PHYSICS AND ASTRONOMY
SEMINAR

Mr. John Fuini

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"Far-From-Equilibrium Dynamics of a Strongly Coupled Non-Abelian Plasma with Non-Zero Charge Density or External Magnetic Field"

Abstract

Using holography, we study the evolution of a spatially homogeneous, far from equilibrium, strongly coupled N=4 supersymmetric Yang-Mills plasma with a non-zero charge density or a background magnetic field. This gauge theory problem corresponds, in the dual gravity description, to an initial value problem in Einstein-Maxwell theory with homogeneous but anisotropic initial conditions. We explore the dependence of the equilibration process on different aspects of the initial departure from equilibrium and, while controlling for these dependencies, examine how the equilibration dynamics are affected by the presence of a non-vanishing charge density or an external magnetic field. The equilibration dynamics are remarkably insensitive to the addition of even large chemical potentials or magnetic fields; the equilibration time is set primarily by the form of the initial departure from equilibrium. For initial deviations from equilibrium which are well localized in scale, we formulate a simple model for equilibration times which agrees quite well with our results.

Tuesday, October 20, 2015
1:00 p.m.
Elliott Building
Room 161