PHYSICS AND ASTRONOMY

SEMINAR

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ñSchwinger-Keldysh effective field theory for dissipative systemsò

Abstract

Hydrodynamics is a universal description of long wavelength dynamics in locally equilibrated systems. While it provides a phenomenologically very well understood framework, its origin as a Wilsonian effective field theory is has long been mysterious. In particular, the emergence of dissipation and the second saw poses challenges from a quantum field theory perspective. In recent years we have seen significant progress on this problem. I will describe an effective field theory framework for understanding the origin of the second law and hydrodynamics in general.

Crucial ingredients are a careful treatment of Schwinger-Keldysh (or in-in) formalism and the KMS condition. An interesting consequence is the realization that coarse grained entropy can be thought of as the Noether charge of an emergent, state dependent symmetry, and the second law follows as a statement of symmetry breaking. This culminates in a complete effective action formulation of hydrodynamic transport.

Tuesday, November 21, 2017
11:00 a.m.
Clearihue Building
Room C115