# KONRAD ANAND

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## About me

I am in the final year of a PhD in Mathematics at Queen Mary University of London supervised by Mark Jerrum, working on counting and sampling. I am interested in these topics, and more broadly algorithms, probability, combinatorics, and their interplay. I am presently looking for a postdoc in a new research group with opportunities to learn and collaborate on my current research topics and others.

## Education

2020 – 2024 **PhD in Mathematics**, *Queen Mary University of London*, London, UK.
Supervised by Mark Jerrum (http://www.maths.qmul.ac.uk/∼mj/)

2018 – 2020 **M.Sc. in Computer Science**, *McGill University*, Montreal, Canada.
Supervised by Luc Devroye (http://luc.devroye.org)
Thesis: *Probabilistic Analysis of RRT Trees*, arXiv:2005.01242 (2020)

2012 – 2018 **B.Sc. Honours in Mathematics**, *McGill University*, Montreal, Canada.
Graduated with First-Class Honours

## Papers

RANDOM 2023 **Perfect Sampling for Hard Spheres from Strong Spatial Mixing**.
Konrad Anand, Andreas Göbel, Marcus Pappik, and Will Perkins
– arXiv:2305.02450

SICOMP 2022 **Perfect Sampling in Infinite Spin Systems via Strong Spatial Mixing**.
Konrad Anand and Mark Jerrum
– arXiv:2106.15992

## Preprints

2023 **Approximate Counting for Spin Systems in Sub-Quadratic Time**.
Konrad Anand, Weiming Feng, Graham Freifeld, Heng Guo, and Jiaheng Wang
– arXiv:2306.14867

2023 **Perfect Sampling of $q$-Spin Systems on $\mathbb{Z}^2$ via Weak Spatial Mixing**.
Konrad Anand and Mark Jerrum
– arXiv:2302.07821

## Talks

Dec. 2022 **Lazy Depth-First Sampling on Infinite Spin Systems**, *Counting and Sampling: Algorithms and Complexity*.
Dagstuhl Seminar 22482

Nov. 2022 **Lazy Depth-First Sampling on Spin Systems**, *QMUL Combinatorics Seminar*.
Queen Mary University of London

Sep. 2021 **Lazy Depth-First Sampling**, *Processes on Random Geometric Graphs*.
University of Cologne

## Seminars/Summer Schools

Dec. 2022 **Counting and Sampling: Algorithms and Complexity**, *Dagstuhl*.
Dagstuhl Seminar 22482

Sep. 2021 **Processes on Random Geometric Graphs**, *University of Cologne*.
Summer school focused on new developments on dynamics on spatial random networks

July 2019 **Nice Summer School**, *Université de Nice Sophia Antipolis*.
Summer school focused on random walks, Markov chains, and random graphs

July 2019 **École d'été Graphes et Arbres Aléatoires**, *Centre International de Rencontres Mathématiques* .
Summer school focused on planar maps, continuum trees and random graphs

## Scholarships

2020 – 2024 **PGR Studentship**, *Queen Mary University of London*.

2017 **NSERC USRA**, *McGill University*.
Undergraduate research scholarship in mathematics

2017 **Supplément aux bourses de 1er cycle du CRSNG**, *McGill University*.
Undergraduate research scholarship in mathematics

## Teaching

2022 **Teaching Assistant**, *King's College London*.
7CCMFM01: Probability Theory

2022 **Teaching Assistant**, *Queen Mary University of London*.
MTH4107 / MTH4207: Introduction to Probability
MTH5105: Differential and Integral Analysis
MTH5114: Linear Programming and Games
MTH6105: Algorithmic Graph Theory

2022 **Teaching Assistant**, *McGill University*.
MATH 235: Algebra 1
MATH 589: Advanced Probability 2
COMP 251: Algorithms and Data Structures
COMP 252: Honours Algorithms and Data Structures
COMP 360: Algorithm Design
Undergraduate Mathematics Help Desk

## Work Experience

2014 **Contract**, *Optimal Computational Algorithms, Inc.*.
Designed 3D sampling patterns for a research project in MR imaging. Designed non-linear trajectories in Haskell according to bounds on velocity and slew in order to evenly sample the space faster than traditional methods.

2013 **Contract**, *Optimal Computational Algorithms, Inc.*.
Designed new algorithms and implementations for IBM Z's Mathematical Acceleration Subsystem using functional assembly language embedded in Haskell.