

# Constantin Kogler

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- EDUCATION**
- University of Oxford, United Kingdom** 2022-
- PhD student in Mathematics. Graduation expected in 2025.
  - Supervisor: Prof. Emmanuel Breuillard.
  - Research Interests: Random Walks on Lie Groups, Fractal Geometry and Self-Similar Measures, Entropy, Harmonic Analysis and Unitary Representation Theory of Lie Groups and (locally) Symmetric Spaces, Diophantine Approximation on Lie Groups, (Effective) Homogeneous Dynamics.
- University of Cambridge, United Kingdom** 2020 - 2022
- PhD student in Mathematics.
  - Member of Center of Doctoral Training in Mathematics of Information.
- ETH Zürich, Switzerland** 2015-2020
- Master of Science in Mathematics.
  - GPA: 6.00/6.00, with distinction.
  - Thesis: Effective  $p$ -adic Ergodic Theory, Diophantine Approximation and Property  $(\tau)$ . Supervisor: Prof. Manfred Einsiedler.

- PUBLICATIONS**
1. On absolute continuity of inhomogeneous and contracting on average self-similar measures (joint with Samuel Kittle).  
<https://arxiv.org/abs/2409.18936>.
  2. Entropy theory for random walks on Lie groups (joint with Samuel Kittle).  
<https://arxiv.org/abs/2501.05395>.
  3. Dimension of contracting on average self-similar measures (joint with Samuel Kittle).  
<https://arxiv.org/abs/2501.17795>
  4. Polynomial tail decay for stationary measures (joint with Samuel Kittle).  
<https://arxiv.org/abs/2502.00086>
  5. Effective density of non-degenerate random walks on homogeneous spaces (joint with Wooyeon Kim).  
<https://arxiv.org/abs/2303.09499>.  
Appeared at International Mathematics Research Notices in 2024.
  6. Local limit theorem for random walks on symmetric spaces.  
<https://arxiv.org/abs/2211.11128>.  
Accepted at Journal d'Analyse Mathématique.
  7. Effective  $p$ -adic ergodic theory, Diophantine approximation and spectral gap.  
<http://constantinkogler.com/Files/CKoglerMscThesis.pdf>.  
Master Thesis. 204 pages.

- ACADEMIC AWARDS**
1. Willi Studer Prize, 2020  
Prize for best masters graduates at ETH
  2. Attendee of Heidelberg Laureate Forum, 2019
  3. Teaching Assistant Award at ETH, 2018
  4. Schweizer Jugend forscht, First Prize, 2015  
National award for work on mathematical billiards

## TEACHING

I have given exercise classes for the following courses with class sizes ranging from 10-30 students.

- Winter 2025: Stochastic analysis and PDEs (Oxford).
- Winter 2025: Continuous Martingales and Stochastic Calculus (Oxford).
- Fall 2024 (2 Sets): Probability, Measure and Martingales (Oxford).
- Winter 2024: Continuous Martingales and Stochastic Calculus (Oxford).
- Fall 2023: Probability, Measure and Martingales (Oxford).
- Winter 2023 (2 Sets): Continuous Martingales and Stochastic Calculus (Oxford).
- Fall 2022 (2 Sets): Probability, Measure and Martingales (Oxford).
- Fall 2021: Part IB Linear Algebra (Cambridge).
- Fall 2018: Linear Algebra (ETH Zürich).

## TALKS

1. 30th April 2025: Université Sorbonne Paris Nord (LAGA).  
Title: Dimension and Absolute Continuity of Self-Similar Measures.
2. 21th October 2024: Institute for Advanced Study. Informal Dynamics Seminar.  
Title: Absolute Continuity of Self-Similar Measures.
3. 14th October 2024: University of Oxford. Junior Number Theory Seminar.  
Title: Self-Similar Sets and Measures.
4. 9th October 2023: University of Warwick. DAGGER Seminar.  
Title: Ergodic actions, random walks and additive combinatorics.
5. 17th January 2023: University of Warwick. ETDS Seminar.  
Title: Random Walks on non-compact Lie groups.
6. 8th June 2022: University of Oxford. Junior Topology and Group Theory Seminar.  
Title: Random Walks on Lie Groups and Diophantine Approximation.
7. 6th May 2022: University of Cambridge. Junior Geometry Seminar.  
Title: Random Walks on Lie Groups and Diophantine Approximation.
8. 24th November 2021: University of Cambridge. S3 seminar.  
Title: Expander Graphs.
9. 13th October 2021: Oberwolfach Arbeitsgemeinschaft.  
Title: Spectral Gap for Compact Lie Groups.

## EXPERIENCE

**Oxford Entrepreneurs** 2022-2024

- Co-President for 2023-2024, Events Lead for 2022-2023.
- Managed a team of 20 board members organising around 60 events every year.
- Organised three startup career fairs, as well as numerous speaker events and panel discussions.

**Board Member of Students Association (VMP)** 2017 - 2018

- Organized lecture feedback.
- Responsible for university policy and attended regular department meetings.
- Took part in hiring committee for new professorship.