

Special Issue on Classical and Quantum Approaches to Black Holes

CALL FOR PAPERS

One of the most fascinating predictions and at the same time one of the least understood aspects of General Relativity is black holes, arising as special solutions of Einstein's field equations. The question of how they might be physically formed and what are, in such a case, their properties, behavior, and evolution has found a first theoretical answer in the work of Oppenheimer and Snyder already in 1939. Since then, the attempt to observe and detect black holes is based on the study of their gravitational effects on the matter and space that surrounds them. The celebrated recent observation of gravitational radiation by the LIGO detectors has confirmed these predictions of General Relativity and initiated the new era of gravitational wave astronomy.

However, there still remain many unresolved theoretical, mathematical, and physical issues, the ongoing investigation of which has led to a great number of scientific papers dealing with questions on, just to name but a few, the formation mechanism and evolution of black holes, the emission and propagation of gravitational radiation, the problem of energy-momentum localization, the possible existence of black holes in higher dimensions, the geometry and topology of the event horizon, their entropy and thermodynamics, and also quantum effects that become relevant at the singularity or at the horizon of a black hole and their study requires an understanding of the behavior of General Relativity in the quantum regime.

In this special issue we want to focus on problems related to classical as well as quantum aspects of black holes. We strongly believe that the study of black holes opens a window to the deeper understanding of gravity and hope that the addressing of questions on open issues in these areas may provide some new answers, thereby expanding the acquired corpus of knowledge about black holes and providing a better insight into their physics. In this sense, we welcome original research articles as well as review articles on theoretical advances in these areas.

Potential topics include but are not limited to the following:

- ▶ Formation and evolution of black holes
- ▶ Energy-momentum localization
- ▶ Quantum approaches to black holes
- ▶ Black holes thermodynamics
- ▶ Accretion discs around black holes
- ▶ Gravitational radiation from black holes
- ▶ Higher-dimensional black holes
- ▶ Topological black holes
- ▶ Stringy black holes
- ▶ Acoustic black holes

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/cqbh/>.

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

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