

# So cool: Study shows Mars in 4-billion-year freeze (Forwarded)

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- *From:* Andrew Yee <[ayee@xxxxxxxxxxxxxxxxxxxxxxxxxxxx](mailto:ayee@xxxxxxxxxxxxxxxxxxxxxxxxxxxx)>
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News Office  
Massachusetts Institute of Technology  
Cambridge, Massachusetts

CONTACT  
Elizabeth A. Thomson, MIT News Office  
Phone: 617-258-5402

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So cool: Study shows Mars in 4-billion-year freeze

The current mean temperature on the equator of Mars is a blustery -69 degrees Fahrenheit. Scientists have long thought that the Red Planet was once temperate enough for water to have existed on the surface and perhaps for life to have evolved there. But a new study by MIT and Caltech scientists gives this idea the cold shoulder.

In the July 22 issue of the journal *Science*, MIT Assistant Professor Benjamin Weiss and California Institute of Technology graduate student David Shuster report that their studies of martian meteorites demonstrate that at least several rocks originally located near the surface of Mars have been freezing cold for 4 billion years.

Their work is a novel approach to extracting information on the past climate of Mars through the study of martian meteorites.

In fact, the evidence suggests that during the last 4 billion years, Mars has never been sufficiently warm for liquid water to have flowed on the surface for extended periods of time. Mars therefore has probably never had an environment hospitable to the evolution of life -- unless life got started during the first half-billion years of its existence, when the

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planet was probably warmer.

The work involves two of the seven known "nakhlite" meteorites (named after El Nakhla, Egypt, where the first such meteorite was discovered), and the celebrated ALH84001 meteorite that some scientists believe shows evidence of microbial activity on Mars. Using geochemical techniques, Shuster and Weiss reconstructed a "thermal history" for each of the meteorites to estimate the maximum long-term average temperatures to which they were subjected.

"We looked at meteorites in two ways," said Weiss, of MIT's Department of Earth, Atmospheric and Planetary Sciences. "First, we evaluated what the meteorites could have experienced during ejection from Mars, 11-to-15 million years ago, in order to set an upper limit on the temperatures in a worst-case scenario for shock heating."

They concluded that ALH84001 could never have been heated to a temperature higher than 650 degrees Fahrenheit for even a brief period of time during the last 15 million years. The nakhlites, which show very little evidence o