

Lecturer: **Gunter Schuetz** (Juelich Forschungszentrums).

Title: Fluctuation theorems for stochastic interacting particle systems.

Abstract: Fluctuation theorems (FT's), first proved rigorously by Gallavotti and Cohen for deterministic dynamical systems, provide important insight into the form of the far-from equilibrium behaviour of non-reversible processes, in particular into the rate of entropy production. Examples besides Gallavotti-Cohen include the (earlier) Evans-Searles transient FT, the Jarzynski relation, the Crooks relation and others. Subsequently analogous theorems were obtained for Markovian stochastic dynamics by Kurchan and Spohn and Lebowitz. Along these lines we introduce within the framework of stochastic interacting particle systems passive counting processes and show with this tool how all FT's emerge from a fundamental time-reversal argument. We also discuss some unexpected limitations of the validity of FT's for stochastic dynamics with unbounded state space.