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The role of impurities in cosmological phase transitions

Wednesday 24 April 2024 10:30 (30 minutes)

Topological defects can play an important role in cosmology. In this talk I will discuss a less explored effect that arises in the context of first order phase transitions, by which defects can act as local impurities catalysing the decay of the false vacuum. This dynamics takes place in one of the simplest extensions of the Standard Model, the xSM, where domain wall configurations associated to the new singlet scalar are shown to enhance the tunneling rate. This dramatically changes the way the electroweak phase transition proceeds, with implications for the corresponding spectrum of gravitational waves. I will finally discuss a similar mechanism involving QCD axion strings at the time of the electroweak phase transition.

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