Physics & Astronomy Colloquium – Spring 2019

Tuesday, April 30th at 3:30 pm in SC 234

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A New Frontier in the Search for Dark Matter

The gravitational evidence for the existence of dark matter is overwhelming; observations of galactic rotation curves, the CMB power spectrum, and light element abundances independently suggest that over 80% of all matter is “dark” and beyond the scope of the Standard Model. However, its particle nature is currently unknown, so discovering its potential non-gravitational interactions is a major priority in fundamental physics. In this talk, I will survey the landscape of light dark matter theories and introduce an emerging field of fixed-target experiments that are poised to cover hitherto unexplored dark matter candidates with MeV-GeV masses. These new techniques involve direct dark matter production with proton, electron, and *muon* beams at various facilities including Fermilab, CERN, SLAC, and JLab. Exploring this mass range is essential for fully testing a broad, predictive class of theories in which dark matter abundance arises from dark-visible interactions in thermal equilibrium in the early universe.

Refreshments at 3:00 pm in SC 103