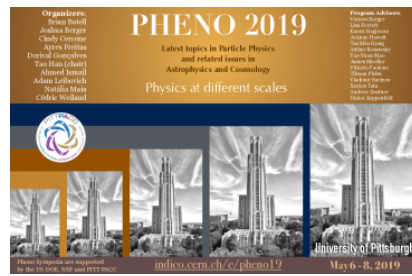


## Phenomenology 2019 Symposium



Contribution ID: 774

Type: parallel talk

# Deciphering the Archaeological Record: Cosmological Imprints of Non-Minimal Dark Sectors

*Monday 6 May 2019 15:45 (15 minutes)*

Many proposals for physics beyond the Standard Model give rise to a non-minimal dark sector containing many degrees of freedom. In this talk, we explore the cosmological implications of the non-trivial dynamics which may arise within such dark sectors, focusing on decay processes which take place entirely among the dark constituents. First, we demonstrate that such decays can leave dramatic imprints on the resulting dark-matter phase-space distribution. In particular, this phase-space distribution need not be thermal—it can even be multi-modal, exhibiting a pattern of peaks and troughs as a function of momentum. We then proceed to show how these features can induce small-scale modifications to the matter power spectrum. Finally, we assess the extent to which one can approach the archaeological “inverse” problem of deciphering the properties of an underlying dark sector from the matter power spectrum. Our results therefore provide an interesting way to learn about, and potentially constrain, the features of non-minimal dark sectors and their dynamics in the early universe.

## Summary

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