



Condensed Matter Theory Center

Seminar

Alex Levchenko

University of Minnesota

Monday, November 10

10:00 AM

2202 Physics Building

“Coulomb Drag in Quantum Circuits”

Drag effect in a system of two electrically isolated quantum point contacts (QPC), coupled by Coulomb interactions is studied theoretically. It is shown that drag current exhibits maxima as a function of QPC gate voltages when the latter are tuned to the transitions between quantized conductance plateaus. In the linear regime this behavior is due to enhanced electron-hole asymmetry near an opening of a new conductance channel. In the non-linear regime the drag current is proportional to the shot noise of the driving circuit, suggesting that the Coulomb drag experiments may be a convenient way to measure the quantum shot noise. Remarkably, the transition to the non-linear regime may occur at driving voltages substantially smaller than the temperature.