

CURRICULUM VITAE

William F. Sawin

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EDUCATION

- Princeton University** 2016
Ph.D. in Mathematics
Advisor: Nicholas M. Katz
Topic: A Tannakian Category and a Horizontal Equidistribution Conjecture for Exponential Sums
- Yale University** 2011
B. S. in Mathematics and Economics with Honors

PUBLICATIONS

- *On Capsets and the Group-Theoretic Approach to Matrix Multiplication*, Discrete Analysis (2017) (with Jonah Blasiak, Thomas Church, Henry Cohn, Joshua A. Grochow, Eric Naslund, and Chris Umans)
- *Kloosterman Paths and the Shape of Exponential Sums*, Compositio Mathematica, (2016) (with Emmanuel Kowalski)
- *Ordinary Primes for Abelian Surfaces*, Comptes Rendus Mathematique, **354**, No. 6 (2016)
- *Notes on Commutation of Limits and Colimits*, Theory and Applications of Categories, **30** (2015) (with Marie Bjerrum, Peter Johnstone, and Tom Leinster)
- *Certifying the Restricted Isometry Property is Hard*, IEEE Transactions on Information Theory, **59**, No. 6 (June 2013) (with Afonso S. Bandeira, Edgar Dobriban, and Dustin G. Mixon)

To Appear:

- *Non-Existence of Smooth Rational Cohomology Tori of General Type* – appendix to *Rational Cohomology Tori* by Olivier Debarre, Zhi Jiang, and Martí Lahoz, to appear in Geometry & Topology
- *Upper Bounds for Sunflower-Free Sets* to appear in Forum of Mathematics Sigma (with Eric Naslund)

Submitted:

- *Ramanujan Coverings of Graphs* (with Chris Hall and Doron Puder) (also appearing in STOC 2016)
- *On Numerical Newton-Okounkov bodies and the Existence of Minkowski Bases* (with David Schmitz)
- *Positivity of GIT Heights of Zero-Cycles and Hyperplane Arrangements* (with Ashwath Rabinathan)
- *Bilinear Forms with Kloosterman Sums and Applications* (with Emmanuel Kowalski and Philippe Michel)
- *The Growth Rate of Tri-Colored Sum-Free Sets* (with Robert Kleinberg and David E. Speyer)

CONFERENCE TALKS

- **Recent developments in Analytic Number Theory** – May 2017 – MSRI – TBD

- **Introductory Workshop on Analytic Number Theory** – February 2017 – MSRI – *Trace Functions and Special Functions*
- **Workshop on Expanders and Extractors** – January 2017 – UC Berkeley – *Ramanujan Covers*
- **4th Israeli Algebra and Number Theory Day** – December 2016 – Tel Aviv University – *The Distribution of L-functions of Character Twists*
- **Recent Breakthroughs in the Polynomial Method** – September 2016 – Heilbronn Institute – *Slice Rank and Sunflowers and Lower Bounds for Slice Rank* (workshop talks)
- **Geometric and Analytic Number Theory** – September 2016 – ETH Zürich – *The Slice Rank Method in Additive Combinatorics*
- **AMS Summer Institute in Algebraic Geometry** – July 2015 – University of Utah – *Applications of Algebraic Geometry to Analytic Number Theory* (contributed lecture)

SEMINAR TALKS

- **University of Michigan (algebraic geometry seminar)** – November 2016 – *On the Unirationality of $\overline{M}_{1,n}$ and Modular Forms*
- **EPFL (algebraic geometry and number theory seminar)** – October 2016 – *On the Unirationality of $\overline{M}_{1,n}$ and Modular Forms*
- **EPFL (combinatorics seminar)** – October 2016 – *Slice Rank and Sunflowers*
- **Stanford University (number theory seminar)** – April 2016 – *Exponential Sums and Modular Forms*
- **Yale University (algebraic geometry seminar)** – January 2016 – *Quasi-random Graphs from Varieties over Finite Fields*
- **University of Michigan (algebraic geometry seminar)** – December 2015 – *Frobenius Arithmetic for Frobenius Geometry*
- **MIT (number theory seminar)** – November 2015 – *The Distribution of the Newton Polygon of a K3 Surface*
- **University of Utah (algebraic geometry seminar)** – November 2015 – *Frobenius Arithmetic for Frobenius Geometry*
- **ETH Zurich (number theory seminar)** – October 2014 – *A Tannakian Category and a Horizontal Equidistribution Conjecture for Exponential Sums*
- **EPFL (analytic number theory seminar)** – October 2014 – *A Tannakian Category and a Horizontal Equidistribution Conjecture for Exponential Sums*
- **ETH Zurich (ITS Members' Seminar)** – October 2016 – *Cap Sets*
- **Princeton University / Institute for Advanced Studies (number theory seminar)** – February 2016 – *Vanishing Cycles and Bilinear Forms*
- **Institute for Advanced Studies (working group on expander graphs and monodromy groups)** – May 2015 – *Exponential sums and expansion of generalized Paley graphs*
- **Princeton University (working group in Diophantine analysis)** – May 2015 – *Ordinary Primes of Abelian Surfaces*
- **Princeton University (working group in Diophantine analysis)** – December 2014 – *Kloosterman Paths*

- **Princeton University (algebraic geometry preprint seminar)** – April 2014 – *Vanishing Theorems for Constructible Sheaves on Abelian Varieties*
- **Princeton University (junior faculty number theory seminar)** – November 2013 – *Equidistribution of Exponential Sums*
- **Princeton University (graduate student seminar)** – four talks, 2011-2015: *Toric Geometry*, *Belyi's Theorem*, Λ -Rings, and *Riemann-Hurwitz*

TEACHING

- Instructor for Linear Algebra and Applications – Spring 2015 (planned and taught 3 lectures/week, held office hours, helped write problem sets and exams)
- TA for Set Theory and Logic – Spring 2013 (led problem sessions, planned and taught 2 lectures, helped write problem sets and exams)
- TA for Abstract Algebra – Fall 2013 (led problem sessions)
- TA for Arizona Winter School – Spring 2016

SERVICE

- Co-organized Princeton Graduate Student Seminar – 2012-2013
- Mentored undergraduates in Mentoring Möbius – 2011-2013
- Led Putnam Practice Sessions – 2011-2013