Contribution ID: **39** Type: **not specified**

Leptogenesis during a First-Order Phase Transition

Friday, 11 October 2024 14:00 (30 minutes)

The typical mass scale and dynamics of thermal leptogenesis is well understood in the 'vanilla' framework where the departure from equilibrium is driven by the expansion of the universe. As opposed to this slow expansion, a first-order phase transition offers a drastic and violent source of out-of-equilibrium dynamics. When coupled to models of baryogenesis, such as leptogenesis, there can be a significant departure from the conventional picture changing the predicted parameter space of the theory and may be connected to a cosmological breaking of B-L. Importantly, the lepton asymmetry generated from their decay can be free from the strong wash-out processes that conventional leptogenesis scenarios suffer from, although new and important washout channels are now predicted leading to a lower-bound on the possible scale of this FOPT if an enhancement is desired.

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Session Classification: 1011C