

Abstract

Collective spin motion has been playing an increasingly prominent role both in high energy and condensed matter physics, especially after the observation of global polarization of Λ hyperons in heavy ion collisions and generation of spin currents in liquid metals. In this talk I will introduce a novel and full fledged construct of spin hydrodynamics, that is, relativistic hydrodynamics of the spin current coupled to the stress tensor. We then apply this to heavy ion collisions and find surprisingly good agreement with data. If time permits, I will also present a holographic approach to spin currents based on the Lovelock-Chern-Simons theory in five dimensions.