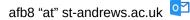
Amlan Banaji

Curriculum Vitae

PhD student in Mathematics at St Andrews



Website









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, <u>arXiv</u> (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

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

2015

2014

A-Levels

Mathematics(A*), Further Mathematics(A*), Physics(A*),

Chemistry(A*), History(A), Extended Project Qualification (EPQ): On

the Creation of the NHS (A*)

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

Grade 1

UKMT Senior Maths Challenge: 105 out of 125, qualified for BMO

(British Mathematical Olympiad) Round 1

Sedgehill School

2008-2013

11, all at grade A* including English, Maths, Triple Science

TALKS

- Intermediate dimensions and infinite conformal iterated function systems
 University of Warwick's Dynamics and Group Geometry Early Researchers (DAGGER) Seminar,
 1/3/21
- Interpolating between the Hausdorff and box dimensions
 Postgraduate Interdisciplinary Mathematics Symposium (PIMS) St Andrews (online instead of at the Burn House due to COVID-19), 26/1/21
- New Intermediate Dimensions
 <u>University of St Andrews Analysis Seminar</u> (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 Interdisciplinary 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 <u>Institute of Mathematics and its Applications</u> (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

- Co-organiser of the Postgraduate Interdisciplinary Mathematics Symposium (PIMS) St Andrews, 2021, held online instead of at the Burn House due to COVID-19. Helped to arrange and schedule talks by 15 different speakers.
- Treasurer of the University of St Andrews Mindfulness Society since 2019
- Was a school prefect

INTEREST AND SKILLS

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