Aktuelle Veranstaltungen

Kolloquium

Thema:	**[Statistical Mechanical Perspectives on Cosmological Puzzles](#)**
Datum:	19.04.21
Uhrzeit:	16:15
Ort:	cyberspace
Vortragender:	[Christian Maes](#)
	KU Leuven
Inhalt:	We review some well-known paradoxes in cosmology and give a statistical mechanics reading. Puzzles to be touched include the horizon and the flatness problem, the information paradox, the dark energy problem and the origin of the so called space roar. Each time, we emphasize the role of statistical arguments to complement the dynamical understanding. In the end, we argue, statistical mechanics clarifies important aspects of the problems and has a great future in contributing to the understanding of newly observed "fluctuation" features of our cosmos.

Ansprechpartner: [P. Reimann](#)

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:	[**A New Unintegrated Gluon Distribution to Probe Saturation Physics in DIS**]
Datum:	08.04.21
Uhrzeit:	14:03
Ort:	Online, via ZOOM
Vortragender:	[Yacine Mehtar-Tani]
	BNL, Upton/NY
Inhalt:	Understanding the relation between QCD evolution in the Bjorken limit and the Regge limit is crucial to achieve a complete and smooth picture of proton and nuclear structure. The hope in the small x regime (where gluon density is expected to reach saturation and the naif partonic breaks down), was that by computing higher order corrections to small x evolution (BK equations) one would capture more and more of the physics at moderate x (DGLAP evolution). However, this research program has encountered some challenges. At NLO large collinear logarithms are present and need to be resummed spoiling the renormalization group structure established at LO. In order to overcome these formal difficulties, we revisit the shock wave approach for high energy scattering. A new gauge invariant operator definition of the unintegrated gluon distribution that accounts systematically for the collinear limit of structure functions

emerges naturally in our framework. I will discuss in particular inclusive DIS and DVCS as first applications.

Ansprechpartner: S. Schlichting

Seminar Kondensierte Materie

Thema:	**Verschoben: Enhanced Convergence of Quantum Typicality using a Randomized Low-Rank Approximation**
Datum:	15.04.21
Uhrzeit:	14:39
Ort:	ZOOM / Konferenzschaltung
Vortragender:	Phillip Weinberg
	Northeastern University Boston
Inhalt:	

Ansprechpartner: FOR 2692

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:	**Products of Random Matrices and their real Eigenvalues**
Datum:	14.04.21
Uhrzeit:	09:00
Ort:	ZOOM / Konferenzschaltung
Vortragender:	Alex Little
	University of Bristol

Inhalt: Recently there has been a wave of research into products of real asymmetric random matrices. Because these random matrices are asymmetric, they have both real and complex eigenvalues, with the number of each being random. The real eigenvalues of an asymmetric random matrix interact in an interesting way with taking products, in particular, longer products tend to lead to more real eigenvalues. We look at a particular ensemble, products of so-called "truncated orthogonal" matrices and prove a conjecture about the number of real eigenvalues and their distribution along the real line. Proving this conjecture amounted to a problem in asymptotic analysis, and I will go over the key tricks we used to carry this out. This was joint work with Francesco Mezzadri (Bristol) and Nicholas Simm (Sussex). Our paper can be found here: https://arxiv.org/abs/2102.08842

Ansprechpartner: Gernot Akemann