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NASA Mars Life Project Inspired By The Past

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When it comes to Mars, NASA looks both forward and backward

*The Web site of The National Aeronautics & Space Administration.

PASADENA, Calif. (November 23, 1998 01:33 a.m. EST http://www.nandotimes.com) -- NASA's latest plan to seek signs of life on Mars would use a rocket developed in 1958 to vault martian rock samples into space for an eventual ride to Earth -- the first time pieces of any planet will have landed here.

When robotics expert Brian H. Wilcox was asked what it would take to launch a light spacecraft from the surface of Mars, he turned to declassified plans for the solid-fuel rocket his father, Howard A. Wilcox, worked on during the Cold War.

Father and son often discussed the rocket, which was developed in 1958 at the China Lake Naval Weapons Station in the shadow of the southern Sierra Nevada near Ridgecrest.

After some tweaking, that concept has now become the basis for the mini-Mars Ascent Vehicle -- part of NASA's $3 billion plan to reorganize Mars exploration for the first decade of the new millennium.

At a relatively inexpensive $30 million, the so-called mini-MAV is consistent with NASA's "faster, cheaper, better" era of space exploration.

A draft of the Mars program overhaul, including the mini-MAV, will be reviewed Tuesday. Then in February, NASA's Jet Propulsion Laboratory in Pasadena, Calif., will announce whether it can carry out the program within a strict $300 million annual budget.

NASA wants to mount the mini-MAV -- at about 3 feet and 200 pounds, smaller than comparable liquid-fuel rockets -- on rover-lander missions flown every two years. Each rover would place rock cores in canisters that the rocket would shoot into low orbit. The canisters later would be retrieved by Mars orbiters for return to Earth.

NASA's revised blueprint for Mars exploration also incorporates low-cost "micromissions" -- balloons, airplanes or little devices that dig into the surface -- that could act as scouts for larger missions.

"Conceptually it appears doable, but you've got to look at this very closely, make sure you've got your (financial) commitments," said Carl Pilcher, NASA science director for solar system exploration in Washington.

With the international space station project sucking up federal dollars, NASA's new Mars plan relies on participation of the French, European and Italian space agencies, as well as private industry.

At this point, the French have the largest foreign role. They'll supply the Ariane 5 rocket and 2005 orbiter to rendezvous with the martian samples and haul them home in a U.S.-built capsule.

The first Mars samples could touch ground in the Utah desert in 2008.

"What we're really after here ... is bringing back samples to terrestrial laboratories that will enable us to determine what the martian environment was like long ago, whether it might have been the kind of environment that could support life and whether or not there is any evidence of life in those samples," said Steve Squyres, a Mars program investigator at Cornell University.

If life never arose there, scientists also want to understand why not, how far the chemistry got, how the climate changed and whether it influenced formation of life.

The Mars program will eventually help NASA decide whether to put humans on martian soil. There has been talk of a July 2019 manned touchdown to mark the 50th anniversary of the Apollo 11 moon landing.

"Ultimately the nature of our questions will reach a level that we will need human explorers to obtain answers," Pilcher said.

Louis Friedman, executive director of The Planetary Society, compares the coming decade of Mars travel to the 16th and 17th centuries when England and Portugal sent explorers across the seas every few years. "We're going to hear about new discoveries all the time," he said.

NASA's martian blueprint imposes order on plans that until months ago were in disarray and shadowed by international failures. The $1 billion Mars Observer disappeared in space in 1993 and Russia's Mars 96 exploded, leaving NASA's modest Mars Pathfinder as the sole recent red planet success. Mars Global Surveyor has yet to begin its mapping.

On the more immediate horizon, NASA plans a Dec. 10 launch for the Mars Climate Orbiter -- part of the Mars Surveyor 1998 project, which should begin orbiting in September 1999. Next up will be the Mars Polar Lander, which is set for a Jan. 3 liftoff and should land at the planet's south pole on Dec. 3, 1999.

Last spring, scientists realized that the elaborate Athena rover, which was to be sent in 2001, was becoming too expensive and unwieldy to launch until 2003.

The decision to replace Athena in 2001 with Marie Curie, a spare copy of the Sojourner rover that roamed Mars last year, meant scientists would have to put hopes on hold.

However, Congress appropriated enough money to have the 2001 mission at least conduct experiments for NASA researchers contemplating human Mars travel, such as measuring radiation and soil toxicity and exploring on-site fuel production to power the flight home.

A silver lining emerged after NASA tapped Charles Elachi, director for Space and Earth Sciences at JPL, to bring together experts and restructure the Mars program. Their road map relies on robotic missions of increasing complexity as precursors to human travel.

Under the old concept, rovers would collect and stash samples and later vehicles would scoop up the best samples for study.

Under the new proposal, mini-MAVs would shoot rocks into Mars orbit as they're being collected. They would linger in space until the French orbiter can rendezvous with them.

"It's fantastic. By returning the samples from the live rover to the live ascent vehicle, the chances of success have gone up markedly," said Squyres, principal investigator on the Athena rover. "This ascent vehicle really saves the program."

By JANE E. ALLEN, AP Science Writer

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