

Studying meteorites may reveal Mars' secrets of life

May 1 2013, by Tom Oswald



A team of researchers, including Michigan State University's Michael Velbel, examined a meteorite from Mars, looking for clues that life may have once existed on the red planet. A professor of geological sciences, Velbel is currently serving as a senior fellow at the Smithsonian Institution's National Museum of Natural History. Credit: Cari Corrigan.

In an effort to determine if conditions were ever right on Mars to sustain life, a team of scientists, including a Michigan State University professor, has examined a meteorite that formed on the red planet more than a billion years ago.

And although this team's work is not specifically solving the mystery, it is laying the groundwork for future researchers to answer this age-old question.

The problem, said MSU [geological sciences](#) professor Michael Velbel, is that most meteorites that originated on [Mars](#) arrived on [Earth](#) so long ago that now they have characteristics that tell of their [life on Earth](#), obscuring any clues it might offer about their time on Mars.

"These meteorites contain water-related mineral and [chemical signatures](#) that can signify habitable conditions," he said. "The trouble is by the time most of these meteorites have been lying around on Earth they pick up signatures that look just like habitable environments, because they are. Earth, obviously, is habitable.

"If we could somehow prove the signature on the meteorite was from before it came to Earth, that would be telling us about Mars."

Specifically, the team found mineral and chemical signatures on the rocks that indicated terrestrial weathering – changes that took place on Earth. The identification of these types of changes will provide valuable clues as scientists continue to examine the meteorites.

"Our contribution is to provide additional depth and a little broader view than some work has done before in sorting out those two kinds of water-related alterations – the ones that happened on Earth and the ones that happened on Mars," Velbel said.

The meteorite that Velbel and his colleagues examined – known as a nakhlite meteorite – was recovered in 2003 in the Miller Range of [Antarctica](#). About the size of a tennis ball and weighing in at one-and-a-half pounds, the [meteorite](#) was one of hundreds recovered from that area.

Velbel said past examinations of meteorites that originated on Mars, as well as satellite and Rover data, prove water once existed on Mars, which is the fourth planet from the sun and Earth's nearest Solar System neighbor.

"However," he said, "until a Mars mission successfully returns samples from Mars, mineralogical studies of geochemical processes on Mars will continue to depend heavily on data from meteorites."

Velbel is currently serving as a senior fellow at the Smithsonian Institution's National Museum of Natural History in Washington D.C.

The research is published in *Geochimica et Cosmochimica Acta*, a bi-weekly journal co-sponsored by two professional societies, the Geochemical Society and the Meteoritical Society.

Provided by Michigan State University

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