This artist's impression shows what the surface of the alien planet Proxima b might look like. (Image credit: ESO/M. Kornmesser)

The closest alien planet to our solar system is even more Earth-like than scientists had thought, new observations suggest.

In a new study, an international team of researchers found that the minimum possible mass for Proxima b (opens in new tab), which lies just 4.2 light-years from Earth, is just 17% more massive than our planet.

Previously, scientists thought that this exoplanet, which lies in the habitable zone of its star, harbored a minimum of about 1.3 Earth masses. The new measurement indicates that Proxima b could be even more like our home planet, at least in size, than previous observations led scientists to think.

The research team studied Proxima b using the Echelle Spectrograph for Rocky Exoplanet and Stable Spectroscopic Observations, or ESPRESSO (opens in new tab)for short. ESPRESSO is a Swiss spectrograph that is currently mounted on the European Southern Observatory's (ESO) Very Large Telescope in Chile. Spectrographs observe objects and split the light coming from those objects into the wavelengths that make it up so that researchers can study the object in closer detail.

Related: Proxima b: Complete Coverage of the Exoplanet Discovery (opens in new tab)

Proxima b was first detected four years ago by an older spectrograph, HARPS ("High Accuracy Radial Velocity Planet Searcher"), which is installed on a scope at ESO's La Silla Observatory in Chile But with these newer observations, scientists have an updated, ultra-precise view of the planet.

"We were already very happy with the performance of HARPS, which has been responsible for discovering hundreds of exoplanets over the last 17 years," study co-author Francesco Pepe, an astronomy professor at the University of Geneva in Switzerland and the person in charge of ESPRESSO, said in a s t (opens in new tab) atement . "We're really pleased that ESPRESSO can produce even better measurements, and it's gratifying and [a] just reward for the teamwork lasting nearly 10 years."

"ESPRESSO has made it possible to measure the mass of the planet with a precision of over one-tenth of the mass of Earth," Michel Mayor, a Swiss astrophysicist who won the Nobel Prize for Physics in 2019 and helped to develop a new type of spectrograph called Elodie, who was not an author on this study, said in the same statement. "It's completely unheard of."

An alien planet

So what's the deal with this Earth-sized planet? Proxima b is "one of the most interesting planets known in the solar neighborhood," Alejandro Suarez

MascareÃ±o, the lead author on this study, said in the same statement.

This strange alien planet orbits Proxima Centauri, the closest star to our sun. Because the planet orbits right in the middle of its star's habitable zone, it's possible that liquid water (opens in new tab) â€” and potentially even life (opens in new tab) â€” could exist there. Because of its Earth-like mass, scientists believe that, not only could liquid water exist on Proxima b, it could also be a rocky, terrestrial planet similar to Earth.

But Proxima b orbits around a star that, while close to our solar system, is also much dimmer, and much less massive than our sun. Researchers think that the exoplanet is tidally locked and in synchronous rotation with its star, meaning that one side is always facing the star and one is always facing away: a light side and a dark side.

In addition, it's unclear if, Proxima b has an atmosphere. The planet lies very close to its star, completing one orbit every 11 Earth days. So, some researchers think that radiation coming from Proxima Centauri might have stripped away Proxima b's air, making it impossible for the alien planet's surface to hold onto liquid water. As scientists continue to study this system with new and better technology, we will be able to better understand what it's really like on Proxima b.

This new study was published May 26 (opens in new tab) to the preprint server arXiv and accepted to the journal Astronomy & Astrophysics.

Editor's Note: A previous version of this article stated that researchers had pinpointed Proxima b's mass. Instead, they changed the minimum possible mass for the alien planet.

Reference

Goodnight Lab: A Scientific Parody Bedtime Book for Toddlers (Funny Gift Book for Science Lovers, Teachers, and Nerds)

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