

JOINT TUFTS/MIT COSMOLOGY SEMINAR

Hidden sectors and the axion domain wall problem

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The post-inflationary breaking of Peccei-Quinn (PQ) symmetry can lead to the cosmic domain wall catastrophe. We show how to avoid domain walls by implementing the instanton interference effect (IIE) with a hidden sector which itself breaks PQ symmetry and confines at an energy scale smaller than QCD. We give a general description of the mechanism and consider its cosmological implications and constraints within a minimal model. Contrary to other mechanisms we do not require an inverse phase transition or fine-tuned bias terms. Incidentally, the mechanism leads to the introduction of new self-interacting dark matter candidates and the possibility of producing gravitational waves in the frequency range of SKA. Unless a fine-tuned hidden sector is introduced, the mechanism predicts a QCD axion in the mass range 115 meV. (Based on arXiv:1905.13116)

Tuesday, November 26, 2019, 2:30 pm

Cosman Seminar Room

Center for Theoretical Physics

Building 6C, Room 6C-442

Massachusetts Institute of Technology