Amlan Banaji

Curriculum Vitae

PhD student in Mathematics at St Andrews

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Website

LinkedIn

ORCID

Nationality: UK

EDUCATION

St Andrews University
2019 – present

PhD Mathematics (in progress)
Topic: Fractal Geometry (more specifically, I am interested in interpolating between different notions of dimension).
Supervisor: Dr Jonathan Fraser
Second supervisor: Professor Kenneth Falconer
With the Analysis Research Group
Fully funded by a grant from the Leverhulme Trust
Research papers:
Generalised intermediate dimensions, arXiv (submitted)

St Andrews University
2018 – 2019

MSc Mathematics (Distinction)
19.5 out of 20 Grade Point Average
Dissertation:
Solvability of Partial Differential Equations on Fractal Domains
(19.1 out of 20, supervised by Professor Kenneth Falconer)
Selection of taught modules: Measure and Probability Theory, Topics in Groups, Graph Theory, Hyperbolic Geometry, Galois Theory, Advanced Combinatorics

King’s College
University of Cambridge
2015 – 2018

BA (Hons) Mathematics (2:1)

Selection of courses:
Part II: Linear Analysis, Analysis of Functions, Topics in Analysis, Differential Geometry, Riemann Surfaces, Logic and Set Theory, Algebraic Topology
Part IB: Statistics, Markov Chains, Linear Algebra, Analysis II, Complex Analysis, Metric and Topological Spaces, Groups Rings and Modules, Fluid Dynamics, Electromagnetism
Part IA: Probability, Differential Equations, Analysis I, Vectors and Matrices, Groups, Numbers and Sets, Vector Calculus, Dynamics and Relativity
Computer-Aided Teaching of All Mathematics (CATAM) projects in topics such as algebra, differential equations, statistics and number theory. Marks are each out of 40:
Part II projects: marks 38, 36, 37, 36
Part IB projects: marks 38, 36, 37, 36

Thomas Tallis Sixth Form
2013 – 2015

A-Levels
Mathematics(A), Further Mathematics(A*), Physics(A*), Chemistry(A*), History(A), Extended Project Qualification (EPQ):* On the Creation of the NHS *(A*)*

2015

***STEP** (Sixth Term Examination Paper): Papers I, II and III, all at Grade 1*

2014

UKMT Senior Maths Challenge: 105 out of 125, qualified for BMO (British Mathematical Olympiad) Round 1

Sedgehill School **GCSEs**
2008-2013 *11, all at grade A* including English, Maths, Triple Science*

TALKS

- New Intermediate Dimensions
  University of St Andrews Analysis Seminar (online), 30/6/20

- Ergodic Theory and Conditional Probability
  Analysis Reading Group, University of St Andrews, 19/2/20

- Weak Tangents in Dimension Theory
  Postgraduate Intradisciplinary Mathematics Symposium (PIMS) St Andrews, The Burn House (Edzell), Scotland, 27/1/20-29/1/20

- Analysis on some post-critically finite self-similar sets
  Pure Postgraduate Seminar, University of St Andrews, 5/11/19

- Leray-Schauder Topological Degree Theory and Applications to Partial Differential Equations
  summer project, University of Cambridge, 24/7/18

CONFERENCES/MEETINGS ATTENDED

- Afternoon workshop on fractal geometry and geometric measure theory
  University of St Andrews, 2/9/19

EMPLOYMENT

- **Teaching undergraduate tutorials at the University of St Andrews:**
  2020-2021 Autumn: MT2502 Analysis (2 groups)
  2019-2020 Spring: MT1003 Pure and Applied Mathematics (2 groups) and remote marking during the UK lockdown due to the COVID-19 pandemic
  2019-2020 Autumn: MT2502 Analysis (4 groups)

- April 2020: Private **online tutoring** during the UK lockdown due to the COVID-19 pandemic

- November-December 2018: **Tutoring** undergraduate mathematics (analysis and statistics) with Oxford Exclusif Tutorial Agency.

WORK EXPERIENCE

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

- 12 July – 4 August 2017: internship at market research company Kantar TNS, working as a **data scientist** for the social media team. Worked in Python to automate the analysis of the sentiment of opinions expressed on social media, for example by creating a Spanish-language part-of-speech tagger using machine learning techniques. Conducted some statistical analysis of social media data.

- 2015 onwards: Periodically **mentoring** students at Thomas Tallis Sixth Form for Mathematics and Further Mathematics A level, Oxford MAT, STEP, and Cambridge Computer Science entrance exam

- 2011 (1 week): shadowing a doctor at Hilly Fields Medical Centre

AWARDS AND PRIZES

- 2019: **Postgraduate Gray Prize** (Science and Medicine) 2018/2019 for the best taught postgraduate student for the 2018/2019 session based on the St Andrews Grade Point Average
- 2013: Achieved the Bronze Duke of Edinburgh's Award

MEMBERSHIP OF PROFESSIONAL BODIES

- 2019 – present: Associate Member of the Institute of Mathematics and its Applications (AMIMA)
- 2020 – present: Edinburgh Mathematical Society (ordinary member)

IT SKILLS

- Good knowledge of **LaTeX** (wrote up eight CATAM projects using LaTeX, and use it to write up research for my PhD)
- Fluent in **MATLAB**: completed eight CATAM projects using MATLAB
- Knowledge of **Python**
- Operating systems: proficient in **Linux** and Windows
- Confident with GIMP, LibreOffice, and Microsoft Office programs, such as Excel

LANGUAGE SKILLS

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

EXTRA-CURRICULAR ACTIVITIES

- Played for St Andrews **Chess** Club
- Regularly played for the King's College **badminton** team, including in the inter-college league
- Took part in **World Challenge** expedition to Morocco. Did volunteering work, helping to refurbish a local school.

MUSIC

- **Piano**: Grade 8. Have performed solo in numerous concerts.
- **Clarinet**: Grade 5. Was a member of the school band; performed on tour in Canada and Venice.

RESPONSIBILITIES

- **Treasurer** of the University of St Andrews Mindfulness Society since 2019
- Was a school **prefect**

INTEREST AND SKILLS

- **Mathematics**: regularly attend St Andrews Analysis Seminars and other talks
- **Travel**: have travelled widely in South Asia, Western Europe and North America