Condensed Matter Theory Center Seminar
Tuesday, February 4 at 11:00am
2205 Physics Building

Speaker: R. Loganayagam (Institute for Advanced Study, Princeton, NJ)

Title: Thermal anomaly polynomial - curious structures in anomaly induced transport

Abstract:
In this talk, I plan to review some of the recent advances in anomaly induced transport processes with a focus on the relation between Lorentz anomalies and thermal transport. The focus will be on an interesting observable called `thermal helicity' (see below).

Consider a relativistic field theory living in even spacetime dimensions d=2n. Let J_{ab} be the angular momentum in the ab-plane and P_a be the linear momentum along a-direction. Thermal helicity is then defined as the average value of the product
< J_{12} J_{34} J_{56} ..... J_{2n-3,2n-2} P_{2n-1} > where <..> denotes average taken in a thermal ensemble with temperature T and chemical potential \mu. For example, in 3 spatial dimensions, thermal helicity is given by < J_{xy} P_z >. = < J_z P_z >.

Recently it has been realized that thermal helicity is always a homogeneous polynomial in temperature T and chemical potential \mu. This polynomial is in turn related simply to the anomaly polynomial of the system under question. This statement can be thought of as a generalization of chiral part of Cardy formula in 2d CFTs.

I will sketch a recent field theory proof of this statement given in [arXiv:1311.2935].

Host: Sriram Ganeshan

http://www.physics.umd.edu/cmtc/seminars.html
