Amlan Banaji

Curriculum Vitae

PhD student in Mathematics at St Andrews

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Website: amlan-banaji.github.io

Nationality: UK

RESEARCH INTERESTS

I am primarily interested in the geometry and dimension theory of fractal sets and measures. I have worked extensively with fractals generated by conformal and non-conformal iterated function systems. Much of my research has focused on interpolating between different notions of dimension. I am interested in finding connections between fractal geometry and other areas of mathematics.

PUBLICATIONS AND PREPRINTS

- Intermediate dimensions of infinitely generated attractors *(with J. M. Fraser)*
  To appear in ***Transactions of the American Mathematical Society****.* *arXiv*
- Attainable forms of intermediate dimensions *(with A. Rutar)*
  Annales Fennici Mathematici *47 (2022) 939–960.* *arXiv*
- Intermediate dimensions of Bedford–McMullen carpets with applications to Lipschitz equivalence *(with I. Kolossváry)*
  Submitted. *arXiv*
- Generalised intermediate dimensions
  Submitted. *arXiv*

EDUCATION

University of St Andrews
2019–present

PhD Mathematics (in progress)

Topic: Fractal geometry and dimension theory
With the Analysis Research Group
Supervisors: Prof. Jonathan Fraser (primary), Prof. Kenneth Falconer
Full scholarship from the Leverhulme Trust

University of St Andrews
2018–2019

MSc Mathematics, Distinction

GPA: 19.5/20. Ranked 1st in the Faculty of Science and Medicine
Dissertation:
Solvability of Partial Differential Equations on Fractal Domains
(Score: 19.1/20, supervised by Professor Kenneth Falconer)

University of Cambridge,
King’s College
2015–2018

BA (Hons) Mathematics

Selected Part II courses: Linear Analysis, Analysis of Functions, Topics in Analysis, Differential Geometry, Riemann Surfaces, Logic and Set Theory

Thomas Tallis Sixth Form
2013–2015

A-Levels:
Mathematics(A), Further Mathematics(A*), Physics(A*), Chemistry(A*), History(A), Extended Project Qualification(A*, AS level)*

PRIZE

- *2019*: **Postgraduate Gray Prize** for the best taught postgraduate student in the Faculty of Science and Medicine at the University of St Andrews.

TALKS

I have given 15 talks (listed at amlan-banaji.github.io/talks) at conferences and seminar series including:

- Geometry of Deterministic and Random Fractals (Budapest University of Technology and Economics, June 2022)
- Junior Ergodic Theory Meeting (ICMS, Edinburgh (March 2022) and online (March 2021))
- Workshop on affine and overlapping iterated function systems (Bristol, May 2022)
- Dynamics and Group Geometry Early Researchers Seminar (DAGGER) (Warwick, May 2022 and March 2021)
- Analysis Seminar (St Andrews, May 2022, October 2021 and June 2020)

EXPERIENCE

- **Teaching undergraduate tutorials at the University of St Andrews:**
  2019 – 2021: MT2502 Analysis (8 groups total)
  2021: MT2505 Abstract Algebra (2 groups)
  2020: MT1003 Pure and Applied Mathematics (2 groups)

- *2018 onwards*: **Tutoring** mathematics (undergraduate, A level and STEP) with Oxford Exclusif Tutorial Agency, PhD Tutors, Sishu Chinese School, and privately.

- *2018*: LMS-funded **Cambridge Summer Research in Mathematics (SRIM) project** on Leray-Schauder Topological Degree Theory and its applications to Partial Differential Equations.

- *2017*: internship at market research company Kantar TNS, working as a **data scientist** for the social media team, using Python.

SERVICE

- *2022*: **Referee** for *Proc. Roy. Soc. Edinburgh Sect. A* and *J. Math. Anal. Appl.*

- *2021*: **Co-organiser** of the Postgraduate Interdisciplinary Mathematics Symposium (PIMS), St Andrews.

- *2019–2021*: **Treasurer** of St Andrews Mindfulness Society.

MEMBERSHIP OF PROFESSIONAL BODIES

- *2022–present:* London Mathematical Society

- *2020–present:* Edinburgh Mathematical Society

- *2019–present*: Associate Member of the Institute of Mathematics and its Applications (AMIMA)

INTERESTS AND SKILLS

- **Languages:** English (native), German (conversational, A* at GCSE), Hindi (conversational)

- **Music**: Piano (grade 8), Clarinet (toured Canada and Venice)

- **Sport:** running, badminton, chess