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Distant planet revealed by microlensing

By Hazel Muir

A new planet has been revealed in the constellation Sagittarius by a technique called microlensing. Astronomers say it is a victory for the controversial technique, which can magically detect invisible planets circling distant, invisible stars.

Ian Bond, an astronomer from the Royal Observatory in Edinburgh, Scotland, announced the result at a NASA press conference on Thursday. “This proves that we can gather statistics on the numbers of planets throughout the galaxy and even beyond,” he says. “And in principle, we can detect planets as small as the Earth.”

Astronomers have discovered more than 100 planets orbiting stars other than our Sun. The vast majority came to light because their gravity makes the parent stars wobble as the planets orbit around them. However, this wobble is only visible for stars up to about 170 light years away.

To try to find more distant planets, astronomers are using another technique – microlensing. Microlensing can occur when one star passes directly in front of another, as seen from Earth.

The gravity of the foreground star can bend and focus the light of the background star, making it appear to brighten briefly. If the foreground “lens star” has a planet in orbit around it, the planet can create telltale blips in brightness that betray its presence.

Weak signal

Two of the teams leading the hunt for microlensing events are called MOA and OGLE. MOA is a collaboration of scientists from Japan and New Zealand, which uses a 0.6-metre telescope at New Zealand’s Mount John Observatory. OGLE is a Polish-US collaboration that uses a 1.3-metre telescope at Las Campanas Observatory in Chile.

In 2002, the MOA team announced they had seen a possible microlensed planet roughly the same size as Earth (**New Scientist** print edition, 22 June 2002). However, the signal was weak and few people were convinced. “It wasn’t greeted with a lot of enthusiasm, mainly because the signal was right on the edge of detectability,” says Bond, a MOA team member.

But OGLE and MOA have now seen a microlensing planet that is far more convincing. OGLE spotted a microlensing event in the constellation Sagittarius in June 2003, and in July, Bond noticed in MOA data that it showed the hallmark brightness blips of a planet.

After analysing observations by both telescopes, the astronomers say they are convinced they have seen a planet. The results suggest the planet is about 1.5 times as heavy as Jupiter. Although the star it orbits is too faint to be visible, the evidence hints that it is a red dwarf star some 17,000 light years away.

One off

Critics have often been dismissive of microlensing because it is difficult to confirm. A microlensing event happens only once, so it is not possible to repeat the observation several times using different instruments.

“Microlensing does not receive as much of the limelight as other planet-hunting techniques,” admits Bond.

But experts say this new demonstration could change that. Hugh Jones, a planet hunter at Liverpool John Moores University in England, calls the new finding “exciting stuff”.

Although he warns that it will be hard to glean detailed information from extremely distant planets, he thinks this could be the start of a new era in which astronomers uncover planets in the far reaches of the Milky Way and even in the galaxies beyond.



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