

UM Physics Department

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Title: Theoretical bounds on dark matter masses

Abstract:

In this talk, I will explain that quantum gravity leads to lower and upper bounds on the masses of dark matter candidates. These bounds depend on the spins of the dark matter candidates and the nature of interactions in the dark matter sector. For example, for singlet scalar dark matter, we find a mass range $10^{-3} \text{ eV} < m_{\phi} < 10^7 \text{ eV}$. The lower bound comes from limits on fifth force type interactions and the upper bound from the lifetime of the dark matter candidate.