Mars Orbiter Sees Rover Tracks Among Thousands of New Images

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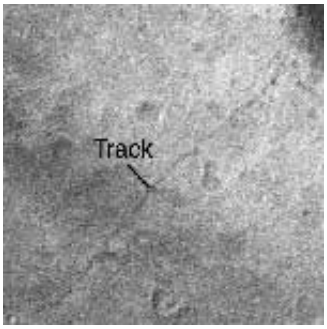


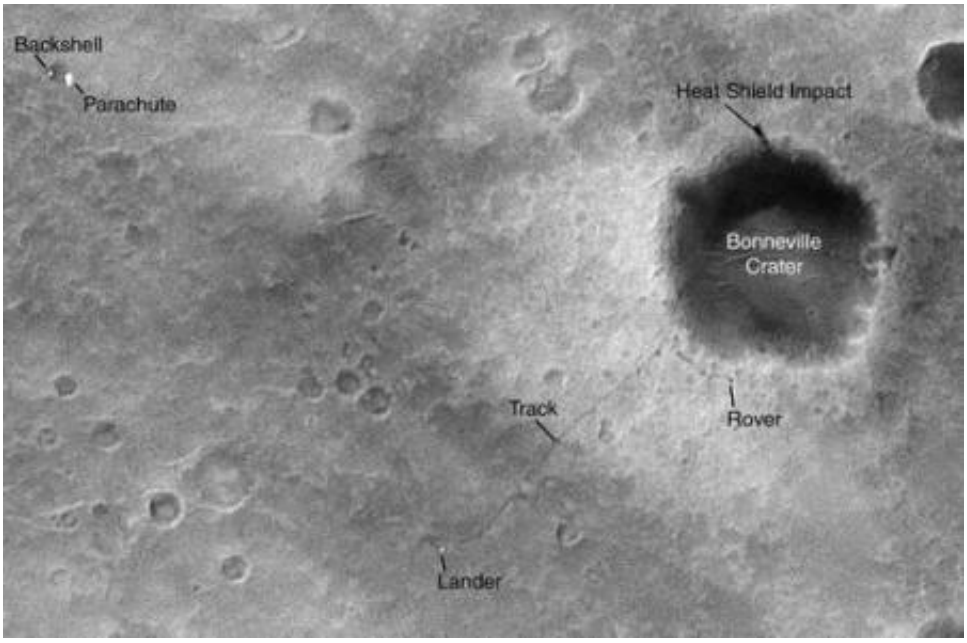
NASA's Mars Global Surveyor, starting its third mission extension this week after seven years of orbiting Mars, is using an innovative technique to capture pictures even sharper than most of the more than 170,000 it has already produced.

One dramatic example from the spacecraft's Mars Orbiter Camera shows **wheel tracks of NASA's Mars Exploration Rover Spirit and the rover itself**. Another tells scientists that no boulders bigger than about 1 to 2 meters (3 to 7 feet) are exposed in giant ripples created by a catastrophic flood.

In addition, about 24,000 newly catalogued images that Mars Global Surveyor took between October 2003 and March 2004 have been added to the Mars Orbiter Camera Image Gallery at http:

//www.msss.com/moc_gallery/. These include additional pictures of the Mars Exploration Rover sites seen from orbit.

"Over the past year and a half, the camera and spacecraft teams for Mars Global Surveyor have worked together to develop a technique that allows us to roll the entire spacecraft so that the camera can be scanned in a way that sees details at three times higher resolution than we normally get," said Dr. Ken Edgett, staff scientist for Malin Space Science Systems, San Diego, Calif., which built and operates the Mars Orbiter Camera. The technique adjusts the rotation rate of the spacecraft to match the ground speed under the camera.



Wheel tracks left by NASA&acutes Mars Exploration Rover Spirit, and even the rover itself, are visible in this image from the Mars Orbiter Camera on NASA&acutes Mars Global Surveyor orbiter. North is up in this image.

"The image motion compensation is tricky and the spacecraft does not always hit its target. However, when it does, the results can be spectacular," Edgett said.

The Mars Orbiter Camera acquires the highest resolution images ever obtained from a Mars-orbiting spacecraft. During normal operating conditions, the smallest objects that can be resolved on the martian surface in these images are about 4 to 5 meters (13 to 16 feet) across. With the adjusted-rotation technique, called "compensated pitch and roll targeted observation," objects as small as 1.5 meters (4.9 feet) can be seen in images from the same camera. Resolution capability of 1.4 meters (4.6 feet) per pixel is improved to one-half meter (1.6 feet) per pixel. Because the maneuvers are complex and the amount of data that can be acquired is limited, most images from the camera are still taken without using that technique.

Mars Global Surveyor began orbiting Mars on Sept. 12, 1997. After gradually adjusting the shape of its orbit, it began systematically mapping the planet in March 1999. The Mars Orbiter Camera's narrow-angle camera has now examined nearly 4.5 percent of Mars' surface, including extensive imaging of candidate and selected landing sites for surface missions. The Mars Orbiter Camera also includes a wide-angle camera that observes the entire planet daily.

"Mars Global Surveyor has been productive longer than any other spacecraft ever sent to Mars, since it surpassed Viking Lander 1's longevity earlier this year and has returned more images than all past Mars missions combined," said Tom Thorpe, project manager for Mars Global Surveyor at NASA's Jet Propulsion Laboratory, Pasadena, Calif. The mission will complete its 25,000th mapping orbit on Oct. 11.

Principal goals for the orbiter's latest mission extension, beginning Oct. 1, include continued weather monitoring to form a continuous set of

observations with NASA's next Mars mission, Mars Reconnaissance Orbiter, scheduled to reach the red planet in 2006; imaging of possible landing sites for the Phoenix 2007 Mars Scout lander and 2009 Mars Science Laboratory rover; continued mapping and analysis of key sedimentary-rock outcrop sites; and continued monitoring of changes on the surface due to wind and ice. Because the narrow-angle camera has imaged only a small fraction of the surface, new discoveries about surface features are likely to come at any time. The extension runs two years, through September 2006, with a budget of $7.5 million per year.

Dr. James Garvin, NASA's chief scientist for Mars and the Moon, said, "Mars Global Surveyor continues to catalyze new science as it explores Mars at scales compatible with those that our Mars Exploration Rovers negotiate every day, and its extended mission will continue to set the stage for upcoming observations by the Mars Reconnaissance Orbiter."

Source: NASA