

Theory of Elementary Particles, Astroparticle Physics, and Phenomenology (TEPAPP) Seminar

*Monday, March 2nd @ 3:00PM
Physics & Astronomy Building (PAB) 4-708*

“Cosmic Archaeology with Gravitational Waves from (Axion) Cosmic Strings”

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Abstract: Many motivated extensions of the Standard Model of particle physics predict the existence of cosmic strings. Gravitational waves (GWs) originating from the dynamics of the resulting cosmic string network have the ability to probe many otherwise inaccessible properties of the early universe. In this study we show how the frequency spectrum of a stochastic GW background (SGWB) from a cosmic string network can be used to probe Hubble expansion rate of the early universe prior to Big Bang Nucleosynthesis (BBN). We also demonstrate that current and planned GW detectors have the potential to detect such GW signals. The potential SGWB from global/axion strings will also be discussed which may provide a new probe for axion-like dark matter models. Furthermore we will show that in contrary to the standard expectation, cosmic strings formed before inflation could regrow back into horizon and leave imprints, with GW bursts potentially being the leading signal.