

UCLA Nuclear Physics Seminar

“Holographic real-time dynamics near a critical point”

Presented by Dr. Maximilian Attems

Universidade de Santiago de Compostela, Spain

Ever since the discovery of the quark-gluon plasma (QGP) the location of the critical point in the QCD phase diagram - the end point of the first-order transition between hadron matter and QGP - has been a main research goal for heavy-ion collision experiments. We use the gauge/gravity duality to study as first a four-dimensional, strongly-coupled gauge theory with a first-order thermal phase transition. In the dual gauge theory we calculate the evolution and saturation of the spinodal instability. We uncover a new surprising example of the applicability of hydrodynamics to systems with large gradients. We discover with shockwave collisions that in theories with a first-order phase transition, a long-lived, quasi-static state may be formed. Moreover, we show the Mueller-Israel-Stewart-type formulation of hydrodynamics to fail to describe pressures near a critical point.

Location: Knudsen 4-134

Date: Monday, January 7, 2019

Time: 11:00am