Upcoming Events

Colloquium

**Topic:** *Shine a light! When matter shatters*

**Date:** 08.06.20

**Time:** 16:15

**Place:** cyberspace

**Guest:** Prof. Dr. Tetyana Galatyuk

TU Darmstadt

The microscopic properties of strong-interaction matter under extreme conditions of temperature and density is a topic of great interest. Matter in equilibrium radiates photons with a thermal spectrum revealing its temperature in the slope of the energy distribution. This is generalized for virtual photons, which materialize after a short time by creation of a pair of charged leptons (dileptons), for which their invariant mass takes the role of the energy as observable. In contrast to the case of photons, their spectral distribution is not affected by a blue (or red) shift. Moreover, dileptons offer the unique opportunity also to directly monitor in-medium electromagnetic spectral functions. Hence, dilepton spectra from strong-interaction medium reflect not only its temperature but also are sensitive to possible effects of a restoration of the spontaneously broken chiral symmetry. This talk will discuss important experimental results obtained so far at various facilities and the latest theoretical developments on emissivity of matter.

**Contact person:** F. Karsch/TR211

Colloquium Mathematical Physics

**Topic:** *The problem of latency in estimating the Covid-19 replication number*
Figuring out how to restart the world's economy without a resurgence of disease depends on understanding how contagious Covid-19 really is. However, estimates of the basic replication number $R_0$ vary greatly, with well-respected groups publishing estimates whose 95% confidence intervals don't even overlap. In this talk I'll go over the basic SIR and SEIR models of disease spread and present several different ways to treat the latency period between being exposed and becoming infectious. Simple SEIR models are unstable; working with a fixed set of data, small changes to the model can result in large changes to the estimated value of $R_0$. More realistic models are more complicated and are even less stable. The upshot is that we know much less about $R_0$ than is generally believed, and the error bars on the high side are particularly large. Containing the outbreak for an extended period may be a lot harder than our leaders think.

**Contact person:** Gähler, Dr. Franz

**Seminar High Energy Physics**

**Topic:** Software design challenges for lattice simulations

**Date:** 12.05.20

**Time:** 14:15

**Place:** cyberspace

**Guest:** Antonin Portelli

University of Edinburgh

Lattice field theory simulations are a crucial tool for fundamental physics, and constitute one of the most difficult numerical problem so far. Most applications of such simulations to present
Lattice field theory simulations are a crucial tool for fundamental physics, and constitute one of the most difficult numerical problems so far. Most applications of such simulations to present physics problems require the use of large-scale supercomputers. In this talk I will summarise the computational challenges behind lattice simulations, and present two free softwares developed mainly by the University of Edinburgh and Brookhaven National Library: Grid and Hadrons. The former is a C++ data parallel library implementing numerous algorithms used in lattice simulations, and the later is a higher-level workflow management system particularly designed to drive lattice simulations of the strong force (lattice QCD).

Contact person:  Ch. Schmidt

Seminar Condensed Matter

22-05-2020-14.15 hrs - D5-153 - Construction of tight binding models from ab initio calculations using maximally localized Wannier functions

Date:  22.05.20

Time:  14:15

Place:  D5-153

Guest:  Thomas Benkenstein

Universtität Bielefeld

Abstract:

Contact person:  Thomas Dahm

Seminar Mathematical Physics

Topic:  CLTs for biorthogonal ensembles: Beyond the Strong Szegö Limit Theorem

Date:  14.05.20

Time:  16:00

Place:  ZOOM / Konferenzschaltung
In random matrix theory, the Strong Szegö Limit Theorem for Toeplitz determinants is a Central Limit Theorem for linear statistics for eigenvalues of a CUE matrix. Although this connection does exploit the determinantal structure for the CUE eigenvalues, it does not use the correlation kernel in an explicit way. This talk will be around a generalization of the Strong Szegö Limit theorem that implies CLTs for the moments of the empirical measure for Multiple Orthogonal Polynomials Ensembles. Such models include Gaussian Unitary Ensembles with external source, complex Wishart matrices, two matrix models and certain specializations of the Schur process. The talk is based on joint works with Jonathan Breuer and a recent joint work with Benjamin Fahs and Rostyslav Kozhan.

Contact person: Gernot Akemann

Seminar AG Zufallsmatrizen

Topic: TBC - 27 May 2020, 0900 hrs

Date: 27.05.20

Time: 09:00

Place: ZOOM / Konferenzschaltung

Guest: Mario Kieburg

University of Melbourne

Abstract: TBC

Contact person: Gernot Akemann