

# Aktuelle Veranstaltungen

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## Kolloquium

**Thema:** [Problems in the Foundations of Physics](#)

**Datum:** 13.12.21

**Uhrzeit:** 16:15

**Ort:** cyberspace

**Vortragender:** [Dr. Sabine Hossenfelder](#)

FIAS Frankfurt

**Inhalt:** In the foundations of physics, we have long-standing open problems such as the nature of dark matter and dark energy, the hierarchy problem, or the missing quantization of gravity. Yet physicists have not made progress on solving those problems for 50 years. In this talk, I discuss how physicists ended up in a vicious cycle of theorizing and null results, and what we can do to overcome the present phase of stagnation.

**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:** **Large Scale Structure and Integrated Sachs-Wolfe Effect Measurements with the Rapid ASKAP Continuum Survey**

**Datum:** 13.01.22

**Uhrzeit:** 15:36

**Ort:** D6-135

**Vortragender:** [Benedict Bahr-Kalus](#)

Korea Astronomy and Space Science Institute, KASI

**Inhalt:**

**Ansprechpartner:** [D. Schwarz](#)

## **Seminar Kondensierte Materie**

**Thema:** tba

**Datum:** 14.01.22

**Uhrzeit:** 14:15

**Ort:** D5-153

**Vortragender:** [Roman Rausch](#)

TU Braunschweig

**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

**Inhalt:** 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 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  $2 \times 2$  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:** [Volume-law entanglement entropy of typical pure quantum states](#)

**Datum:** 08.12.21

**Uhrzeit:** 09:00

**Ort:** ZOOM / Konferenzschaltung

**Vortragender:** [Lucas Hackl](#)

University of Melbourne

**Inhalt:** In this talk, I will discuss the statistical properties of entanglement entropy, which serves as a natural measure of quantum correlations between a subsystem and its complement. Entanglement is a defining feature of quantum theory and understanding its statistical properties has applications in many areas of physics (quantum information, statistical mechanics, condensed matter physics, black hole thermodynamics). First, I will introduce the physical model and explain its relevance for practical applications. Second, I will explain how the statistical ensemble of quantum states can naturally be described through the methods of random matrix theory. Third and finally, I review a number of new results describing the typical properties (e.g., average, variance) of the entanglement entropy for various ensembles of quantum states (general vs. Gaussian, arbitrary vs. fixed particle number).

**Ansprechpartner:** [Mario Kieburg](#)