

The world's largest radio telescope has scanned Barnard's star for extraterrestrial signals

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Artist depiction of the surface of a super-Earth orbiting Barnard's Star. Credit: ESO/M. Kornmesser

Barnard's Star is a small red dwarf just six light-years from Earth. Despite its proximity, it was only noticed in 1916 when E. E. Barnard

found it had a particularly high proper motion. It had appeared in photographic plates taken by Harvard Observatory in the late 1800s, but as a small dim star, no one took notice of it. Since its discovery, Barnard's Star has been one of the most studied red dwarfs.

Interestingly, Barnard's Star is one of the first stars claimed to have planets. As far back as the 1970s studies claimed the presence of orbiting gas giants, though further observations overturned these results. Then in 2018 astronomers measured the radial motion of the star, which suggested the presence of a close-orbiting super-Earth with a mass of about 3 Earths. Further observations, however, overturned this discovery, suggesting that the radial fluctuations observed were due to [solar flares](#). Recent studies have confirmed Barnard's Star has no close-orbiting or potentially [habitable planets](#) larger than 70% of Earth's size.

This makes Barnard's Star a bit unusual since most red dwarfs have planets. For example, the red dwarf star Kepler-42 is similar in size and age to Barnard's Star and has at least three terrestrial planets. So while Barnard's Star isn't a strong candidate for [alien life](#), a recent study posted to the preprint server *arXiv* has made detailed observations of the star, looking for any signs of an extraterrestrial signal.

The study used the Five-hundred-meter Aperture Spherical Telescope (FAST). The Chinese telescope is a fixed-dish design similar to the Arecibo Observatory, but significantly larger. FAST is particularly sensitive in frequency ranges useful to long-distance communication, making it a good tool in the search for aliens.

The study searched Barnard's Star for narrow-band emissions, which are the kind of signals we might see if an alien civilization intentionally directed radio messages our way. The team even focused part of their search on signals coming from the hypothetical super-Earth Barnard's Star b, accounting for Doppler shifts due to the relative motion between

it and Earth.

As you might expect, the study found no evidence of an alien signal. But this study was mostly a test of what FAST could do. Future studies, particularly those aimed at [nearby stars](#) with confirmed planets in their habitable zones, will have better odds of finding something.

More information: Zhen-Zhao Tao et al, The most sensitive SETI observations toward Barnard's star with FAST, *arXiv* (2023). [DOI: 10.48550/arxiv.2309.15377](#)

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