



Advances in High Energy Physics

Special Issue on
**Phenomenological Aspects of Quantum Gravity and
Modified Theories of Gravity**

CALL FOR PAPERS

Formulating a quantum theory of gravity, unifying Einstein's theory of general relativity with a quantum theory that describes the other three fundamental forces of nature, is one of the most important open problems in theoretical physics. Promising approaches such as string theory and loop quantum gravity have made significant advances in this direction. They suffer, however, from one important drawback, namely, the paucity of concrete predictions which can be tested in the laboratory or in cosmological and astrophysical observations.

The phenomenological aspects of various approaches to quantum gravity are getting a lot of attention and cover many different topics such as theories with minimal length, noncommutative geometry, theories with generalized uncertainty principle, violations of Lorentz symmetries, and loop quantum cosmology. The recent developments in these approaches with their phenomenological implications in particle physics, cosmology, and astrophysics are the main theme of this special issue.

Potential topics include, but are not limited to:

- ▶ Theories with minimal length
- ▶ Modified dispersion relations and gravity's rainbow
- ▶ Deformation/breakdown of Lorentz symmetries
- ▶ Noncommutative geometry
- ▶ Thermodynamic approaches of gravity
- ▶ Modified theories of gravity
- ▶ Loop quantum gravity and loop quantum cosmology
- ▶ Wheeler-DeWitt equation and its applications
- ▶ Euclidean quantum gravity
- ▶ Horava-Lifshitz gravity
- ▶ Perturbative quantum gravity
- ▶ Holographic principle and AdS/CFT correspondence
- ▶ Phenomenological consequences of extra dimensions
- ▶ String motivated phenomenological models

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ahmed.ali@fsc.bu.edu.eg

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f2mir@uwaterloo.ca

Barun Majumder, Montana State
University, Bozeman, USA
barunbasanta@iitgn.ac.in

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