Kolloquium

Thema: From coherent Raman microscopy to coherent Raman endoscopy

Datum: 16.04.18

Uhrzeit: 16:15

Ort: H6

Vortragender: Prof. Hervé Rigneault

Institut Fresnel, Marseille

Coherent Raman scattering (CRS) microscopy has become an established imaging techniques that as proved to have ground breaking potential in various application fields including cell machinery and tissue imaging. Recently the ability of CRS to distinguished cell nuclei from cell cytoplasm has opened the route toward coherent Raman histology, with potential applications in real time intra-operative cancer tissue diagnostic. However CRS for in vivo applications would require to access the vibrational spectrum information for every pixel in few microseconds only. We have developed a fast ratio-metric stimulated Raman (SRS) technology using a frequency modulation scheme to access vibrational information in few microseconds and suitable for tissue drug penetration monitoring and stimulated Raman histology. We are also working to extend the CRS imaging ability into flexible endoscopes that would enable intra vital exploration and remote CRS histology. Using hollow core fiber and resonant distal scanner we perform CRS images at few frames/s over a 350 microns field of view. This brings label free nonlinear imaging at the distal end of a flexible probe.

Ansprechpartner: T. Huser

Kolloquium Mathematische Physik

Thema: Mesoscopic eigenvalue correlations of random matrices
Ever since the pioneering works of Wigner, Gaudin, Dyson, and Mehta, the correlations of eigenvalues of large random matrices on short scales have been a central topic in random matrix theory. On the microscopic spectral scale, comparable with the typical eigenvalue spacing, these correlations are now well understood for Wigner matrices thanks to the recent solution of the Wigner-Gaudin-Dyson-Mehta universality conjecture. In this talk I focus on eigenvalue density-density correlations between eigenvalues whose separation is much larger than the microscopic spectral scale; here the correlations are much weaker than on the microscopic scale. I discuss to what extent the Wigner-Gaudin-Dyson-Mehta universality remains valid on such larger scales, for Wigner matrices and random band matrices.

Seminar Hochenergiephysik

Thema: Sign problem and diagrammatic representation of scalar vs. real QCD

Datum: 01.03.18
Uhrzeit: 14:15
Ort: D6-135
Vortragender: Falk Bruckmann

Univ. Regensburg

We discuss representations of lattice field theories in terms of diagrams of dual variables (occupation numbers). Our main motivation is the nonzero density sign problem which can be solved through this approach in various systems. As a start we will dualize two-dimensional sigma models (which are asymptotically free and generate
We discuss representations of lattice field theories in terms of diagrams of dual variables (occupation numbers). Our main motivation is the nonzero density sign problem which can be solved through this approach in various systems. As a start we will dualize two-dimensional sigma models (which are asymptotically free and generate a dynamical mass, as does QCD) and present some numerical results on the phase diagram. In the second part we will present a dualization of QCD with scalar quarks, where the sign problem is solved, too. Finally a comparison to real QCD will be made.

Ansprechpartner: W. Unger

Seminar Kondensierte Materie

Thema: Realistische thermodynamische Kreisprozesse

Datum: 19.04.18

Uhrzeit: 15:46

Ort: D5-153

Vortragender: Christian Beckmann

Universität Bielefeld

Inhalt:

Ansprechpartner: Jürgen Schnack

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

Inhalt:

Ansprechpartner: Gernot Akemann

Seminar AG Zufallsmatrizen

**On statistics of bi-orthogonal eigenvectors in real and complex Ginibre ensembles: combining partial Schur decomposition with supersymmetry**

**Thema:**

**Datum:**

18.04.18

**Uhrzeit:**

16:00

**Ort:**

V3-201

**Vortragender:** Yan Fyodorov

King's College London

I will present a method of studying the joint probability density (JPD) of an eigenvalue and the associated 'non-orthogonality overlap factor' (also known as the condition number) of the left and right eigenvectors for non-selfadjoint Gaussian random
Inhalt: I will present a method of studying the joint probability density (JPD) of an eigenvalue and the associated 'non-orthogonality overlap factor' (also known as the condition number) of the left and right eigenvectors for non-selfadjoint Gaussian random matrices. First I derive the exact finite-N expression in the case of real eigenvalues and the associated non-orthogonality factors in the real Ginibre ensemble, and then analyse its 'bulk' and 'edge' scaling limits. The ensuing distributions are maximally heavy-tailed, so that all integer moments beyond normalization are divergent. Then I present results for a complex eigenvalue and the associated non-orthogonality factor in the complex Ginibre ensemble complementing recent studies by P. Bourgade & G. Dubach. The presentation will be mainly based on the paper arXiv: 1710.04699 and a joint work with Jacek Grela and Eugene Strahov arXiv: 1711.07061.

Ansprechpartner: Gernot Akemann