

Mars rover nearing marathon achievement

February 12 2015, by Guy Webster



The map shows the rover's location as of Feb. 10, 2015, in the context of where it has been since late December 2014 and the "Marathon Valley" science destination ahead. Opportunity is within about 220 yards (200 meters) of completing a marathon. The green band indicates where it could reach the official Olympic marathon-race distance of 26.219 miles (42.195 kilometers). The rover's route might zigzag as the rover team chooses a path toward Marathon Valley, so there is uncertainty about where exactly it will pass marathon distance. In this image, north is up. The southern end of the solid blue line indicates the rover's position after a drive on Sol 3926, the 3,926th Martian day of Opportunity's work on Mars (Feb. 9, 2015). The rover team plans to drive Opportunity near or into "Spirit of St. Louis Crater" before the rover enters Marathon Valley. This area is all part of the western rim of Endeavour Crater. Credit: NASA/JPL-Caltech/Univ. of Arizona

NASA's Mars Exploration Rover Opportunity is nearing a location on Mars at which its driving distance will surpass the length of a marathon race.

A drive on Feb. 8, 2015, put the rover within 220 yards (200 meters) of this marathon accomplishment. An Olympic marathon is 26.219 miles (42.195 kilometers).

Opportunity is headed for a portion of the western rim of Endeavour Crater where observations by NASA's Mars Reconnaissance Orbiter have detected multiple types of clay minerals. These minerals are indicative of an ancient wet environment where water was more neutral rather than harshly acidic. More than six months ago, the rover team informally named that destination "Marathon Valley," having estimated what the odometry would total by the time Opportunity gets there.

"When Opportunity was in its prime mission 11 years ago, no one imagined this vehicle surviving a Martian winter, let alone completing a marathon on Mars," said Mars Exploration Rover Project Manager John Callas of NASA's Jet Propulsion Laboratory, Pasadena, California.

"Now, that achievement is within reach as Opportunity approaches a strategic science destination. What's most important about the longevity and driving distance the mission keeps extending are not numerical thresholds, but the wealth of scientific information returned about Mars, made possible by these feats."

Before driving Opportunity into Marathon Valley, the team plans to use the rover for observations of an impact crater called "Spirit of Saint Louis Crater," at the entrance to the valley.

The team is operating Opportunity in a mode that avoids use of the rover's flash memory. In this mode, data gathered during each Martian day are stored in volatile memory and transmitted to an orbiter before

the rover's overnight, energy-conserving "sleep." NASA orbiters Mars Odyssey and Mars Reconnaissance Orbiter relay the rover data to Earth.

Opportunity engineers plan in coming weeks to upload a software revision they have developed to enable resuming use of non-volatile [flash memory](#). It is designed to restore Opportunity's capability to store data overnight or longer, for transmitting later.

During its original three-month prime mission, beginning after landing on Jan. 25, 2004, UST (Jan. 24, 2004, PST) Opportunity drove 0.48 mile (771.5 meters). Its twin, NASA's Mars Exploration Rover Spirit, landed three weeks earlier and covered 0.39 mile (635 meters) in its three-month prime mission. Both Spirit and Opportunity have returned compelling evidence about wet environments on ancient Mars. Spirit's mission ended in 2010. Since 2011, Opportunity has been investigating the western rim of Endeavour, a crater that is 14 miles (22 kilometers) in diameter.

The rover climbed to its highest elevation on the Endeavour rim on Jan. 6, 2015, reaching a point about 440 feet (135 meters) above the local plains. It has driven about 440 yards (400 meters) since then, mainly southward toward the entrance to Marathon Valley.

Provided by Jet Propulsion Laboratory

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