Barry's Title/ Abstract

Title: Viscosity of 2D Topological Phases

Abstract: One hallmark of topological phases with broken time reversal symmetry is the appearance of quantized non-dissipative transport coefficients, the archetypical example being the quantized Hall conductivity in quantum Hall states. Here I will talk about a new non-dissipative transport coefficients that appear in such systems - the Hall viscosity. In the first part of the talk, I will start by reviewing previous results concerning the Hall viscosity, including its relation to a topological invariant known as the shift when rotational symmetry is preserved. Next, I will show how the Hall viscosity can be computed from a Kubo formula. For Galilean invariant systems, the Kubo formula implies a relationship between the viscosity and conductivity tensors which may have relevance for experiment. In the second part of the talk, I will examine the fate of the Hall viscosity when rotational symmetry is broken. Through a combination of field theory and numerical techniques, I will show that rotational symmetry breaking allows for the introduction of a new topological quantum number characterizing quantum Hall states. Finally, I will present results on the Hall viscosity of quantum Hall systems in a tilted magnetic field.