

A U S H A N G

FREIE UNIVERSITÄT BERLIN

Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

D I S P U T A T I O N

Donnerstag, 11. September 2025, 10:00 Uhr

Ort: Seminarraum 2006

(Zuse Institut Berlin, Takustr. 7, 14195 Berlin)

Disputation über die Doktorarbeit von

Alexander Sikorski

Thema der Dissertation:

Transfer operator methods for Markov processes in high dimensions

Thema der Disputation:

The Renormalization Group: Dynamics of Scale

Die Arbeit wurde unter der Betreuung von **PD Dr. M. Weber** durchgeführt.

Abstract: The renormalization group (RG) provides a systematic way to understand how models behave under changes of scale. Originally developed in statistical mechanics and quantum field theory, the RG has since found applications in probability, dynamical systems, and partial differential equations. Its central idea is to view coarse-graining and rescaling as a transformation acting on a space of models. The long-term behavior of this transformation is governed by fixed points and their stability, which shed light on phenomena such as universality and scaling laws. In this talk, I will introduce the renormalization group from a mathematical perspective and illustrate how changes of scale help explain the emergence of large-scale structures.

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

Interessierte werden hiermit herzlich eingeladen

Der Vorsitzende der Promotionskommission
PD Dr. M. Weber