Soham Karwa
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Research Interests

Algebraic geometry, non-archimedean geometry, mirror symmetry, logarithmic geometry, tropical geometry, enumerative geometry, moduli spaces

Employment

- **William W. Elliott Assistant Research Professor, Duke University** Aug 2024 - Jul 2027
  - **Mentor**: Joe Rabinoff

Education

- **PhD, Imperial College London (LSGNT)** Oct 2019 - Aug 2024
  - **Project**: Non-Archimedean Periods for log Calabi-Yau surfaces
  - **Advisor**: Johannes Nicaise
- **MMath, University of Cambridge** 2018-2019
  - **Part III Essay**: Arithmetic Statistics of Elliptic Curves, supervised by Professor Jack Thorne
- **BA in Mathematics, University of Cambridge** 2015-2018

Work experience

- **Parliamentary Office for Science and Technology (POST) Fellow** May - Aug 2023
  - Worked with the House of Lords Digital and Communications Select Committee
  - Led the planning and scoping of the inquiry on Large Language Models (LLMs), including preparing multiple briefings and delivering a presentation to the committee on AI and LLMs
  - Supported briefing work in other areas of the committee's remit including BBC regulation and Digital Market competition

Preprints

- Non-archimedean periods of log Calabi-Yau Surfaces, with Jonathan Lai (arXiv, under revision following favourable referee reports at the Journal of Algebraic Geometry)
- K-tropical curves, Riemann Roch and Serre duality, with Joe Rabinoff (arxiv)

Teaching

- Instructor of Record for Math 218D-1: Matrices and Vector Spaces, Duke x2 Jan - May 2025
- Instructor of Record for Math 283S: Advanced Problem Solving, Duke Aug - Dec 2025
- Instructor of Record for Math 221: Linear Algebra and its applications Duke, x2 Aug - Dec 2025
- Instructor of Record for Math 218D-1: Matrices and Vector Spaces, Duke Jan - May 2025

Awards

- Turing Grant Global Fellows placement (£1600) Jan 2023
- Doris Chen Mobility Award (£1000) November 2022
- EPSRC Studentship for London School of Geometry and Number Theory 2019-2023

Research Visits

- University Paris-Saclay November 2026
- Institut des Hautes Études Scientifiques November 2023
- Katholieke Universiteit Leuven Feb - May 2023
- Technische Universität München Oct - Dec 2022

Talks

- K-affine structures on skeleta, MIT/Harvard — Mar 2026
- Periods and Skeletons, UT Austin — Nov 2025
- Periods and Skeletons, John Hopkins — Oct 2025
- Non-archimedean periods of log Calabi-Yau surfaces, Paderborn University — Jul 2025
- Non-archimedean periods of log Calabi-Yau surfaces, École Polytechnique — Jul 2025
- Non-archimedean periods of log Calabi-Yau surfaces, Caltech — Apr 2025
- Non-archimedean periods of log Calabi-Yau surfaces, University of Michigan, Ann Arbor — Mar 2025
- Non-archimedean periods of log Calabi-Yau surfaces, Duke University — Nov 2024
- Non-archimedean periods of log Calabi-Yau surfaces, The University of Edinburgh — Apr 2024
- Non-archimedean periods of log Calabi-Yau surfaces, King's College London — Nov 2023
- Non-archimedean periods of log Calabi-Yau surfaces, Imperial College London — Nov 2023
- Non-archimedean periods of log Calabi-Yau surfaces, Institut des Hautes Études Scientifiques — Nov 2023
- Large Language Models, House of Lords — Aug 2023
- Non-Archimedean SYZ and Periods, Universität Regensburg — Aug 2022
- Temkin's Metrization of pluricanonical forms, KU Leuven Reading Seminar — Mar 2022
- An Introduction to Logarithmic Geometry, London Junior Number Theory Seminar — Mar 2022
- HMS of $\mathbb{P}^1$ and $\mathbb{P}^1\backslash\{3 \text{ pts}\}$, Homological Mirror Symmetry Learning Seminar — Feb 2022
- Non-Archimedean K-stability, Birational Geometry Learning Seminar — Dec 2022
- Comparison of Adic and Berkovich Spaces, Non-Archimedean Geometry Study group (co-organiser) — Dec 2021
- Kulikov Models, K3 Degenerations Study Group — Nov 2021
- An Introduction to Logarithmic Geometry, Imperial Junior Geometry — Nov 2021
- Classification and Minimal Model Program for Surfaces, K3 Degenerations Study Group — Jul 2021
- Mirror symmetry and p-adic integration, London Junior Number Theory (co-organiser) — June 2021
- Ampleness and Serre Duality, K3 Degeneration Study Group — March 2021
- The Kuga-Satake Construction, K3 Study Group — Feb 2021
- A Brief Introduction to Mirror Symmetry, KCL+UCL Junior Geometry — Dec 2020
- The Divisor-Line Bundle Correspondence, Imperial Junior Geometry — Nov 2020
- Coherent Cohomology with Compact Support, London Number Theory Study Group — Oct 2020
- Obstruction to rational points, Étale Homotopy Study Group (co-organiser) — Sept 2020
- Grothendieck-Teichmüller Lie Algebras, ATOM Summer School — Jul 2020
- Non-Archimedean Mirror Symmetry Lightning Talk, ATOM Summer School — Jul 2020
- The role of Shimura varieties in the Local Langlands Correspondence — May 2020

Undergraduate Research

- **The Shape of Elliptic Curves**: supervised by Professor J A Thorne (Department of Pure Mathematics and Mathematical Statistics, University of Cambridge), funded by London Mathematical Society Undergraduate Research Grant £2000, Summer 2018
- **Depletion Interaction**: supervised by Dr Thierry Savin (Dynamics of Living Matter Research group, University of Cambridge), funded by Centre for Mathematical Sciences (Cambridge) £2000, Summer 2018
- **Noncommutative Riemannian geometry of graphs and finite groups**: supervised by Professor Shahn Majid (Queen Mary, University of London), funded by Trinity College, Cambridge £600, Summer 2017