Physical Sciences Seminar

Transport in fractional quantum Hall edges with counterpropagating modes

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Generically, edges of fractional quantum Hall (FQH) systems involve multiple modes. Furthermore, for a majority of fractions, there are counterpropagating modes on the edge. In particular, it was predicted that this is always the case for filling fractions between 1/2 and 1, including such prominent FQH states as 2/3, 3/5, etc. In this talk, I will review recent theoretical and experimental progress on understanding transport properties of such complex edges. The observables of interest include, in particular, electrical and thermal conductances. Our theory predict distinct quantized values for them (determined by the bulk topology) for coherent (non-equilibrated) and equilibrated regimes. Another important observable is electric shot noise. We show that noise is an effective tool to study the thermal transport and the topology of the state. On the experimental side, there are major advances in the last few years in engineering such systems and exploring their transport characteristics. Combination of experimental and theoretical progress paves the way for better understanding the topology of FQH states, including non-abelian states such as 5/2.

Friday, February 3, 2023 11:00am - 12:00pm
Heinzel Seminar Room / Office Bldg West (I21.EG.101)

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