First pics of faraway planet confirmed

Stuart Gary for ABC Science Online, ABC
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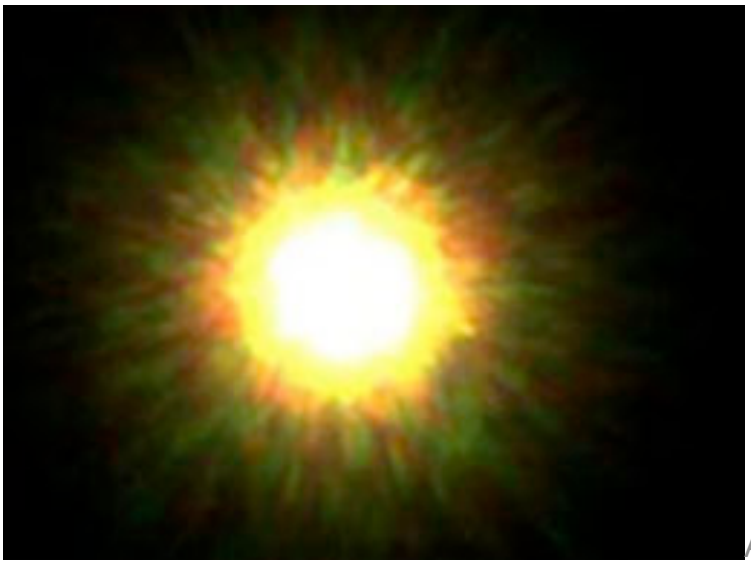
About 500 light years away

Astronomers say they have confirmed the first ever direct image of a planet orbiting a Sun-like star.

Scientists led by Dr David Lafreniere from the University of Montreal in Canada say the planet, about eight times the size of Jupiter is circling the Star 1RXS J160929.1-210524 which is about 500 light years away in a group of young stars called the Upper Scorpius Association which formed about five million years ago.

The planet orbits 300 astronomical units out from its parent star. That's some 300 times further out than the Earth is from the Sun and 10 times further out than Pluto.

First reported in 2008, the confirmation will be published in an upcoming issue of The Astrophysical Journal.

Scientists used the Gemini telescope to conduct further observations, confirming the planet and star were indeed moving through space together.

Hot world

The planet has an estimated temperature of about 1500 degrees Celsius, making it much hotter than Jupiter, which has an atmospheric cloud-top temperature of about -110 degrees Celsius.

The host star has an estimated mass of about 85 per cent that of our Sun.

"Back in 2008 all he knew for sure was that there was a young planetary mass object next to a young Sun-like star," Dr Lafreniere said.

"The extremely close proximity of the two strongly suggested that they were associated with each other but it was still possible that they were unrelated and only aligned by chance."

According to Dr Lafreniere, new observations rule out a chance alignment and thus confirm that the planet and the star are related to each other.

The discovery may challenge current planetary formation theories due to its extreme separation from the star.

Since the initial observations several other worlds have been discovered using direct imaging, including a system of three planets around the star HR 8799 also discovered with Gemini.

But the planets around HR 8799 orbit much closer to their host star.

A bit soon to tell

Australian Astronomical Observatory planetary scientist Dr Simon O'Toole says the findings are interesting, but it's still far too early to say whether the planet is orbiting the star.

"I'm just not convinced that this result is that significant. I don't see any clear evidence yet that the planet and star are gravitationally bound," he said.

"The probability is there, but until they gather enough orbital data, all they have really found is that the two are moving through space together.

"These objects are in a cluster, and all objects in a cluster would move through space together anyway."

With the Upper Scorpious cluster being just five million years old, the discovery would imply a newer lower age limit for planetary formation.

"Just a few weeks ago we were looking at building planets in as little as 12 million years now if these observations are correct it's just five million," Dr O'Toole said.