

Announcement for a Special Seminar, SFB631

Dr. Alexandre Faribault (Universiteit van Amsterdam)
Monday, March 17, 11:00
Theresienstr. 37, Room 450

Interaction quenches in the Richardson model: A Bethe Ansatz approach

In the recently developed field of ultra cold fermionic gases, detuning from a Feshbach resonance allows one to control the interaction between fermions. It then becomes possible to modify the interaction strength on extremely short time scales therefore driving the system completely out of equilibrium. The feasibility of such experiments has resulted in a renewed interest in the nonequilibrium dynamics of fermion pairing which led to theoretical studies of this problem using the Richardson (or reduced BCS) model. So far, these calculations have only been carried out using a mean-field description.

Using properties specific to this integrable quantum model, I intend to show how the exact solution obtained through the algebraic Bethe Ansatz gives access to the non-equilibrium quantum dynamics of this system following a sudden change in the interaction between particles, i.e. an interaction quench. This approach can be used for finite-size systems which are larger than those accessible to exact diagonalization methods, applies for quenches in which a large interaction change prevents the use of perturbative methods and since no errors accumulate as time is evolved, it also allows us to study long-time behavior.

Signed: Jan von Delft, Stefan Kehrein