

# Earth-like ‘water world’ with steamy atmosphere aids search for alien life

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Astronomers have found evidence of a hot and steamy atmosphere on an Earthlike “water world” planet that orbits a red dwarf star in the southern sky about 39 light years away.



The discovery marks one of the first times that scientists have detected an atmosphere on a small, rocky world and brings them a step closer to the goal of finding life elsewhere in the universe.

The planet, in the constellation of Vela, is not considered habitable, but astronomers regard it as a prime candidate for honing the instruments and techniques they will need to detect the existence of alien life.

When the planet, GJ 1132b, was first discovered in 2015, astronomers did not know if it had an atmosphere. But in a paper reported in the *Astronomical Journal* yesterday, scientists said recent observations revealed a shroud of gas. The researchers pored over measurements from the European Southern Observatory in Chile and found that at one wavelength band of light the planet looked larger than at other bands as it crossed the face of its star, Gliese 1132.

“These things don’t pop up in the way you expect,” said John Southworth, an astronomer at Keele University, who led the team. “We found evidence for the atmosphere at one wavelength band and that wasn’t what we were expecting.”

The observations point to an atmosphere rich in water or methane, but it will take more measurements with other telescopes to identify the chemicals. “With this research, we have taken the first tentative step into studying the atmospheres of smaller, Earth-like planets,” he said.

GJ 1132b is 16% larger than Earth and orbits too close to its star for scientists to consider it habitable. Temperatures on the surface reach more than 250C. “That’s a bit high for life as we know it,” said Southworth.

“The planet is significantly hotter and a bit larger than Earth, so one possibility is that it is a ‘water world’, with an atmosphere of hot steam.”

The discovery will encourage astronomers seeking alien life. Small stars, like the one orbited by GJ 1132b, are extremely common and are known to harbour scores of small, potentially habitable planets. But they can emit huge amounts of x-rays, which are capable of stripping away atmospheres from the planets. “What we’ve shown is that a planet similar to Earth can retain an atmosphere for several billion years,” said Southworth.

Nasa's James Webb Space Telescope (JWST), due to be launched next year as a successor to the Hubble Space Telescope, will be powerful enough to begin studying the atmospheres of Earth-like exoplanets.

There are also proposals for a HighDefinition Space Telescope (HDST), with a 40ft mirror twice as large as the JWST, which would search for the fingerprints of life in planets' atmospheres.