

Aktuelle Veranstaltungen

Kolloquium

Thema: [Spin-orbitronics: controlling magnets with electric currents](#)

Datum: 18.06.18

Uhrzeit: 16:15

Ort: H6

Vortragender: [Prof. Dr. Pietro Gambardella](#)

ETH Zürich

Inhalt: The coupling of spin and orbital angular momenta underlies the magnetoelectric properties of matter. Although small, the spin-orbit interaction determines the equilibrium properties of magnets as well as the possibility to excite the magnetization out of equilibrium while ensuring the conservation of angular momentum. In this talk, I will review prominent mechanisms due to spin-orbit coupling that give rise to spin currents in ferromagnetic and antiferromagnetic heterostructures, showing how unusual magnetoresistance and spin torque phenomena emerge from charge-spin conversion in these materials. Finally, I will present recent results based on pump-probe magneto-optic experiments that allow us to measure the spin Hall effect in nonmagnetic conductors and image current-induced magnetization switching of ferromagnetic dots on a timescale of 100 ps.

Ansprechpartner: [T. Kuschel](#)

Kolloquium Mathematische Physik

Thema: [Upper and lower Lipschitz bounds for the perturbation of edges of the essential spectrum](#)

Datum: 01.06.18

Uhrzeit: 16:15

Ort: V3-204

Vortragender: [Ivan Veselic](#)

TU Dortmund

Inhalt: Let A be a selfadjoint operator, B a bounded symmetric operator and $A+tB$ a perturbation. I will present upper and lower Lipschitz bounds on the function of t which locally describes the movement of edges of the essential spectrum. Analogous bounds apply also for eigenvalues within gaps of the essential spectrum. The bounds hold for an optimal range of values of the coupling constant t . This result is applied to Schrodinger operators on unbounded domains which are perturbed by a non-negative potential which is mostly equal to zero. Unique continuation estimates nevertheless ensure quantitative bounds on the lifting of spectral edges due to this semidefinite potential. This allows to perform spectral engineering in certain situations. The talk is based on the preprint <https://arxiv.org/abs/1804.07816>

Ansprechpartner: [G. Akemann](#)

Seminar Hochenergiephysik

Thema: tba

Datum: 10.07.18

Uhrzeit: 14:15

Ort: D6-135

Vortragender: Jens Mund

UFJF, Juiz de Fora, Brazil

Inhalt:

Ansprechpartner: [F. Karsch](#)

Seminar Kondensierte Materie

Thema: [Impact of Eigenstate Thermalization on the Route to Equilibrium](#)

Datum: 14.06.18

Uhrzeit: 14:15

Ort: D5-153

Vortragender: [Robin Steinigeweg](#)

Universität Osnabrück

Inhalt: The eigenstate thermalization hypothesis (ETH) and the theory of linear response (LRT) are celebrated cornerstones of our understanding of the physics of many-body quantum systems out of equilibrium. While the ETH provides a generic mechanism of thermalization for states arbitrarily far from equilibrium, LRT extends the successful concepts of statistical mechanics to situations close to equilibrium. In our work, we connect these cornerstones to shed light on the route to equilibrium for a class of properly prepared states. We unveil that, if the off-diagonal part of the ETH applies, then the relaxation process can become independent of whether or not a state is close to equilibrium. Moreover, in this case, the dynamics is generated by a single correlation function, i.e., the relaxation function in the context of LRT. Our analytical arguments are illustrated by numerical results for idealized models of random-matrix type and more realistic models of interacting spins on a lattice. Remarkably, our arguments also apply to integrable quantum systems where the diagonal part of the ETH may break down.

Ansprechpartner: [Peter Reimann](#)

Seminar Mathematische Physik

Thema: [Eigenvector-related correlation functions and their connection with generalized chiral random matrix ensembles with a source](#)

Datum: 11.01.18

Uhrzeit: 16:00

Ort: D5-153

Vortragender: Jacek Grela

LPTMS Université Paris-Sud

Inhalt: 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. 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

Ansprechpartner: [Gernot Akemann](#)

Seminar AG Zufallsmatrizen

Thema: [The Random Normal Matrix Model: Insertion of a Point Charge](#)

Datum: 27.06.18

Uhrzeit: 16:15

Ort: V3-201

Vortragender: [Yacin Ameur](#)

Lund University

Inhalt:

We study conditional two-dimensional log-gases in the determinantal case, given that there is a point charge in the interior of the support of the equilibrium measure (the "droplet"). On a microscopic level, we obtain near the inserted charge a family of universal point-fields, depending on the strength of the charge and so on, which are characterized by special entire functions -- Mittag-Leffler functions. The charge also affects the microscopic behaviour near the boundary of the droplet, where it gives rise to a kind of balayage operation. One motivation for studying this kind of conditional point-processes is that they are closely related to the characteristic polynomial of a random normal matrix -- an object of interest for field theories and multiplicative chaos. The talk is based on joint work with Kang and Seo.

Ansprechpartner: [Gernot Akemann](#)