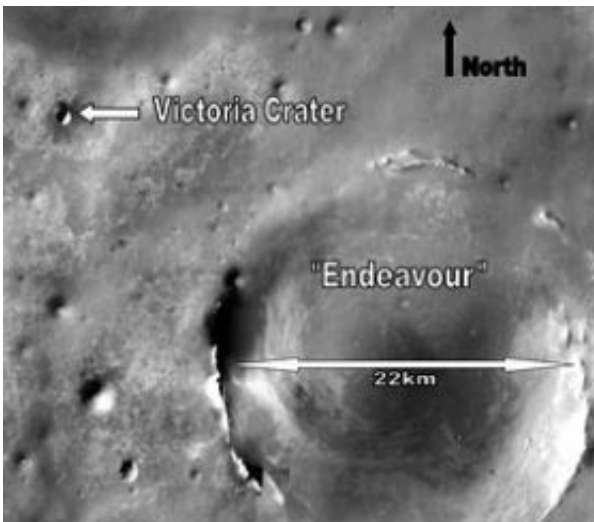


Mars rover Opportunity sets out on its greatest journey yet

September 25 2008



The Mars rover Opportunity, currently located near the northwestern rim of Victoria Crater, is headed next for a massive crater the rover team unofficially calls "Endeavour." The image was taken from orbit by the THEMIS instrument on NASA's Mars Odyssey spacecraft. Image: NASA/JPL/ASU

(PhysOrg.com) -- The Mars rover Opportunity, which has just crawled out of the 800-meter-wide (875 yards) Victoria Crater is setting out on the longest journey of its life. It will take the rover roughly two years of driving at its top speed -- up to 100 meters (109 yards) a day -- to reach its new target, a crater 20 times the size of Victoria that the Mars Exploration Rover team has unofficially dubbed "Endeavour."

But there's a survival problem. Opportunity is already four years past its warranty -- NASA's Sept. 22 announcement was made on day 1,658 of Opportunity's original 90-day mission. Despite its age, though, Opportunity has proved itself capable of driving and doing science on Mars. Its twin, Spirit, on the other side of the planet, is still alive as well, although one of its six wheels no longer functions.

To get to the 22 kilometer-wide crater (nearly 14 miles), Opportunity will need to drive 11 kilometers (nearly 7 miles) to the southeast -- that's equal to the total distance the rover has traveled since it landed on Mars in January 2004.

If Opportunity makes it to the crater, the view should be spectacular, said Steve Squyres, principal investigator of the Mars Exploration Rover mission and Cornell's Goldwin Smith Professor of Astronomy.

"It's the deepest window into the subsurface of Mars that we could possibly ever see," Squyres said. "I have no idea whether we'll make it, but scientifically, it's the right direction to go whether we make it or not."

Because the rock layers at Meridiani Planum (the region of Mars that Opportunity has been exploring) are older in the north and get younger toward the south, Opportunity should encounter younger and younger rock layers -- and Squyres thinks that alone could make the drive worthwhile.

No matter what Opportunity finds, the new plan is exciting the Cornell-based rover operations team.

"It's bold, it's challenging, and it's going to be fun. It's going to push the team to get better and better at what we do just to have a chance of making it," Squyres said.

Opportunity's journey to Victoria Crater was a long haul, as well; the rover traveled 6.5 kilometers (4 miles) over ripples of loose sand -- sometimes getting stuck in them -- before reaching the edge of the crater.

This time around, the rover team has some new resources that should make Opportunity's drive easier. One is a software package uploaded to both rovers in 2006 that will help them autonomously choose safe driving routes.

Another advantage is the HiRISE instrument on NASA's Mars Reconnaissance Orbiter -- a camera so powerful it can image the rovers from orbit -- that arrived at Mars in 2006. With its impressively high-resolution images, the team can identify potential hazards along Opportunity's route before the rover encounters them.

Nonetheless, Squyres believes that driving an aging Opportunity to what will probably be its final goal "will be one of the hardest things anyone's ever tried to do on Mars."

Provided by Cornell University

Citation: Mars rover Opportunity sets out on its greatest journey yet (2008, September 25)
retrieved 25 April 2024 from

<https://phys.org/news/2008-09-mars-rover-opportunity-greatest-journey.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.