

Spirit Rover Makes Successful Mars Landing

by Marsha Freeman

Seven months of nervous waiting and “six minutes of hell” ended well for more than 200 scientists and engineers late evening on Saturday, Jan. 3, when the first of two identical exploration rovers safely landed on Mars. The rovers—the *Spirit* and *Opportunity* mobile geologists—will explore different sites on opposite sides of the red planet, as the next step in NASA’s research effort to “follow the water” on Mars.

Across the Atlantic, a group of British scientists and engineers, while happy for their American colleagues, was suffering the disappointment of having most likely lost its *Beagle 2* lander somewhere on Mars. The diminutive spacecraft was to land on Christmas Day, but has not been heard from since.

Mars is known as a graveyard for spacecraft, referred to as “the death planet,” the “Bermuda Triangle” of the Solar System where spacecraft disappear. At the point when NASA’s *Spirit* rover was launched toward Mars on June 8, a total of 30 spacecraft had been sent there since the 1960s. Only 12 had succeeded, and two were then in transit. Since then, one of those, Japan’s *Nozomi* orbiter, missed Mars after suffering damage from solar flares during its traverse through the Solar System; and the other, the European *Beagle 2* lander, remains AWOL.

At a cadre school for organizers of his movement on Jan. 1 in Mainz, Germany, American Presidential candidate Lyndon LaRouche commented that the loss of *Beagle* “merely points up” the “fundamental problem” in the way space exploration is being approached. LaRouche is well known, internationally, for designing (in the mid-1980s) a 40-year program for

establishing a scientific research colony on Mars—especially through his one-hour 1984 television educational entitled “The Woman on Mars.”

The basic problem, LaRouche said, is that “in making anything work, you have to create the infrastructure that will support your effort.” He pointed out that “the further you go, the greater the distance you have to operate over, the larger part of the Solar System you’re operating in. . . . When you go from Earth to Mars . . . it’s not like taking the train, from someplace to someplace. You’re actually going through a very large part of the Solar System. . . . There are a lot of things going on there. This is not simply empty space. Electromagnetically, it’s very active”—a lesson recently learned again in the loss of the *Nozomi* spacecraft.

As the *Spirit* rover scientists also tried to make clear throughout the mission, LaRouche emphasized, “You’re going to an unknown destination—that is, you don’t know what you’re going to find when you get there. That’s why you’re going there!” This means that what you must do “is build a fail-safe logistical system first, which can deliver and support these kinds of [spacecraft], so if one fails, you’re immediately in place to make the next one.” And, once you have sent astronauts to Mars, LaRouche cautioned, “and they’re distressed, how are you going to rescue them? You’d better have a system out there, which can anticipate that problem and deal with it.” The problem, particularly with *Beagle 2*, was the “el cheapo” approach, LaRouche advised, without the “human infrastructure for space exploration,” or “the supporting systems planted all over the place.”

The “el cheapo” *Beagle 2* lander was added to the Mars Express orbiter mission by a team of British scientists. With no European Space Agency backing, they decided to raise the funds themselves. When they ran short of resources, the British government bailed them out, but the stripped-down lander had no redundancy in its systems. While managers bragged about how cheap the rover was, in fact, it had little chance of success.

Lessons Learned

During the 1990s, under the regime of former NASA Administrator Dan Goldin, the policy of “faster, better, cheaper”



NASA’s *Spirit* rover is now perched inside Gusev crater on the red planet, getting ready to start its three-month exploration of the planet’s geological past.

was introduced, to try to accommodate massive layoffs and budget cuts in the space agency, thanks to Vice President Al Gore's "reinventing government" program. This insane policy led to a string of planetary mission failures, and also contributed to the Columbia Space Shuttle accident last Feb. 1.

The 1999 Mars Climate Orbiter was lost near Mars, and two months later, the 1999 Mars Polar Lander disappeared. The space agency learned its lesson: building up the infrastructure would be the next step. The following Mars launch opportunity placed the 2001 Odyssey spacecraft into orbit, where it joined the Mars Global Surveyor, which was already there. These two remote sensing spacecraft have assured ready, and multiply-redundant communication between Earth and the *Spirit* rover, increasing the chances of mission success, and assuring that mission controllers would know what happened to the rover, should the mission fail.

The rovers themselves, at a cost of more than \$400 million each, have multiply-redundant systems, hazard avoidance techniques, and were sent as a pair to lower the risk. "Cheaper" was not the organizing principle of this mission; success was.

