JOINT TUFTS/MIT COSMOLOGY SEMINAR

From dark particle physics to the matter distribution of the Universe and beyond

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We formulate an effective theory of structure formation (ETHOS) that enables cosmological structure formation to be computed in almost any microphysical model of dark matter physics. This framework maps the detailed microphysical theories of particle dark matter interactions into the physical effective parameters that shape the linear matter power spectrum and the self-interaction transfer cross section of non-relativistic dark matter. These are the input to structure formation simulations, which follow the evolution of the cosmological and galactic dark matter distributions. These effective parameters in ETHOS allow the classification of dark matter theories according to their structure formation properties rather than their intrinsic particle properties, paving the way for future simulations to span the space of viable dark matter physics relevant for structure formation. We finally discuss observational prospects to constrain dark matter physics using gravitational lensing.

Tuesday, March 1, 2016, 2:30 pm
574 Boston Ave, Room 310
Tufts University

Refreshments at 2:00 outside room 304