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The 105th HENPIC seminar by Dr. Lipei Du (杜立配), Ohio State University, May 21st, 2020, Thursday, 10:30am (Beijing time)

Title: Hydrodynamics at non-zero net baryon density and fluctuation dynamics near the QCD critical point

Speaker : Dr. Lipei Du (杜立配), Ohio State University

Abstract:
Dissipative relativistic fluid dynamics has been unexpectedly successful in describing the evolution of the hot and dense fireballs created in relativistic light- and heavy-ion collisions at very high collision energies, and the distributions of particles emitted from them. I will discuss two recent developments that extend the applicability of the approach to lower collision energies: (1) the consistent evolution of the net baryon density and of the dissipative baryon diffusion current which are both non-zero and possibly large at lower collision energies (arXiv: 1906.11181); and (2) the non-hydrodynamic evolution of critical slow modes coupled to the hydrodynamic evolution of the medium as it passes by the critical point in the QCD phase diagram, using the newly developed HYDRO+ framework (arXiv: 2004.02719). These developments can provide guidance for future realistic simulations of heavy-ion collisions aiming at finding possible signals and the location of the QCD critical point.

Self-introduction: Lipei Du (杜立配), PhD student at The Ohio State University (2015-present), main research interest lies in theoretical modeling of heavy-ion collisions at Beam Energy Scan energies, including hydrodynamics at non-zero net baryon density and dynamics near the QCD critical point.