Exploring novel phenomena at the early stages of relativistic heavy ion collisions



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Collisions of two nuclei at the modern accelerators like the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory and the Large Hadron Collider (LHC) at CERN provide ideal testing ground for the theories of fundamental forces & symmetries. The early stages of such collisions generate strongest color fields and highest gluon densities allowed by the strong interaction and eventually lead to the formation of a liquid-like quark-gluon matter that filled the microsecond-old universe. Interestingly, such collisions also generate the strongest known electromagnetic fields (~10^18 Gauss) in the universe. The quantum fluctuations, amidst such strong fields, can lead to a phenomenon that is similar to what led to matter-antimatter asymmetry in the early universe. In this talk, I will discuss the recent experimental efforts in unraveling the signatures of such a phenomenon at the early stages of relativistic heavy ion collisions.

