

# Condensed Matter Theory Center Seminar



Wednesday, March 27  
11:00 am – 12:30 pm, Physics Building 2205

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## “Shot Noise Signatures of Charge Fractionalization in the $\nu=2$ Quantum Hall edge”

We investigate the effect of non-equilibrium and interactions on shot noise in  $\nu=2$  quantum Hall edges, where interactions between the two co-propagating edge modes are expected to give rise to charge fractionalization. We consider a setup consisting of a Hall bar pinched by two Quantum point contacts (QPCs). The first QPC selectively drives out of equilibrium the outer edge mode only, which then interacts with the unbiased inner one over the distance between the two QPCs. We describe the edge modes by two chiral Luttinger liquids, whose coupling is introduced via a quantum quench. In order to study the relaxation dynamics of the inner edge mode, we employ the method of non-equilibrium bosonization. Non-equilibrium bosonization is a convenient framework to treat exactly strongly interacting, one dimensional systems far from equilibrium. The core feature of this method is the relation between the observables of the theory and the determinants of full counting statistics.

In our model, we find that even asymptotically the edge distribution function does not thermalize, but instead depends in a sensitive way on the interaction strength between the two edge modes. We compute shot noise and Fano factor from the asymptotic distribution function of the inner edge mode at the second QPC, and from comparison with a reference model of fractionalized excitations we find that the Fano factor can be close to the value of the fractionalized charge.

(All are welcome to attend)

