

JOINT TUFTS/MIT COSMOLOGY SEMINAR

Small scale structure in ultralight dark matter and inflaton fields

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Modern cosmology has had great success modeling the observed universe with dark matter and inflation. While each of these paradigms has become part of the standard model of cosmology, complete mathematical descriptions remain elusive. In this talk, I will present recent results concerning the formation of small-scale structure in models of dark matter and inflationary reheating. In both cases, theoretical models differ in their predictions for small-scale structure formation and may contribute to future constraints. In ultralight dark matter (ULDM) wavelike effects smooth dark matter distributions on small scales. I will discuss the effects of interactions and multiple fields on the dynamics of ultralight dark matter. In the early universe, reheating is required to transition from primordial inflation to big bang nucleosynthesis. I will finish by discussing the gravitational collapse of perturbations during reheating. The formation of such structures would tighten constraints on models of inflation.

Tuesday, October 31, 2023, 2:30 pm
Cosman Seminar Room
Center for Theoretical Physics
Building 6C, Room 6C-442
Massachusetts Institute of Technology