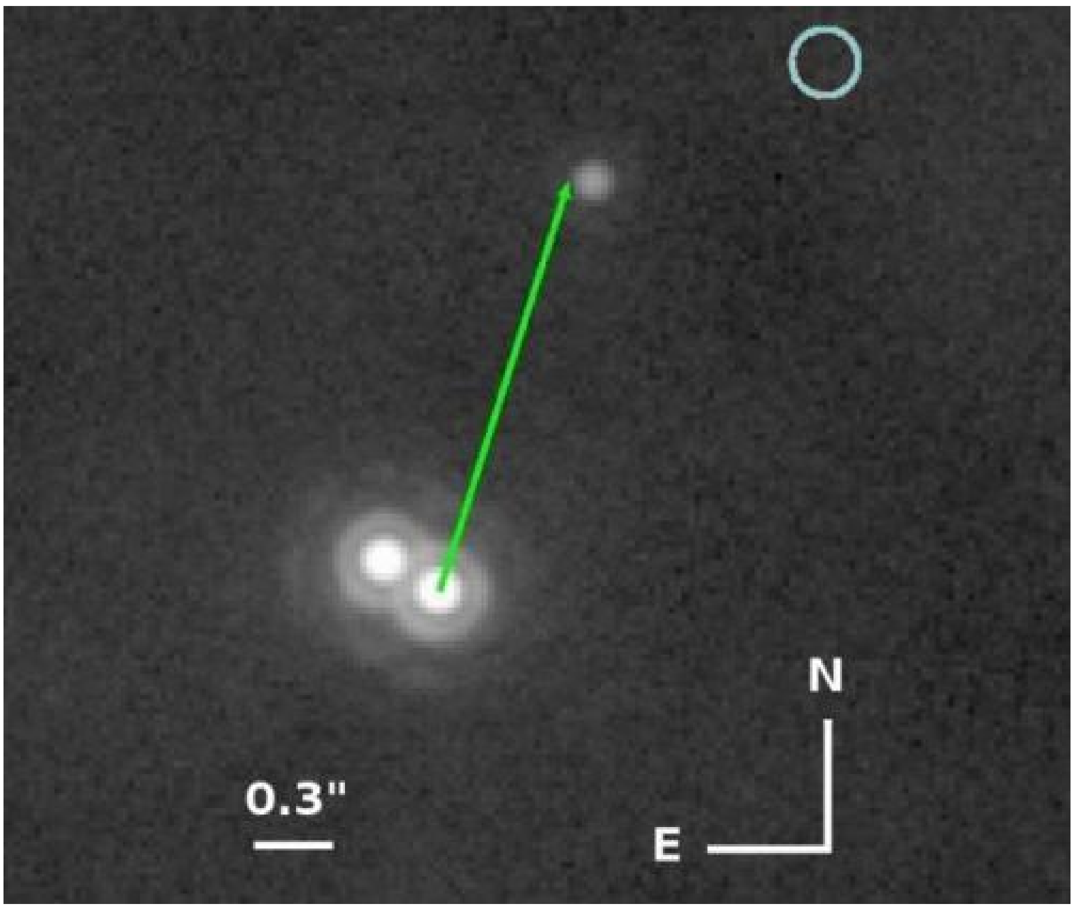
Researchers capture possible first picture of 'Tatooine' type planet orbiting binary stars

March 27 2013, by Bob Yirka



2MASS0103(AB)b in November 2012, with NACO in L' band. The green arrow shows the position of the companion in 2002. The light-blue circle identifes the expected position of the companion if it had been a background source. Credit: arXiv:1303.4525 [astro-ph.SR]

(Phys.org) —An international team of space scientists led by Philippe Delorme of Joseph Fourier University in Grenoble, France has taken a photograph of what might be a very large planet orbiting two suns. In their paper they've uploaded to the preprint server *arXiv*, the team describes how they compared the objects in their photograph with data previously captured by telescopes in 2002, to derive the orbital motion of the system. In so doing, they have found they've captured on film either a very large planet, or a brown dwarf circling binary stars.

The name Tatooine comes from the fictional home planet of Luke Skywalker of the Star Wars movies—it had two suns in its sky, providing audiences with surreal and iconic images. But it appears, that's as close as the planet in the movie comes to the one found by the team studying a photograph taken last year using the Very Large Telescope sitting atop a mountain in Chile. The real one, named 2MASS0103(AB)b, is colossal—approximately 12 to 14 times the mass of Jupiter. It appears to be made of gas as well, and it may not even be a planet at all, but a brown dwarf—a failed small star.

The researchers note that the dividing line between a brown dwarf and a planet is still being drawn by scientists, thus, they can't say for sure which the object in their image really is. They theorize that because it orbits so close to its stars—approximately 12.5 billion kilometers—it likely came into existence as material from the disc surrounding the stars clumped together due to gravitational instability, rather than via core accretion as is common with other planets. In this case, it would seem to be too big to have grown via accumulation of new material striking its surface.

To confirm whether the object in their photograph is indeed a planet, rather than a brown dwarf, the researchers will next focus their attention on learning more about its chemical makeup—if it turns out to be a planet after all, that will lend credence to the instability theory of its origin. Either way, in studying the newly found system, researchers will almost certainly gain new insights that are likely to be helpful in identifying similar bodies in the future.

More information: Direct imaging discovery of 12-14 Jupiter mass object orbiting a young binary system of very low-mass stars, arXiv:1303.4525 [astro-ph.SR] arxiv.org/abs/1303.4525

Abstract
Though only a handful of extrasolar planets have been discovered via direct imaging, each of these discoveries had tremendous impact on our understanding of planetary formation, stellar formation and cool atmosphere physics. Aims. Since many of these newly imaged giant planets orbit massive A or even B stars we investigated whether giant planets could be found orbiting low-mass stars at large separations. Methods. We have been conducting an adaptive optic imaging survey to search for planetary-mass companions of young M dwarfs of the solar neigbourhood, to probe different initial conditions of planetary formation. Results. We report here the direct imaging discovery of 2MASS J01033563-5515561(AB)b, a 12-14 MJup companion at a projected separation of 84 AU from a pair of young late M stars, with which it shares proper motion. We also detected a Keplerian-compatible orbital motion. Conclusions. This young L-type object at planet/brown dwarf mass boundary is the ?first ever imaged around a binary system at a separation compatible with formation in a disc.

via Newscientist

Citation: Researchers capture possible first picture of 'Tatooine' type planet orbiting binary stars (2013, March 27) retrieved 11 May 2024 from https://phys.org/news/2013-03-capture-picture-

tatooine-planet-orbiting.html