Condensed Matter Theory Center Seminar

Thursday, February 10
10:00 am
2205 Physics Building

Claudia De Grandi, Boston University

"Probing quantum systems through adiabatic dynamics"

We analyze the response of a quantum system when perturbed from its quantum critical point. In particular we consider the case of quenches with arbitrary power law dependence on time of the tuning parameter. Using adiabatic perturbation theory we find the scaling behaviour of several observables with the quench amplitude and the system size. We show that the universal scalings of those observables, as the excitation probability, the density of excited quasiparticles, the heat and the entropy, can be understood through the singularities at the critical point of some adiabatic susceptibilities, which are defined as a simple generalization of the fidelity susceptibility.

We specify those results to the case of the sine-Gordon model, showing its connections to experimental realizations with cold atoms in one-dimension. In particular we discuss the relevance of these findings for the choice of the optimal protocol to load atoms in optical lattices.

All are welcome to attend.

DEPARTMENT OF PHYSICS
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