

Scientists work to free Mars rover Spirit

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Free Spirit logo

(PhysOrg.com) -- In the past several weeks, scientists at NASA's Jet Propulsion Laboratory finished experimentation on methods to get the rover Spirit unstuck from its location near a plateau called Home Plate.

The international campaign to "Free Spirit" -- complete with a dramatic logo -- sounds like a rallying cry around a political prisoner. It's actually a months-long, painstaking effort to extract Spirit, the long-lasting [Mars exploration rover](#), from a patch of treacherous Martian soil.

"Free Spirit" may be coming to a head soon. In the past several weeks, scientists at NASA's Jet Propulsion Laboratory finished experimentation on methods to get the rover unstuck from its location near a plateau called Home Plate. This has involved many hours of maneuvering a [test](#)

[rover](#) back on Earth in a manufactured patch of soil. Spirit has not moved since May 6.

The team is about to submit its plan to free Spirit -- a carefully crafted driving maneuver -- to a team of outside experts. After a review by NASA headquarters, the team hopes this final push can free the trapped rover. Cornell's Steve Squyres, principal scientific investigator of the Mars Exploration Rover mission, says he is not "wildly optimistic," especially since Spirit lost the use of its right front wheel about 800 days into the expected 90-day mission.

"We're in a pretty bad fix," Squyres said. "If we had six good wheels -- if this were a young rover -- we could power our way out of this. But with this dead wheel, it makes it really hard, and we've been living on borrowed time for a while."

But as long as Spirit is capable of doing more science, they're not giving up on it. While immobile, the rover has been collecting data on the fine, white soil it's stuck in using all its instruments, including one called a Mössbauer [spectrometer](#). That instrument is much less powerful than it was five and a half years ago, when Spirit first touched down, but it still works, albeit slowly. With Spirit's long stay at its current location, the team has acquired good Mössbauer data, Squyres said.

In the meantime, the rover Opportunity, on the opposite side of the planet, is continuing its journey toward Endeavour Crater.

The 20-kilometer-wide, 100-meter-deep crater's rim, as observed from orbit, contains the oldest rocks Opportunity has yet seen, Squyres said. It also contains clay minerals, which form on Earth as the result of action with water.

"If we can get to Endeavor, it will be like a whole new mission," he said.

Opportunity also just finished analyzing an iron meteorite, dubbed Block Island, that could hold clues as to how water on [Mars](#) might have contributed to its weathering process. It is now looking at a new iron meteorite called Shelter Island.

Provided by Cornell University

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