Contribution ID: **29** Type: **not specified**

Time evolution of a solvable quantum many body system

Thursday, June 8, 2017 11:20 AM (40 minutes)

The Luttinger model is a solvable model describing interacting fermions in one dimension; the solution was found in 1965 by Mattis and Lieb but only equilibrium properties were explored. We present some recent results, obtained in collaboration with Langmann,
Lebowitz and Moosavi (CMP 2016; PRB 2017) on the time evolution of such model starting from a non-equilibrium situation,
that is a domain wall initial state, i.e., a state with different densities on its left and right sides, or a
non uniform temperature profile state. The system approaches a non equilibrium steady state carrying a (density or heat) current
with remarkable universality properties, and explicit formulas for the time evolution of several physical properties can be obtained.
Physically the system describes a one dimensional metals as realized in quantum wires.
The analysis is rigorous in the first case, and exact in the second, and
depends crucially on the solvability of the model; how much the behavior changes if solvability is broken is an important
open question.
E. Langmann, J. Lebowitz, V.Mastropietro, P Moosavi (CMP 2016; PRB 2017)

Primary author: Prof. MASTROPIETRO, Vieri (universita' statale di Milano)

Presenter: Prof. MASTROPIETRO, Vieri (universita' statale di Milano)