Berlin Leipzig Seminar
Analysis/probability theory
First Meeting Summer Term 2011

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

DATE: Friday, 8 July 2011

VENUE: Institut für Mathematik, TU Clausthal, Erzstrasse 1, 38678 Clausthal-Zellerfeld, Seminarraum A

PROGRAMME:

9:30–10:20: **Margit Rösler (TU Clausthal)**

Multivariable special functions and symmetries

Abstract: Multivariable special functions occur naturally in the analysis of high dimensional systems with symmetries. Typically, these symmetries are encoded in the action of a finite reflection group. For prominent examples like the Schur polynomials or Jack polynomials, this is just the symmetric group acting on the set of independent variables. In the talk, we shall present some classes of special functions with reflection symmetries, in particular orthogonal polynomials and Bessel functions. We shall explain typical methods and results, and outline connections to applications, such as quantum many body systems.

10:30–11:20: **Wolfgang König (Weierstrass Institute Berlin and TU Berlin)**

Eigenvalue order statistics and mass concentration in the parabolic Anderson model

Abstract: We consider the random Schrödinger operator on the lattice with i.i.d. potential, which is double-exponentially distributed. In a large box, we look at the lowest eigenvalues, together with the location of the centering of the corresponding eigenfunction, and derive a Poisson process limit law, after suitable rescaling and shifting, towards an explicit Poisson point process. This is a strong form of Anderson localisation at the bottom of the spectrum. Since the potential is unbounded, also the eigenvalues are, and it turns out that the gaps between them are much larger than of inverse volume order. We explain an application to concentration properties of the corresponding Cauchy problem, the parabolic Anderson model.

This is joint work with Marek Biskup (Los Angeles and Budweis).

11:30–12:20: **Paul Jung (Sogang University, Seoul)**

Random-time transformations and fractional stable motions

Abstract: We introduce a mechanism called a random-time transformation which transforms a given fractional stable motion (self-similar, stationary-increment, symmetric alpha-stable processes) into a different one. Some examples include obtaining Brownian motion from a fractional Brownian motion with $H > 1/2$, obtaining sub-stable fractional stable motions from a random-slope process, and obtaining indicator fractional stable motions from alpha-stable Levy motions. In a final example, we show that we may obtain new fractional stable motions (previously not found in the literature) from random-time transformations of linear fractional stable motions. This is done using ergodic theory's Hopf decomposition and certain extensions thereof introduced by Rosinski (1995) and Samorodnitsky (05).

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