Contribution ID: **7** Type: **not specified**

Enhanced Dark Matter Abundance in First-Order Phase Transitions

Saturday 2 November 2024 17:24 (18 minutes)

We propose a novel scenario to obtain the correct relic abundance for thermally under-produced dark matter. This scenario utilizes a strongly first-order phase transition at temperature $T_{\rm PT}$ that gives rise to dark matter mass m. Freeze-out in the broken phase can yield the desired abundance in the entire region currently allowed by observational bounds and theoretical constraints for $10^2 T_{\rm PT}$
$lesssim m$
$lesssim 10^4 T_{\rm PT}$. We show that the accompanying gravitational waves are strong enough to be detected by many upcoming and proposed experiments. This, in tandem with dark matter indirect searches, provides a multi-messenger probe of such models. Positive signals in the future can help reconstruct the potential governing the phase transition and shed light on an underlying particle physics realization.

Authors: HAUPTMANN, Cash (University of Nebraska - Lincoln); HUANG, Peisi; ALLAHVERDI, Rouzbeh (University of New Mexico)

Presenter: HAUPTMANN, Cash (University of Nebraska - Lincoln)

Session Classification: Beyond the Standard Model Phenomenology 1