Upcoming Events

Colloquium

Topic: Used Nuclear Fuel - Past, Present, and Future

Date: 29.01.18

Time: 16:15

Place: H6

Guest: Dr. Maik Stuke

Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH

After a short introduction and overview of the company GRS I will focus on the past, present, and future of nuclear fuel used in German nuclear reactors. A summary of the origin and composition of different types of used nuclear fuel will be followed by an overview of the current situation and future plans of storage. This includes an overview of the foreseen steps until a final repository. I summarize my talk by discussing some open scientific questions.

Contact person: D. Schwarz

Colloquium Mathematical Physics

Topic: Mesoscopic eigenvalue correlations of random matrices

Date: 01.12.17

Time: 16:00

Place: V2-210/216
Guest: Antti Knowles
University of Geneva

Abstract: Ever since the pioneering works of Wigner, Gaudin, Dyson, and Mehta, the correlations of eigenvalues of large random matrices on short scales have been a central topic in random matrix theory. On the microscopic spectral scale, comparable with the typical eigenvalue spacing, these correlations are now well understood for Wigner matrices thanks to the recent solution of the Wigner-Gaudin-Dyson-Mehta universality conjecture. In this talk I focus on eigenvalue density-density correlations between eigenvalues whose separation is much larger than the microscopic spectral scale; here the correlations are much weaker than on the microscopic scale. I discuss to what extent the Wigner-Gaudin-Dyson-Mehta universality remains valid on such larger scales, for Wigner matrices and random band matrices.

Guest: Helmut Satz
Bielefeld

Abstract: Twenty years ago, Tamás Vicsek and collaborators introduced “a novel type of dynamics to investigate self-ordered motion of particles with biologically motivated interaction”. The model is a generalized spin system, proposed to account for the swarm formation of birds; the birds’ velocities become the spins. The resulting two-dimensional spin system has continuous rotational symmetry, but because of dynamical features it leads to spontaneous symmetry breaking and a phase transition to a state of long-range order in both one and two dimensions. It has become of considerable interest in different areas of statistical physics and continues to pose challenging problems.
Seminar Condensed Matter

Topic: Finite-temperature dynamics using matrix product states

Date: 26.01.18

Time: 14:15

Place: V2-205

Guest: Salvatore Manmanna

Universität Göttingen

Abstract:

Contact person: Jürgen Schnack

Seminar Mathematical Physics

Topic: CANCELLED

Date: 18.01.18

Time: 16:00

Place: D5-153

Guest: Thorsten Neuschel

University Catholique de Louvain

We explore the boundaries of sine kernel universality for the eigen-values of Gaussian perturbations of large deterministic Hermitian matrices. Equivalently, we study for deterministic initial data the time after which Dyson's Brownian motion exhibits sine kernel correlations. We explicitly describe this time span in terms of the limiting density and rigidity of the initial points. This is joint work with Tom Claeys and Martin Venker.
Seminar AG Zufallsmatrizen

Topic: **Local inhomogeneous circular law**

Date: 18.12.17

Time: 14:15

Place: V3-201

Guest: Johannes Alt

Institute of Science and Technology, Austria

The density of eigenvalues of large random matrices typically converges to a deterministic limit as the dimension of the matrix tends to infinity. In the Hermitian case, the best known examples are the Wigner semicircle law for Wigner ensembles and the Marchenko-Pastur law for sample covariance matrices. In the non-Hermitian case, the most prominent result is Girko’s circular law: The eigenvalue distribution of a matrix $X$ with centered, independent entries converges to a limiting density supported on a disk. Although inhomogeneous in general, the density is uniform for identical variances. In this special case, the local circular law by Bourgade et al. shows this convergence even locally on scales slightly above the typical eigenvalue spacing. In the general case, the density is obtained via solving a system of deterministic equations. In my talk, I explain how a detailed stability analysis of these equations yields the local inhomogeneous circular law in the bulk spectrum for a general variance profile of the entries of $X$. This result was obtained in joint work with László Erdos and Torben Krüger.

Abstract:

Contact person: Gernot Akemann

Contact person: Friedrich Götze