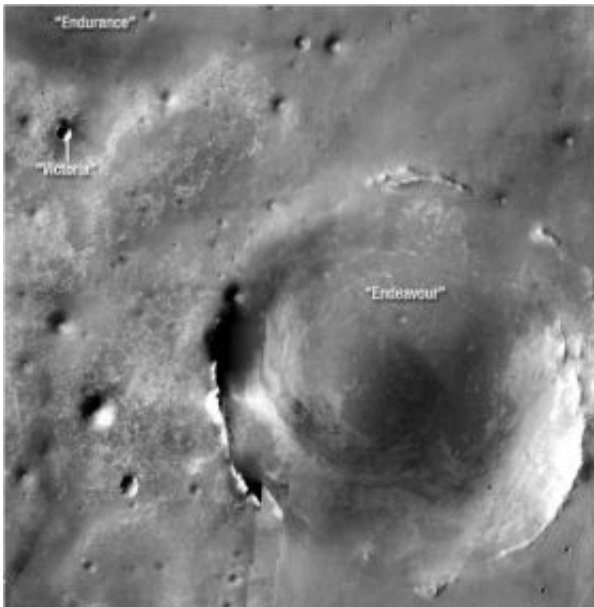


Mars Rover Opportunity To Head Toward Bigger Crater

September 22 2008



The team operating NASA's Mars Exploration Rover Opportunity has chosen southeast as the direction for the rover's next extended journey, toward a crater more than 20 times wider than "Victoria Crater." Image credit: NASA/JPL/ASU

(PhysOrg.com) -- NASA's Mars Rover Opportunity is setting its sights on a crater more than 20 times larger than its home for the past two years.

To reach the crater the rover team calls Endeavour, Opportunity would need to drive approximately 7 miles to the southeast, matching the total

distance it has traveled since landing on Mars in early 2004. The rover climbed out of Victoria Crater earlier this month.

"We may not get there, but it is scientifically the right direction to go anyway," said Steve Squyres of Cornell University, principal investigator for the science instruments on Opportunity and its twin rover, Spirit. "This crater is staggeringly large compared to anything we've seen before."

Getting there would yield a look inside a bowl 13.7 miles across. Scientists expect to see a much deeper stack of rock layers than those examined by Opportunity in Victoria Crater.

"I would love to see that view from the rim," Squyres said. "But even if we never get there, as we move southward we expect to be getting to younger and younger layers of rock on the surface. Also, there are large craters to the south that we think are sources of cobbles that we want to examine out on the plain. Some of the cobbles are samples of layers deeper than Opportunity will ever see, and we expect to find more cobbles as we head toward the south."

Opportunity will have to pick up the pace to get there. The rover team estimates Opportunity may be able to travel about 110 yards each day it is driven toward the Endeavour crater. Even at that pace, the journey could take two years.

"This is a bolder, more aggressive objective than we have had before," said John Callas, the project manager for both Mars rovers at NASA's Jet Propulsion Laboratory in Pasadena, Calif. "It's tremendously exciting. It's new science. It's the next great challenge for these robotic explorers."

Opportunity, like Spirit, is well past its expected lifetime on Mars, and

might not keep working long enough to reach the crater. However, two new resources not available during the 4-mile drive toward Victoria Crater in 2005 and 2006 are expected to aid in this new trek.

One is imaging from orbit of details smaller than the rover itself, using the High Resolution Imaging Science Experiment (HiRISE) camera on NASA's Mars Reconnaissance Orbiter, which arrived at the Red Planet in 2006.

"HiRISE allows us to identify drive paths and potential hazards on the scale of the rover along the route," Callas said. "This is a great example of how different parts of NASA's Mars Exploration Program reinforce each other."

Other advantages come from a new version of flight software uplinked to Opportunity and Spirit in 2006, boosting their ability to autonomously choose routes and avoid hazards such as sand dunes.

During its first year on Mars, Opportunity found geological evidence that the area where it landed had surface and underground water in the distant past. The rover's explorations since have added information about how that environment changed over time. Finding rock layers above or below the layers already examined adds windows into later or earlier periods of time.

Provided by NASA

Citation: Mars Rover Opportunity To Head Toward Bigger Crater (2008, September 22)
retrieved 25 April 2024 from
<https://phys.org/news/2008-09-mars-rover-opportunity-bigger-crater.html>

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