

# Upcoming Events

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## Colloquium

**Topic:** [Statistical Mechanical Perspectives on Cosmological Puzzles](#)

**Date:** 19.04.21

**Time:** 16:15

**Place:** cyberspace

**Guest:** [Christian Maes](#)

KU Leuven

**Abstract:** 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.

**Contact person:** [P. Reimann](#)

## Colloquium Mathematical Physics

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

**Date:** 05.02.21

**Time:** 16:15

**Place:** ZOOM/Konferenzschaltung

**Guest:** [Tamara Grava](#)

University of Bristol

**Abstract:** 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.

**Contact person:** [G. Akemann](#)

## Seminar High Energy Physics

**Topic:** [Is Our Universe the Remnant of Chiral Anomaly in Inflation?](#)

**Date:** 27.04.21

**Time:** 14:15

**Place:** Online, via ZOOM

**Guest:** [Azadeh Maleknejad](#)

CERN, Geneva

**Abstract:** Modern cosmology has been remarkably successful in describing the Universe from a second after the Big Bang until today. However, its physics before that time is still much less certain. It profoundly involves particle theory beyond the Standard Model to explain long-standing puzzles: the origin of the observed matter asymmetry, nature of dark matter, massive neutrinos, and cosmic inflation. In this talk, I will explain that a new framework based on embedding axion-inflation in left-right symmetric gauge extensions of the SM can possibly solve and relate these seemingly unrelated mysteries of modern cosmology. The baryon asymmetry and dark matter today are remnants of a pure quantum effect (chiral anomaly) in inflation which is the source of CP violation in inflation. As a smoking gun, this setup has robust observable signatures for the GW background to be probed by future CMB missions and laser interferometer detectors.

Contact  
person: [D. Bödeker](#)

## Seminar Condensed Matter

**Topic:** **Verschoben: Enhanced Convergence of Quantum Typicality using a Randomized Low-Rank Approximation**

**Date:** 15.04.21

**Time:** 14:39

**Place:** ZOOM / Konferenzschaltung

**Guest:** Phillip Weinberg

Northeastern University Boston

**Abstract:**

Contact  
person: [FOR 2692](#)

## Seminar Mathematical Physics

**Topic:** **The Character Expansion in effective Theories for chiral Symmetry Breaking**

**Date:** 03.12.20

**Time:** 16:30

**Place:** ZOOM / Konferenzschaltung

**Guest:** [Noah Ayyün](#)

Universität Bielefeld

**Abstract:**

**Contact person:** [Gernot Akemann](#)

## **Seminar AG Zufallsmatrizen**

**Topic:** **Reflective intelligent surfaces: random matrices in 6G wireless systems modeling**

**Date:** 21.04.21

**Time:** 14:58

**Place:** ZOOM / Konferenzschaltung

**Guest:** [Giuseppa Alfano](#)

Politecnico di Torino

**Abstract:** TBC

**Contact person:** [Gernot Akemann](#)