



Out of This World

Looking for Life on Mars

Nearly 230,000 kilometers away from Earth, several rovers are exploring the surface of Mars. *Curiosity* is a small SUV-sized rover that has been investigating Gale Crater since it landed there in 2012. *Curiosity's* mission is to determine whether Mars was ever able to support microbial life.

Dr. Debarati Das collaborates with NASA's Mars Science Laboratory team. Her research focuses on analyzing rocks in Gale Crater on Mars. She uses data collected by an instrument on the *Curiosity* Rover called ChemCam. The ChemCam shoots a laser at a target rock. The laser's energy turns a tiny part of the rock into a *plasma*, which is like a superheated, electrically charged gas. The ChemCam then analyzes the spectrum of light emitted by the plasma to identify the chemical elements it is made of.

Using this tool, researchers found boron on Mars—an exciting discovery! Why? Boron is a sign of past water activity on Mars. Boron is also linked to molecules that supported early life on Earth. Das uses this link in her research.

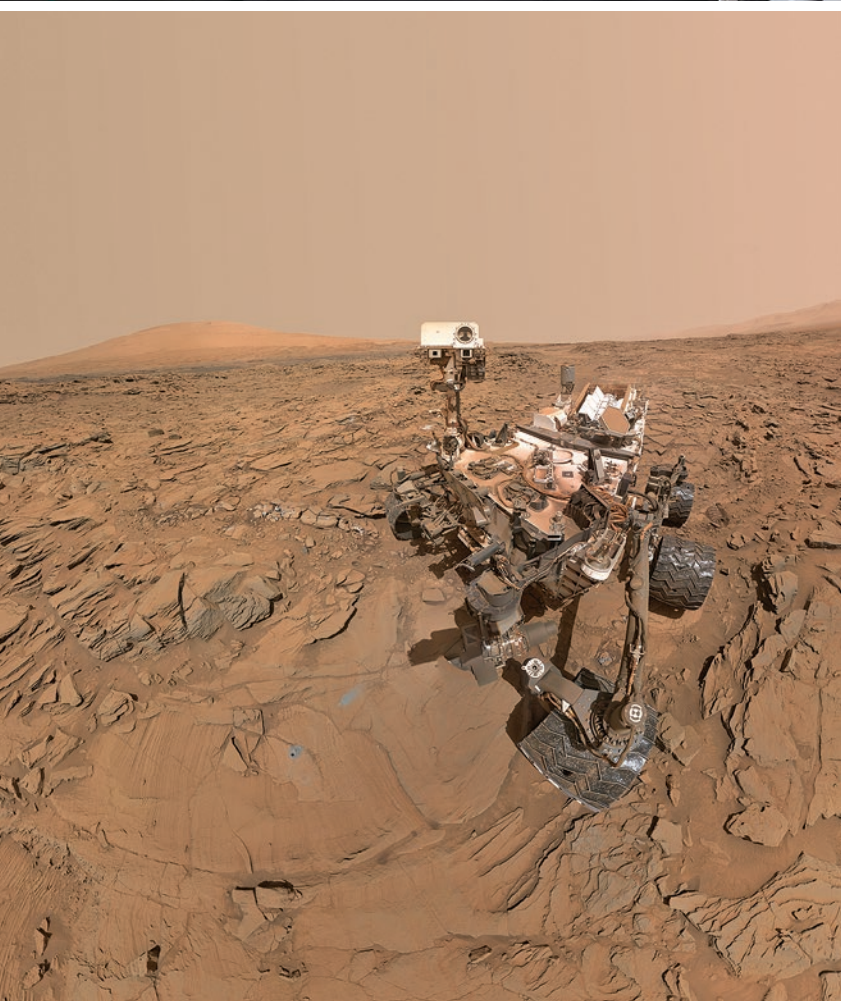
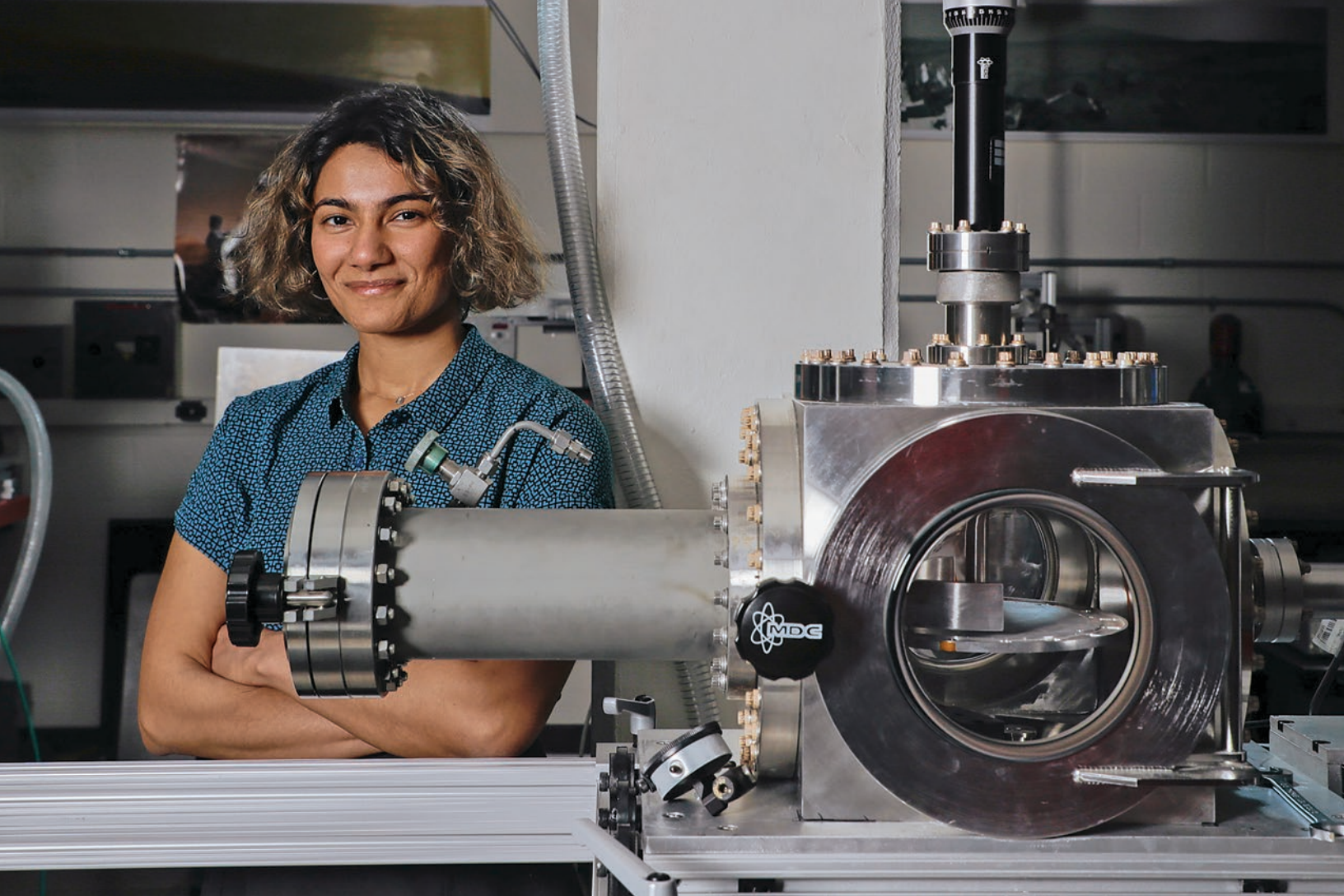
"One way to support our inferences about Martian observations is by comparing them to what we've seen here on Earth," Das says. "If you want to understand why we see boron in veins of Mars rocks, a good place to start would be veins in an Earth rock. A great candidate for a place where we can find such a sample is borate deposits in dry lakes of southern California, and that's exactly where I went."

In a project funded by the National Geographic Society, Das traveled to Death Valley to collect evaporites from those dry lake beds. *Evaporites* are rocks composed mostly of minerals produced by evaporation of saline solutions. By examining these rocks, Das can better understand the dry lakes here on Earth as well as how they formed on Mars. Das thinks her research can help others draw conclusions, including where future Mars missions in search of life should land on the red planet.

"I'm hoping to bring together Mars observations and Earth observations to develop a model of what happened on Mars in terms of habitability and past water activity and the potential for life," Das says. ■

Thinking Critically

Scientific Knowledge How does Das's work studying geologic phenomena on Earth help scientists to understand geologic phenomena on Mars?



Top Dr. Das stands next to a replica of the ChemCam instrument aboard *Curiosity*. |

Bottom left This selfie of *Curiosity* was taken by the rover from the surface of Mars, near where it collected rock samples. | **Bottom right** Das in Death Valley, a site rich in evaporite rocks.

▶ Watch our interview with Das and learn more about her career and research.

