

Visiting 'the death planet'

New rovers prepare for dangerous landing on Mars

By Andrew Bridges
THE ASSOCIATED PRESS

PASADENA, Calif. — After seven routine months of spaceflight, NASA is bracing for six minutes of high anxiety in January, when the twin rovers it launched earlier this year punch through the Martian atmosphere to land on the Red Planet.

Each of the unmanned, \$400 million rovers must be slowed from 12,000 mph to a complete stop within minutes after first plunging into the planet's tenuous atmosphere.

"Just getting to Mars is hard, but landing is more so," Ed Weiler, NASA's associate administrator for space science said Tuesday during a news briefing from Washington, D.C., that was broadcast to the Jet Propulsion Laboratory.

Landing the rovers safely requires the elaborately choreographed and fast-paced use of heat shields, parachutes, rockets and air bags. A strong gust of wind, or a single sharp rock, could destroy either or both rovers.

Two-thirds of all previous Martian missions have failed, including the last lander NASA launched, 1999's Polar Lander. A second mission, the Climate Orbiter satellite, also failed that year.

Just eight seconds before landing, the rovers will inflate enormous air bags, similar to those successfully used by 1997's Pathfinder spacecraft and the small Sojourner rover it carried, to cushion their arrival on the planet's surface.

"We could bounce about as high as a four-story building," project manager Peter Theisinger said.

The first of the rovers, Spirit, is scheduled to land Jan. 3 in Gusev Crater, a Connecticut-sized basin that may have held a brimming lake after it formed 4 billion years ago.

The second six-wheeled robot, Opportunity, should land Jan. 24, on the far side of the planet in Meridiani Planum, where mineralogical evidence indicates water once was present.

The camera- and instrument-laden rovers are designed to analyze Martian rocks and soil for additional clues that could reveal whether the planet was ever a warmer, wetter place capable of sustaining life.

"The easy parts of these missions are over. Now the tough part comes. Mars has been a most daunting destination. Some, including myself, call it 'the death planet,'" Weiler said.

Once the roving robotic field geologists have landed, NASA may not hear from them again for nearly 24 hours. In the meantime, the rovers should begin surveying their surroundings.

Even after the first pictures and data are received on Earth, it will take each rover at least nine days to become ready to roll off its lander and begin exploratory work in earnest, project scientist Joy Crisp said.

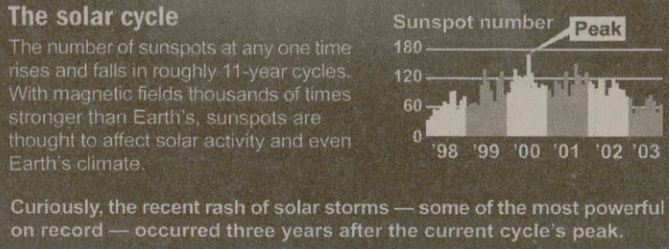
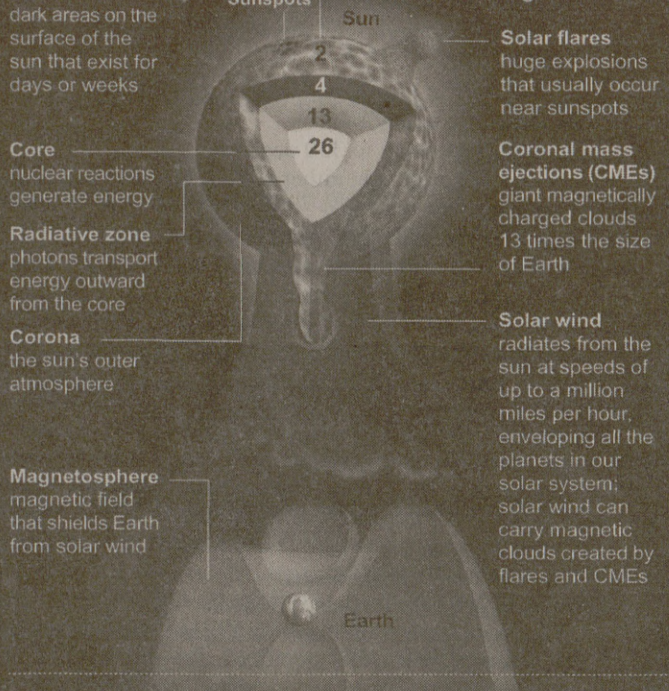
Steve Squyres, the mission's lead scientist, said any scientific payoff could be months away. Each mission is expected to last 90 days.

