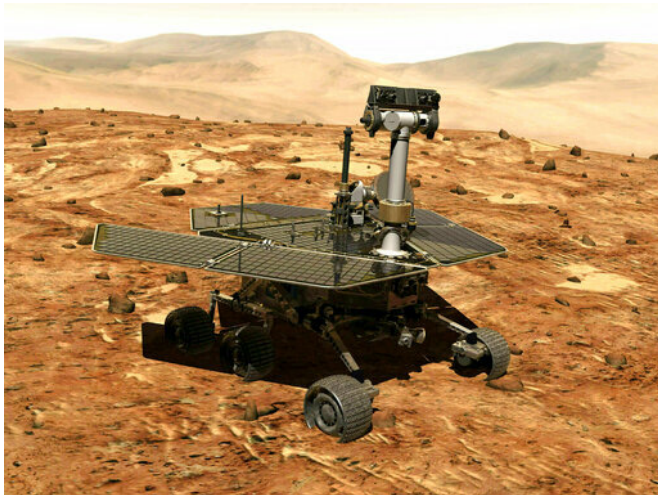


NASA about to pull plug on Mars rover, silent for 8 months

13 February 2019, by Marcia Dunn



This illustration made available by NASA shows the rover Opportunity on the surface of Mars. The exploratory vehicle landed on Jan. 24, 2004, and logged more than 28 miles (45 kilometers) before falling silent during a global dust storm in June 2018. There was so much dust in the Martian atmosphere that sunlight could not reach Opportunity's solar panels for power generation. (NASA via AP)

NASA is trying one last time to contact its record-setting Mars rover Opportunity, before calling it quits.

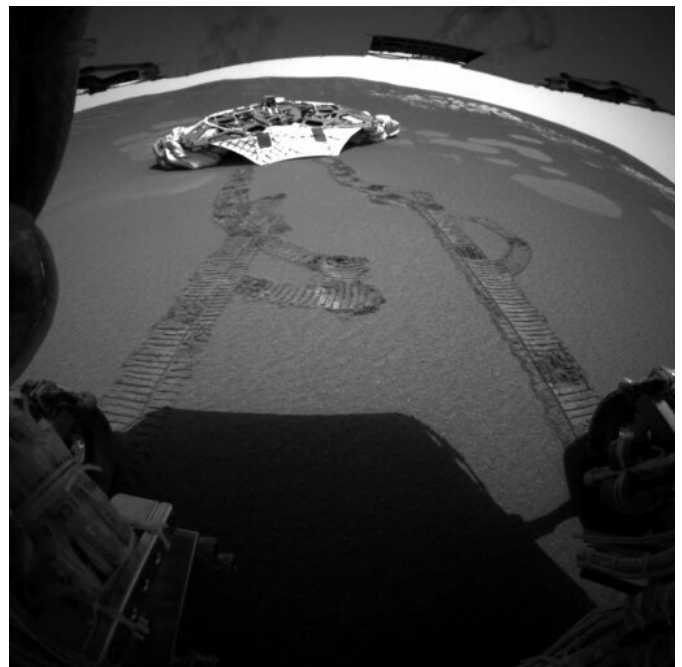
The rover has been silent for eight months, victim of one of the most intense dust storms in decades. Thick dust darkened the sky last summer and, for months, blocked sunlight from the spacecraft's solar panels.

NASA said Tuesday it will issue a final series of recovery commands, on top of more than 1,000 already sent. If there's no response by Wednesday—which NASA suspects will be the case—Opportunity will be declared dead, 15 years after arriving at the red planet.

Team members are already looking back at Opportunity's achievements, including confirmation water once flowed on Mars. Opportunity was, by far, the longest-lasting lander on Mars. Besides endurance, the six-wheeled rover set a roaming record of 28 miles (45 kilometers.)

Its identical twin, Spirit, was pronounced dead in 2011, a year after it got stuck in sand and communication ceased.

Both outlived and outperformed expectations, on opposite sides of Mars. The golf cart-size rovers were designed to operate as geologists for just three months, after bouncing onto our planetary neighbor inside cushioning air bags in January 2004. They rocketed from Cape Canaveral a month apart in 2003.



