

# Recent Results from RHIC

S.E. Vigdor

Brookhaven National Laboratory, Upton, New York, USA

Relativistic heavy-ion collisions permit laboratory study of unique quantum many-body manifestations of QCD in matter produced under thermodynamic conditions akin to those of the infant universe about a microsecond after the Big Bang. I will review a number of recent results from RHIC that demonstrate dramatic advances up the learning curve in exploring condensed QCD matter. Particular emphasis will be given to progress in a few areas: quantifying the degree of perfection of the nearly perfect liquid matter discovered at RHIC; probing the role of quantum fluctuations in the evolution of the "mini-universe" created in each RHIC collision; searching via a beam energy scan for the onset of the quark-gluon deconfinement transition and for a possible critical point in the QCD phase diagram; and evidence consistent with the saturation of gluon densities in the cold nuclei just before collision. Improving constraints from RHIC polarized proton collisions on the contribution of gluons to the spin of the proton will also be presented. I will also briefly review ongoing and planned facility upgrades and their impact on the physics reach of RHIC.

E-mail:

[vigdor@bnl.gov](mailto:vigdor@bnl.gov)