"This isn't a sprint. It's a marathon," Squyres said. "The best stuff may come in February, March or April. It may take a while."

The National Aeronautics and Space Administration has taken pains to publicize the risk inherent in space exploration since the loss of the 1999 Mars missions, as well as of the space shuttle Columbia and its crew earlier this year. It has also beefed up oversight of how its spacecraft are designed, built, tested and launched.

Shedding light on solar storms

The intense solar activity that erupted in mid-October could flare up again this week, possibly causing more electrical and radio disturbances on Earth. Astronomers have studied coronal mass ejections for decades and sunspots for centuries, but there is still much to learn about the solar phenomena's relationships to each other and to Earth.



SOURCE: NASA, N. Rapp, P. Santilli/AP

"Now people ask me, can we guarantee success? Of course not. We cannot do that. But on the other hand, I would say the team deserves it. Because they have done everything humanly possible that we know about to be able to minimize the risk and enhance our possibility of succeeding," JPL director Charles Elachi told reporters.

The rovers are part of an international armada, including Japanese and European orbiters and a British lander, all en route to Mars. Two other NASA satellites are already in orbit around the planet.

Mars trip encountering numerous obstacles

By David McHugh
THE ASSOCIATED PRESS

DARMSTADT, Germany — European space officials on Wednesday showed off the first pictures of Mars sent back by the Mars Express spacecraft as it heads for a Christmas rendezvous with the Red Planet.

The blurry pictures, taken from 3.36 million miles away, show little more than part of a polar ice cap. Instead, the images prove the spacecraft's German-made high-resolution camera is in working order before it begins orbiting Mars and snapping pictures close up.

The camera test, performed Monday, was one of many checks and rehearsals ahead of a sequence of intricate navigational maneuvers starting Dec. 19. That's when Mars Express will turn loose its British-built Beagle 2 lander toward the Martian surface on a mission to probe for signs of extraterrestrial life.

Mars Express will then steer away from a collision with the planet and on Dec. 25 will fire its main engine for about 30 minutes to put it into Martian orbit.

"We will have to carry out some very precise navigational operations," Gaelle Winters, the European Space Agency's director for technical operations and support, said at the agency's mission control center in Darmstadt in western Germany. "You will understand there is a certain level of tension in the center."

Previous attempts to find signs of life have been inconclusive. Of 34 unmanned American, Soviet and Russian missions to Mars since 1960, two-thirds ended in failure. In 1976, twin U.S. Viking landers searched for life but sent back inconclusive results.

Beagle 2 is not the only space craft heading to Mars. Two American Mars rover craft are due to arrive in January, and Japan's trouble-plagued Nozomi orbiter, launched in 1998, continues on its way despite technical problems.

The Mars Explorer, which cost about \$345 million, is an attempt to demonstrate that Europe can have an effective space exploration program.

The spacecraft, launched June 2 atop a Russian Soyuz-Fregat rocket from Kazakhstan, has weathered solar eruptions that bombarded it with high-energy particles last month, temporarily disrupting its computers.

In another hitch, solar panels are only generating about 70 percent of the electricity they were supposed to, but officials said that was not expected to derail the mission either.

Flight operations director Michael McKay said controllers have been using computer simulations to rehearse how to deal with potential obstacles.

If that happens, controllers figured out, the mission can use the craft's smaller maneuvering rockets.

"We have flown every possible contingency, and some impossible ones," McKay said.

The 143-pound Beagle 2 will use a robotic arm to gather and sample rocks for evidence of organic matter and water, while Mars Express orbits overhead.

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