News

Space Exploration

Scientists Add Up Gains, Losses In Bush’s New Vision for NASA

To the relief of many lawmakers, scientists, and space enthusiasts, the United States now has a vision for space exploration with a White House seal of approval. But the remedy for NASA’s woes, presented last week by President George W. Bush, includes some unpleasant scientific side effects. It would end the Hubble Space Telescope’s brilliant run and could jeopardize the future of any activity that doesn’t directly serve the exploration effort.

On 14 January, Bush announced his intention to retire the aging shuttle, redefine the purpose of the half-built space station, and design and build a vehicle to take humans to the moon and then Mars. White House and NASA officials insist that researchers would prosper under the proposal, gaining a new flotilla of lunar robots, increased support for Mars rovers, and advanced technology to benefit outer solar system missions. “This provides more opportunities for science,” says presidential science adviser John Marburger.

But, while applauding the desire to fix NASA’s troubled human space flight program—grounded since last February—some scientists worry that a portion of the funding for the new venture will come out of the hide of existing programs. “It’s a serious issue, and people are going to be passionate on all sides,” says Charles Kennel, an earth scientist who heads NASA’s Advisory Council and directs the Scripps Institution of Oceanography in La Jolla, California.

Bush’s announcement, made at NASA Headquarters in Washington, D.C., follows intensive debate in the White House over how to rebound from the Columbia disaster. It paints a dramatic picture of human exploration over the next 2 decades, but with few details. Bush said the agency would begin testing a new launcher dubbed the Crew Exploration Vehicle in 2008, while a series of lunar robotic missions begins probing the moon. After hauling up the last pieces of the space station in 2010, the shuttle would halt operations. But it would be another 4 years before the new launcher would be ready to transport humans. Work on a lunar base could begin as early as 2015, and the space station would be abandoned the following year. A trip to Mars would follow much later. “The vision I outline today,” Bush said, “is a journey, not a race.” And other nations are welcome to join in, he added.

To pay for it, Bush will ask Congress to add $800 million to NASA’s pending $15.4 billion budget for 2004. Its budget would grow by 5% in each of the following 3 years, followed by 1% increases in 2009 and 2010. The bulk of the money for the new initiative, however, would come from reshuffling and cutting existing NASA programs. The biggest savings would not come until the end of the decade, when the shuttle’s $4-billion-a-year budget would be available.

Administration officials refused last week to say exactly what areas will be cut until the 2005 request is released on 2 February. That reticence tempered early reviews of the proposal. “Everyone is confused,” says one scientist. “I am particularly concerned that NASA’s other missions not be cannibalized in an attempt to cover the costs of these proposals,” adds Representative Bart Gordon (D–TN), ranking Democrat on the House Science Committee that oversees NASA. “A couple of billion dollars a year extra for NASA would go a long way to solving this,” says Kennel.

Collateral damage. Planetary scientists, flush with the success of the Mars Spirit rover, are ecstatic about the possibility of a new line of lunar robotic missions and an even more robust Mars effort. Astronomers and earth scientists are much less enthusiastic, however.

Astronomers were stunned to learn that the president’s plan precludes any more servicing missions to the Hubble Space Telescope. “It’s a disaster for science and a giant step backward for U.S. astronomy,” says Yale University astronomer Meg Urry. The shuttle was expected to make one trip between 2006 and 2008, and as recently as this fall scientists held out hope for an additional servicing mission that would have kept Hubble flying until the James Webb Space Telescope is in orbit in 2011. “We’re very seriously concerned,” adds Sidney Wolff, director of Kitt Peak National Observatory in Arizona. “It would leave a very long gap.”

NASA space science chief Ed Weiler says that killing the mission was a “tough call” but that there was no alternative. Hubble’s position in an orbit different from that of the space station raised serious safety issues, he said, and the rush to finish the station by 2010 left no time for a rendezvous with the telescope. Weiler expects Hubble to be able to continue operating normally until around 2007, with the chance of extending its life by adopting power-saving procedures. Wolff proposes that two instruments built for the next Hubble servicing mission instead be placed in orbit by an expendable launch vehicle and operated independently of Hubble. Weiler declined to discuss details of the upcoming 2005 budget request but allowed that “there are not going to be radical, drastic, large cuts to any parts of space science.” Other agency managers said that major observatories—
both those on the drawing board and those in orbit—would not suffer either under the president’s new plan. An apparent decline from his pending 2004 budget of $4 billion, Weiler added, will reflect the transfer of some programs to the new exploration office NASA created last week.