So far, even from its perch at the landing site, *Spirit* is challenging scientists to understand more about Mars. Its home in Gusev crater shows: evidence of water flow into the depression; rocks strewn about that have had their surfaces scoured by wild dust storms and "dust devils"; inviting hills in the distance; and a shallower depression the scientists have dubbed "Sleepy Hollow," which may be a secondary crater.

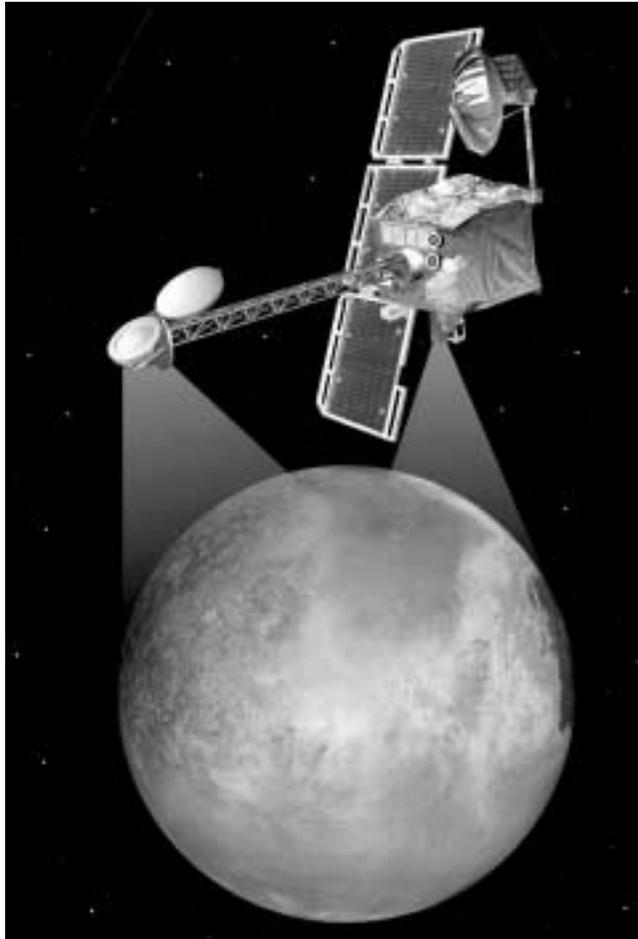
Scientists hope also to determine if there are volcanic rocks and ash at the site, rocks that have been deposited inside the crater by water flowing into it, and evidence of subsurface ice.

When it rolls off the lander and starts its three-month sojourn around Gusev crater, *Spirit* will be intensively examining the rocks and soil, to see if there is evidence of persistent, or standing, liquid water at this site. The program to "follow the water" on Mars, is one of determining if the conditions for the flourishing of life existed in the red planet's past.

The Right Steps

NASA is embarked on a series of unmanned Mars exploration missions through the rest of the decade which will help scientists reduce the number of "unknowns" about the red planet, and build up the communications and other infrastructure. But there are no missions planned for the next steps—to bring samples of Mars back to Earth, leading up to sending people there.

For the past month, pundits and space-watchers have spread rumors that President George Bush will announce a visionary program for NASA, possibly during the State of the Union address later this month, and possibly to include a manned mission to Mars. All of them agree, however, that



Following the loss of an orbiter and lander at Mars in 1999, NASA refocused its exploration program to infrastructure-building in Mars orbit. The Mars Odyssey spacecraft, depicted here, along with the orbiting Mars Global Surveyor, helped increase the chance of success for the Spirit rover.

such an effort would have to "fit" within the current, tightly constrained NASA budget. The Mars Society has been promoting a "quick and cheap" manned Mars project, based on building *no* infrastructure, which would, in fact, most likely result in a one-way trip for the crew.

LaRouche has proposed an effort for Mars exploration, as he explained, which takes "40 years to do it. Why? Because I went through, step by step, the logistical basis you have to build up, to make" each step—starting with the industrial development of the Moon. This approach, LaRouche explained, is how people in the space program "had gone through this, in the Moon" mission during the Apollo project. This sustained effort creates milestones at each step, laying the basis for the next.

The alternative, as the difference between the *Spirit* and *Beagle 2* missions make clear, is to "sneak some small object, at the lowest price, into some destiny, and hope it works! It probably won't."