Small sun hosts mini planet in distant solar system

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Scientists have detected a rocky planet that is smaller than Mercury, the smallest planet in our solar system, orbiting a solar-type star 80% of the size and mass of the Sun, according to research published in the journal Nature today (Wednesday 20 February 2013). The exact dimensions of the star, and the absolute size of the planet, were determined by asteroseismologists led by the University of Birmingham.

Previously only large planets could be detected using ground-based telescopes. However, the NASA Kepler spacecraft has made it possible to detect small, rocky planets that are Earth-sized or even smaller. This new planet is the innermost of three planets orbiting a small, dense solar-type star called Kepler-37. The planet is very close to the star, and its surface is therefore extremely hot and inhospitable, with no atmosphere or water.

Extrasolar planets, or exoplanets, are planets that are located outside our solar system. The Kepler spacecraft is monitoring the brightness of more than 150,000 stars in the Cygnus-Lyrae constellations of our galaxy, the Milky Way. Its data are being used to search for exoplanets and also to monitor the natural oscillations of stars – which is the field of asteroseismology.

The oscillations lead to tiny changes or pulses in brightness, and are caused by sound trapped inside the stars which makes the stars “ring” or vibrate like musical instruments. By analyzing the oscillations scientists can measure the properties of the stars very accurately and probe their interiors.

The planets were detected by the miniscule dimming of the starlight as the planets transited, or passed across, the stellar disc. The fractional dimming in the intensity of the light received from the host star enables scientists to accurately measure the size of the planet relative to the size of the star. Here, asteroseismology gave an exquisite measurement of the stellar radius, and hence fixed the planet size to a high level of accuracy.

Bill Chaplin, Professor of Astrophysics at the University of Birmingham’s School of Physics and Astronomy, who led the asteroseismic modelling work, said: ‘*This research shows for the first time that other stellar systems host planets much smaller than anything in our solar system. This helps us to put our own solar system into a wider context.’*

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Notes to Editors
Listen to a **sound file (/Audio/news/sub-mercury-host-star.mp3)** of the star.

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