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Dark Decay of the Neutron

Wednesday 26 September 2018 14:00 (20 minutes)

There is a long-standing discrepancy between the neutron lifetime measured from trapped neutrons versus those decaying in flight. In this talk, I will give an brief description of the experimental status of this puzzle and describe recent proposals to explain it by allowing the neutron to decay into hidden sector particles. In particular, I will focus on a scenario in which the neutron decays into 2 invisible particles: a dark Dirac fermion and an unstable dark photon. This setup can be consistent with all constraints if the fermion is a subdominant component of the dark matter. I will discuss the limits on the model's parameter space that are derived from the existence of two solar mass neutron stars, direct and indirect dark matter detection, supernova observations, and cosmological considerations.

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