

A tidal disruption event coincident with a high-energy neutrino

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IceCube discovered a diffuse flux of high-energy neutrinos in 2013, and recently identified the flaring gamma-ray blazar TXS 0506+056 as a likely neutrino source. However, a combined analysis of the entire resolved gamma-ray blazar population limited the contribution of such objects to no more than 27% of the total neutrino flux, leaving the vast majority of the neutrino flux unexplained. Here we present the identification of a second probable neutrino source, the Tidal Disruption Event (TDE) AT2019dsg, found as part of a systematic search for optical counterparts to high-energy neutrinos using the Zwicky Transient Facility. The probability of finding such a TDE with our follow-up program by chance is just 0.2%. Multi-wavelength observations reveal the presence of a central engine powering particle acceleration in AT2019dsg, and confirm that this object can satisfy necessary conditions for PeV neutrino production.

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Collaboration

other (fill field below)

other Collaboration

Zwicky Transient Facility (ZTF)

Subcategory

Experimental Results

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