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Inelastic Dark Matter Through The Ages

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The microphysics of Dark Matter (DM) remains an open question in high energy physics and cosmology. Given the diversity of particles in the Standard Model (SM), it is plausible that DM is also composed of more than one type of particle organized in a “dark sector”. In case of inelastic or pseudo-Dirac DM, the dark sector consists of two nearly mass-degenerate states. These can participate in exothermic or endothermic reactions, and hence result in novel signatures at cosmological, astrophysical and terrestrial scales.

In this talk, I will use a minimal inelastic DM model to explore its possible (non)-thermal histories and how they map on to observables. In particular, I will investigate the imprints that such a dark sector leaves throughout the history of the universe—in the abundance of light elements, in the cosmic microwave background and in small scale structure—as well as discuss the complementarity between these and terrestrial experiments.

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