'Water world' found just 39 light years away represents leap forward in search for aliens, scientists say

The discovery marks the first time that an atmosphere has been found around another Earth-like planet.
Scientists have found a planet that looks like Earth – and, for the first time, has its own hazy atmosphere.

The discovery represents a major leap forward in the hunt for a planet like our own that could support alien life.

The planet, which is 39 lightyears from us, has a hazy atmosphere that could have a "water world" beneath it, scientists say.

While the planet isn't likely to be habitable, it suggests that there might be more planets out there with the kind of atmosphere that could support life. Until now, scientists have only been able to see giant "hot Jupiter" planets that are too warm to house aliens.
The "super-Earth" planet known as GJ 1132b was observed as it passed in front of a cool red dwarf star, blocking out some of the star's light.

By measuring the slight drop in the star's brightness, astronomers were able to work out that the planet was 1.4 times the size of Earth.

They also found that in one light wavelength band, the planet looked slightly bigger. This could be explained by an atmosphere that was opaque to some light wavelengths, but transparent to others.

Dr John Southworth, from the University of Keele, who led the team, said: "While this is not the detection of life on another planet, it's an important step in the right direction."
The detection of an atmosphere around the super-Earth GJ 1132b marks the first time that an atmosphere has been detected around an Earth-like planet other than Earth itself.

"With this research, we have taken the first tentative step into studying the atmospheres of smaller, Earth-like planets. We simulated a range of possible atmospheres for this planet, finding that those rich in water and/or methane would explain the observations of GJ 1132b.

"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."

Analysing the chemical composition of exoplanet atmospheres could in future yield tell-tale signs of life.

Ozone, derived from oxygen released by plants, is one atmospheric life marker. Methane is another, although it can also be generated by volcanic activity.

US planetary scientist Dr Sara Seager, from the Massachusetts Institute of Technology, has compiled a list of 14,000 different molecules that could provide biosignatures of life on alien worlds.

The American space agency Nasa's new 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 an even bigger High Definition Space Telescope (HDST), with a 40ft-wide mirror twice as large as the one carried by the JWST. It would directly image planets in nearby star systems and search for the fingerprints of life in their atmospheres.

The HDST, likely to be a multibillion-pound international project, is not expected to be launched until the 2030s.

Additional reporting by Press Association

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Big mirrors are so yesterday. A much better idea is to fly an array of much cheaper individual telescopes and link them together. Trials to test flying two satellites tightly linked so they stay micrometer accurate distances apart are ongoing.

This can give us space telescopes with apertures kilometres to tens or hundreds of kilometres wide which can not only image exoplanet atmospheres but surface details.

Terrestrial array telescopes, largely radio dishes, are in operation and under construction now. One will have dishes in both South Africa and Australia giving it a huge diameter. This has been made possible by advances in fast computing, networking and integrating data.

Space array telescopes will use lasers and radar like/microwave systems to both space themselves and communicate to a central hub processor.

Why are we so foolish as to continually consider water to demonstrate that it's likely we'll find life? There are so, so many many other factors required for life - the presence of water is far less of a step towards finding life than the media makes discusses it as. http://www.reasons.org/blogs/todays-new-reason-to-believe/why-water-worlds-are-inhospitable-for-life

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