

Martian gems could point to evidence of life

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Valles Marineris, Mars. Credit: NASA

Scientists have discovered for the first time direct physical evidence of the existence of opals on Mars.

The traces of the precious stone, which were found in a Martian meteorite, could help future exploration missions decide where to look for evidence of life on the red planet.

University of Glasgow researchers discovered the opal in a 1.7-gram fraction of the Martian meteorite known as Nakhla, which was supplied by the Natural History Museum in London.

Nakhla is named after the town in Egypt where it fell to Earth in 1911, millions of years after being blasted from the face of Mars by a massive impact of unknown origin.

In a new paper published in the journal *Meteoritics and Planetary Science*, the team describes how they identified traces of the gem known on Earth

as 'fire opal' for its brilliant orange, yellow and red colouration.

Using a powerful [scanning electron microscope](#) in the University's School of Physics and Astronomy, the team found very small traces of the gem in the rock created by the interaction of Martian water with silica within the meteorite.

Professor Martin Lee, of the University's School of Geographical and Earth Sciences, is lead author of the research paper. He said: "The slice of Nakhla that we have is small, and the amount of fire opal we've found in it is even smaller, but our discovery of opal is significant for a couple of reasons.

"Firstly, it definitively confirms findings from NASA's imaging and exploration of the Martian surface which appeared to show deposits of opal. This is the first time that a piece of Mars here on Earth has been shown to contain opal.

"Secondly, we know that on Earth opals like these are often formed in and around hot springs. Microbial life thrives in these conditions, and opal can trap and preserve these microbes for millions of years. If Martian microbes existed, it's possible they too may be preserved in [opal](#) deposits on the surface of Mars.

"Closer study of Martian opals by future missions to Mars could well help us learn more about the planet's past and whether it once held life."

The research builds on the team's 2013 discovery of the first direct evidence of water dissolving the surface of Mars. They found physical traces of secondary minerals created by water interacting with the minerals olivine and augite contained within Nakhla.

The team's new paper, titled 'Opal-A in the Nakhla meteorite: A tracer of ephemeral liquid water in the Amazonian crust of Mars' is published in *Meteoritics and Planetary Science*.

More information: "Opal-A in the Nakhla meteorite: A tracer of ephemeral liquid water in the Amazonian crust of Mars." *Meteoritics & Planetary Science*. doi: 10.1111/maps.12471

Provided by University of Glasgow

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