

Almut Rödder

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Research Interests

Keywords: high-dimensional probability, Markov Chain Monte Carlo (MCMC), concentration of measure, statistical machine learning.

Current work investigates sampling from high-dimensional probability measures, with focus on settings where the target measure exhibits symmetry under a group action.

Education

- 2024 – **Ph.D. Mathematics**, ETH Zürich, Switzerland
Under the supervision of Prof. Afonso Sousa Bandeira and Prof. Yuansi Chen.
- 2022–2024 **M.Sc. Mathematics** (distinction), University of Mannheim, Germany
Thesis: *Mathematical Foundations and Asymptotic Theory for Neural Estimators*, supervised by Prof. Sebastian Engelke (University of Geneva).
Final grade: 1.0 (best possible).
- 2018–2021 **B.Sc. Mathematics in Business and Economics** (distinction), University of Mannheim, Germany
Thesis: *Markov Decision Processes in a General Framework*
Final grade: 1.0 (best possible).
- 2018–2021 **B.Sc. Economics** (distinction), University of Mannheim, Germany
Completed in parallel with the B.Sc. Mathematics in Business and Economics.
Final grade: 1.0 (best possible).

Preprints & Other Work

- 2025 Theoretical guarantees for neural estimators in parametric statistics (A. Rödder, M. Hentschel, S. Engelke), preprint.
- 2025 Randomstrasse101: Open Problems of 2024 (A. S. Bandeira, A. Kireeva, A. Mailard, A. Rödder), available online.

Teaching & Mentoring

- 2024–2025 **Teaching Assistant**, ETH Zürich
Further Topics in Mathematics of Data Science (Master's course), advanced session on the mathematics of data science, with a focus on open problems and recent advances in research.
Further Topics in Mathematics of Signals, Networks and Learning (Bachelor's course), advanced session for undergraduate students and introduction into relevant research topics.
- 2019–2023 **Teaching Assistant**, University of Mannheim
Teaching Assistant for Linear Algebra, Stochastics II and Extreme Value Theory

2025– **Student Supervision**, ETH Zürich
B.Sc. Thesis: Mixing times of Glauber dynamics in the Curie-Weiss model for low temperatures (2025),
M.Sc. Thesis: Variational inference for the stochastic block model (2025, joint supervision with Kevin Lucca),
Semester Project: Average vs worst case performance of Glauber Dynamics for Ising Models (2026).

Scientific Activities

2026 **Co-organiser**, Summer School on Mathematics of Randomized Linear Algebra Techniques (EPFL/ETH), Murten, Switzerland. One-week school for 30 participants.

2025 – **Ph.D. Student Representative for ETH**, Zurich Graduate School of Mathematics.

Awards & Scholarships

2024 **Werner-Oettli-Prize** for an outstanding Master Thesis, awarded by the University of Mannheim

2020–2024 **Student Scholarship** for outstanding academic potential, German National Academic Foundation (Studienstiftung des deutschen Volkes)

2019–2020 **Student Scholarship**, National Scholarship Program (Deutschlandstipendium)