This photo released Thursday, Feb. 5, 2004 made by one of the rear hazard-avoidance cameras on NASA's Opportunity rover, shows Opportunity's landing platform, with freshly made tracks leading away from it.

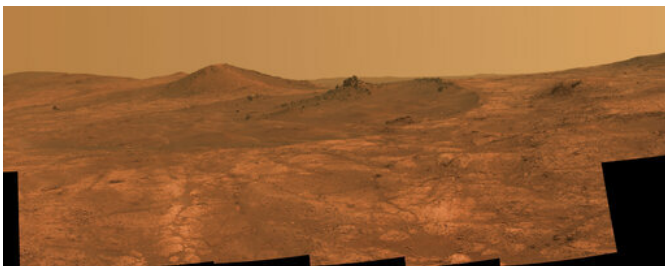
Opportunity rolled about 11 feet on Thursday, the first day it has moved since it left the lander on Saturday. Engineers commanded Opportunity to turn slightly during the drive, to test how it steers while rolling through the martian soil. (NASA/JPL via AP)

It's no easier saying goodbye now to Opportunity, than it was to Spirit, project manager John Callas told The Associated Press.

"It's just like a loved one who's gone missing, and you keep holding out hope that they will show up and that they're healthy," he said. "But each passing day that diminishes, and at some point you have to say 'enough' and move on with your life."

Deputy project scientist Abigail Fraeman was a 16-year-old high school student when Opportunity landed on Mars; she was inside the control center as part of an outreach program. Inspired, Fraeman went on to become a planetary scientist, joined NASA's Jet Propulsion Laboratory in Pasadena, California, and ended up deputy project scientist for Opportunity.

"It gives you an idea just how long this mission has lasted," she said. "Opportunity's just been a workhorse ... it's really a testament, I think, to how well the mission was designed and how careful the team was in operating the vehicle."



This composite of March 2015 photos made available by NASA shows a shallow crater called Spirit of St. Louis, about 110 feet (34 meters) long and about 80 feet (24 meters) wide, with a floor slightly darker than surrounding terrain. The rocky feature toward the far end of the crater is about 7 to 10 feet (2 to 3 meters) tall, rising higher than the crater's rim. (NASA/JPL-Caltech/Cornell University/Arizona State University via AP)

Rather than viewing the dust storm as bad luck, Callas considers it "good luck that we skirted so many possible storms' over the years. Global dust storms typically kick up every few years, and "we had gone a long time without one." Unlike NASA's nuclear-powered Curiosity rover still chugging along on Mars, Opportunity and Spirit were never designed to endure such severe weather.

Cornell University's Steve Squyres, lead scientist for both Opportunity and Spirit, considers succumbing to a ferocious storm an "honorable way" for the mission to end.

"You could have lost a lot of money over the years betting against Opportunity," Squyres told the AP Tuesday.

The rovers' greatest gift, according to Squyres, was providing a geologic record at two distinct places where water once flowed on Mars, and describing the conditions there that may have supported possible ancient life.



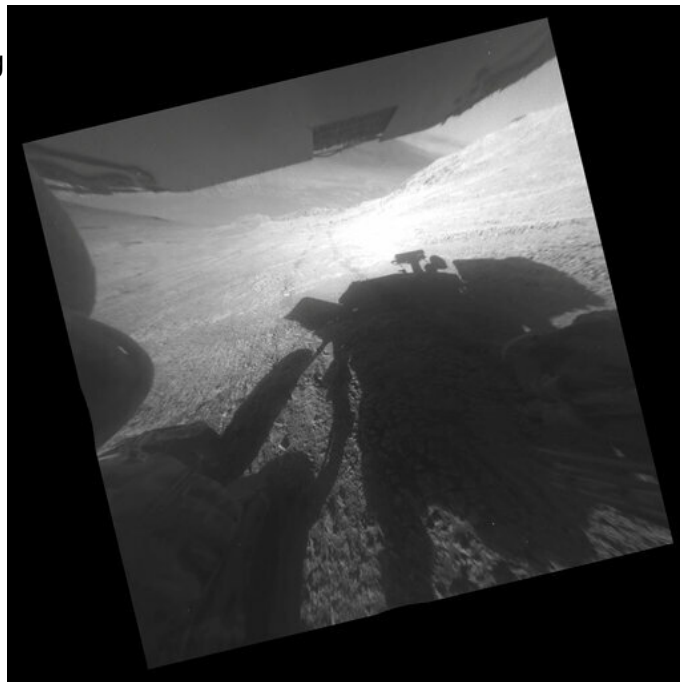
This Jan. 5, 2016 photo made available by NASA shows the tool turret at the end of the the Opportunity rover's robotic arm on the southern side of "Marathon Valley," which goes through the western rim of Endeavour Crater. (NASA/JPL-Caltech via AP)

