

# Production of Self Interacting Scalars in the Early Universe

*Thursday, 16 October 2025 09:15 (20)*

In this talk, I will present an overview of my research on Dark Matter (DM). I will begin with a brief introduction to the study of DM across different approaches, before focusing on Cannibal DM produced via the freeze-in mechanism in the early Universe. I will discuss the non-trivial thermal dynamics of this scenario and the importance of tracking the DM temperature evolution. I will then outline the resulting detectability prospects, which become viable in non-standard cosmological histories, particularly when the early Universe is dominated by a cold inflaton field. In the second part, I will turn to cosmological phase transitions, emphasizing how first-order transitions can generate observable gravitational waves (GWs). Finally, I will show that an inverse phase transition can occur within the freeze-in framework, where cannibalization dynamics crucially modify the evolution of the transition and the associated GW phenomenology, potentially within reach of future interferometer experiments.

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