

In All The Galaxy, Just 15 Percent Of Solar Systems Are Like Ours

January 5 2010, by Pam Frost Gorder

(PhysOrg.com) -- In their quest to find solar systems analogous to ours, astronomers have determined how common our solar system is.

They've concluded that about 10 percent of [stars](#) in the universe host systems of [planets](#) like our own, with several gas giant planets in the outer part of the [solar system](#).

"Now we know our place in the universe," said Ohio State University astronomer Scott Gaudi. "Solar systems like our own are not rare, but we're not in the majority, either."

Gaudi will report the results of the new study on Tuesday, January 5 at the American Astronomical Society Meeting in Washington, DC, when he accepts the Helen B. Warner Prize for Astronomy.

The find comes from a worldwide collaboration headquartered at Ohio State called the Microlensing Follow-Up Network (MicroFUN), which searches the sky for [extrasolar planets](#).

MicroFUN astronomers use a method called gravitational microlensing, which occurs when one star happens to cross in front of another as seen from Earth. The nearer star magnifies the light from the more distant star like a lens. If planets are orbiting the lens star, they boost the magnification briefly as they pass by.

This method is especially good at detecting giant planets in the outer

reaches of solar systems -- planets analogous to our own Jupiter.

This latest MicroFUN result is the culmination of 10 years' work -- and one sudden epiphany, explained Gaudi and Andrew Gould, professor of astronomy at Ohio State.

Ten years ago, Gaudi wrote his doctoral thesis on a method for calculating the likelihood that extrasolar planets exist. At the time, he concluded that less than 45 percent of stars could harbor a configuration similar to our own solar system.

Then, in December of 2009, Gould was examining a newly discovered planet with Cheongho Han of the Institute for Astrophysics at Chungbuk National University in Korea. The two were reviewing the range of properties among extrasolar planets discovered so far, when Gould saw a pattern.

"Basically, I realized that the answer was in Scott's thesis from 10 years ago," Gould said. "Using the last four years of MicroFUN data, we could add a few robust assumptions to his calculations, and we could now say how common planet systems are in the universe."

The find boils down to a statistical analysis: in the last four years, the MicroFUN survey has discovered only one solar system like our own -- a system with two gas giants resembling Jupiter and Saturn, which astronomers discovered in 2006 and reported in the journal *Science* in 2008.

"We've only found this one system, and we should have found about eight by now -- if every star had a solar system like Earth's," Gaudi said.

The slow rate of discovery makes sense if only a small number of systems -- around 10 percent -- are like ours, they determined.

"While it is true that this initial determination is based on just one solar system and our final number could change a lot, this study shows that we can begin to make this measurement with the experiments we are doing today," Gaudi added.

As to the possibility of life as we know it existing elsewhere in the [universe](#), scientists will now be able to make a rough guess based on how many solar systems are like our own.

Our solar system may be a minority, but Gould said that the outcome of the study is actually positive.

"With billions of stars out there, even narrowing the odds to 10 percent leaves a few hundred million systems that might be like ours," he said.

Provided by The Ohio State University

Citation: In All The Galaxy, Just 15 Percent Of Solar Systems Are Like Ours (2010, January 5) retrieved 26 April 2024 from <https://phys.org/news/2010-01-galaxy-percent-solar.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.