JOINT TUFTS/MIT COSMOLOGY SEMINAR

Condensed Matter to Cosmology: Axions and Inflatons in the Early Universe

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The discovery of the Higgs boson reinforces the possibility that other similar, scalar particles may exist in nature and could drive cosmological inflation. In this talk, I will begin by discussing one such dark matter and sometime inflaton candidate, the axion. After describing why the axion is so appealing to theorists, I will talk about the claim that dark matter axions form an exotic state of matter called a Bose-Einstein condensate and my own work on this idea. This unique intersection of early universe cosmology with ideas from condensed matter is but one example of the exciting ways in which we are still exploring the dynamics of established and proposed particles in the early universe, especially those that may drive inflation. Thus I will also describe efforts to understand different inflationary models through the lens of reheating – particle production at the end of inflation. I will also discuss how these ideas make contact with data from direct detection experiments and astrophysical observations.

Tuesday, February 24, 2015, 2:30 pm
Cosman Seminar Room
Center for Theoretical Physics
Building 6C, Room 6C-442
Massachusetts Institute of Technology

Refreshments at 2:00 in the same room