Alex J. Best

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EDUCATION & WORK

Ph.D. Mathematics
Boston University, 2016 – present
Advisor: Jennifer Balakrishnan
Funded in part by the Simons Collaboration on Arithmetic Geometry, Number Theory, and Computation.

Scientific assistant/software developer
University of Kaiserslautern, 2016
Worked on the MPIR library, funded by the EU Horizon 2020 project OpenDreamKit.

M.A.St. Pure Mathematics (69%)
University of Cambridge, 2014 – 2015
Essay title: Serre's Conjecture

B.Sc. Discrete Mathematics, First class (94%)
University of Warwick, 2011 – 2014
Courses included: Elliptic curves, modular forms, (algebraic) number theory, commutative algebra, Galois theory, (algebraic) topology, algorithms and complexity.

Awarded department prizes for the best overall graduating B.Sc. student in Discrete Mathematics, and for outstanding second year performance.

PUBLICATIONS

Quadratic time Coleman integration on superelliptic curves, in preparation.

Explicit Coleman Integration in Larger Characteristic, Proceedings of the Thirteenth Algorithmic Number Theory Symposium, doi:10.2140/obs.2019.2.85.

Computing Zeta Functions of Cyclic Covers in Large Characteristic, joint with Vishal Arul, Edgar Costa, Richard Magner, Nicholas Triantafillou, Proceedings of the Thirteenth Algorithmic Symposium, doi:10.2140/obs.2019.2.37.

TEACHING

Teaching Assistant, MA225 Multivariable Calculus – BU Fall 2017

Teacher Teacher (T^2), PROMYS for Teachers – BU Summer 2 2017

Lecturer, MA123 Calculus I – BU Summer 1 2017

Teaching Assistant, EK102 Linear Algebra – BU Spring 2017

Teaching Assistant, MA121 Calculus for Life and Social Sciences 1 – BU Fall 2016

Seminar Tutor, CS137 Discrete Maths and its Applications 2 – Warwick 2014

TALKS GIVEN

Research:

- *Zeta functions and p-adic integrals; computations and applications*, AMS Graduate Student Conference in Algebra/Number Theory, Brown, 2019.
- *(Explicit) Coleman Integration in Larger Characteristic*, ANTS XIII 2018.

Expository:

- *Something to lean on; fun with interactive theorem provers*, BU Math Retreat Lightning Talks, Spring 2019.
- *The Brauer-Siegel theorem*, STAGE, MIT, Spring 2019.
- *Explicit non-abelian Chabauty, I & II*, Math 258, Harvard, Spring 2019.

- *Explicit Galois deformations*, BU Number Theory Expository Seminar, Spring 2019.
- *The Kodaira-Parshin construction*, STAGE, MIT, Fall 2018.
- *Quaternion Algebras*, and *Descent and Canonical models*, BU Number Theory Expository Seminar, Fall 2018.
- *The (inescapable) p-adics*, BU Math Retreat Lightning Talks, Spring 2018.
- *A Smörgåsbord of Dessins d'Enfants* and *Dessins, integer points on elliptic curves and a proof of the ABC conjecture*, BU Number Theory Expository Seminar, Spring 2018.
- *Neutral Tannakian categories and (pro-)unipotent algebraic groups*, STAGE, MIT, Spring 2018.
- *Complex Theory of Abelian Varieties*, *Polarizations & Étale Cohomology* and *The Rosati involution*, BU Number Theory Expository Seminar, Fall 2017.
- *The Cotangent Complex*, BU Perfectoid Spaces learning seminar, Spring 2017.
- *Ribet's Converse to Herbrand: Cuspstruction*, STAGE, MIT, Spring 2017.
- *Rigid Analytic Spaces*, and *Mumford Curves*, BU Rigid Geometry learning seminar, Fall 2016.
- *Serre's Conjecture*, Ulm University Oberseminar, 2016.
- *Singular Moduli*, Cambridge Part III Seminar Series, 2014.
- *Singular Moduli*, Warwick Imperial Autumn Meeting, 2014.
- *Riemann Hypotheses*, Warwick Mathematics Society talks, 2014.
- *Category Theory* (with Ben Wormleighton), Warwick Mathematics Society talks, 2013.
- *Introduction to Abstract Algebra revision lecture*, for Warwick first year mathematics cohort, 2013.
- *Geometric approaches to solving Diophantine equations*, Tomorrow's Mathematicians Today, University of Greenwich, 2013.

CONFERENCE & WORKSHOP ATTENDANCE

- AMS Graduate Student Conference in Algebra/Number Theory, Brown, 2019.
- Arizona Winter School 2019: Topology and Arithmetic.
- LMFDB Development Workshop, Modular forms, MIT, 2018.
- Arithmetic Geometry, Number Theory, and Computation, MIT, 2018.
- Arithmetic Statistics and Diophantine stability, Fondation des Treilles, 2018.
- Algorithmic Number Theory Symposium (ANTS) XIII 2018, University of Wisconsin, Madison, 2018.
- Homotopy Theory and Arithmetic Geometry: Motivic and Diophantine Aspects, Imperial College London, 2018.
- Explicit and computational approaches to Galois representations, University of Luxembourg, 2018.
- Mathematics is a long conversation: a celebration of Barry Mazur, Harvard, 2018
- CTNT 2018 Conference.
- UNCG Summer School in Computational Number Theory 2018: Algorithms for Extensions of Large Degree.
- 32nd Automorphic Forms Workshop, Tufts, 2018.
- Arizona Winter School 2018: Iwasawa Theory.
- Boston Graduate Math Colloquium, December 2017 & February 2018.
- AGNES 2017, Northeastern.
- Advanced School and Workshop on the Arithmetic of Hyperelliptic Curves, ICTP Trieste, 2017.
- Sage Days 87: p-adics in Sage and the LMFDB, University of Vermont, 2017.
- Distribution of modular symbols and L-values: computations and applications, Harvard, 2017.
- Arizona Winter School 2017: Perfectoid Spaces.
- Current Developments in Mathematics 2016, Harvard.
- Super QVNTS: Kummer Classes and Anabelian Geometry, University of Vermont, 2016.
- 7th European Congress of Mathematics, Berlin, 2016.

– Shimura Varieties, Leiden, 2016.
– Arizona Winter School 2015: Arithmetic and Higher-Dimensional Varieties.
– Elliptic curves, Modular Forms and Iwasawa Theory, Cambridge, 2015.
– Joint BMC/BAMC, Cambridge, 2015 (Student volunteer).
– Warwick-Imperial Autumn (2014 & 2015) & Spring (2015) Meetings.
– Heilbronn Annual Conference, University of Bristol, 2014.
– Summer School on Number Theory for Cryptography, University of Warwick, 2013.
– Tomorrow's Mathematicians Today, 2013 & 2014.