Contribution ID: **347** Type: **Poster**

A high-energy neutrino coincident with a Tidal Disruption Event

IceCube discovered a diffuse flux of high-energy neutrinos in 2013, and recently identified the flaring blazar TXS 0506+056 as a likely neutrino source. However, a combined analysis of many similar blazars revealed no significant population excess, leaving the vast majority of the neutrino flux unexplained. Here we present the identification of a second likely 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%. Our multi-wavelength observations reveal the presence of a central engine powering particle acceleration in AT2019dsg, and confirm that this object can satisfy all necessary conditions for PeV neutrino production.

Mini-abstract

ZTF identifies the tidal disruption event AT2019dsg as a likely high-energy neutrino source

Experiment/Collaboration

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Session Classification: Poster Session 1