



News Release

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BOULDER SCIENTIST WILL EXPLORE MARS WITH NEW ROVERS

Geologist William Farrand, a researcher at the Space Science Institute of Boulder, Colo., is part of a NASA science team that will use two new rovers to explore the surface of Mars beginning in January 2004.

NASA launched the two identical Mars Exploration Rovers – dubbed Spirit and Opportunity – in June and July 2003. Spirit is scheduled to land on January 3 at about 11:35 p.m. EST. Opportunity's landing is slated for January 25, at about 12:05 a.m. EST. The rovers will bounce to an airbag-assisted landing using the same technology pioneered by the 1997 Mars Pathfinder mission.

"The mission's objective is to go to sites where there is evidence that water has acted in the past and to try to get a better idea of what role water has played in the geologic history of Mars," Farrand said.

The two distinct sites which the rovers will visit are Gusev crater, believed to be the site of an ancient lake and Meridiani Planum, a region that has deposits of gray hematite, which is a type of iron oxide often associated with water-lain mineral deposits.

Scientists will identify interesting rocks for the rovers to visit in part using stereo imaging cameras – a system called the "Pancam" for short. The two cameras are positioned about five feet above the ground and give researchers a three-dimensional, panoramic view of the scene around the rover. Farrand is a Payload Downlink Lead for the Pancam instrument. He will use his expertise in spectroscopy – which uses light to discover what materials are present in the scene – to check the quality and perform preliminary processing of the Pancam data as it arrives from Mars.

Because Mars will be more than 100 million miles from Earth during the rover missions, it can take more than 15 minutes for commands from Earth to reach Mars, and the same amount of time to receive the rovers' reply.

"A couple of times each Martian day, which is called a sol, the science team members for each rover meet to decide where it might be interesting to send the rovers next," Farrand said. "Using the rovers' stereoscopic cameras, we build a 3-D image of the terrain, so that when we have a 'drive-sol' where the rover is going to be moving, we are able to send a series of commands, like 'drive forward 3 meters, turn right 1 meter, go forward 4 meters.'" The rover can also be commanded to drive to a specific location and use its hazard-detecting cameras and onboard intelligence to navigate itself around obstacles to get there.

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Farrand hopes to find mineralogic and geologic evidence to support theories for how some of Mars' intriguing mineral deposits formed. "For instance," he said, "we know the type of hematite at Opportunity's landing site is usually associated with past activity by water. If we could determine definitively the origin of that hematite, I think that would be a big success. Also, since the rovers are landing on opposite sides of Mars, it will be highly instructive to compare one landing site with the other."

Farrand also is participating in a student intern program related to the mission in which he mentors a teacher and two students from Centaurus High School in Lafayette, Colo.

Farrand grew up in Long Valley, N.J. He received a Bachelor's degree in Geology from Franklin & Marshall College in Lancaster, Penn.

The Mars Exploration Rover program is managed for the NASA Office of Space Science by the Jet Propulsion Laboratory, a division of the California Institute of Technology, in Pasadena, Calif.

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