



Dr. Dominik Schröder

* 18.07.1990 · MÜNCHEN

Hegarstrasse 4, 8032 Zürich, Schweiz

☎ (+41) 76 221 57 59 | ✉ dschroeder@ethz.ch | 🏠 n.ethz.ch/~dschroeder

Education

Maria-Theresia-Gymnasium

ABITUR

München

2001 – 2010

ETH Zürich

MATHEMATICS & PHYSICS

Zürich

2010 – 2011

LMU München

MATHEMATICS & PHYSICS

München

2011 – 2014

- **BSc in Mathematics.** Final grade *1.08*
Bachelor thesis “The Integrated Density of States of Random Schrödinger Operators” supervised by Prof. Dr. Peter Müller.
- **MSc in Theoretical and Mathematical Physics** with distinction (final grade *1.0*)
Master thesis “Phase Transition in the Density of States of Quantum Spin Glasses” supervised by Prof. Dr. László Erdős.

University of Cambridge

MATHEMATICS

Cambridge

2014 – 2015

- **MASt in Mathematics.** Abschluss mit Auszeichnung *distinction*
Essay “Interlacing Families and the Kadison-Singer Problem” supervised by Prof. Timothy Gowers.

IST Austria

MATHEMATICS

Wien

Sep 2015 – Mär 2019

- **PhD in Mathematics.**
Doctoral thesis “From Dyson to Pearcey: Universal Statistics in Random Matrix Theory” supervised by Prof. Dr. László Erdős.

Positions

Bosch Center for Artificial Intelligence

INDUSTRY SABBATICAL (DURING THE PhD)

Renningen

Apr 2018 – Aug 2018

- Work on clustering of image and audio data
- Focus: Analysis of facets of the lifted multicut polytope on paths
- Goal: Combination of initial segmentation by neural networks with additional expert knowledge

IST Austria

POSTDOC

Wien

Mar 2019 – Sep 2019

ETH Zürich

POSTDOC

Zürich

since Oct 2019

- 2019–2022: *Junior Fellow* at the ETH Institute for Theoretical Studies,
- Since 2022: *SNF Ambizione Independence Grant*
- Mentors: Prof. Vincent Tassion, Prof. Wendelin Werner & Prof. Alain-Sol Sznitman

Publications

ORCID ID orcid.org/0000-0002-2904-1856
Google Scholar scholar.google.com/citations?user=u3ilHrcAAAAJ

Statistical physics

- 1 PUBLICATION:
- Phase transition in the density of states of quantum spin glasses, *Math. Phys. Anal. Geom.*

Random matrix theory

- 24 PUBLICATIONS. KEY PUBLICATIONS:
- Random Matrices with Slow Correlation Decay, *Forum of Mathematics, Sigma*
 - Edge Universality for non-Hermitian Random Matrices, *Probab. Theory Related Fields*
 - Central Limit Theorem for Linear Eigenvalue Statistics of non-Hermitian Random Matrices, *Comm. Pure Appl. Math.*
 - Normal Fluctuation in Quantum Ergodicity for Wigner Matrices, *in revision at Ann. Probab.*

Machine learning theory

- 3 PUBLICATIONS:
- Analysis of one-hidden-layer Neural Networks via the Resolvent Method, *NeurIPS 2021*
 - Deterministic Equivalent and Error Universality of Deep Random Features Learning, *ICML 2023*
 - Asymptotics of Learning with Deep Structured (Random) Features, *submitted to ICML 2024*

Personal Projects

cSP wirhabenzeit/csp
PYTHON, JAVASCRIPT
Regression on EEG data using resnet1d. Written in Python (PyTorch), inference and visualization in JavaScript (onnxruntime)

StravaMap wirhabenzeit/stravamap
JAVASCRIPT
Map and statistical analysis of personal outdoor activities. Written in JavaScript (React.js, D3.js)

Programming Skills

Python Advanced, including deep learning frameworks (PyTorch, TensorFlow)
JavaScript Avanced, including React, Node.js, D3.js
SQL Intermediate
C++ Basic

Teaching experience

Lecture ETH Zürich
PROBABILITY THEORY 2022

	Motivation	Clarity	Script	Structure
<i>Evaluation</i>	4.5/5.0	4.3/5.0	4.4/5.0	4.4/5.0

Course assistant ETH Zürich
MEDLEY IN ADVANCED PROBABILITY 2020

Course assistant IST Austria
RANDOM MATRIX THEORY 2017 – 2018

Supervision of students

Master thesis

VANESSA PICCOLO: "ASYMPTOTIC SPECTRAL DENSITY OF NON-LINEAR RANDOM MATRIX MODELS"

ETH Zürich

2020 – 2021

Won the "Premio Pro Ticino Zurigo" prize

Bachelor thesis

NICOLAS HOTTON: "THE BBP PHASE TRANSITION IN PRINCIPAL COMPONENT ANALYSIS"

ETH Zürich

2023

Semester papers

TOPICS: DYSON BROWNIAN MOTION, RANDOM MATRIX THEORY, PRINCIPAL COMPONENT ANALYSIS

ETH Zürich

2021–2023

Prizes & Fellowships

2010 – 2015 **Studienstiftung des deutschen Volkes**, Scholarship

2015 **Horne Prizes for Physical Sciences**

Clare College, Cambridge

2015 – 2017 **IST Austria Excellence Scholarship**

IST Austria

2019 – 2022 **ITS Junior Fellow** supported by Dr. Rössler and the Walter Haefner Foundation

ETH Zürich

Acquired funding

2022 – 2026 **SNF (Schweizerischer Nationalfonds) Ambizione**. Value CHF544,720
Project: *Random matrix universality in data science and theoretical physics*

Miscellaneous

Jul – Aug 2010 **Volunteer teacher for mathematics & english**, Godavari State School

Nepal