Alexander Smith

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Born: March 4, 1993

Appointments held

2023 -	Visiting Clay fellow at UCLA
2021 - 2023	Visiting Clay fellow at Stanford University
2020 - 2021	NSF Postdoctoral fellow at MIT

Education

2015 - 2020	Harvard University, PhD in Mathematics
2011 - 2015	Princeton University, AB in Mathematics

Publications & Talks

ARTICLES

Sums of rational cubes and the 3-Selmer group, with Peter Koymans. Submitted (arXiv 2405.09311).

Faithful Artin induction and the Chebotarev density theorem, with Robert J. Lemke Oliver. Submitted (arXiv 2405.08383).

The distribution of ℓ^∞-Selmer groups in degree ℓ twist families I. Submitted (arXiv 2207.05674).

The distribution of ℓ^∞-Selmer groups in degree ℓ twist families II. Submitted (arXiv 2207.05143).

The Cassels–Tate pairing for finite Galois modules (with Adam Morgan). Submitted (arXiv 2103.08530).

Algebraic integers with conjugates in a prescribed distribution. Annals of Mathematics, 200, no. 1 (2024): 71-122.

Abelian varieties of prescribed order over finite fields (with Raymond van Bommel, Edgar Costa, Wanlin Li, and Bjorn Poonen). Accepted at Math. Ann.

New lower bounds for the Schur-Siegel-Smyth trace problem (with Bryce Orloski and Naser Sardari). Mathematics of Computation (2024).

Field change for the Cassels–Tate pairing and applications to class groups (with Adam Morgan). Research in Number Theory, 10 : 61 (2024).

2^∞-*Selmer groups,* 2^∞-*class groups, and Goldfeld's conjecture.* Available at arXiv 1702.02325.

Governing fields and statistics for 4-*Selmer groups and* 8-*class groups.* Available at arXiv 1607.07860.

The congruent numbers have positive natural density. In preparation (arXiv 1603.08479)

Irreducible canonical representations in positive characteristic (with Benjamin Gunby and Allen Yuan). Research in Number Theory 1 : 3 (2015).

Ball packings with periodic constraints (with Robert Connelly and Jeffrey Shen). Discrete & Computational Geometry 52 : 4 (2014).

INVITED TALKS

Sept 2016	*Statistics for 8-class groups and 4-Selmer groups* Number Theory / Representation Theory Seminar, UW Madison
	2^∞-*Selmer groups,* 2^∞-*class groups, and Goldfeld's conjecture*
Mar 2017	Joint Columbia-CUNY-NYU Number Theory Seminar
	30th Southeastern Regional Meeting on Numbers
Sept 2017	Princeton University/IAS Number Theory Seminar
Oct 2017	Harvard University Number Theory Seminar
Feb 2018	Five College Number Theory Seminar (UMass Amherst)
Mar 2018	Berkeley Arithmetic Geometry and Number Theory Seminar
May 2018	Algebraic Groups and Geometrization of the Langlands Program conference (ENS Lyon)
Jun 2018	Seminar talk at University College London
	New Developments in Arithmetic Geometry (Tsinghua University)
	Automorphic Forms and L-functions (Shandong University, Qingdao)
Nov 2018	UChicago Number Theory Seminar
Dec 2018	Quebec-Vermont Seminar (McGill)

Jan 2019	Joint Mathematics Meeting:
	"Counting Methods in Number Theory" invited paper session
	"Arithmetic Statistics" special session
Mar 2019	Hawaii Number Theory Conference
Apr 2019	AMS Grad Student Conference (Brown)
Jun 2019	Enumerative Arithmetic and the Cohen-Lenstra Heuristic (Max Planck)
	Rational Points on Irrational Varieties (Institut Henri-Poincaré)
Jul 2019	JNT Biennial Conference
Sep 2019	UMichigan Number Theory Seminar
Oct 2019	BostonU Number Theory Seminar
Jul 2021	Explicit Methods in Number Theory (Oberwolfach workshop): three lectures
Feb 2022	UCSD number theory seminar
Apr 2022	UGA number theory seminar
Aug 2022	Mordell 2022 (Cambridge University)
Aug 2022	Geometry of arithmetic statistics (Simons symposium)

	Simple abelian varieties over finite fields with extreme point counts
Feb 2022	Number theory days (UCSD)
Apr 2022	Anabelian days down in Georgia (UGA)
Nov 2022	Analytic number theory (Oberwolfach workshop)
Nov 2022	Heilbronn number theory seminar (University of Bristol)
Nov 2022	MIT number theory seminar
Nov 2023	Tufts number theory seminar
Mar 2024	UC Berkeley number theory seminar
Apr 2024	BC-MIT number theory seminar
May 2024	Caltech number theory seminar

Teaching positions

Spring 2017, 2018, 2019	Teaching Fellow for Math 21a (multivariable calculus)

Honors & awards

2015- 2018	Pierce Fellowship (graduate student fellowship at Harvard)
2019	David Goss Prize in Number Theory
2019	Certificate of distinction in teaching
2019-2020	Merit/Graduate Society Term-time Research Fellowship

Last updated: September 30, 2024