

# NASA rover prepares for 5th winter on Mars

7 December 2011, By ALICIA CHANG , AP Science Writer



This image provided by NASA shows a fragment along the rim of Endeavour Crater where the Mars rover Opportunity has been exploring since August. With Martian winter approaching, Opportunity has been in search of a spot to spend the winter. (AP Photo/NASA)

NASA's lone surviving Mars rover has been busy exploring its surroundings since it rolled up to its latest crater destination four months ago. Now the solar-powered, six-wheel Opportunity is in search of a place to hunker down for the winter.

The robot geologist has been scouting out sites along the crater rim that not only have interesting rocks to examine but also ample sunshine. The hardy rover survived four previous Martian winters. Scientists expect no different and even drew up a to-do list.

Opportunity will "keep active all winter long," said Bruce Banerdt, rover project scientist at NASA headquarters.

Among its chores: studying bedrock and soil at its chosen winter site. While Opportunity can drive short distances from one outcrop to another, it can't venture far in the cold.

It's a bittersweet juncture for Opportunity, which along with its twin, Spirit, landed on opposite sides of the red planet in January 2004. Both operated beyond their original three-month mission and

found geologic evidence that Mars was warmer and wetter than it is today.

Spirit suddenly stopped communicating with Earth last year, shortly after it became stuck in fluffy sand. NASA diligently listened for any sign from Spirit and finally gave up this past spring.

Despite Spirit's demise, Opportunity continued to trek across the Martian plains and arrived at the western rim of Endeavour Crater in August. The rover has wowed scientists with discoveries at the site, which includes rocks and soil unlike any it has encountered during its years roaming the planet.

Opportunity recently uncovered a mineral deposit that formed from water flowing out of volcanic rocks.

Chief scientist Steve Squyres of Cornell University called it the "single most powerful piece of evidence" that Opportunity has found so far of liquid water existing on Mars long ago.

The finding was presented Wednesday at a meeting of the American Geophysical Union in San Francisco.

With a little over 21 miles on its odometer, Opportunity is showing some wear, including an arthritic shoulder, but is otherwise in good health.

"It's going on eight years, but we're not done yet," said Ray Arvidson, the mission deputy scientist from Washington University in St. Louis.

Opportunity will soon get some company on the surface. NASA launched its latest spacecraft to Mars last month, a mega-rover named Curiosity that's set to land next summer.

The \$2.5 billion mission will study a mountain inside a crater to determine whether the environment was conducive for microbial life.

**More information:** Mars mission:

<http://marsrover.nasa.gov/home/index.html>

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