

# Gravitational waves from cosmic strings : relics of the early Universe

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Gravitational astronomy, which is still in its infancy, offers great prospects for studying the earliest moments in the History of the Universe. Unlike photons and neutrinos, gravitational waves propagated freely from the first moments of the Universe to our detectors, and are a direct probe of primordial cosmology and high energy physics. The Laser Interferometer Space Antenna which is due to be launched in 2034 will be able to observe/constrain sources of cosmological origins, among which cosmic strings. These objects are one-dimensional remnants of the phase transitions that occurred at early times. To this day, cosmic strings have not yet been discovered but their presence should produce a wide range of signatures due to their gravitational and non-gravitational effects.

First we model the formation and the dynamics of the cosmic string network and we quantify its signature in terms of gravitational waves as well as in high energy gamma rays. Second we compare these signals with bounds given by present and planned experiments and assess their ability to constrain extensions of the standard model.

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