Upcoming Events

Colloquium

Topic: tba
Date: 08.04.19
Time: 16:15
Place: H6
Guest: Prof. Aleksandra Radenovic
EPFL Lausanne

Abstract:

Contact person: T. Huser

Colloquium Mathematical Physics

On symmetry-protected topological states: from free fermions to the Haldane phase

Topic: phase
Date: 01.02.19
Time: 16:15
Place: H6
Guest: Martin Zirnbauer
University of Cologne

The Nobel-Prize winning Haldane phase of spin-1 antiferromagnetic spin chains is a paradigm for symmetry-protected topological phases. When local charge fluctuations are allowed, there has been a debate: protection by what? My answer is that there exists an adiabatic path to a free-fermion topological phase of class AIII, protected by a particle-hole symmetry. To set the stage, I will review Dyson’s Threefold Way and recall the Tenfold Way of disordered fermions.

Contact person: G. Akemann

Seminar High Energy Physics

Topic: Heavy Flavor Azimuthal Correlations in Cold Nuclear Matter

Date: 12.02.19

Time: 14:15

Place: D6-135

Guest: Ramona Vogt

Lawrence Livermore Nat. Lab. and Univ. of California at Davis

It has been proposed that the azimuthal distributions of heavy flavor quark-antiquark pairs may be modified in the medium of a heavy-ion collision. This work tests this proposition through next-to-leading order (NLO) calculations of the azimuthal distribution, $d\sigma/d\phi$, including transverse momentum broadening, employing $\langle k_T^2 \rangle$ and fragmentation in exclusive $Q \bar{Q}$ pair production. While these studies were done for $p+p$, $p + \bar{p}$ and $p+Pb$ collisions, understanding azimuthal angle correlations between heavy quarks in these smaller, colder systems is important for their interpretation in heavy-ion collisions. First, single inclusive $p_T$ distributions calculated with the exclusive HVQMN code are compared to those calculated in the fixed-order next-to-leading logarithm approach. Next the azimuthal distributions are calculated and sensitivities to $\langle k_T^2 \rangle$, $p_T$ cut, and rapidity are studied at $\sqrt{s} = 7$ TeV. Finally, calculations are compared to $Q\bar{Q}$ data in elementary $p+p$ and $p + \bar{p}$ collisions at $\sqrt{s} = 7$ TeV and 1.96 TeV as well as to the nuclear modification factor $R_{p+Pb}/(p+\bar{p})$ at $\sqrt{s_{NN}} = 5.02$ TeV measured by ALICE. The low $p_T$ ($p_T < 10$ GeV) azimuthal distributions are very sensitive to the $k_T$ broadening and rather insensitive to the fragmentation function. The NLO contributions can result in an enhancement at $\phi \sim 0$ absent any other effects. Agreement with the data was found to be good. The NLO calculations, assuming collinear factorization and introducing $k_T$ broadening, result in significant modifications of the azimuthal distribution at low $p_T$ which
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**Seminar Condensed Matter**

**Topic:** *Coupled Superconducting Qubits*

**Date:** 25.01.19

**Time:** 14:15

**Place:** D2-240

**Guest:** Timo Gahlmann

Universität Bielefeld

**Abstract:**

**Contact person:** S. Schlichting

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**Seminar Mathematical Physics**

**Topic:** *Rate of Convergence to the Circular Law*

**Date:** 17.01.19

**Time:** 17:15

**Place:** D5-153

**Guest:** Jonas Jalowy

Bielefeld University
Abstract: It is well known that the (complex) empirical spectral distribution of a non-Hermitian random matrix with i.i.d. entries will converge to the uniform distribution on the complex disc as the size of the matrix tends to infinity. In this talk, we investigate the rate of convergence to the Circular Law in terms of a uniform, 2-dimensional Kolmogorov-like distance. The optimal rate of convergence is determined by the Ginibre ensemble and is given by $n^{-1/2}$. I will present a smoothing inequality for complex measures that quantitatively relates the Kolmogorov-like distance to the concentration of logarithmic potentials. Combining it with results from local circular laws, it is applied to prove nearly optimal rate of convergence to the circular law with overwhelming probability. Furthermore I will relate the result to other distances, present an analogue for the empirical root measure of Weyl random polynomials with independent coefficients and discuss a possible generalization for products of independent matrices. The talk is based on joint work with Friedrich Götze.

Contact person: Gernot Akemann

Seminar AG Zufallsmatrizen

Topic: On Kac polynomials and truncations of random orthogonal matrices

Date: 30.01.19

Time: 16:00

Place: V3-201

Guest: Mihail Poplavskyi

King's College London

Zeros of random polynomials give a rise to a point process which does look similar to the ones arising in RMT but has no integrable structure. We discuss a long standing problem of finding persistence probability asymptotic behaviour for the family of Kac polynomials of even large degree. We first use imprecise connection to the model of truncations of random orthogonal matrices and calculate persistence probability by using integrability of corresponding RMT model. We then present recent progress in solving another integrable model, namely Gaussian Stationary Process with sech correlations, which was shown in 2002 [Dembo, Poonen, Shao, Zeitouni] to give a precise approximation for Kac polynomials. The talk is based on joint works with M. Gebert (QMUL/UC Davis), G. Schehr (LPTMS).

Contact person: Gernot Akemann