Ahmed M Hamed, J Astrophys Aerospace Technol 2017, 5:4(Suppl)
DOI: 10.4172/2329-6542-C1-014

Relativistic heavy-ion collisions and relics from the early Universe

Ahmed M Hamed
University of Mississippi, USA

World-wide efforts over the past half-century have produced a remarkably successful theoretical framework, the standard model (SM) describing matter and energy (only ~4% of the Universe) in a flat 4-dimensional spacetime, as built of certain constituents, interacting through specific forces according to general principles of symmetry, relativity, and quantum mechanics. The SM of particle physics predicts two phase transitions that are relevant for the evolution of the early universe; one occurs at temperatures of a few hundred GeV (electroweak symmetry breaking), and another is expected to occur at ~200 MeV (chiral symmetry breaking). The prediction for the latter phase to be created in a domain where complete analytical calculations are unobtainable increase the challenges at the theoretical level. Nevertheless, this situation provides an exciting opportunity for an experimentalist to lead the endeavor, hence the relativistic heavy-ion program, which was proposed in 1974. The relativistic heavy ion experiments are constructed to produce the quark gluon plasma (QGP), a proposed precursor phase to the big bang nucleosynthesis, after setting the stage for one of the most important signatures of the QGP, Jet Quenching, I'll discuss whether it can be considered as unequivocal evidence for such phase.

Biography

Ahmed M Hamed is a Visiting Assistant Professor at the Department of Physics and Astronomy, University of Mississippi. He was a Postdoctoral Research Associate in the Cyclotron Institute, and had concurrently been a Visiting Assistant Professor in the Physics Department, at Texas A&M University. He was involved in the experimental high-energy nuclear physics research in the STAR Collaboration at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory (BNL).

amhamed@olemiss.edu

Notes: