



LABORATORY FOR ELEMENTARY-PARTICLE PHYSICS (LEPP)

Joint Experimental and Theory Seminar in Particle Physics and Cosmology:

Looking for the WIMP Next Door



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Dark matter that freezes out from a hidden sector is a simple and compelling scenario for the missing 25% of our universe, which can parametrically explain null results in searches to date. Any theory where DM arises from an internally thermalized dark sector must address the question: how was this dark sector populated in the early universe? The most minimal cosmological history for a dark sector is for it to interact strongly enough with the SM that the two sectors were in thermal equilibrium at early times. In this case, the existence of a thermal SM plasma in the early universe guarantees the population of the dark sector. I will demonstrate that the requirement that the dark sector was once in thermal equilibrium with the SM defines a UV-insensitive cosmological history for DM with a bounded parameter space and potentially observable consequences. I will show how cosmic and terrestrial searches for DM depend on the choice of leading interaction, highlight the leading signatures, and discuss prospects for testing the cosmological history of dark sectors in terrestrial experiments.

Friday, November 10th 2017
1:00pm
401 Physical Sciences Bldg.