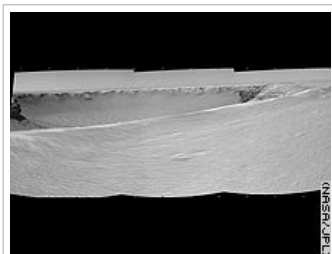


# What an Opportunity! Mars rover reaches new milestone

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Opportunity reached the rim of Victoria Crater with a 26-meter (85-foot) drive during the rover's 951st Martian day.

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**ATLANTA, Georgia (CNN)** -- Nearly three years after landing on Mars, the rover "Opportunity" has reached a region of the planet that may provide the best clues yet about the history of the red planet.

The golf cart-sized robot is now overlooking Victoria Crater, half a mile wide, 230 feet deep. NASA has just released pictures of the area transmitted by Opportunity.

"The thing we've been looking forward to is to dig deeper into the Martian crust," said Bruce Banerdt, Mars Exploration Rover Project Scientist at the Jet Propulsion Laboratory in Pasadena, California. ([Watch Opportunity's pictures from the crater -- 2:56](#))

"For geologists, deeper usually means farther back in time. By going down deeper, in a place five times bigger than the last crater, we hope to see the history of Mars."

But for Banerdt and about 50 other scientists working on the project, what is just as amazing as what may come out of Victoria Crater is the fact that Opportunity, and its sister rover Spirit, are still going strong nearly 1,000 days into their field work on Mars.

The longevity of the little robots is beyond the wildest dreams of some working on the project. ([Watch how the rovers go about their work -- 4:09](#) )

"We would have been happy with 30, maybe 90 days," said Ray Arvidson, deputy principal investigator for Spirit and Opportunity. Arvidson is based at Washington University in St. Louis, Missouri.

The two rovers are working on opposite sides of the planet. Both are outfitted with the basic tool kit of a field geologist, gathering information on rock formations, soil, and atmosphere.

The Victoria Crater will be the third region examined by Opportunity, and could provide the best evidence that water, and perhaps life, could have existed there. ([Explore the crater](#))

Opportunity first examined rock layers inside the Eagle Crater, near its landing spot January 24, 2004. Geological evidence gathered there showed that water had once flowed there, and wind had once blown there.

"Rocks we've seen everywhere were formed in shallow lakes," said Arvidson. "At some time they were in contact with water. And the older you go, there's more evidence that this liquid was close to the surface," he said.

The second destination was a crater called Endurance, where Opportunity spent nine months examining exposed layers of rock about 23 feet thick.

"Lo and behold, it looked like shallow lakes. Water was definitely involved, possibly on the surface," said Arvidson.

Then, on its trek from Endurance to Victoria, the rover documented wind and water activity with shifting dunes and rising and falling levels of groundwater. Analysis of the minerals found there showed the ancient water was acidic.

The rock formations in Victoria Crater are thicker still, and older than the two areas already examined. That will likely give scientists the ability to look even further into the planet's past.

In examining the three craters so far, Opportunity has logged 5.7 miles. Spirit has traveled 3.7 miles. The rovers can move about 44 yards per day.

Arvidson says for the scientists working on the rovers, every day they are still working "is like another day for a kid in a candy store."

"We don't have major discoveries every week. But we do expect some major new discoveries when we get inside Victoria," he said.

Among the surprises: The rovers have stumbled upon three meteorites, metallic masses made of nickel and iron that had fallen to the planet's surface from somewhere else in outer space.

And to show how genuinely surprised scientists are at the long duration of the rovers, scientists recently had to solve a problem similar to the "Y2K" crisis of 1999-2000. In the latest revision of software sent to the rovers, programmers had to add a fourth digit to the assignment of tasks for each Mars day. When the rovers were designed, no one could imagine they would still be thriving more than 999 sols, or Mars days.

Is that a good kind of problem to have?

"Absolutely!" said Banerdt.

Banerdt said Spirit and Opportunity were designed to work interactively with scientists, and to question and even refuse commands that they interpret as dangerous to their survival.

"We built them to be very conservative, to question our commands," said Banerdt. "First they check to make sure the commands were not corrupted in transmission. After that, they have quite a bit of autonomy. They can take paths we did not program into them. They can go around rocks, back up, turn. There's a lot of artificial intelligence that's been delivered into these," he said.

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