Aktuelle Veranstaltungen

Kolloquium

Thema:　　**[Critical transitions in Earth system dynamics](#)**

Datum:　　24.01.22

Uhrzeit:　　16:15

Ort:　　cyberspace

Vortragender:　　[Dr. Niklas Boers](#)

Technical University of Munich and Potsdam Institute for Climate Impact Research

Inhalt:　　Both theory and evidence from paleoclimate proxy records econding the evolution of the climate system in the long-term past suggest that some components of the Earth system can respond abruptly to gradual changes in forcing. These transitions can be described in terms of bifurcations in nonlinear dynamical systems, which also hints at means to atnicipate them. After giving some basic elements of the underlying theory, we review some of the potentially mutlistable subsystems, focusssing on paleoclimate and observational data. These include the polar ice sheets, the Atlantic Meridional Overturning Circulation, as well as tropical rainforests and monsoon systems. We discuss different ways to predict their future evolution under anthropogenic forcing.

Ansprechpartner: [W. Pfeiffer](#)

Kolloquium Mathematische Physik

Thema:　　**20220506-Volker Bach-TBC**

Datum:　　06.05.22

Uhrzeit:　　16:15

Ort:	ZOOM/Konferenzschaltung
Vortragender:	[Volker Bach](#)
	Technische Universität Braunschweig
Inhalt:	TBC
Ansprechpartner:	[M. Baake](#)

Seminar Hochenergiephysik

Thema:	[**Gravitational Waves from Strong First-Order Phase Transitions**](#)
Datum:	15.02.22
Uhrzeit:	14:15
Ort:	Online, via ZOOM
Vortragender:	[David Weir](#)
	University of Helsinki
Inhalt:	In many extensions of the Standard Model, the electroweak transition is first order - in some cases, strongly so. The ensuing phase transition would result in collisions of bubbles of the new Higgs phase. These collisions, and the associated interactions of sound waves in the plasma, are substantial sources of gravitational waves. For a phase transition at or around the electroweak scale, these gravitational waves may be detectable by future missions such as LISA. They can indirectly provide a probe of particle physics beyond the Standard Model, complementary to future colliders. However, concrete predictions of the resulting gravitational waves will require good understanding both of the particle physics models themselves, as well as the non-equilibrium physics of the transition. In other words, we need accurate studies of the phase diagrams in the underlying particle physics theories, as well as good predictions of the expected gravitational wave signal from simulations. These feed into one another, forming a so-called 'pipeline'. The stronger the phase transition, the better the chance of being detected (or constrained) by future missions like LISA. However, strong transitions are also the most poorly understood. In this talk I will discuss some recent results from different points along the 'pipeline', with a focus on the consequences for strong first-order phase transitions.

Ansprechpartner: [D. Bödeker](#)

Seminar Kondensierte Materie

Thema:	**Toroidale Momente in anisotropen Spinsystemen**
Datum:	21.01.22
Uhrzeit:	14:15
Ort:	Hybrid - Zoom/D5-153
Vortragender:	Daniel Pister
	Universität Bielefeld

Inhalt:

Ansprechpartner: [Jürgen Schnack](#)

Seminar Mathematische Physik

Thema:	**[On Non-Hermitian Beta-Ensembles](#)**
Datum:	14.10.21
Uhrzeit:	16:00
Ort:	D5-153
Vortragender:	[Patricia Päßler](#)
	Universität Bielefeld

Log-gases with inverse temperature beta are systems with many applications in physics, for example in the theory of superconductors or the fractional quantum Hall effect. For some specific values of beta a correspondence to random matrix theory (RMT) is well

Inhalt:	established. The advantage of this connection is the usage of the RMT methods in the study of those systems. The goal of this talk is the discussion of Log-gases in two dimensions, i.e. in the non-Hermitian case, for more general values of the inverse temperature. Therefore, we study in the first part a model of normal 2×2 matrices with beta in [0,2] and discuss whether we find a surmise for the nearest-neighbour spacing distribution of large matrices. In the second part of the talk we introduce the study of symmetry classes in non-Hermitian RMT. We conjecture that the classes of complex symmetric and complex quaternion matrices can be effectively described by Log-gases in two dimensions with non-integer inverse temperatures.

Ansprechpartner: Gernot Akemann

Seminar Bielefeld-Melbourne Zufallsmatrizen

Thema:	**Eigenvectors of Truncated Unitary Ensembles**
Datum:	26.01.22
Uhrzeit:	09:00
Ort:	ZOOM / Konferenzschaltung
Vortragender:	Guillaume Dubach
	IST Austria
Inhalt:	Left and right eigenvectors of non-Hermitian random matrices can be chosen so as to form a biorthogonal family. One of the most relevant statistics about them is the "matrix of overlaps", introduced in the late 90's by Chalker & Mehlig and studied since in different models, using a variety of techniques. I will present some recent progress on the study of overlaps between eigenvectors in the Truncated Unitary Ensembles (truncations of Haar-distributed unitary matrices) and related models of random matrices.

Ansprechpartner: Gernot Akemann