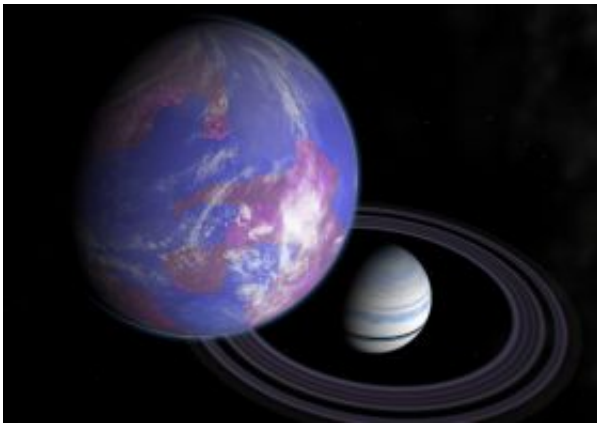


Wobbly planets could reveal Earth-like moons

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An artist's representation of a gas giant exoplanet with a habitable moon Credit: Andy McLatchie

Moons outside our Solar System with the potential to support life have just become much easier to detect, thanks to research by an astronomer at University College London (UCL).

David Kipping, whose work is funded by the UK's Science and Technology Facilities Council (STFC), has found that such moons can be revealed by looking at wobbles in the velocity of the planets they orbit. His calculations, which appear in the *Monthly Notices of the Royal Astronomical Society* today (11th December), not only allow us to confirm if a planet has a satellite but to calculate its mass and distance from its host planet – factors that determine the likely habitability of a

moon.

Out of the 300+ exoplanets (planets outside our Solar System) currently known, almost 30 are in the habitable zone of their host star but all of these planets are uninhabitable gas giants. The search for moons in orbit around these planets is important in our search for alien life as they too will be in the habitable zone but are more likely to be rocky and Earth-like, with the potential to harbour life.

"Until now astronomers have only looked at the changes in the position of a planet as it orbits its star. This has made it difficult to confirm the presence of a moon as these changes can be caused by other phenomena, such as a smaller planet," said David Kipping. "By adopting this new method and looking at variations in a planet's position and velocity each time it passes in front of its star, we gain far more reliable information and have the ability to detect an Earth-mass moon around a Neptune-mass gas planet."

The appearance of wobbles in a planet's position and velocity are caused by the planet and its moon orbiting a common centre of gravity. While the old method of looking at the wobbles in position allowed astronomers to search for moons, it did not allow them to determine either their mass or their distance from the planet.

Professor Keith Mason, Chief Executive of the Science and Technology Facilities Council, said, "It's very exciting that we can now gather so much information about distant moons as well as distant planets. If some of these gas giants found outside our Solar System have moons, like Jupiter and Saturn, there's a real possibility that some of them could be Earth-like."

Source: Science and Technology Facilities Council

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