# Universität zu Köln
**Department Mathematik/Informatik**
**Prof. Dr. Alexander Drewitz**

# Einladung zum
# Oberseminar Stochastik

**ONLINE Vortrag über Zoom:**
**https://uni-koeln.zoom.us/j/96361123932?pwd=ZG8xcGlBbmlZQ3ZSU1FNTWJZemxSdz09**

**am Donnerstag, 10.06.2021 um 17:45 Uhr**

## David Belius
**(Universität Basel)**

zum Thema

## Triviality of the geometry of mixed p-spin spherical Hamiltonians with external field

Abstract

Isotropic Gaussian random fields on the sphere are paradigmatic high dimensional complex functions. Due to their appearance in spin glass models in statistical physics, they are also known as mixed p-spin spherical Hamiltonians. One manifestation of the complexity is the presence, in general, of an exponentially large number of critical points. In this talk I will present a result stating that in the presence of a deterministic linear term (external field in the physics terminology) with strength above a certain threshold, the geometry of such functions trivializes in the sense that the only critical points of the random function are then one maximum and one minimum. This extends work of Fyodorov '13, which identified the trivial regime for the special case of pure p-spin Hamiltonians with random external field, and makes mathematically rigorous part of the results of work of Ros et al '19 which derived this claim for pure p-spin Hamiltonians with deterministic external field using physics methods. Our main tool is the Kac-Rice formula for computing the expected number of critical points of random functions.

Based on joint work with Jiri Cerny, Shuta Nakajima, and Marius Schmidt.

Alle Interessenten sind herzlich eingeladen.

Die Dozenten der Stochastik