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Can Galaxy Clusters Explain the Diffuse Neutrino Flux Observed by IceCube? Speaker: Mehr Un Nisa

Friday, 29 October 2021 10:30 (20 minutes)

The originating sites of astrophysical neutrinos, diffuse extragalactic gamma rays, and ultra-high energy cosmic rays remain a largely unresolved puzzle. One class of astrophysical objects that could potentially provide a unified solution to the aforementioned mystery is galaxy clusters. Clusters of galaxies have been hypothesized as reservoirs of accelerated cosmic rays, which can interact with the intra-cluster medium (ICM) to produce a steady flux of neutrinos. Using 10 years of IceCube data, we perform a search for TeV—PeV neutrinos from by stacking 1094 clusters with masses between 10^{13} \(\textup{M}*odot\) *and* $\sim 10^{15}$ \(*textup{M}*\odot\) at redshifts between 0.01 and 2, detected by the Planck mission via the Sunyaev-Zeldovich (SZ) effect. We present the results of our study that places very strong constraints on the contribution of galaxy clusters to the diffuse neutrino flux, and discuss the implications for various models of neutrino production in the aforementioned population of objects.

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Neutrinos

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