



## When will U.S. send Man back to Moon?

Not by 2020, concludes committee

By Joel Achenbach

NASA doesn't have nearly enough money to meet its goal of putting astronauts back on the Moon by 2020—and it might be the wrong place to go, anyway. That's one of the messages emerging from a sweeping review of NASA's human space flight program.

The Human Space Flight Plans Committee, appointed by President Obama and headed by retired aerospace executive Norman Augustine, has been trying to find options that stay under the current budget and include missions worthy of the cost and effort.

According to the committee there's no realistic way to get Americans back on the Moon by the target date of 2020, which has been the agency's goal since President George W. Bush signed off on the "Vision for Space Exploration" in 2004. Landing on the Moon by 2020 would require such drastic budgetary maneuvers as de-orbiting the International Space Station—crashing it into the South Pacific—in 2016.

The final list of options being explored by the Augustine group includes some variation of a lunar base down the road. But the committee is most animated by what it calls the "Deep Space" option, a strategy that emphasizes getting astronauts far beyond Low Earth Orbit but not necessarily landing them on alien worlds.

Astronauts may go to near-Earth asteroids and gravitationally significant points in space, known as Lagrange points, that are beyond the Earth's protective magnetosphere. They might even go all the way to Phobos, a tiny moon of Mars, where the spaceship wouldn't land but "rendezvous" with the moon's surface, in the same way that a spacecraft docks at the International Space Station.

The Earth's moon would be a possible "off-ramp" of such a strategy but not a central target for exploration. Putting astronauts on the surface of Mars, and then returning them to Earth, would be prohibitively expensive, according to an

analysis by the committee, which sent its report to the president end of August.

The "program of record"—NASA's current strategy—has not fared well in the committee's review. Former astronaut Sally Ride, a member of the panel, said the gap between NASA's goals and its current budget will total roughly \$50 billion by 2020. If the space station's life is extended for five years, she said, the current budget would allow for the completion of a heavy-boost moon rocket only in 2028, and that would be without spending money on developing the components of a lunar base.

"If you're willing to wait until 2028, you've got a heavy lift vehicle, but you've got nothing to lift," she said. "You cannot do this program on this budget."

The panel is certain to recommend extending the life of the International Space Station. It is also pushing hard for greater commercialization of space, including using private companies to taxi astronauts to Low Earth Orbit.

Some options include pulling the plug on the Ares I rocket that NASA has been building for four years. The Ares I is supposed to replace the space shuttle, the final flight of which is slated for late 2010 or possibly early 2011.

For all the promised "giant leap for mankind" the mission foretold, the prophesied future of Moon bases and journeys to Mars, Jupiter, and beyond is still science fiction. The last of six Moon landings, bringing two men each time to the lunar surface, was in 1972. The astronauts who made the first Moon landing are still alive, and so are many of the 600 million people around the world who watched the unusual images of Neil Armstrong and Edwin "Buzz" Aldrin Jr.'s first bounding steps on the dusty lunar surface on July 20, 1969. But the generations born since then have other interests: A YouTube clip of the first moon walk has 2 million views; Michael Jackson moon-walking to "Billie Jean" has 20 million.

Aldrin himself critiqued the nation's space exploration strategy in a Washington Post op-ed piece, saying that to rekindle pride in its program, the United States needs to embrace a vision that, for the moment, sounds impossible: a homestead on Mars.

Getting back to the Moon will be difficult—and expensive. Human space exploration has always moved in tandem with politi-

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cal realities. Even President John F. Kennedy, who issued the challenge to land on the Moon by the end of the 1960s, framed his goal in the context of a Cold War rivalry with the Soviet Union that intensified when the Communist regime hurled the Sputnik satellite into orbit in 1957.

"I am not that interested in space," Kennedy told James E. Webb, NASA's administrator in late 1962. "I think it's good. I think we ought to know about it. But we're talking about fantastic expenditures."

Most Americans would seem to agree. Even during NASA's heyday in the 1960s, when the agency's expenditures stood at 4 1/2 percent of the federal budget and it employed nearly 400,000 civil servants and contractors, polls showed most Americans did not think Apollo was worth the expense, according to Roger D. Launius, the chairman of the space history division at the National Air and Space Museum. (The only exception was after the landing in 1969, when a poll showed a bare majority of 53 percent of Americans supporting the spending.)

"The bottom line was that the political will was not based on a desire to explore space per se," Launius said. "Nobody objected to that, but that was not the reason."

Absent the space race, now NASA employs about half as many people as at its peak and its budget is less than one percent of the federal budget.

To return to the Moon would take renewed political support and a clear vision of how to get there. The latter question is one subject that has been taken up by the Human Space Flight Plans Committee, but when asked what it would take to rally support behind a push into space today, historians and experts were mostly stumped.

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"I'm not sure what the motivator would be," said Stephen J. Garber, a NASA historian. "There's not the sort of fundamental rationale that everybody could easily understand in the general public."

Dale Ketcham, the director of the University of Central Florida's Spaceport Research and Technology Institute, said it would take nothing less than a meeting with intelligent alien life. "That would make for some very interesting appropriations debates," Ketcham said.

Environmental decay would give humans a good reason to get off the planet, but that's a problem that is best addressed here at home. An asteroid hitting the planet is a serious threat—it has already happened several times in Earth's history—but a vague one; it could happen tomorrow or 100,000 years from now. And nobody has figured out how to make a lot of money off space exploration. Space tourism is

affordable for only a handful of people, and the idea of mining precious minerals and gases from asteroids or other planets faces huge technological hurdles.

Some former astronauts confessed that they were surprised about how things have actually turned out, 40 years later. "There's a lot more discussion, debate, and I think that's good, as long as it's not paralyzing," said one of them.

There is some cause for remaining optimistic about space exploration—if only for the reason that humans have achieved things that past generations thought impossible.

Humans will eventually move out into space. There's no way to stop that outward movement. If the United States does not lead, someone else will lead. It's not a matter of what country, but actually when.