ferris wheel.

Gerstenmaier said, in fact, that he is making no promises about actually capturing an asteroid, because not enough will be known about it before the robotic rendezvous craft arrives. The only way to study the object in advance, he said, would be to send a precursor mission. But that would add cost and time, undermining the very rationale of the project!

Once this still-imaginary asteroid is captured, it would be nudged by low-powered thrusters on the robotic spacecraft. Gerstenmaier stressed that it will not be "towed," which would require more propellant, but "redirected." That is, the asteroid must already be on a course toward cislunar space to even make this possible. All told, it is expected to take about one and a half years to reach the asteroid, three years to nudge it into lunar orbit, and another year to move it to the desired, stable orbit. Theoretically, it would be in the right place for a manned visit in 2021. This slow-boat-to-an-asteroid approach is dictated by the use of low-thrust solar-electric propulsion, rather than more capable, high-thrust nuclear systems, which should be prerequisite for such deep space missions.

At the June 18 forum, Lori Garver made her pitch for the mission by reporting on the bipartisan support for planetary defense against asteroids, referencing hearings that have been held in Congress. She also promoted a new Grand Challenge from the Administration, focusing on "on detecting and characterizing asteroids and learning how to deal with potential threats."

Yet, in an April presentation before the Space Transportation Association,

Gerstenmaier warned against this argument as a way to garner support for the retrieval mission. Marcia Smith, of SpacePolicyOnline.com reports that Gersenmaier "cautioned that the relationship of this (retrieval) activity and planetary defense... defending Earth from Potentially Hazardous Asteroids (PHAs) that could cause catastrophic damage—is tangential." He said that this mission would increase our knowledge, but may not be "the most efficient and most effective way to get planetary protection." For one, PHAs are much larger than these candidate asteroids, which pose no threat to the Earth. He described selling the program's purpose as planetary protection as "disingenuous." So much for trying to propitiate Congress.

Hands and Feet

On June 19, the space subcommittee of the House Science, Space and Technology Committee released its draft of a two-year 2013 NASA Authorization bill, to replace the three-year 2010 law, which will soon expire. It included no funding for the Asteroid Retrieval Mission. Subcommittee chairman Steve Palazzo (R-MS) said: "Because the mission appears to be a costly and complex distraction, this bill prohibits NASA from doing any work on the project..." The draft reiterates the priorities promulgated in the current Act, in that missions to lunar orbit, the surface of the Moon, and Mars are NASA's human spaceflight long-term goals. The Committee has received support from the space community, voiced by numerous witnesses during a series of hearings over the past three months.

Even Administrator Bolden has had to refrain from proposing the asteroid mission as anything but a retreat in human space exploration. Defending the Administration's budget request before Congress in mid-April, when asked why missions to the Moon had been nixed, Bolden simply said that he would "need money to go to the

Moon," saying it would be three times more expensive than this rendezvous with an asteroid.

At a House space subcommittee hearing with Administrator Bolden on April 24, full Committee chairman Lamar Smith (R-TX) advised the witness that, "While federal budgets will continue to be uncertain, Congressional support for NASA's exploration mission is clear and unwavering."

On the same day that the FY14 budget request was sent to Capitol Hill, Representative Bill Posey (R-FL), with bipartisan co-sponsors, reintroduced his Re-Asserting American Leadership in Space Act, to develop a plan for returning Americans to the Moon. However, the bill also calls for keeping within current budgetary constraints.

In order to regain the leadership in space exploration, which is not our birthright but must be earned, Congress will have to stop waving its hands and demonstrate its resolve with its feet.

Books on Mars



These books provide a blueprint for manned missions to Mars and continued presence on the planet's surface, including what technology, precursor missions and experiments are required.

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