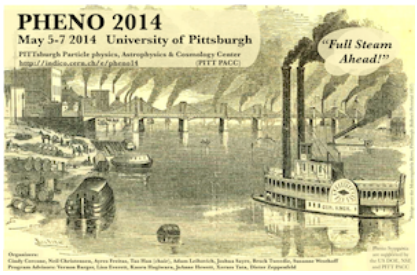

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New Directions in Dark-Matter Complementarity: Inelastic Scattering and Constraints on Dark-Sector Instability

Monday, 5 May 2014 14:15 (15 minutes)

Dark-matter complementarity is a reflection of the fact that even in single-component theories of dark matter, a single Lagrangian operator often contributes to a variety of physical processes including production at colliders, elastic scattering at direct-detection experiments, and dark-matter annihilation. However, in multi-component theories of dark matter, a single such operator can also give rise to a complementarity between additional processes such as inelastic scattering at direct-detection experiments and dark-matter decay. In this talk, I examine the generic consequences of such additional complementarities. I also show that within the context of a two-component dark-matter model, direct and indirect detection together provide perfect coverage of the model parameter space for large couplings. By contrast, for smaller couplings there emerges a range of mass-splittings between the dark-matter components within which the dark sector evades detection. I also discuss the prospects future experimental results afford for covering this gap.

Primary author: Dr THOMAS, Brooks (Carleton University)

Co-authors: Mr YAYLALI, David (University of Hawaii); Prof. KUMAR, Jason (University of Hawaii); Prof. DIENES, Keith (University of Arizona)

Presenter: Dr THOMAS, Brooks (Carleton University)

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