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Dark matter production out of kinetic equilibrium: the latest developments

Thursday 29 June 2023 14:40 (20 minutes)

In this talk I will discuss some of the recent progress in understanding the impact of non-equilibrium effects on dark matter (DM) production. First I will present a framework for performing calculations beyond kinetic equilibrium and exemplify its importance on several classes of DM models. Then I will discuss the latest results regarding impact of processes distorting the momentum distribution like semi-annihilation and cannibalization as well as numerical treatment of the elastic scattering collision term relaxing some of the up to now adopted assumptions. Finally I will comment on the effect of DM self-scatterings which although have been mostly neglected in the calculation of the relic abundance in fact can have a significant impact on the evolution of DM density through the modification of momentum distribution influencing the effectiveness of annihilation processes.

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