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## Earth-Mass Exoplanet Found Orbiting Alpha Centauri B, only 4.3 Light Years Away

European astronomers using HARPS instrument on the 3.6-m telescope at ESO's La Silla Observatory, Chile, have discovered an exoplanet with about the mass of the Earth orbiting the star Alpha Centauri B.



This artist's impression shows the planet orbiting the star Alpha Centauri B, a member of the triple star system that is the closest to Earth, Sun is visible to the upper right (ESO / L. Calçada)

Alpha Centauri is one of the brightest stars in the southern skies and is the nearest stellar system to our Solar System – only 4.3 light years away. The star is actually a triple star – a system consisting of two stars similar to the Sun orbiting close to each other, known as Alpha Centauri A and B, and a more distant and faint red component – Proxima Centauri.

“Our observations extended over more than four years using the HARPS instrument and have revealed a tiny, but real, signal from a planet orbiting Alpha Centauri B every 3.2 days,” said lead author Dr Xavier Dumusque of Geneva Observatory in Switzerland and Centro de Astrofísica da Universidade do Porto, Portugal. “It’s an extraordinary discovery and it has pushed our technique to the limit!”

[The discovery will appear online today in the journal \*Nature\* \(eso.org version\).](#)

The astronomers detected the planet by picking up the tiny wobbles in the motion of the star Alpha Centauri B created by the gravitational pull of the orbiting planet. The effect is minute – it causes the star to move back and forth by no more than 1.8 km per hour. This is the highest precision ever achieved using this method.

Alpha Centauri B is very similar to the Sun but slightly smaller and less bright. The newly discovered planet, with a mass of a little more than that of the Earth, is orbiting about six million kilometers (only 0.04 AU) away from the star, much closer than Mercury is to the Sun in the Solar System.



Wide-field view of the sky around the bright star Alpha Centauri (ESO / Digitized Sky Survey 2 / Davide De Martin)

The orbit of the other bright component of the double star, Alpha Centauri A, keeps it hundreds of times further away, but it would still be a very brilliant object in the planet's skies.

The new planet is also the lightest exoplanet ever discovered around a star like the Sun.

“This is the first planet with a mass similar to Earth ever found around a star like the Sun. Its orbit is very close to its star and it must

be much too hot for life as we know it, but it may well be just one planet in a system of several,” said co-author Dr Stéphane Udry of Geneva Observatory.

“Our other HARPS results, and new findings from Kepler, both show clearly that the majority of low-mass planets are found in such systems,” he said.

“This result represents a major step towards the detection of a twin Earth in the immediate vicinity of the Sun. We live in exciting times!” Dr Dumusque concluded.

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Bibliographic information: Xavier Dumusque et al. An Earth mass planet orbiting Alpha Centauri B. *Nature*, published online October 17, 2012; doi: 10.1038/nature11572

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