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String Theory in Greater Paris

Rencontres Théoriciennes

"Supergravité, théorie des cordes et théorie M"

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Maximilian Attems

Universidade de Santiago de Compostela

Holographic dynamics of phase separation

Understanding hot unstable plasmas such as the ones produced at RHIC is a notoriously difficult open problem that needs to be tackled in order to elucidate the QCD phase diagram. The detection of a spinodal instability of the plasma would present a key signature of the presumed first-order phase transition. In this talk I will report on progress in describing hot unstable plasmas in the context of the gauge/gravity duality. I will discuss a holographic non-conformal model of hot plasma with QCD-like properties and explain the features of a first-order phase transition near criticality. A spinodal instability of the plasma is modeled by a Gregory-Laflamme type instability in gravity. While the standard Mueller-Isreal-Stewart hydrodynamical prescription fails due to the presence of large plasma gradients I will demonstrate the necessary correction terms for the surprisingly good hydrodynamical description of the pressures.

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