Astronomers find smallest known planet — smaller than Mercury

Yale UniversityYale University

A team of scientists including two Yale University astronomers has discovered the smallest planet yet detected.

“With this discovery we now have an inventory of planets that are both much larger than Earth and also much smaller than Earth,” said Sarbani Basu [1], professor of astronomy at Yale and a member of the team. “The detection of Earth-sized, and hopefully Earth-like, planets cannot be far behind.”

In research published online Feb. 20 in the journal *Nature*, the scientists reported finding a planetary system, Kepler-37, with three planets. Two of them are smaller than Earth, and one of these is smaller than Mercury, the smallest of the eight planets in Earth’s solar system.

Until now, astronomers had never found a planet smaller than Mercury. The discovery of one establishes that stars indeed host planets smaller than any in Earth’s solar system, researchers said. They already knew that stars host planets much bigger than Earth.

The smallest planet in the Kepler-37 system is slightly larger than Earth’s Moon and likely has no atmosphere or water, like Mercury itself, researchers said. The Moon has a radius of about 1080 miles, slightly more than one-quarter of Earth’s.

The next largest of the Kepler-37 planets is also smaller than the Earth, while the third is more than twice Earth’s size. The size of the two smaller planets suggests they are rocky. The planets are called Kepler-37b, c, and d.

The planets were discovered using data from NASA's Kepler satellite, which observes small amounts of starlight obscured by the planets.

To ascertain planet sizes, astronomers first determined the size of the host star, Kepler-37, through asteroseismology — the seismic analysis of stars. Basu, an expert in the sun and other stars, was involved in this aspect of the work. Debra A. Fischer [2], also a professor of astronomy at Yale and co-author of the research paper, analyzed the chemical composition of the star. Combined with seismic data, this information enabled scientists to characterize the planet.

The overall project was led by Thomas Barclay of the NASA Ames Research Center in California. For a complete list of authors, read the paper [3].

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