Star Trek's planet Vulcan found to not be a planet after all

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A large international team of space scientists has discovered that the detection of an exoplanet orbiting the star 40 Eridani was made in error.

The group has published a paper on the *arXiv* pre-print server describing their reanalysis of the star and its exoplanet and how they discovered the error.

Back in 1966, the television show "Star Trek" made its debut—it lasted all of three years, but made an indelible impression on the American psyche. Several spin-offs have been made along with several motion pictures. One of the main characters was an alien named Spock, who hailed from the planet Vulcan, which orbited a star called 40 Eridani A.

That star and its fictional planet were based on the real star 40 Eridani A and a presumed exoplanet. In 2018, an exoplanet was discovered orbiting 40 Eridani A—it was named 40 Eri b, though many "Star Trek" fans no doubt wanted it to be named Vulcan. Unfortunately, it turns out that 40 Eri b does not really exist—the discovery was a mistake.

In this new effort, the researchers were working their way through a list of exoplanets that NASA is considering for closer study to make sure they are worthy of the huge costs involved. But in taking a closer look at 40 Eri b, they found some problems.

Such problems were not wholly unexpected. Some astronomers had questioned whether 40 Eri b, was actually a planet shortly after it was discovered. This was because it seemed unlikely that the duration of one orbit would be the same as the duration of one star rotation.

40 Eri b was thought to be a planet based on an analysis using radial velocity to study the wavelengths of light emitted from 40 Eridani. The team observed what they thought was a gravitational tug on the star, indicating pull from an exoplanet. But in tracing features of the light spectrum from the star, the new team found that the pull that had been observed was actually due to activity on the surface of the star—not evidence of an exoplanet.

More information: Katherine Laliotis et al, Doppler Constraints on Planetary Companions to Nearby Sun-like Stars: An Archival Radial Velocity Survey of Southern Targets for Proposed NASA Direct Imaging Missions, *arXiv* (2023). DOI: 10.48550/arxiv.2302.10310