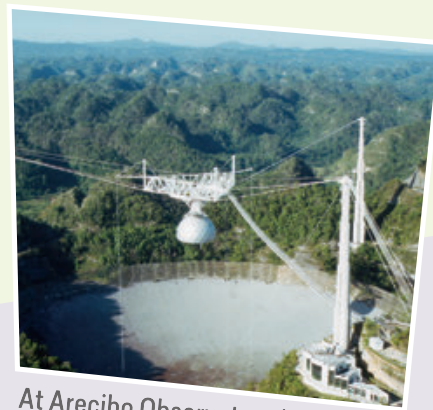




ASK A SPACE SCIENTIST

Our universe is full of mysteries, and some of the most mind-boggling are in space. Curious kids asked questions, and we sent them to two Bahá'í scientists who work for the National Aeronautics and Space Administration (NASA). Have questions about space? Send them to brilliant@usbnc.org (with your name and age).



At Arecibo Observatory in Puerto Rico, a 1,001-ft-wide (305 m) telescope can detect radio signals from our galaxy and beyond.

Is there any scientific evidence of life on other planets?

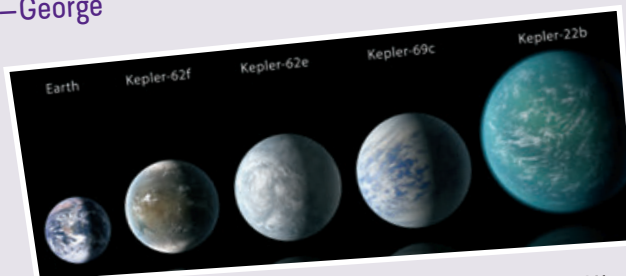
—Avery, age 15

Hi, Avery,

Not yet. But thousands of scientists and engineers around the world are working to find evidence of extraterrestrial life. Those at SETI [Search for Extraterrestrial Intelligence] projects are listening for radio transmissions from other civilizations. You can even donate your computer's idle time to sift through those deep space signals, looking for a message. Others are designing and building planetary probes that look for liquid water under the surface of Mars and in the underground oceans of the moons of Jupiter and Saturn, all in hopes of finding evidence of past or present microbial life. Still others are looking at images of planets orbiting other stars, which are taken by telescopes based on Earth and in space.

We have already measured the atmospheres of more than 55 exoplanets and found sodium, water, carbon dioxide, and methane. If we find an exoplanet with oxygen, it will be evidence of extraterrestrial bacteria or plants, since free oxygen must be constantly replenished in an atmosphere by life forms, or else it will bind with surface rocks and disappear.

—George



Along with Earth, some other planets or moons may have liquid water to support life.

BACH IN TIME

Nicole-Reine Lepaute, born in 1723, was a French astronomer and mathematician. A lunar crater and asteroid are named after her. Two years before it occurred, she predicted the *exact time* of this event in 1764, and its progress across Europe. It was a:

S L R C L P S E



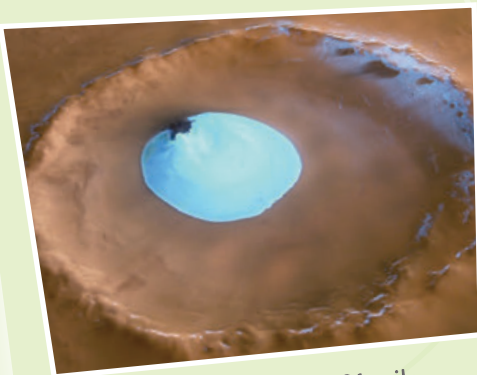


How can there be ice on Mars? – Gavin, age 13

Hi, Gavin,

The discovery of water ice on Mars within the last 15 years is very exciting, because it increases our chances of finding life there. Also, a source of water would be needed if we want to send pioneers to “live off the land” of Mars in the future.

Unlike the Earth, Mars has no bodies of liquid water, such as oceans. Why is that? Because Mars is about 50 million miles (80 million km) farther from the sun than we are on Earth, so it is cold—about 141° F (78° C) colder than Earth. But another reason we don’t see liquid water on Mars is that the atmosphere on Mars is much thinner than Earth’s. At the surface of Mars, the average pressure is less than 1% of the pressure on Earth. Water cannot be a liquid at such low pressures.



On Mars, ice sits inside a 21-mile-wide (35 km) crater.

Because Mars is so cold, most of the water found has been in the solid form of ice. But if that ice is warmed to higher temperatures (as might occur during the summers on Mars), it does not melt and become liquid, but turns directly to a gas—a process called **sublimation**.

—Steve



STEVE SCOTTI is a research engineer at NASA Langley Research Center in Virginia, U.S. He works to develop lighter, stronger materials and structures for aircraft and spacecraft. Watching the first astronaut launched into space inspired his interest in space exploration. He enjoys sharing his enthusiasm about science and space with kids.



GEORGE HATCHER is an avionics engineer at the Kennedy Space Center in Florida, U.S. He works on electrical systems of uncrewed rockets. He also studies planetary science at the University of Central Florida. Working for NASA is a dream come true for George. He’s aspired to be an astronaut since he was three. He’s one of 100 finalists in the Mars One Project, which aims to create a human settlement on Mars.

COSMIC QUIZ

Over 150 million of these rocky objects orbit the sun between Mars and Jupiter. Despite their huge number, an average of 600,000 miles (965,606 km) stretches between each one. These are:

- A) Comets
- B) Dwarf Planets
- C) Droids
- D) Asteroids
- E) Moons
- F) Kryptonite

