Upcoming Events

Colloquium

Topic: **Topological and morphological analysis of random fields with applications to compressible turbulence**

Date: 28.05.18

Time: 16:15

Place: H6

Guest: Prof. Anvar Shukorov

Newcastle University

Abstract: The theory of random functions and techniques of data analysis based on it mostly rely on the Gaussian statistical properties of the underlying random fields. This limitation is becoming less and less acceptable as the resolution, sensitivity and physical complexity of experimental and numerical data increase. Observations and simulations of compressible random flows, especially in astrophysical contexts, provide a good example of this difficulty. This work is motivated by the need to compare with observations the results of comprehensive simulations of turbulence in the interstellar medium. The quantitative methods used at present are largely limited to probability densities and Fourier spectra of random fields. Meanwhile, observations suggest widespread filamentary structures of the interstellar gas to which the available methods are insensitive. We discuss novel methods of data analysis that are applicable to intermittent, strongly non-Gaussian random fields and are based on recent developments in computational topology and morphology or random fields. Particular aspects that will be discussed include the recovery of a three-dimensional structure of a random field from its two-dimensional cross-section and the effects of magnetic field on interstellar turbulence.

Contact person: D. Schwarz

Colloquium Mathematical Physics

Topic: **The numerical range of positive operators**

Date: 25.05.18

Time: 16:15

Place: V3-204

Guest: Agnes Radl

Universität Greifswald

Abstract: The numerical range of a linear operator A on a Hilbert space H is defined as $W(A):={: x in H, ||x||=1}$. It is well-known that the closure of the numerical range contains the spectrum. Hence, it can be used to localise the spectrum. In this talk, we will first study symmetry properties of the numerical range of positive operators in Hilbert lattices. Then we will investigate various generalisations of the numerical range. It turns out that the numerical range exhibits a certain rotational symmetry which is similar to the rotational symmetry of the spectrum of a positive operator.

Contact person: M. Baake

Seminar High Energy Physics

Topic: **The QCD crossover up to O(\mu^6_B) from Lattice QCD**

Date: 29.05.18

Time: 14:00

Place: D6-135

Guest: Patrick Steinbrecher

Bielefeld University

Abstract:

Contact person: F. Karsch

Seminar Condensed Matter

Topic: **tba**

Date: 24.05.18

Time: 14:15

Place: D5-153

Guest: Ben Niklas Balz

Universität Bielefeld

Abstract:

Contact person: Peter Reimann

Seminar Mathematical Physics

Topic: **Eigenvector-related correlation functions and their connection with generalized chiral random matrix ensembles with a source**

Date: 11.01.18

Time: 16:00

Place: D5-153

Guest: Jacek Grela

LPTMS Université Paris-Sud

We will introduce eigenvector-related correlation functions, discuss briefly their significance in dynamical Ginibre ensemble [1,2] and present asymptotic results in the large matrix size limit.

Abstract: Motivated by recent work [3] on joint eigenvector-eigenvalue correlation function valid for finite matrix size N in the complex and real Ginibre Ensembles, we study integrable structure of a certain generalized chiral Gaussian Unitary Ensemble with a source [4]. This model can be also interpreted as a deformation of the complex Ginibre Ensemble with an external source with additional determinant term. We present compact formulas for the characteristic polynomial, inverse characteristic polynomial and the kernel. In the case of a special source, we calculate asymptotics in the joint "bulk-edge" regime of all aforementioned objects and show their Bessel-type behaviour. References: [1] "Dysonian dynamics of the Ginibre ensemble", Z. Burda, J. Grela, M. A. Nowak, W. Tarnowski, P. Warcho?, Phys. Rev. Lett. 113, 104102 (2014) [2] "Unveiling the significance of eigenvectors in diffusing non-hermitian matrices by identifying the underlying Burgers dynamics", Z. Burda, J. Grela, M. A. Nowak, W. Tarnowski, P. Warcho?, Nucl. Phys. B 897, 421 (2015) [3] "On statistics of bi-orthogonal eigenvectors in real and complex Ginibre ensembles: combining partial Schur decomposition with supersymmetry", Y. V. Fyodorov, arXiv:1710.04699 [4] "On characteristic polynomials for a generalized chiral random matrix ensemble with a source", Y. V. Fyodorov, J. Grela, E. Strahov, arXiv:1711.07061

Contact person: Gernot Akemann

Seminar AG Zufallsmatrizen

Topic: **tba**

Date: 27.06.18

Time: 16:15

Place: V3-201

Guest: Yacin Ameur

Lund University

Abstract:

Contact person: Gernot Akemann