NASA last heard from Opportunity on June 10. Flight controllers tried to awaken the rover, devising and sending command after command, month after month. The Martian skies eventually cleared enough for sunlight to reach the rover's solar panels, but there was still no response. Now it's getting colder and darker at Mars, further dimming prospects.

Engineers speculate the rover's internal clock may have become scrambled during the prolonged outage, disrupting the rover's sleep cycle and draining on-board batteries. It's especially frustrating, according to Callas, not knowing precisely why Opportunity—or Spirit—failed.

Now it's up to Curiosity and the newly arrived InSight lander to carry on the legacy, he noted, along with spacecraft in orbit around Mars.

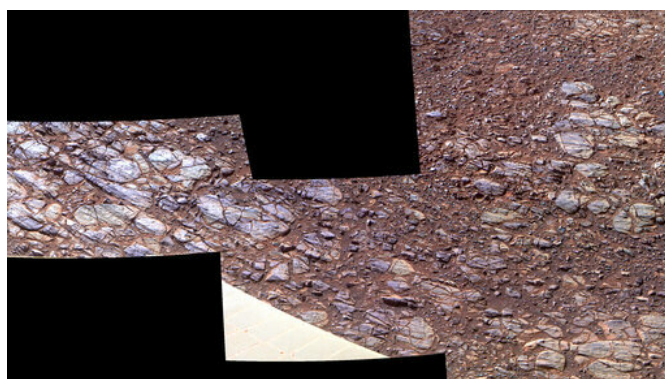
As for Opportunity, "It has given us a larger world," Callas said. "Mars is now part of our neighborhood."



This March 22, 2016 photo made available by NASA shows the shadow and wheel tracks of the Mars Exploration Rover Opportunity just after a drive on a slope above Endeavour Crater. The image has been rotated 13.5 degrees to adjust for the tilt of the rover on a hillside. (NASA/JPL-Caltech via AP)



In this Feb. 15, 2018 photo made available by NASA, the sun rises as seen by the Mars Exploration Rover Opportunity. This is a processed, approximately true-color scene. (NASA/JPL-Caltech/Cornell/Arizona State University/Texas A&M via AP)



This October 2017 photo made available by NASA shows an enhanced-color view of ground sloping downward to the right in "Perseverance Valley," seen by the Opportunity rover on Mars. The textures may be due to abrasion by wind-driven sand. (NASA/JPL-Caltech/Cornell University/Arizona State University via AP)



This image sent by NASA's Opportunity rover on Wednesday, Jan. 7, 2015 shows a view from atop a hill on Mars. (NASA via AP)



This March 31, 2016 photo made available by NASA shows a dust devil in a valley on Mars, seen by the Opportunity rover perched on a ridge. The view looks back at the rover's tracks leading up the north-facing slope of "Knudsen Ridge," which forms part of the southern edge of "Marathon Valley." (NASA/JPL-Caltech via AP)



This composite of May 2017 photos made available by NASA shows "Perseverance Valley" which is just on the other side of the dip in the crater rim as seen by the Mars Exploration Rover Opportunity, in preparation for driving down into the valley. (NASA/JPL-Caltech via AP)

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