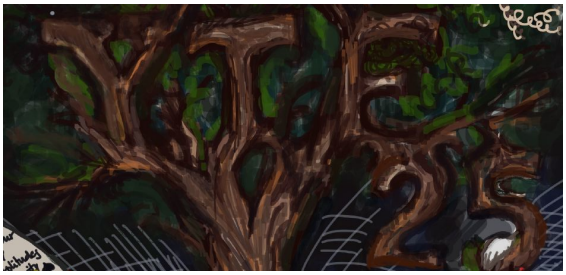

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Spectrum of radiation from global strings

Thursday 18 December 2025 11:30 (30 minutes)

Axion strings are topological defects that arise when the Standard Model is extended to include a Peccei-Quinn symmetry, which is spontaneously broken in the early Universe. Upon that, the Universe is filled with a network of strings that decay, losing energy by emission of, among others, axions. The spectral index of the axion energy spectrum can be measured in the field theory simulations and is used to predict the mass of the axion, which is a key parameter for the haloscope experiments searching for these particles. However, the energy spectrum usually measured in the simulations contains, besides the contribution of axions, also a sizeable contamination with the string self-field. In this talk, I will present a recent work in which, using a simplified model of a sinusoidally perturbed straight string, we managed to subtract the majority of this contamination. As a result, we could compute a corrected spectral index and axion mass, showing a substantial difference between the axion mass inferred using our method and the standard approach.

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