Hidden sectors and the axion domain wall problem

Mario Reig
Institut de Fisica Corpuscular, University of Valencia

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