

OUTLOOKS IN EARTH AND PLANETARY MATERIALS
Are quasicrystals really so rare in the Universe?

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ABSTRACT

Until 2009, the only known quasicrystals were synthetic, formed in the laboratory under highly controlled conditions. Conceivably, the only quasicrystals in the Milky Way, perhaps even in the Universe, were the ones fabricated by humans, or so it seemed. Then came the report that a quasicrystal with icosahedral symmetry had been discovered inside a rock recovered from a remote stream in far eastern Russia, and later that the rock proved to be an extraterrestrial, a piece of a rare CV3 carbonaceous chondrite meteorite (known as Khatyrka) that formed 4.5 billion years ago in the pre-solar nebula. At present, the only known examples of natural quasicrystals are from the Khatyrka meteorite. Does that mean that quasicrystals must be extremely rare in the Universe? In this speculative essay, we present several reasons why the answer might be no. In fact, quasicrystals may prove to be among the most ubiquitous minerals found in the Universe.

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