New exoplanet a hot 'ice giant'

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WASHINGTON (Reuters) -- An odd planet the size of Neptune, made mostly of hot, solid water, has been discovered not far from Earth and offers evidence that other planets may be covered with oceans, European astronomers reported Wednesday.

Called GJ 436b, the planet orbits quickly around a cool, red star just 30 light-years away, the team at the Geneva Observatory said.

"It's not a very welcoming planet," Frederic Pont, an astronomer who helped make the discovery, said in a telephone interview. The planet is hot because it is near its star and under high pressure because of its mass.

"The water is frozen by the pressure but it's hot. It's a bit strange -- we are used to water changing conditions because of temperature, but in fact water can also be solidified by pressure," Pont said.

The planet is also likely blanketed by hydrogen, the researchers said -- conditions hardly conducive to life. But if there is water, there could be water on other planets in other solar systems and thus life as we know it.

"It shows there are many ocean planets," Pont said.

Using a Swiss-based telescope, the team determined the size of the planet by watching it pass in front of its star. The rest is guesswork, but it is easy guesswork, Pont said.

"When it passes in front of the star it is like a mini eclipse," Pont said.

"The amount of light that it hides is proportional to its size," he said.

And the size says a lot. Astronomers have found about 200 so-called extrasolar planets orbiting stars other than our sun. Many are detected by indirect measurements, such as tiny variations in the wobble of a star.

Solid water

And many appear to be gas giants like Jupiter. This one appears to be smaller, but not small enough to have a rocky center as the Earth does.

"From the size and the mass we get the density," Pont said. And the density of GJ 436b suggests it is made of water.

"We are not absolutely sure that it's water, but with this kind of density and if you take the materials that usually make a planet, it is very typical of water planets," Pont said.

The researchers wrote in their report: "The mass and radius that we measure for GJ 436b indicate that it is mainly composed of water ice. It is an 'ice giant' planet like Uranus and Neptune rather than a small-mass gas giant or a very heavy 'super-Earth'."

It is very close to its star, the M-dwarf star GJ 436. "It's a small star, 100 times less bright than the sun," Pont said. It is about half the sun's mass.

"Smaller stars are cooler and redder," he added.

That is why the water can persist, albeit in a hot and solid state. The astronomers estimate its temperature at 520 K, which is 250 degrees Celsius or 540 degrees F.

"It is by far the closest, smallest and least massive transiting planet detected so far," the researchers, who included a team in Tel Aviv, Israel, wrote in their report published in the journal Astronomy & Astrophysics.

The star is relatively close in astronomical terms, about 33 light-years away. A light-year is the distance light travels in a year at 186,000 miles per second , or close to 6 trillion miles.

Just last month members of the same team said they had found the most Earth-like planet yet outside our solar system, with balmy temperatures and orbiting a red dwarf star called Gliese 581.