M A T H E M A T I C A L  P H Y S I C S  S E M I N A R

Rutgers University
Hill Center - Room 705

**An Exact Formalism For Quench Dynamics**

Natan Andrei, Rutgers University
Thursday, April 25, 2013 - 2:00pm

**Abstract**

We describe a formulation for studying the quench dynamics of integrable systems generalizing an approach by Yudson. We study the evolution of Lieb-Liniger system, a gas of interacting bosons moving on the continuous infinite line and interacting via a short range potential. The formalism allows us to quench the system from any initial state. We find that for any value of repulsive coupling independently of the initial state the system asymptotes towards a strongly repulsive gas, while for any value of attractive coupling, the system forms a maximal bound state that dominates at longer times. In either case the system equilibrates but does not thermalize, an effect that is consistent with prethermalization. If time permits I shall discuss also the quench dynamics of the XXZ Heisenberg chain and of a mobile impurity in an interacting Bose gas.