

Aktuelle Veranstaltungen

Kolloquium

Thema: Soft X-ray Spectroscopy of Quantum Materials

Datum: 15.11.22

Uhrzeit: 14:15

Ort: H6

Vortragender: [Prof. Kai Rossnagel](#)

Universität Kiel

Inhalt:

Ansprechpartner: [A. Hütten](#)

Kolloquium Mathematische Physik

Thema: tba

Datum: 04.11.22

Uhrzeit: 16:15

Ort: D5-153

Vortragender: [Lisa Hartung](#)

Universität Mainz

Inhalt:

Ansprechpartner: [G. Akemann](#)

Seminar Hochenergiephysik

Thema: [Mitigating the Hubbard Sign Problem. A Novel Application of Machine Learning](#)

Datum: 07.11.22

Uhrzeit: 16:15

Ort: D6-135

Vortragender: Marcel Rodekamp

FZ Jülich

Inhalt: Many fascinating systems suffer from a severe (complex action) sign problem preventing us from simulating them with Markov Chain Monte Carlo. One promising method to alleviate the sign problem is the transformation towards Lefschetz Thimbles. Unfortunately, this suffers from poor scaling originating in numerically integrating of flow equations and evaluation of an induced Jacobian. In this talk we present a Neural Network architecture based on complex-valued affine coupling layers. This network performs such a transformation efficiently, ultimately allowing simulation of systems with a severe sign problem. We test this method within the Hubbard Model at finite chemical potential, modelling strongly correlated electrons on a spatial lattice of ions.

Ansprechpartner: [O. Kaczmarek](#)

Seminar Kondensierte Materie

Thema: **Assigning Temperatures to Eigenstates**

Datum: 04.11.22

Uhrzeit: 14:15

Ort: D5-153

Vortragender: Masudul Haque

TU Dresden

Inhalt: In formulating the statistical mechanics of isolated quantum systems, an inescapable issue is the definition of temperature, which is not a priori defined within closed-system quantum mechanics. We examine and compare different possible ways of assigning temperatures to energies, or equivalently, to eigenstates. The commonly used assignment of temperature is based on the canonical energy-temperature relationship, which depends only on energy eigenvalues and not on the structure of eigenstates. For eigenstates, we consider defining temperature by minimizing the distance between (full or reduced) eigenstate density matrices and canonical density matrices. We show that for full eigenstates, the minimizing temperature depends on the distance measure chosen, and matches the canonical temperature for the trace distance; however the two matrices are not close. With reduced density matrices, the minimizing temperature has fluctuations that scale with subsystem and system size but is apparently independent of distance measure, and in particular limits the two matrices become equivalent.

Ansprechpartner: [FOR2692/Jürgen Schnack](#)

Seminar Mathematische Physik

Thema: tba

Datum: 01.12.22

Uhrzeit: 16:00

Ort: D5-153

Vortragender: [José Gracia Bondia](#)

University of Zaragoza, Spain

Inhalt:

Ansprechpartner: [Gernot Akemann](#)

Seminar AG Zufallsmatrizen

Thema: [Unitary matrix integrals, spectral form factors, and long range random walk models](#)

Datum: 05.10.22

Uhrzeit: 09:00

Ort: ZOOM / Konferenzschaltung

Vortragender: [Ward Vleeshouwers](#)

University of Amsterdam

Inhalt: Unitary matrix integrals over symmetric functions have a wide variety of applications, including quantum chaos, random processes, enumerative combinatorics, and number theory. In this talk, we derive various novel identities on such integrals, demonstrating universality of the spectral form factor for a broad class of matrix models. We then extend these results and apply them to correlation functions of long-range random walk models, leading to various surprising relations and dualities between them, as well convenient methods for their computation.

Ansprechpartner: [Leslie Molag](#)