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Statistical Approaches in High Energy Physics

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Message from the Guest Editors

The vast amount of data from high energy collisions has opened up an opportunity toward further understanding of fundamental aspects in high-energy physics, in particular of the nonperturbative regime of quantum chromodynamics (QCD), the theory of strong interactions. Many phenomenological and theoretical approaches have been formulated for accurate description of the strongly interacting matter where a complex system of excited matter is formed, in order to understand its evolution, hadronization, and freeze-out.

The hydrodynamics approach to quark–gluon plasma expansion, the saturation model of color glass condensate, and the hadron resonance gas models are some examples of successful approaches to comprehensive description of the hot and dense system formed in high energy collisions. Statistical methods have been found to be valuable in understanding those mechanisms and to help with building the nonperturbative QCD sector.

In this Special Issue, we invite research in the field to present the state-of-the-art of statistical approaches in high energy physics, in particular in the QCD at extreme conditions, hadroproduction, and hot and dense nuclear matter formation.