The long-term fate of earth sciences, on which NASA spends $1.6 billion annually, is less certain. Some Administration sources told Science that large portions of the effort would be shifted to the National Oceanic and Atmospheric Administration (NOAA) to make room in NASA’s 2006 budget for the new exploration programs. “It’s not true,” replies Ghassem Asrar, NASA’s earth sciences chief. He says that satellites deemed operational will be transferred to NOAA, but that there are no major budget decreases planned for the next few years. O’Keefe backs him up, insisting that there will be “no diminution” of the program. “There should be no concerns,” he adds.

In his speech, Bush said that the space station, designed to host experimental facilities covering work in materials science, fundamental physics, and molecular biology, would henceforth be devoted to gathering data on the effects of long-term space living. That will force yet another replanning of station research, a topic that a National Research Council panel will tackle in March. “We’re excited,” says Mary Kicza, chief of NASA’s biological and physical research office. “This gives us a clarity of objective and purpose.” Although Kicza declined to say what research would be halted, or how the budget would be affected, O’Keefe said “it will be a very dramatic adjustment.” The 2016 termination date is several years earlier than NASA had planned to retire the station. In the intervening years, the Russian Soyuz will ferry crews, and an automated European vehicle could transport scientific equipment and samples.

Sales pitch. Bush and O’Keefe must now sell their vision to Congress. The president’s father failed to do this when, in 1989, he proposed a similar return to the moon and Mars. But many lawmakers appear hopeful that the president’s new direction for human space flight will overcome the high costs, low reliability, and lack of focus that has plagued current efforts. “Exactly the jump-start NASA needs to move into the future,” says Senator Sam Brownback (R–KS), who heads the space panel within the Senate Commerce, Science, and Transportation Committee. Representative Sherwood Boehlert (R–NY), who chairs the House Science Committee, called the proposal “a thoughtful, gradual, achievable set of missions.” Brownback’s panel will hold a hearing 4 February, with Boehlert’s committee to follow the next week.

With elections in November, the president’s proposal has already sparked a response along partisan lines. Former Vice President Al Gore, a Democrat, dismissed the Bush plan as “an unimaginative and retread effort to make a tiny portion of the moon habitable for a handful of people.” Marburger’s predecessor under President Bill Clinton, physicist John Gibbons, called it “a misplaced focus on the future” that caters to “people who like making money building things in space. … It means profits for them.” Bush’s plan could create business for the aerospace industry. But companies already benefiting from shuttle contracts would lose out if expensive upgrades were avoided and the vehicle was retired.

It’s too early to know the impact of the new plan on other spacefaring nations. But space officials in several countries that are partners on the space station generally praised the plan as a way to bolster their field and international cooperation. Russian officials were busy dusting off their own plans for lunar and Mars exploration and were quick to say that they would be able to provide important elements of human expeditions—such as large vehicles—at low cost and with high reliability.

“It’s a good thing,” says European Space Agency spokesperson Franco Bonacina in Paris: “We’re excited; it shows increased interest in space activities.” Canadian Space Agency President Marc Garneau hopes that NASA’s emphasis on Mars exploration will help persuade Ottawa to provide the necessary funding for a robotic mission to Mars that he has proposed for early in the next decade. Japanese officials, meanwhile, declined to comment.

In contrast, Chinese officials were decidedly cool to Bush’s proposal. “China will still depend on its own ability to carry out space plans, including manned flights and deep-space exploration,” says Li Jinduo, spokesperson for Beijing’s Commission of Science, Technology, and Industry for National Defense. Li Mingzhu, deputy chief of the Center for Space Science and Applied Research at the Chinese Academy of Sciences, says that “China will not be affected very much” by the U.S. plan. But he speculates that “the shift of U.S. focus will have an impact on the whole world in the long run.”

In the meantime, everyone wants more detail. “We will be very happy to work with NASA,” says G. Madhavan Nair, chair of the Indian Space Research Organisation (ISRO) in Bangalore. “But it is difficult for India to make an assessment.” India plans to launch a probe to the moon in 2007, and Nair says that NASA and ISRO are discussing including a U.S. instrument on board the spacecraft.

In his speech, Bush named former Air Force Secretary Pete Aldridge to lead a commission and asked for its report by the summer. The new panel is expected to wrestle with issues such as hiring the scientists and engineers needed to do the job and managing such a sprawling initiative. “The president has given us a mandate,” says O’Keefe. “Now all we gotta do is do it.”

—ANDREW LAWLER

With reporting by Wayne Kondro in Canada, Dennis Normile in Tokyo, Ding Yimin in Beijing, Pallava Bagla in New Delhi, and Daniel Clery and Richard Stone in Cambridge, U.K.

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