

## Search for the QCD Critical Point in Heavy-ion Collisions at RHIC

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Understanding the properties of quark matter and its phase structure can enhance our knowledge of universe evolution and the structure of visible matters. In the last two decades, many experimental evidences for the strongly interacting quark-gluon plasma (sQGP) have been observed in high energy heavy-ion collisions. Therefore, exploring the QCD phase structure at high baryon density, such as mapping the 1st order phase boundary and finding the QCD critical point, becomes one of the most important goals of the heavy-ion collisions. During 2010-2017, RHIC has finished the first phase of Beam Energy Scan program (BES-I), and STAR experiment has collected the data of Au+Au collisions at various collision energies from 200 to 7.7 GeV. To confirm the intriguing observations at BES-I, RHIC has started the second phase of beam energy scan program (BES-II) since 2018, focusing on the energies below 27 GeV. From 2018 to 2020, STAR experiment has taken the data of high statistics Au+Au collision at 9.2, 11.5, 14.6, 19.6 and 27 GeV (collider mode) and 3.0 - 7.7 GeV (fixed target mode). In this talk, I will discuss the experimental progress for exploring the QCD phase structure at RHIC-STAR experiment, especially focusing on the QCD critical point search. New facilities aiming for high baryon density region and future plan will be also discussed.

**Primary author(s)** : Prof. LUO, Xiaofeng (Central China Normal University)

**Presenter(s)** : Prof. LUO, Xiaofeng (Central China Normal University)

**Session Classification** : Session 10: Theoretical ideas and experimental searches of the critical point (NOTE! Early starting time)

**Track Classification** : Theoretical ideas and experimental searches of the critical point