Berlin Leipzig Seminar
Analysis/probability theory
First Meeting Winter Term 2009/10

Organized by the DFG Research Group *Analysis and Stochastics in Complex Physical Systems*

DATE: Friday, 27 November 2009

VENUE: Technical University Berlin, Institute for Mathematics, Str. des 17. Juni 136, 10623 Berlin, Room MA315 (Mathe-Lounge)

PROGRAMME:

9:40–10:30: **Bernd Metzger (Weierstraß Institute Berlin)**

The discrete Gross-Pitaevskii model and condensation in the single particle ground state

Abstract: In the context of a tight-binding approximation of the Gross-Pitaevskii energy functional with a random background potential we want to discuss in dependence on the interaction coupling constant a criteria when the Gross-Pitaevskii ground state and the single particle ground state coincide.

10:40–11:30: **Errico Presutti (University of Rome II 'Tor Vergata')**

Phase transitions in the continuum: results and open problems

Abstract: There are only a few models of particle systems in $\mathbb{R}^d$ where a rigorous proof of phase transition is availalble. I will briefly describe the models, sketch the proofs and then focus on the approach proposed by Kac. Its implementation leads to an extension of the Pirogov Sinai theory to perturbations of mean field where techniques of probability theory are complemented with techniques of variational problems and control theory. I will then conclude with some open problems.

11:40–12:30: **Jean-Dominique Deuschel (Technical University Berlin)**

Hydrodynamic limit for the interface model with non convex interaction

Abstract: We discuss the hydrodynamic limit for the Ginzburg-Landau interface model. Under the assumption that the microscopic interaction is strictly convex, the study of the asymptotic behavior for the stochastic dynamics, including the hydrodynamic limit, is highly developed. The aim of this talk is to discuss the behavior of the interface model without the assumption of strict convexity of the potential, and to derive the hydrodynamic limit. Our analysis is based on a recent paper with Codina Cotar where the unicity of the extremal gradient Gibbs measure and the strict convexity of the surface tension is shown in the high temperature regime.

This is a joint work with T. Nishikawa and Y. Vignaud.

Everybody is welcome to attend. Wolfgang König, TU Berlin and WIAS Berlin