

Proof positive: Mars once had water, researchers conclude

December 7 2004



There is undeniable proof that water once existed on the planet [Mars](#), a team of researchers has concluded in a series of 11 articles this week in a special issue of the journal [Science](#).

A team of more than 100 scientists from numerous government agencies and universities, among them Mark Lemmon of Texas A&M University's College of Geosciences, co-wrote the articles. Lemmon was the principal author on one article and co-author on three others describing the work of Spirit and Opportunity, NASA's twin rovers that landed on Mars in January. The rovers landed in different locations on Mars and have been sending back data and images for the past 10

months.

The reports in Science focused on results from Opportunity, which is in a region of Mars called Meridiani Planum, although Lemmon's article and one other described findings from both rovers regarding Mars' atmosphere.

One of the primary goals of the mission was to learn once and for all if liquid water ever existed on the red planet. That question has now been answered, Lemmon reports.

"The conclusion of the entire team, backed by substantial evidence, is that water was indeed present on Mars," Lemmon says.

"The proof is there in several ways. There are sulfates present on Mars that were left behind when the water evaporated, plus other salts that show the definite presence of water long ago.

"Also, Opportunity examined rocks that show evidence of 'cross-bedding,' meaning ripples of water once flowed over them. There are also mineral deposits we call blueberries, and on Earth we know these formations only appear if water is present.

"So the answer, without a doubt, is yes, liquid water was once on Mars. So far, we have not seen any evidence that liquid water is currently on Mars."

The presence of water could mean that life - in some form - existed on Mars.

Lemmon says the atmosphere of Mars contains water, but in miniscule amounts.

"Even though we are currently seeing frequent clouds with Opportunity, if you squeezed all of the water out of the atmosphere, it would only be less than 100 microns deep, about the thickness of a human hair," he said.

Because of the lack of water, weather on Mars has a lot to do with dust in the atmosphere. A small dust storm one month before the rovers landed spread small amounts of dust around the planet.

"Both rovers saw very dusty skies at first. It was only after the dust settled after a few months that Spirit could see the rim of the crater it was in, Gusev Crater, about 40 miles away," Lemmon said.

British scientists have speculated that the British Mars Lander, Beagle 2, crashed because the atmosphere was thinner than usual as a result of heating caused by atmospheric dust from the December storm.

"The other key question is when the liquid water was last present on Mars. Was it a few thousand years ago or billions of years ago?" he points out.

"We know that Mars is about four billion years old. We assume that water was there at any time from one to four billion years ago, but we don't when the last time water was present."

Lemmon says the rock samples and mineral deposits tend to point to a large area of water that once existed on Mars, such as a lake or even a sea. "The marks on some of the rocks and other evidence suggest standing water," he says.

"But whether this was once an ocean or other large body of water, we just don't know."

The next phase in the \$820 million NASA mission will have Opportunity examining the heat shield that protected it when it landed, and also have it travel to another crater. Because the rovers use solar power and sunlight is currently limited on Mars, the rovers can only cover from 50 to 100 feet on a good day.

Spirit will continue climbing to the top of Husband Hill, informally named after the Columbia commander Rick Husband, and the tallest hill in the area. The rovers are funded by NASA to collect data and send back photos through March, Lemmon says, but no one knows how long they will keep working. The rovers were originally designed only to operate through April 2004.

Lemmon is participating in another Mars mission in 2007 called Phoenix, which will go to Mars' north polar region and dig into a permafrost layer to search for evidence that Mars was habitable when the permafrost was liquid.

Source: Texas A&M University

Citation: Proof positive: Mars once had water, researchers conclude (2004, December 7) retrieved 26 April 2024 from <https://phys.org/news/2004-12-proof-positive-mars.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.