

# KMI Colloquium

## **Quark gluon plasma mapped over the QCD phase diagram with beam energy scan program at RHIC-BNL**



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### Abstract:

High-temperature and high-density state of matter such as Quark Gluon Plasma (QGP), which is supposed to exist in early universe or inside the neutron stars, has been extensively studied in the laboratory at the Relativistic Heavy Ion Collider (RHIC) and the Large Hadron Collider. Here two major discoveries are the large elliptic flow via collective flow of partons and the significant high transverse momentum suppression via energy-loss of energetic partons inside the QGP. One of the ultimate goal of QGP study is to locate critical point at the end of the first order phase boundary, which is expected in high-density area of the quantum chromo dynamics (QCD) phase diagram of quark-nuclear matter. This is accessible via lowering the colliding beam energy by large baryon stopping. The beam energy scan program phase II (BES-II) will be pursued in the next few years to search for a critical point and the first order phase transition. The recent results from RHIC experiments and the future plans in BES-II program will be presented and discussed.

