Aktuelle Veranstaltungen

Kolloquium

Thema: Antrittsvorlesung tba
Datum: 14.01.19
Uhrzeit: 15:15
Ort: H6

Vortragender: Prof. Dr. Sören Schlichting
Universität Bielefeld

Inhalt:

Ansprechpartner: Dekan

Kolloquium Mathematische Physik

Thema: tba
Datum: 01.02.19
Uhrzeit: 16:15
Ort: U2-228

Vortragender: Martin Zirnbauer
University of Cologne
Seminar Hochenergiephysik

Thema: **On Dark Matter Self Interactions, Viscosity and Cosmic Expansion**

Datum: 08.01.19

Uhrzeit: 14:15

Ort: D6-135

Vortragender: Abhishek Atreya

CAPSS Kolkata, India

In this talk we focus on the self interacting dark matter (SIDM) paradigm which can provide us with a consistent explanation of certain astrophysical observations that are in conflict with the cold dark matter (CDM) paradigm. We will make use of the constraints on SIDM cross-sections from astrophysical observations, to estimate the mean free path of the dark matter particles. Assuming thermalization within this volume we estimate the shear viscosity ($\eta$) and bulk viscosity ($\chi$) of SIDM, within kinetic theory formalism. The dissipation due to viscosity affects the solution of Einstein's equation through energy conservation. In a simplified model, we calculate this change and try to argue that $\sigma = m$ constraints on SIDM provide us with sufficient viscosity to contribute significantly to the observed cosmic acceleration at present epoch. We next calculate $H(z)$ and $q(z)$ within the simplified model, and perform $\chi^2$ analysis, using the the cosmic chronometer data, to estimate the best fit model parameters. The best fit values also explain type IA supernova data quite well.

Seminar Kondensierte Materie

Thema: **tba**
Datum: 24.01.19

Uhrzeit: 14:15

Ort: D5-153

Vortragender: Oliver Waldmann
Universität Freiburg

Inhalt:

Ansprechpartner: Jürgen Schnack

Seminar Mathematische Physik

Thema: Eigenvector correlations for quaternionic Ginibre ensembles

Datum: 20.12.18

Uhrzeit: 15:00

Ort: D5-153

Vortragender: Yanik-Pascal Foerster
Bielefeld University

Non-Hermitian matrices feature distinct left and right eigenvectors, neither of which forms an orthonormal system, while both sets together satisfy bi-orthogonality. It was suggested by Chalker and Mehlig in 2000 to study the statistics of eigenvector overlaps, in particular their correlation functions. For complex Ginibre ensembles they obtained one-point and two-point eigenvector correlations via Schur decomposition for finite $N$ as well as the corresponding limiting behaviour. Recently, several works by Bourgade, Dubach, and Fyodorov have brought new attention to the topic, establishing the results for the complex ensembles rigorously and deriving similar results for the real and quaternionic cases. In this talk, I will present how Chalker's and Mehlig's approach is applied to quaternionic Ginibre matrices, leading to correlation functions that can be written compactly in terms of Pfaffian determinants. Given one purely imaginary eigenvalue, the formulae simplify, enabling us to derive the limiting behaviour near the origin of the complex plane. Finally, I will report on the limiting behaviour for
one-point and two-point correlation functions for eigenvalues inside the bulk, which turn out to be identical to the limits in the real and complex cases.

Ansprechpartner: Gernot Akemann

Seminar AG Zufallsmatrizen

Thema: \textbf{The level spacing distribution at the hard edge}

Datum: 28.11.18

Uhrzeit: 16:15

Ort: V3-201

Vortragender: Valentin Gorski

Bielefeld University

The level spacing distribution in the bulk of a spectrum is approximately given by the Wigner surmise. Yet, at the hard and the soft edge one can expect strong deviations from these laws. Using the orthogonal polynomial method we derive the spacing distribution of the smallest two singular values of the chiral Gaussian unitary ensemble (chGUE) at finite matrix dimension with additional characteristical polynomials in the weight. The number of these polynomials represents the number of flavors (types of quarks) in the physical system. This ensemble approximates the Euclidean Dirac operator in Quantum Chromodynamics (QCD). In my talk, I will report on the behavior of the level spacing distribution in this particular setting.

Ansprechpartner: Gernot Akemann