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Neutrino signals from Dark Stars seeding SMBHs

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Dark Stars (DS), powered by dark matter annihilation may form in the place of Pop. III stars. They can grow to
$gtrsim10^5\ M_\odot$ and collapse to black holes making them excellent candidates to seed supermassive black holes. We establish first constraints on DSs as SMBH progenitors based on DM annihilations using data from Super-Kamiokande and IceCube neutrino experiments, while remaining consistent with James Webb Space Telescope observations. Upcoming experiments such as Hyper-Kamiokande, DUNE, and JUNO will be able to explore DS properties with enhanced sensitivity.

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