Contribution ID: **2** Type: **not specified**

Effect of Fluctuating Fuzzy Dark Matter Haloes on Stellar Dynamics

Friday 27 September 2019 11:55 (20 minutes)

Ultra light axion fuzzy dark matter (FDM) has recently risen as a topical alternative that solves some of the galactic scale problems associated CDM-based structure formation. The long de Broglie wavelength leads for example to constant density cores replacing the density cups at the centres of CDM haloes.
This same property however also leads to interference patterns and accompanying fluctuations that can have observable effects on classical galactic components,
such as the disk and bulge, 'heating' them beyond observationally acceptable levels.

I develop and explain a detailed analytical model evaluating the effect of such fluctuations and apply it to the Milky Way disk and bulge to obtain a lower limit of m 2* 10ˆ-22 and 8 10ˆ-22 eV respectively for the axion mass. Application to the central cluster of Eridamus II leads to stronger constraints, which may entirely rule out FDM as a solution to galactic problems associated with CDM structure formation

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Session Classification: Friday morning talks