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Axion String Evolution

The axion is a pseudo-Goldstone boson of a new spontaneously broken symmetry, the Peccei-Quinn symmetry. If the symmetry is broken after inflation, topological strings are formed. As they slowly decay, they emit axion radiation. The axion production analysis is complicated because topological defect structures, global strings, appear in the axionic field and because the only reliable way to analyse their dynamics is through field simulations that require a huge amount of computational resources. In this talk we will investigate the recent claims that, contrary to the usual expectation for cosmic strings, state that the number of Hubble lengths of string per Hubble volume shows a logarithmic increase with time, instead of remaining constant. This would increase the axion dark matter density for a given symmetry-breaking scale and axion mass.

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