

Study the QCD Phase diagram with Beam Energy Scan at RHIC

Sunday, 29 September 2024 09:00 (30 minutes)

Understanding the properties of quark matter and its phase structure is crucial for advancing our knowledge of the universe's evolution and the composition of visible matter. Over the past two decades, numerous experimental observations have provided evidence for the existence of strongly interacting quark-gluon plasma (sQGP) in relativistic heavy-ion collisions. As a result, exploring the QCD phase structure at high baryon densities—such as mapping the first-order phase transition boundary and locating the QCD critical point—has become a primary objective in heavy-ion collision research. Between 2010 and 2021, the first and second phase of the Beam Energy Scan (BES-I) at RHIC were completed, with the STAR experiment collecting data from Au+Au collisions at energies ranging from 200 GeV to 3 GeV (Collider and Fixed-target mode). In this talk, I will present the latest experimental progress in exploring the QCD phase structure at RHIC, with a special emphasis on the search for the QCD critical point. I will also discuss new facilities designed for exploring the high baryon density region and outline future research plans.

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