

New link between water and planet formation revealed in study

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Water distribution in the HL Tauri disc. (ESO)

Astronomers found water vapour in a disc around a young star, where planets could be forming, said the European Southern Observatory on Thursday. The study revealed at least three times as much water as in all oceans on our planet in the inner disc of the young Sun-like star HL Tauri, which is located about 450 light-years away from Earth.

Water is a key ingredient for life on Earth and it could also play an important role in planet formation. “I had never imagined that we could capture an image of oceans of water vapour in the same region where a planet is likely forming,” said Stefano Facchini, an astronomer at the University of Milan, Italy, in a press statement.

The spatially resolved observations with the Atacama Large Millimeter/submillimeter Array (ALMA) in Chile let astronomers find the distribution of water in different parts of the disc. “Taking part in such an important discovery in the iconic HL Tauri disc was beyond what I had ever expected for my first research experience in astronomy,” added Mathieu Vander Donckt from the University of Liège, Belgium.

A lot of water was found in a region where a gap exists. Such ring-shaped gaps are formed in gas and dust-rich discs when young orbiting planet-like bodies that are gathering material and growing. “Our recent images reveal a substantial quantity of water vapour at a range of distances from the star that include a gap where a planet could potentially be forming at the present time,” added Facchini.

Taking observations of water with ground-based telescopes is quite difficult because the large amount of water vapour in Earth’s atmosphere can reduce the quality of signals. The ALMA telescope was built in the Chilean Atacama Desert about 5,000 metres above mean sea level in a high and dry environment so that it can take a better look at stars and galaxies beyond.

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