

The Department of
Physics



Carnegie Mellon

McWilliams Center for Cosmology Colloquium

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The Search for WIMP Dark Matter

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Abstract:

For nearly the past century, the nature of dark matter in the Universe has puzzled astrophysicists. During the next decade, a series of experiments will determine if a substantial amount of the dark matter is in the form of non-baryonic, Weakly-Interacting Massive Particles (WIMPs). In this talk I will discuss and interpret modern limits on WIMP dark matter from two particularly promising searches: particle dark matter annihilation into high energy gamma-rays in satellite galaxies and scattering of dark matter particles in underground laboratories. I will show that these searches are just now obtaining sensitivity to probe the parameter space of cosmologically-predicted WIMPs created during the earliest epoch in the Universe. I will discuss the science to extract from a positive signal in different experiments, and the prospects for an era of dark matter astrophysics.