

## Special Issue on Analytical Methods for High Energy Physics

# CALL FOR PAPERS

Many of our complicated problems in particle and high energy physics are mainly mathematical challenges. For example, when we work with various field equations, nonlinear or fractional wave equations, noncommutative formalism, few- or many-body systems, and many other cases, finding the mathematical solution is the main task in studying the physics of the system. In order to solve these problems, both numerical and analytical techniques are followed, with their own merits and failures. Although both approaches are quite old, there are still many unanswered questions. Within the present special issue, we intend to concentrate on the mathematical problems in high energy physics and related analytical (and approximate-analytical) methods. These techniques, despite their limitations, provide us with a better insight into the physics of the system and are definitely attractive.

Potential topics include but are not limited to the following:

- ▶ Lie groups under a vector Yukawa-type potential
- ▶ Lorentz groups in particle physics
- ▶ Green functions in high energy physics
- ▶ Factorization methods in high energy heavy-ion collisions
- ▶ Path integral approach
- ▶ Integral transforms including Laplace, Fourier, Hanckel, and so forth
- ▶ Generalized special functions including Heun function
- ▶ Superintegrable systems
- ▶ Variational approaches at Large Hadron Electron Collider
- ▶ Approximate analytical solutions for not exactly solvable interactions
- ▶ Homotopy method for heavy-ion collisions
- ▶ Method of multiple scales
- ▶ Perturbative approaches in spin-one particles
- ▶ Higher order differential equations due to GUP
- ▶ Fractional order equations for scalar bosons
- ▶ Fractional order equations under scalar, vector, and tensor Cornell interactions
- ▶ Nonlinear wave equations for modeling high energy collisions
- ▶ Wave equations in curved spaces
- ▶ Einstein tensor field equations for gravitational instanton
- ▶ Nonlinear Maxwell-Klein-Gordon fields
- ▶ Quantum deformed algebras for classical and quantum gravity
- ▶ Noncommutative quantum mechanics
- ▶ Renormalization problems
- ▶ Similarities between condensed matter and high energy physics
- ▶ Dyson-Schwinger formalism
- ▶ Faddeev-Yakubovskii equation for quark-gluon plasma

Authors are expected to deposit their manuscript in the arXiv pre-print server prior to submission, under the relevant high energy physics subject area: Experiment (hep-ex), Lattice (hep-lat), Phenomenology (hep-ph), or Theory (hep-th). Articles that are rejected by arXiv for these categories are unlikely to be suitable for the journal.

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

Papers are published upon acceptance, regardless of the Special Issue publication date.

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