Contribution ID: **16** Type: **not specified**

Metastable bound states in the early universe and dark matter freeze-out

Thursday 1 December 2022 11:40 (40 minutes)

If dark matter couples to force mediators that are much lighter than itself, then bound states appear in the spectrum of the theory. The formation and decay of metastable dark matter bound states in the early universe can deplete the dark matter abundance, thereby changing the predicted parameters and the interpretation of experimental constraints. I will discuss how metastable bound states give rise to a generalised Saha equilibrium, and describe their effect on the dark matter relic density in different models, emphasising the potentially dramatic effect of the Higgs doublet in such processes.

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Session Classification: DM pheno theory