

First opal-like crystals discovered in meteorite

3 August 2011

Scientists have found opal-like crystals in the Tagish Lake meteorite, which fell to Earth in Canada in 2000. This is the first extraterrestrial discovery of these unusual crystals, which may have formed in the primordial cloud of dust that produced the sun and planets of our solar system 4.6 billion years ago, according to a report in the *Journal of the American Chemical Society*.

Katsuo Tsukamoto and colleagues say that colloidal crystals such as opals, which form as an orderly array of particles, are of great interest to for their potential use in new electronics and optical devices. Surprisingly, the crystals in the [meteorite](#) are composed of magnetite, which scientists thought could not assemble into such a crystal because magnetic attractions might pack the atoms together too tightly. "We believe that, if synthesized, magnetite colloidal crystals have promising potential as a novel functional material," the article notes.

The formation of colloidal crystals in the meteorite implies that several conditions must have existed when they formed. "First, a certain amount of solution water must have been present in the meteorite to disperse the [colloidal particles](#)," the report explains. "The solution water must have been confined in small voids, in which colloidal crystallization takes place. These conditions, along with evidence from similar meteorites, suggest that the crystals may have formed 4.6 billion years ago."

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