Aktuelle Veranstaltungen

Kolloquium

Thema:	**[Phases of QCD: a lattice perspective](#)**
Datum:	01.02.21
Uhrzeit:	16:15
Ort:	cyberspace
Vortragender:	[JProf. Francesca Cuteri](#)
	Goethe-Universität Frankfurt
Inhalt:	Quantum chromodynamics (QCD) is established as the fundamental underlying theory of the strong interaction, yet there are only few firmly established aspects when it comes to its rich phase diagram. There are, though, systems which did/may happen to wander around in the QCD phase diagram within environments that are so extreme, in terms of temperature and/or density, as to accommodate other QCD phases than the hadronic one that we are more familiar with. These systems are our Universe, in the first microseconds after the "Big Bang", Neutron Stars (even more so in their mergers), heavy ions in their collisions and, theoretically rather than practically speaking, a large part of modern supercomputers around the globe. We can, indeed, use supercomputers to simulate strong interaction matter under extreme conditions thanks to an almost 50-years-old numerical framework for describing non perturbative phenomena in QCD via Monte Carlo simulations: lattice QCD. In this talk we will discuss how lattice QCD simulations allow us to explore, from a theoretical perspective, some rather interesting portions of the QCD phase diagram (in temperature and nonzero net isospin density directions). We will also discuss how we try to learn about interesting regimes, like that of nonzero net baryon densities, that lattice QCD fails accessing, by extending our parameter space even further (varying i.e. the microscopic parameters of the theory away from their physical value) and then exploiting the universal features of continuous phase transitions.

Ansprechpartner: [F. Karsch/TR211](#)

Kolloquium Mathematische Physik

Thema:	**[Integrability and Universality in nonlinear waves](#)**

Datum:	05.02.21

Uhrzeit:	16:15

Ort:	ZOOM/Konferenzschaltung

Vortragender:	[Tamara Grava](#)
	University of Bristol

Inhalt:	What is an integrable system? Intuitively, an integrable system is a dynamical system that can be integrated directly. While in principle integrable systems should be very rare, it happens that in nature, a lot of fundamental systems are integrable such as many models of nonlinear waves, models in statistical mechanics and in theory of random matrices. The study of nonlinear waves has led to many remarkable discoveries, one of them being 'solitons', found some 50 years ago. Solitons motivated the development of the Inverse Scattering Transform (IST). History and some examples will be discussed. Finally I will present some universality results about small dispersion limits and semiclassical limits of nonlinear dispersive waves.

Ansprechpartner: [G. Akemann](#)

Seminar Hochenergiephysik

Thema:	**tba**

Datum:	23.03.21

Uhrzeit:	14:15

Ort:	D6-135

Vortragender:	[Marco Drewes](#)
	Centre for Cosmology, Particle Physics and Phenomenology - CP3, Louvain-la-Neuve

Inhalt:

Ansprechpartner: [D. Bödeker](#)

Seminar Kondensierte Materie

Thema:	**[Bielefeld/El Paso Mini Symposium >> Tuesday, 16.00 hrs <<](#)**
Datum:	02.03.21
Uhrzeit:	16:00
Ort:	ZOOM / Konferenzschaltung
Vortragender:	PhD students and PostDocs Bielefeld & El Paso University

Inhalt: 16:00 CET, 8:00 MT: Mark Pederson and J\"urgen Schnack - Welcome 16:05 CET, 8:05 MT: Patrick Vorndamme (UBI) - Free induction decay under unitary time evolution and Heisenberg interactions 16:25 CET, 8:25 MT: Alex Johnson (UTEP) – FLOSIC: A Method for F-Electron Molecular Magnets 16:45 CET, 8:45 MT: Julian Ehrens (UBI) - Classical Molecular Dynamics Simulations of Nanometer-thin Carbon Nanomembranes 17:05 CET, 9:05 MT: Coffee, soft drinks - Help yourself 17:10 CET, 9:10 MT: Karma Dema (UTEP) – Towards a fully coupled DFT-based spin-Hamiltonian 17:30 CET, 9:30 MT: Henrik Schl\"uter - Approximating thermodynamic functions of spin systems with the Chebychev Method 17:50 CET, 9:50 MT: Zahra Hooshmand (UTEP) – Multiferroicity in a Mn3 Molecular Magnet 18:10 CET, 10:10 MT: Good bye - prepare for dinner/lunch

Ansprechpartner: [Jürgen Schnack](#)

Seminar Mathematische Physik

Thema:	**The Character Expansion in effective Theories for chiral Symmetry Breaking**
Datum:	03.12.20
Uhrzeit:	16:30

| **Ort:** | ZOOM / Konferenzschaltung |

| **Vortragender:** | [Noah Aygün](#) |

| | Universität Bielefeld |

Inhalt:

Ansprechpartner: [Gernot Akemann](#)

Seminar Bielefeld-Melbourne Zufallsmatrizen

| **Thema:** | [**On integrals of the tronquee solutions and the associated Hamiltonians for the Painleve II equation**](#) |

| **Datum:** | 03.03.21 |

| **Uhrzeit:** | 09:00 |

| **Ort:** | ZOOM / Konferenzschaltung |

| **Vortragender:** | [Lun Zhang](#) |

| | Fudan University, Shanghai |

Inhalt:

In this talk, we consider a family of tronquée solutions of the Painlevé II equation $q''(s) = 2q(s)^3 + sq(s) - (2? + 1/2)$, $? > -1/2$, which is characterized by the Stokes multipliers $s\_1 = -\exp[-2??i]$, $s\_2 = ?$, $s\_1 = -\exp[2??i]$ with $?$ being a free parameter. These solutions include the well-known generalized Hastings-McLeod solution as a special case if $? = 0$. We derive asymptotics of integrals of the tronquée solutions and the associated Hamiltonians over the real axis for $? > -1/2$ and $? ? 0$, with the constant terms evaluated explicitly. Our results agree with those already known in the literature if the parameters $?$ and $?$ are chosen to be special values. Some applications of our results in random matrix theory are also discussed. Joint work with Dan Dai and Shuai-Xia Xu.

Ansprechpartner: [Anas Rahman](#)