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ASTRONOMY

Method to find new planets leaves trail of questions

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BY TOM STATLER

Exoplanets are all the rage these days, and for good reason. Humanity is barely into its second decade of knowing with certainty that there are planets orbiting other stars. We're still years away from being able to detect planets similar to Earth.



But last month, an international research team announced its discovery of a planetary system resembling a scaled-down version of the sun-Jupiter-Saturn trio. The team found these planets using gravitational microlensing, which happens when a star, in this case one with planets, passes between Earth and a more distant star.

In this rare alignment, the gravity of the intervening star acts as a magnifying glass, brightening the star behind it. The planets reveal themselves through their own gravity, which causes a "flickering" in the magnified image. This is a pretty slick technique, no question.

But it raises the issue of reproducibility in science. Reproducibility means you don't completely trust an experimental result unless it can be reproduced by somebody else.

New observations are always on probation until they can be independently confirmed. The problem is that there is no chance of observing a second microlensing event by this planetary system. Perfect alignments with a third star are too rare. Techniques that don't depend on a third star don't bring up this problem. The planets keep going around, and you can always observe the system again and get more data.

So why not use one of these other methods to confirm the microlensing observation? Sorry. Can't. Too far away. Way too faint.

So does this mean the microlensing results are worthless? No, but we have to appeal to consistency rather than reproducibility as a reality check.

That is, as we detect more planets through microlensing (there are six so far), and expand the capabilities of the other methods, will a consistent picture emerge? Or will different techniques point to different realities? I'm hoping for the latter. The best science raises new questions, and a disturbing inconsistency often signals a fundamental discovery just around the corner.

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