Upcoming Events

Colloquium

Topic: Antrittsvorlesung

Date: 04.05.20

Time: 16:15

Place: H6

Guest: Prof. Dr. Gergely Endrödi

Universität Bielefeld

Abstract:

Contact person: Dekan

Colloquium Mathematical Physics

Topic: Numerics for resonances of Schottky surfaces

Date: 10.01.20

Time: 16:15

Place: V3-201

Guest: Anke Pohl

Universität Bremen
Resonances of Riemannian manifolds are of great importance in many areas of mathematics and physics. Even though many fascinating results about these spectral entities have already been found, an enormous amount of their properties, also some very elementary ones, is still undiscovered. A few years ago, by means of numerical experiments, Borthwick noticed for some classes of Schottky surfaces (certain hyperbolic surfaces of infinite area) that their sets of resonances exhibit unexpected and nice patterns, which are not yet fully understood. After a survey of some parts of this field, we will discuss an alternative numerical method, combining tools from dynamics, zeta functions, transfer operators and thermodynamic formalism, functional analysis and approximation theory. This is joint work with Oscar Bandtlow, Torben Schick and Alexander Weiße.

Contact person: M. Baake

Seminar High Energy Physics

Topic: **Chiral charge dynamics in Abelian gauge theories at finite temperature**

Date: 18.02.20

Time: 15:15

Place: D6-135

Guest: Adrien Florio

EPFL Lausanne

The chiral anomaly present in the standard model can have important phenomenological consequences, especially in cosmology and heavyions physics. In this talk, I will focus on the contribution from the Abelian gauge fields. Despite an absence of topologically distinct sectors, they have a surprisingly rich vacuum dynamics, partly because of the chiral anomaly. I will present results obtained from real-time classical lattice simulations of a U(1) gauge field in the presence of a chiral chemical potential. They account for short distance fluctuations, contrary to effective descriptions such as Magneto-Hydrodynamics (MHD). I will discuss various phenomena, like inverse magnetic cascade, which occur in this system. In particular, in presence of a background magnetic field, the chemical potential exponentially decays. The associated chiral decay rate is related to the diffusion of the Abelian Chern-Simons number in a magnetic background, in the absence of chemical potential. The rate obtained from the simulations is an order of magnitude larger than the one predicted by MHD. If this result is shown to be robust under corrections such as Hard Thermal Loops, it will call for a revision of the implications of fermion number and chiral number non-conservation in Abelian theory at finite temperature.
**Seminar Condensed Matter**

**Topic:** Mini-workshop

**Date:** 16.04.20

**Time:** 14:00

**Place:** D5-153

**Guest:** Andreas Honecker, Johannes Richter, Nedko Ivanov, Heinz-Jürgen Schmidt

**Abstract:**

**Contact person:** Jürgen Schnack

**Seminar Mathematical Physics**

**Topic:** Critical behaviour and characteristic polynomials of non-Hermitian random matrices

**Date:** 23.05.19

**Time:** 16:15

**Place:** D5-153

**Guest:** Nicholas Simm

University of Sussex

I will discuss some recent developments regarding the normal matrix model. In particular my interest will be in certain critical models where the limiting support of the eigenvalues can
Abstract: I will discuss some recent developments regarding the normal matrix model. In particular my interest will be in certain critical models where the limiting support of the eigenvalues can radically change its topology by slightly adjusting an external parameter. I will discuss how aspects of the model can be explicitly mapped to the study of expectations of characteristic polynomials of non-Hermitian random matrices (e.g. Ginibre or truncated unitary). Many of these averages are related to Painlevé transcendents, and by exploiting this, a precise and non-trivial asymptotic expansion of partition functions can be calculated in the critical models. This is joint work with Alfredo Deaño (University of Kent).

Contact person: Gernot Akemann

Seminar AG Zufallsmatrizen

**Dimensional reduction for elliptic SPDE's: integrable structures and large deviations**

**Topic:** Dimensional reduction for elliptic SPDE's: integrable structures and large deviations

**Date:** 18.12.19

**Time:** 16:15

**Place:** V3-201

**Guest:** Oleg Zaboronski

University of Warwick

I will review the phenomenon of dimensional reduction for elliptic stochastic PDE's in two and three dimensions due to hidden supersymmetry discovered by Parisi and Sourlas. I will use dimensional reduction to establish a link between matrix-valued elliptic SPDE's and determinantal point processes. I will show that the large deviations principle can be established for a class of equations without any reference to supersymmetry. The talk is based on joint work with Roger Tribe and David Elworthy

Contact person: Gernot Akemann