

A new, potentially inhabitable super-Earth

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Credit: Instituto de Astrofísica de Canarias

Researchers at the University of Oviedo, in collaboration with the Instituto de Astrofísica de Canarias (IAC) have discovered and characterized a planet in the habitability zone of a red dwarf star. It was detected using the method of transits.

A team of researchers at the University of Oviedo and the Instituto de Astrofísica de Canarias (IAC) have discovered and characterized a super-



Earth exoplanet orbiting at the inner limit of the habitability zone of a red dwarf star of type M0 called K2-286. They used data from the 15th campaign of the Kepler Space Telescope during its extended mission (K2).

The Kepler satellite was designed to discover exoplanets using the transit method by which the light from a star is measured to see whether it has periodic small dips, rather like an eclipse. If this occurs, it is because there is an orbiting planet passing regularly between Earth and the star.

In the study, the researchers also used OSIRIS and HARPS-N, instruments on the Gran Telescopio Canarias (GTC) and the Telescopio Nazionale Galileo (TNG) respectively, both at the Roque de los Muchachos Observatory (Garafía, La Palma).

The star K2-286, in the constellation of Libra, at a distance of 76 parsecs (244 light years), has a radius of 0.62 solar radii and an effective surface temperature of 3,650 C. The planet is 2.1 times larger in radius than the Earth, has an <u>orbital period</u> of 27,36 days, and an equilibrium temperature of around 60 C. The planet is at the inner limit of the habitability zone, which under suitable conditions allows it to retain water in liquid state, a necessary condition for life as we know it.

The planet is particularly interesting not only because it is in the habitability zone of its star, but also because it is an ideal candidate for atmospheric parameter measurement with the future James Webb Space Telescope, and also for observations from the ground with which its mass can be accurately measured. The researchers write, "We have shown that the activity of the star is moderate compared with other <u>stars</u> of similar basic parameters, which increases the chance that the planet could be habitable."

"The accurate data from HARPS-N, on the TNG in La Palma have



allowed us to measure moderate activity in the star and to put limits to the mass of this new planet, of type super-Tierra," says Borja Toledo, a doctoral student at the IAC and a co-author of the article.

"This exoplanet could be a good candidate for a new generation instrument such as ESPRESSO, recently installed on the VLT (Very Large Telescope) at the Paranal Observatory (Chile)," adds Jonay Gonzalez, a Ramón y Canal <u>postdoctoral researcher</u> at the IAV and another co-author of the article.

More information: A transiting super-Earth close to the inner edge of the habitable zone of an M0 dwarf star". Monthly Notices of the Royal Astronomical Society. <u>academic.oup.com/mnras/advance ...</u> <u>nras/sty3467/5259110</u>

Provided by Instituto de Astrofísica de Canarias

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