

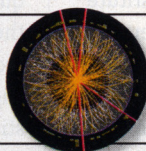
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A LOOK BACK AT AN EXTRAORDINARY YEAR OF DISCOVERY

We found the **God particle**,



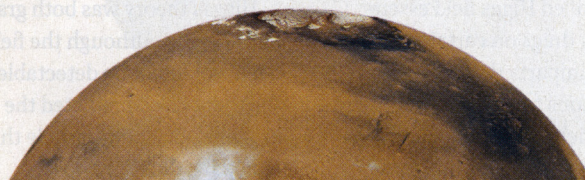
learned to make **clean**



energy work, tapped the healing power of **germs**,



explored ancient streams on **Mars**, and made 96 other stirring advances.



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DISCOVER

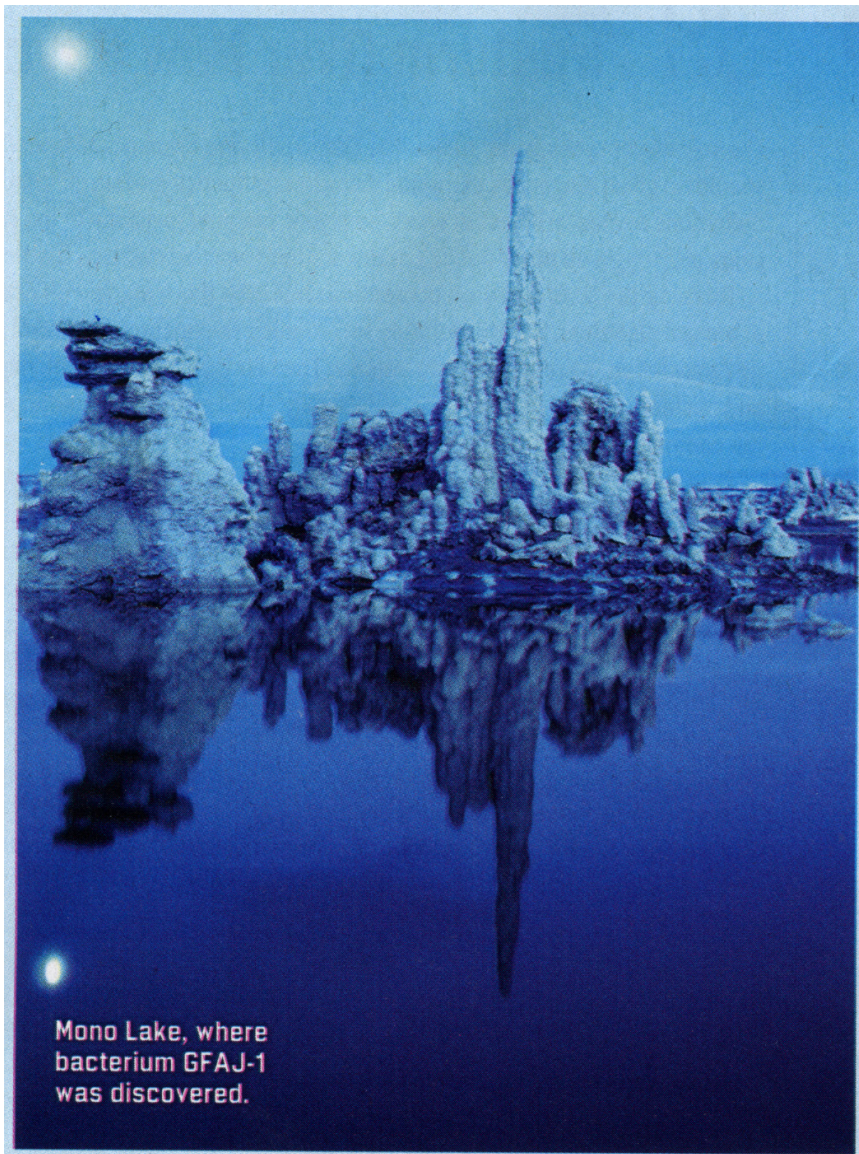
January/February 2013 Issue

41 "ALIEN" ARSENIC LIFE DISCREDITED

Two years ago, at a press conference that drew wide attention, scientists described a newfound microbe in California's Mono Lake that flouted life's basic instruction manual. They claimed that the bacterium, GFAJ-1, survived not on phosphate (essential to all known organisms) but on arsenate, a toxic arsenic compound. NASA hailed the work as a step forward in the search for alien life. But now other researchers have discredited the discovery.

Swiss investigators Tobias Erb, Julia Vorholt, and Detlef Günther of the Swiss Federal Institute of Technology exposed GFAJ-1 to varying concentrations of phosphate and noted that the more phosphate there was, the better the bacterium grew. When phosphate levels were too low it did not grow at all, contradicting the original claim. Before publishing his findings in July, Erb shared his data with protein expert Dan Tawfik of the Weizmann Institute of Science in Israel. Tawfik wanted to know if GFAJ-1's proteins could at least distinguish between phosphate and arsenate, which are very similar. In that regard, the bacterium turned out to be remarkable after all. Tawfik revealed in March that GFAJ-1 can track down phosphate even when arsenate outnumbered it 4,500 to 1. "It's very interesting," Erb says, "but not in the way it looked in the beginning."

GREGORY MONE



Mono Lake, where bacterium GFAJ-1 was discovered.