SPACE SCIENCE

Flotilla Is Heading to Mars Seeking End to Data Drought

A Zen-like patience is a prerequisite for planetary scientists. Next summer, if all goes well, the first Mars data in 15 years will begin streaming back to Earth thanks to three missions launched within a 4-week period this month and next. The spacecraft—NASA's Global Surveyor, launched last week; Russia's Mars '96, scheduled for 16 November; and NASA's Mars Pathfinder, planned for 2 December—herald the start of an impressive flotilla of U.S., Japanese, and Russian spacecraft headed for Mars in the next decade. If they succeed, they will also help ease the bad memories of ill-fated U.S. and Russian probes.

A new era of exploration is, however, far from assured. NASA managers are betting that possible evidence of life in a Martian meteorite will protect the U.S. missions from a budget knife hanging over the space agency. Their hopes are also riding on innovative technology that is intended to prevent a repeat of the 1992 explosion that destroyed the $500 million Mars Observer shortly before its arrival and shook the confidence of politicians and the research community.

For Russian space scientists, the Mars '96 probe could revitalize their flagging field and reverse a long string of unsuccessful missions to Mars. The last was a 1988 flight to Mars's companion, Phobos, that ended abruptly when one satellite was lost due to a ground-control error, and a second went dead within sight of the moon. But the pressure is on: Russia has already abandoned plans for a 1998 mission, and there is no funding yet for one proposed in 2001, says Lev Mukhin, a planetary scientist who serves as senior science and technology counselor at the Russian embassy in Washington. Last week, a Russian Academy of Sciences panel discussed the 2001 Russian mission and the possibilities for conducting it jointly with the United States.

Japan, meanwhile, intends to send one modest satellite to the Red Planet in 1998, while cash-strapped Europe has abandoned a proposal to build a network of sensors on Mars to relay scientific data back to Earth. Instead, European researchers are putting a handful of their own instruments aboard U.S. and Russian spacecraft.

The three missions blasting off this fall will seek data on Martian climate changes and the planet's dramatic geology. "These are not missions designed to look for life," says Wes Huntress, NASA's space science chief. "We want to ask broad, general questions up front until we learn enough to ask more specific questions." Once the satellites reach their target, an extensive array of instruments—in Martian orbit, on ground-based landers, and attached to tiny rovers—will probe, pick at, and penetrate the planet. A second wave is slated for 1998, when the Earth and Mars are again favorably aligned, followed by 2001 and 2003 launches culminating in an effort to bring Martian rocks and soil back to Earth for analysis.

NASA is still debating the details of returning samples. Huntress says one option is a 2003 mission to gather rocks in one place, followed 2 years later by a ship to bring them back to Earth. But researchers insist there is no rush, citing the importance of pinpointing which rocks would yield the most clues to possible Martian life. "We have a lot of science to do before we bring back a sample," says NASA Administrator Dan Goldin.

The quantity and quality of that science hinge on the success of the landers, orbiters, and small rovers that will gather the data in coming years. Their success, in turn, could pave the way for human flights—"if we do the right things and figure out how people could go to Mars cheaply," says Goldin. A NASA document presented recently to the agency's advisory council suggests such a landing in 2011.

In the short term, however, modest successes in delivering the current batch of robots to Mars would go a long way to lifting the curse of the Red Planet that has plagued would-be Martian explorers since the 1976 launch of the Viking mission.

–Andrew Lawler

With additional reporting by Gretchen Vogel.