

Diffuse Multi-messenger Signals of Dark Matter Powered Stars

Thursday, 19 February 2026 11:00 (20 minutes)

Dark matter (DM) annihilation can power the first generation of stars as long lived dark stars (DSs) that grow to supermassive scales M_{DS} $\gtrsim 10^5 M_{\odot}$ and eventually collapse into heavy black holes that could seed the supermassive black holes observed at high redshifts. We compute the electromagnetic and neutrino emission from these objects and determine the diffuse background flux from a population which would seed supermassive black holes. Using data from Fermi-LAT, Super-K, and IceCube, we draw constraints on this scenario of SMBH production in terms of the DM models which power the stars.

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Session Classification: parallel session A: DM