Advances in High Energy Physics

Special Issue on

Cosmic Strings: Fields in Their Space-Time and Their Cosmological Signatures

CALL FOR PAPERS

Cosmic strings are topological defects in the space-time structure that are supposed to have been formed during a symmetry breaking phase transition in the early universe. Their linear energy density distributions act as source for the gravitational field and curve space-time around them. This effect leads to important consequences to field theory and cosmology.

In fact, the description of quantum systems, relativistic or not, changes on a background characterized by a deficit angle. This special issue invites works on the dynamics and characterization of fields in space-times curved by the presence of topological defects.

Cosmic strings also lead to effects in cosmology. Kaiser-Stebbins lensing effect and cosmic string wakes are mechanisms for generating potentially observable imprints of cosmic strings. Observational windows include the angular power spectrum of cosmic microwave background (CMB) anisotropies and 21 cm redshift surveys. Cosmic strings may also be subdominant source of structure formation; moreover, they may seed formation of globular clusters or supermassive black holes at high redshift. Cusps annihilation on string loops may generate bursts of focused electromagnetic radiation that could explain ultrahigh-energy cosmic rays and even the recently observed fast radio bursts.

This special issue invites contributions to the cosmological signatures of cosmic strings and its new observational windows. This special issue is intended to consider various and high-quality studies of different aspects of cosmic strings.

Potential topics include but are not limited to the following:

- Prediction of cosmic string from particle physics models beyond the standard model
- Cosmic strings and superstrings
- Gravitational waves from cosmic string cusps
- Cosmic strings and their observational windows
- ThE0020mathematical theory of cosmic strings
- Topological defects in cosmology
- Cosmic string wakes and large-scale structure
- Noninertial effects in cosmic string space-time
- Bosons and fermions under the influence of noninertial effects in cosmic string space-time
- Higher-derivative theories and cosmic strings
- Thermal properties for relativistic particles in cosmic string space-times

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/ahep/csfs/.

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