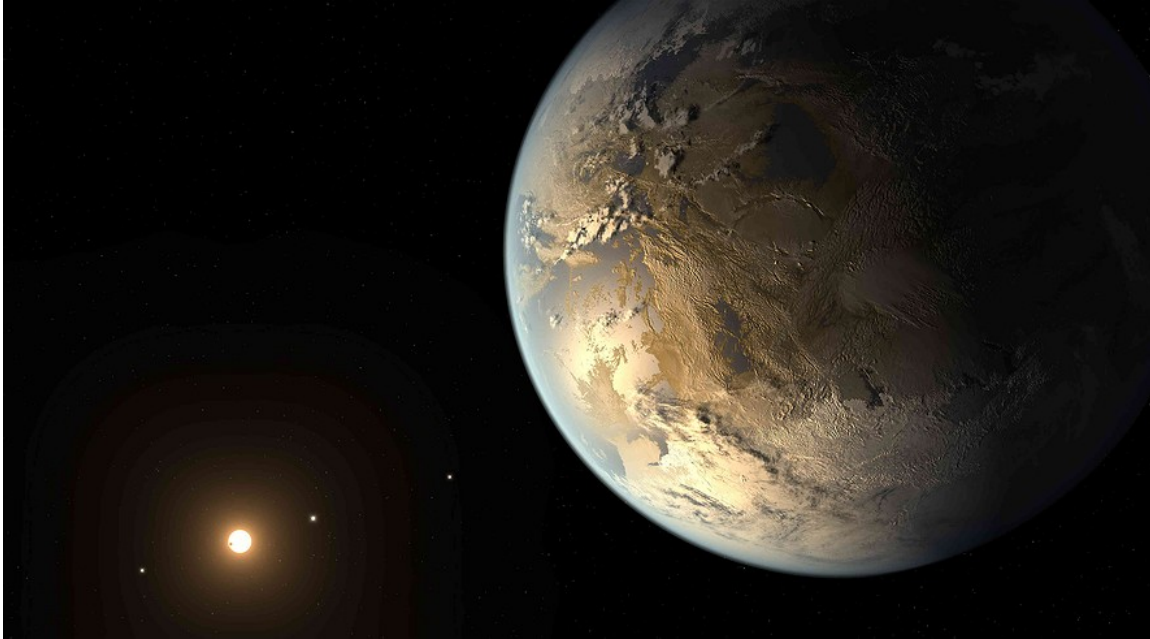


Earth-like planet discovered deep in space

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An artist's concept depicts Kepler-186f, the first validated Earth-size planet to orbit a distant star in the habitable zone — a range of distance from a star where liquid water might pool on the planet's surface. Photo: NASA.gov

LOS ANGELES — A group of astronomers say they have discovered an Earth-size planet where water could exist in liquid form. The planet is the first yet found that might be able to support life.

Experts don't know if the planet actually has water or an atmosphere that protects it from its sun. But they said the groundbreaking discovery suggests that a large group of Earth-like planets is waiting to be found much closer to home.

"This is really a tip-of-the-iceberg discovery," said astronomer Jason Rowe. He and his team spent a year analyzing information gathered by NASA's Kepler Space Telescope.

Rowe and the others are still examining distant stars and planets located by Kepler. But after finding the Earth-like planet known as Kepler-186f, it seems reasonable to assume "that other ones are likely to exist. And that's going to be the job of future missions to find (them)."

Not Too Hot, Not Too Cold

Scientists who were not involved in the study praised the find.

This is a historic discovery of the first Earth-size planet found in the right distance from a star where life could actually survive, astronomer Geoffrey Marcy commented. "The results are absolutely rock solid."

If planets like this turn out to be common among the distant stars Kepler studies, it may mean that life could be found other places in the universe. It could also mean that astronomers should be able to find plenty of similar planets closer to home.

Future NASA missions may enable scientists to add to the list of planets that life could potentially survive on. Because the planet is located a safe distance from its sun, it is said to be in a "habitable zone." Powerful telescopes in space will determine which planets have the strongest signs of water and atmospheres that can support life.

The discovery marks a breakthrough in the quest to find planets that are not just Earth-size, but truly Earth-like.

Out of 1,800 or so confirmed planets, fewer than two dozen sit in a zone where life could survive. In such regions, it's neither so hot that water boils off into space nor so cold that it remains in a permanent deep freeze. And none of the other planets are as close in size to Earth as Kepler-186f. Its diameter is only 10 percent larger than our planet's.

Sits 490 Light-Years Away

Size is a critically important factor, scientists said: If a planet is about 50 percent wider than Earth, its gravity could attract a hydrogen-helium envelope. That would shroud the surface in a gassy atmosphere that's too thick for Earth-like life.

Kepler-186f may be close to Earth in size, but it's hardly close by. It sits some 490 light-years away in the group of stars called Cygnus, and circles its home star, Kepler-186, in just 130 days. A light-year is the distance light can travel in a year. Light travels at 186,000 miles per second.

That star is an M-dwarf, smaller, dimmer and cooler than our sun. So even though Kepler-186f is closer to its sun than Mercury is to our sun, it is still safely located in a zone where life could survive.

In the past, scientists have argued that M-dwarf stars may not be good places for life to develop around. This is because they tend to give off more flares and damaging radiation than G-type stars like our sun. Kepler-186f, however, appears to sit far away enough from its star to be out of harm's way.

The discovery of Kepler-186f indicates that there may be more than one kind of habitable planet. From now on, scientists will look beyond worlds circling stars similar to our sun.

"I believe that planets are very varied and a whole range of them could be habitable," said astrophysicist Sara Seager.

Life In The Universe

That's an encouraging sentiment, given that planets like Kepler-186f could be easier to find than planets exactly like Earth. Before it was hobbled last year by a broken gyroscope, the Kepler telescope stared at a patch of roughly 150,000 stars. It waited for dips in the starlight as planets passed in front.

Close-in planets with shorter orbits complete their orbits more often, which makes them easier to find. Around our sun, those planets would be baked. Around a red dwarf like Kepler-186, the climate could still be mild.

M-dwarf planets are also easier to find because they block relatively more of their star's light. And given that M-dwarf stars account for 70 percent of the stars in the Milky Way, there could be billions of Earth-size planets throughout the galaxy.

NASA's Transiting Exoplanet Survey Satellite, set for launch in 2017, could look for such planets closer to home. And then there's the James Webb Space Telescope, the follow-up to the Hubble Space Telescope. It will be able to spot water and other things necessary for life in the atmospheres of nearby planets.

The discovery of Kepler-186f is a sign that scientists are homing in on the answers to fundamental questions about life in the universe.

"Whether we are an extremely rare fluke — a phenomenon that only happens once in a universe — or in a galaxy teeming with life is a very basic question," said planetary astrophysicist Dimitar Sasselov. It's a question "not only of science, but of our existence." For "the first time in human history we have a good shot at answering that question, and that's very exciting."