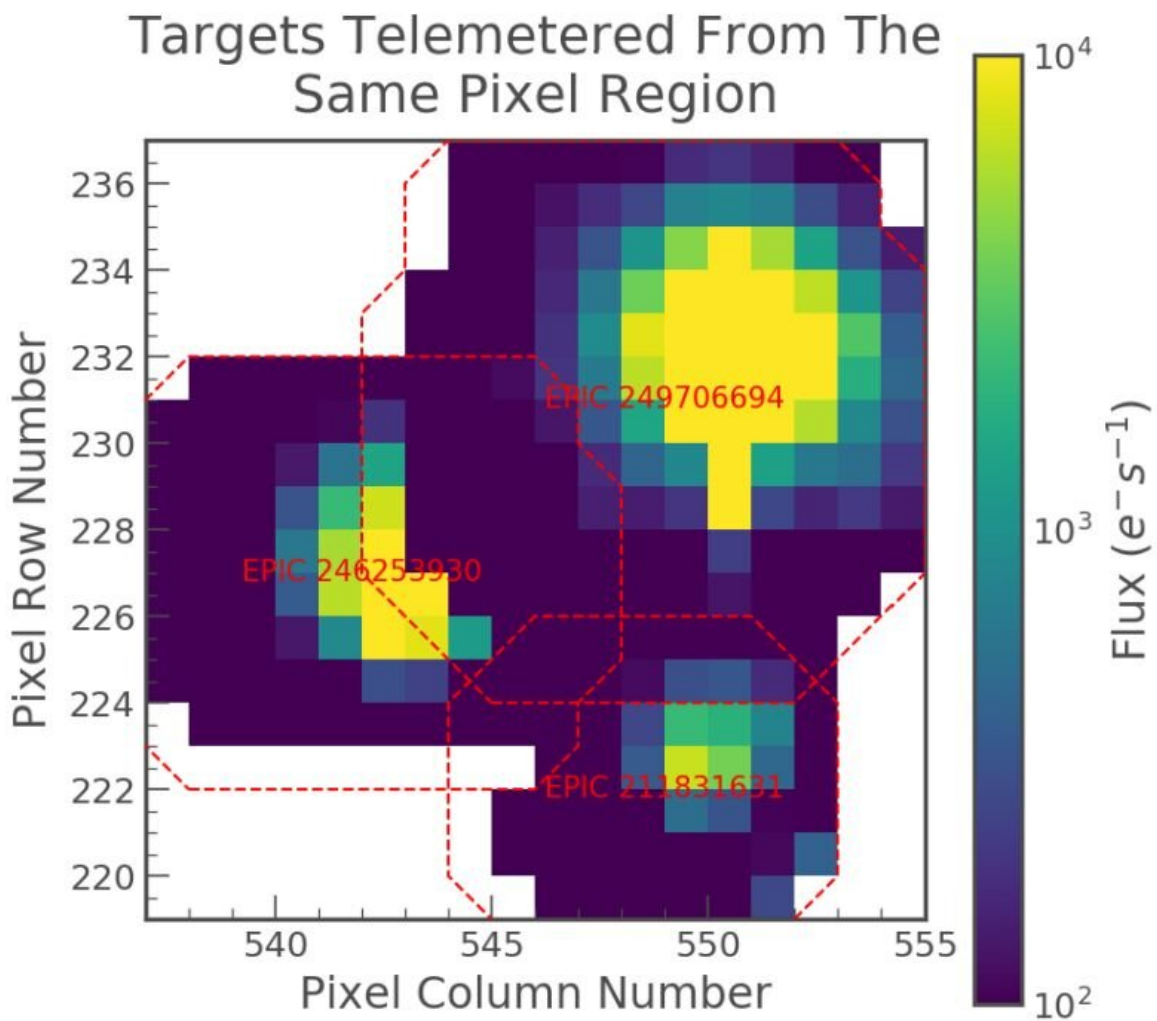


Binary stars with unexplainable dimming pattern

July 3 2019, by Bob Yirka



Composite image of EPIC 249706694 showing our target star as well as two other EPIC stars 211831631 and 246253930, each observed during a different campaign. The red lines denote the postage-stamp boundaries for each star

during its respective observation. We have verified that during observations of EPIC 211831631 and 246253930 the pixels in the overlap region were behaving normally. Credit: arXiv:1906.11268 [astro-ph.EP]

A team of researchers from the U.S., Denmark and the U.K., working with a group at NASA's Ames Research Center, has found a binary star system that dims unpredictably. They have written a paper describing their findings and have posted it on the *arXiv* preprint server and also on Oxford's *Monthly Notices of the Royal Astronomical Society*.

Binary star systems are those with two stars—astronomers tend to group pairs together as one when naming them. In this case, the researchers have spotted one they named EPIC 249706694 (HD 139139). And thus far, it is defying explanation with what the researchers describe as totally random transit periodicity.

A transit is dimming that occurs when a planet (or other object) passes between its star and Earth, blocking some of the light from the star. Transits are typically due to orbiting [planets](#)—this means they tend to happen on a regular predictable basis, known as their periodicity. But data from the Kepler space telescope indicates that the [binary star](#) has no apparent pattern to its periodicity.

The researchers observed 28 transits over the period from August 23 to November 20, 2017. They looked like other transits, and the amount of dimming was the same each time, except for two transits, suggesting that a single object is causing them. The researchers considered the possibility of multiple planets causing the transmits, but suggest that it seems beyond reason—there would have to be more of them than has ever been observed in any other star system, and they would all have to be the exact same size.

They also considered the possibility of one or disintegrated planets in the system, possibly due to collision; they also considered the possibility of dust clouds orbiting the star. But again, the odds against multiple pieces being of the same size very nearly rules out such a possibility. The researchers also considered that one or both of the [stars](#) might be experiencing variations in brightness for some unknown reason—but that seems far-fetched as well, because it would have to happen within a matter of hours.

As it stands, the researchers are stumped. They are asking others in the field, particularly those with access to powerful telescopes, to have a look to see if they might be able to provide an explanation for the erratic behavior.

More information: S Rappaport et al. The Random Transiter – EPIC 249706694/HD 139139, *Monthly Notices of the Royal Astronomical Society* (2019). [DOI: 10.1093/mnras/stz1772](https://doi.org/10.1093/mnras/stz1772) .

On *Arxiv*: arXiv:1906.11268 [astro-ph.EP]: arxiv.org/abs/1906.11268

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