DAY 3 (25 June): 11:30 – 12:10

Quantum shock waves in fractional quantum Hall edge states: Nonlinear dynamics and topology.

Paul Wiegmann (James Frank Institute, University of Chicago)

Transport in interacting non-dissipative electronic systems is essentially nonlinear and unstable: a propagating semiclassical wave front develops a shock wave at a finite time. A wave collapses into oscillatory features which further evolve into regularly structured localized pulses carrying a fractionally quantized charge. I present a theory which describe fractional quantum Hall edge states where non-linear effects where taken into account and discuss perspectives of observation of quantum shock waves and a direct measurement of the fractional charge in fractional quantum Hall edge states. The talk is based on series of papers written with Bettelheim E, Abanov AG.