Peter Koepernik

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Homepage Google Scholar LinkedIn

EDUCATION

D.Phil. Statistics, *University of Oxford* 10/2021 – NOW
ANTICIPATED GRADUATION: 08/2025

- Working on applications of rough path theory to numerical stochastic analysis with Terry Lyons
- Two completed projects in mathematical population genetics [2,3] with Alison Etheridge

M.Sc. Mathematics, *University of Oxford* 10/2020 – 07/2021
GRADE: DISTINCTION (**Rank 1 / 52**)

- Specialisation in probability theory and stochastic analysis
- Oxford Mathematical Prize for best performance in examinations

B.Sc. Computer Science, *Karlsruhe Institute of Technology* 10/2017 – 10/2020
GRADE: 1.0 (GPA 4.0) **Top 0.5%**

- Thesis on posterior consistency of Gaussian process regression in metric spaces
- Received best thesis award and published thesis in JMLR [5]

B.Sc. Mathematics, *Karlsruhe Institute of Technology* 10/2018 – 07/2020
GRADE: 1.0 (GPA 4.0) **Top 3.3%**

- Joint maths–physics thesis on quantum Anderson localisation in disordered media
- Theoretically best possible final transcript (best grade 1.0 in every exam)

B.Sc. Physics, *Karlsruhe Institute of Technology* 10/2016 – 08/2020
GRADE: 1.0 (GPA 4.0) **Top 1.9%**

EXPERIENCE

Center for Human-Compatible AI (UC Berkeley) 03/2025 – 08/2025 (FT)
Visiting Research Student

Developing memory learning algorithms for reinforcement learning in partially observable environments [1].

QED Analytics 06/2024 – 10/2024 (FT)
Mathematical Modeller (Internship)

In one project, I used probabilistic modelling, data analysis, and machine learning to develop predictive algorithms for financial regime changes. In a second project, I worked on novel applications of methods in combinatorial optimisation and numerical linear algebra to develop bespoke solutions for large scale scheduling problems in the LNG industry.

FUNDING & AWARDS

EPSRC Postdoctoral Pathway Fellowship (formerly EPSRC Doctoral Prize) 2025
Award for outstanding EPSRC-funded PhD graduates (∼10 awarded across entire MPLS division per year, ∼5% of students).
University of Oxford

EPSRC DTP Scholarship 2021 – NOW
University of Oxford

St. Catherine's Science Graduate Scholarship 2021 – NOW
Awarded to the top two incoming PhD students in sciences at St. Catherine's College each year
St. Catherine's College, Oxford

Oxford Mathematical Prize 2021
For best performance in examinations in the 2021 cohort of the M.Sc. in Mathematical Sciences
University of Oxford

Gisela and Erwin Sick Science Award 2020
For best 2020 thesis across all areas related to information science and technology
Karlsruhe Institute of Technology

Scholarship by Studienstiftung 2017 – 2021
Most prestigious undergraduate scholarship in Germany, awarded to less than 0.5% of students
German Academic Scholarship Foundation

ACADEMIC ACTIVITIES

Peer Reviewer for *Electronic Journal of Probability* and *Stochastic Processes and their Applications*

Invited Conference Talks

JUL 2025	44th Conference on Stochastic Processes and their Applications	*Wrocław, Poland*
MAR 2024	Evolution in structured populations: recent progress and new challenges	*University of Oxford*

Invited Seminar Talks

NOV 2023	Bath Probability Seminar *University of Bath*
MAY 2023	Oxford Probability Seminar *University of Oxford*

Contributed Talks

NOV 2023	Junior Probability Seminar	*University of Oxford*
FEB 2023	Oxford Stochastic Analysis Seminar	*University of Oxford*
JUN 2022	Short Talk at PIMS Summer School in Probability	*University of British Columbia, Vancouver*

CODING COMPETITIONS

Citadel–C1 Terminal AI Competition. Players code algorithms that compete in a head-to-head turn based strategy game, placing defensive structures, managing resources, and coordinating attacks.

- I wrote an AI–assisted tree search algorithm built on top of a highly optimised turn simulator and handcrafted algorithms that find effective attacks and minimal defensive answers to possible incoming attacks.
- **1st Place** on Global Leaderboard April to June 2022, **2nd Place** in Summer Invitational August 2022

International Collegiate Programming Contest (ICPC). The ICPC is a competitive programming contest in which teams of three students from universities across the world (or, in the GCPC, across Germany) compete in five hour contests, solving problems that require mathematical and algorithmic thinking, coding skills, and team work.

- **5th Place** in GCPC 2020, **6th Place** in GCPC 2019

TEACHING EXPERIENCE

St Peter's College, Oxford — 01/2022 – NOW
College Lecturer

Tutored undergraduate students in analysis, measure theory, and integration. Involved in the annual undergraduate interview and admissions process. Tutored visiting students in one-on-one and small group tutorials.

Department of Statistics, University of Oxford — 01/2022 – 06/2024
Class Tutor

Tutored undergraduate students in probability theory.

Karlsruhe Institute of Technology — 10/2017 – 09/2020
Class Tutor

Taught classes and marked exams for undergraduate students in probability theory, measure theory, and analysis.

PUBLICATIONS

[1] **P. Koepernik, R.Y. Tao, R. Parr, G. Konidaris, C. Allen** (2025). General Value Discrepancies Mitigate Partial Observability in Reinforcement Learning. *RLC Finding the Frame Workshop*.

[2] **Koepernik, Peter** (2024). The Brownian Spatial Coalescent. *arXiv:2401.08557*, *submitted*.

[3] **Koepernik, Peter** (2024). On a repulsion-diffusion equation with immigration. *Discrete and Continuous Dynamical Systems*, 44(4), 1106-1133.

[4] **Hambly, Ben and Koepernik, Peter** (2023). Dimension results and local times for superdiffusions on fractals. *Stochastic Processes and their Applications*, 158, 377-417.

[5] **Koepernik, Peter** (2023). Convergence Rates for Nearest Neighbour Regression in Infinite Dimensions. *St Catherine's Academic Review*, 1, 45-63.

[6] **Koepernik, Peter and Pfaff, Florian** (2021). Consistency of Gaussian process regression in metric spaces. *Journal of Machine Learning Research*, 22(244), 1-27.