Curriculum Vitae

Jacob Mayle

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Research Interests

Theoretical and computational aspects of number theory and arithmetic geometry; especially elliptic curves (and abelian varieties more generally), Galois representation, and local-global phenomena.

Employment

2022 -	Teacher Scholar Postdoctoral Fellow Wake Forest University
Education	
2018 - 2022	Ph.D. in Mathematics University of Illinois Chicago Thesis: Galois representations of abelian varieties Advisor: Nathan Jones
2016 - 2018	M.S. in Mathematics University of Illinois Chicago
2012 - 2016	A.B. in Mathematics Colgate University Magna cum laude, honors in mathematics
Publications	
2023	On the effective version of Serre's open image theorem (with Tian Wang) <i>To appear in Bulletin of the London Mathematical Society.</i>
2023	Serre curves relative to obstructions modulo 2 (with Rakvi) To appear in LMFDB, Computation, and Number Theory.
2023	Computing nonsurjective primes associated to Galois representations of genus 2 curves (with Barinder Singh Banwait, Armand Brumer, Hyun Jong Kim, Zev Klagsbrun, Padmavathi Srinivasan, and Isabel Vogt) To appear in LMFDB, Computation, and Number Theory.
2023	Rigidity in elliptic curve local-global principles Acta Arithmetica, Vol. 211, no. 3, 265–288.
2022	A bound for the image conductor of a principally polarized abelian variety with open Galois image Proceedings of the American Mathematical Society Series B, Vol. 9 272-285.
2021	Square curious numbers (with Neelima Borade) Journal of Integer Sequences, Vol. 24: 21.7.4.

2015 **The asymptotic distribution of a hybrid arithmetic function** (with Sarah Manski and Nate Zbacnick) *INTEGERS, Vol. 15: A28.*

Preprints

2023 An effective open image theorem for products of principally polarized abelian varieties (with Tian Wang) Submitted. Preprint, arXiv:2212.11472.

Awards & Achievements

2022 - 2023	Project NExT Fellow , Mathematical Association of America
2019	MSCS Graduate Student Teaching Award, University of Illinois Chicago
2018 - 2019	Certificate in the Foundations of College Instruction , University of Illinois Chicago
2016	MSCS First Year Graduate Student Award, University of Illinois Chicago
2016	Edwin J. Downey Award, Colgate University
2014	First Place Team, Alma MATH Challenge
2013	Sisson Mathematical Prize, Colgate University

Teaching

Wake Forest University, Instructor

- MTH 345/645 Elementary Number Theory Spring 2023, Spring 2024
- MTH 324/624 Advanced Linear Algebra Spring 2024
- MTH 346/646 Modern Number Theory (Topic: Elliptic Curves) Fall 2023
- MTH 117 Discrete Mathematics Fall 2023
- MTH 111 Calculus with Analytic Geometry I Fall 2022, Spring 2023

University of Illinois Chicago, Instructor

- MATH 211 Emerging Scholars Workshop in Calculus III Spring 2022
- MATH 110 Summer Enrichment Workshop in College Algebra Summer 2019

University of Illinois Chicago, Teaching Assistant

• Calculus I (16 sections), Calculus II (3 sections), Calculus III (6 sections), Precalculus (1 section), College Algebra (1 section)

Talks

2023	Graduate Number Theory Seminar, University of Illinois Chicago
	Galois representations \mathfrak{E} odd order reductions

2022	PANTS XXXV , University of South Carolina An effective open image theorem for products of abelian varieties
2022	Math Dept. Colloquium, Wake Forest University Local-global phenomena in number theory
2022	UNCG ANT-CoG Seminar , UNC Greensboro Galois representations of elliptic curves (and beyond!)
2022	PANTS XXXIV , UNC Charlotte Elliptic curves with nearly maximal Galois action on torsion
2022	UGA Number Theory Seminar, University of GeorgiaLocal-global phenomena & Galois representations of elliptic curves
2021	OSU Number Theory Seminar , Ohio State University On the effective open image theorem
2021	miniMAGNTS , Midwest Arithmetic Geometry and Number Theory Series Poster: On the effective version of Serre's open image theorem
2021	UCI Number Theory Seminar , University of California, Irvine Local-global phenomena for elliptic curves
2020	Bucharest Number Theory Day , Inst. of Math. of the Romanian Academy Galois representations of abelian varieties
2020	Front Range Number Theory Day , University of Colorado Lightning talk: Rigidity in elliptic curve local-global principles
2020	Graduate Student Colloquium, University of Illinois Chicago Elliptic curves: A hands-on introduction

Service

2023 -	Mentor, Math Alliance	
2019 - 2022	Graduate Ambassador, University of Illinois Chicago	
2020 - 2021	Co-Organizer , UIC Graduate Number Theory Seminar	
2020	Co-Organizer , UIC Winter Seminar on Modular Forms	
2020	Teaching Assistant Coordinator, University of Illinois Chicago	
2020	Co-Organizer, Chicago Number Theory Day 2020	
Summer 2020	Coordinator, UIC Summer Enrichment Mathematics Workshop	
2013 - 2015	Undergraduate Tutor, Colgate University	
Undergraduate Experience		
Spring 2016	Math in Moscow (AMS Scholarship)	
Spring 2015	Budapest Semesters in Mathematics	

Summer 2015 **REU in Representation Theory**, Sam Houston State University *Mentor: Ken W. Smith*

Summer 2014 **REU in Analytic Number Theory**, Kent State University Mentor: Gang Yu