Scientists spot unseen planet in Kepler scope data

Irene Klotz, Reuters

(Reuters) - Scientists poring over data collected by NASA's Kepler space telescope have discovered a world outside its field of view, demonstrating a new technique for finding planets beyond the Solar System, scientists reported on Thursday.

From its vantage point in space, Kepler stares at about 150,000 sun-like stars located a few hundred light years to a few thousand light years from Earth. One light year is about 5.9 trillion miles (9.5 trillion km).

The goal is to find Earth-like worlds at the right distance from their parent stars for liquid water to exist. Water is believed to be necessary for life.

So far, scientists using Kepler and other telescopes have found 763 exoplanets, which orbit suns other than Earth's own, and identified more than 2,300 possible exoplanets, primarily through two techniques.

The transit method, such as what the Kepler team uses, looks for slight and regularly occurring dips in the amount of light coming from a star, which could indicate a planet is passing by, relative to the telescope's point of view.

Another method analyzes starlight for tiny wobbles, a possible telltale sign of a planet's gravitational tug on its host star.

In a report published in the journal Science, David Nesvorny, with the Southwest Research Institute in Boulder, Colorado, and colleagues describe a third technique that takes a Kepler observation into a new and literally unseen domain.

PLANET REGULARLY LATE

They reported on a sun-like star modestly named Kepler Object of Interest 872, which is thought to have at least one planet in tow passing before Kepler's eye.

Using raw data released by NASA for the general scientific community, Nesvorny and his team noted the planet was regularly late.

"It was showing enormous time variations in transits, exceeding two hours," Nesvorny told Reuters. "At that point we were sure there is something important in the system that is causing these perturbations."

They ran computer models until they found a match, a second planet about the size of Saturn circling the star every 57 days. The planet, designated KOI-872c, does not pass in front of the star, relative to Kepler's view.

"Initially we thought it could be a big moon but we have these computer models which can consider a moon or a planet. We run it over and over with different (sized) moons, different planets and see which of these models fit the data best. None of the moons fits to the data, except very large moons which would not be stable, so the system wouldn't make physical sense," Nesvorny said.

The method, known as transit timing variations, or TTVs, had not been used before to find planets, notes astrophysicist Norman Murray, with the University of Toronto.

"The use of TTVs to find unseen planets, although predicted some seven years ago, has not yielded secure detections before this work," Murray wrote in a related paper posted Thursday in the online journal Science Express.

Nesvorny also described a third planet, about twice the diameter of Earth, that passes in front of the star every 6.77 days.

Nesvorny said the system "is reminiscent of the orderly arrangement of orbits in our solar system."

But none of the planets believed to be circling the star are in the so-called habitable zone where liquid water could exist.

(Editing by Jane Sutton [1] and Xavier Briand [2])

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