

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

Montag, 15. September 2025, 16:30 Uhr

Ort: gr. Hörsaal & [WebEx](#)

(Fachbereich Mathematik und Informatik, Takustr.9, 14195 Berlin)

Disputation über die Doktorarbeit von

Lukas Johannes Gräfner

Thema der Dissertation:

Critical and supercritical singular $S(P)$ DEs: A probabilistic approach

Thema der Disputation:

Percolation: A brief overview

Die Arbeit wurde unter der Betreuung von **Prof. Dr. N. Perkowski** durchgeführt.

Abstract: In a percolation model, edges (bond percolation) or vertices (site percolation) of a graph are declared open at random. The prototypical motivation for such models is to describe the inside of porous media but since their advent in the middle of the 20th century a broad range of connections to physics, materials science, epidemiology, complex networks and other fields has been established. In this talk I will first give a brief overview of classical problems and results in percolation theory and then touch on current directions in the field. If time permits, I will place particular focus on the recent work [DFH25] which establishes a polynomial lower bound on the effective resistance for the one-dimensional critical long-range percolation, thus ruling out a phase transition.

[DFH25] Ding, J., Fan, Z. and Huang, L.-J. (2025), Polynomial lower bound on the effective resistance for the one-dimensional critical long-range percolation. Comm. Pure Appl. Math., 78: 1251-1284.

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
Prof. Dr. N. Perkowski