

# David J. Zywina

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## Education

University of California, Berkeley, 2003–2008

Ph.D. in Mathematics

Advisor: Bjorn Poonen

Thesis title: The large sieve and Galois representations

McMaster University, 1999–2003

B.Sc. (Honours) in Mathematics

## Employment

University of Pennsylvania, 2008–2010

Lecturer of Mathematics

## Research Interests

Arithmetic geometry with strong influences from analytic number theory and Galois theory; Galois representations, abelian varieties, equidistribution

## Publications/Preprints

1. Arithmetic  $E_8$  lattices with maximal Galois action (with Tony Varilly), preprint arXiv:0803.3063.
2. The Lang-Trotter conjecture and mixed representations, preprint
3. An explicit integral polynomial whose splitting field has Galois group  $W(E_8)$  (with Florent Jouve & Emmanuel Kowalski), preprint arXiv:0801.1733
4. The large sieve and Galois representations, preprint
5. Elliptic curves with maximal Galois action on their torsion points, preprint
6. A refinement of Koblitz's conjecture, in preparation
7. The larger sieve and arithmetic geometry, in preparation
8. Splitting fields of characteristic polynomials of random elements in arithmetic groups (with Florent Jouve & Emmanuel Kowalski), in preparation

## Selected Awards

Clay Liftoff Fellow, 2008.

Herb Alexander Prize, for outstanding doctoral dissertation, 2008

Outstanding Graduate Student Instructor Award - Berkeley 2006/2007

Natural Sciences and Engineering Research Council of Canada (NSERC) Postgraduate Scholarship  
2004-2006

NSERC Undergraduate Student Research Award - Summer 2001, 2002 & 2003

Governor General's Academic Medal, McMaster 2003

## Teaching Experience

**Graduate Student Instructor (GSI)** University of California, Berkeley

Math 54: Linear Algebra & Differential Equations, Spring 2007

Math 110: Linear Algebra, Fall 2005

Math 55: Discrete Mathematics, Spring 2005

Math H54: Honors Linear Algebra & Differential Equations, Fall 2004

Math 1B: Calculus, Fall 2003 & Spring 2004

**Teaching Assistant (TA)** McMaster University

Math 2C03: Introductory Differential Equations (Winter 2001, 2002 & 2003)

Engineering 1D04: Engineering Computation, (Summer 2000)

## Recent Seminar Talks

The image of the Galois representation associated to a random elliptic curve.

Contributed talk, Canadian Number Theory Association X Meeting,  
Waterloo, July 2008

Number theory seminar,  
ETH Zürich, March 2008

Student Number Theory Seminar,  
Princeton, December 2007.

Seminar on Topics in Arithmetic, Geometry, Etc. (STAGE),  
MIT, October 2007.

The Large Sieve and Galois representations.

Number Theory Seminar,  
UC Berkeley, May 2007.

An introduction to Artin  $L$ -functions

Student Number Theory Seminar.  
UC Berkeley, April 2007.

## Conferences and Workshops Attended

Canadian Number Theory Association X, University of Waterloo, July 2008.

Summer School in Analytic Number Theory and Diophantine Approximation, University of Ottawa, July 2008.

Arizona Winter School: Special Functions and Transcendence, University of Arizona, March 2008.

Iwasawa Summer School, McMaster University, August 2007.

Arizona Winter School: p-adic Geometry, University of Arizona, March 2007.

CMI Summer School on Arithmetic Geometry, Georg-August-Universität, July-August 2006.

Canadian Number Theory Association IX, University of British Columbia, July 2006.

Number theory and random matrix theory, University of Rochester, June 2006.

Analytic Methods for Diophantine Equations, Banff International Research Station, May 2006.

Cohomological Approaches to Rational Points, MSRI, March 2006.

Arizona Winter School: Computational and Algorithmic aspects of Algebra and Arithmetic, University of Arizona, March 2006.

Introductory Workshop in Rational and Integral Points on Higher-Dimensional Varieties, MSRI, January 2006.

Deligne Conference, Institute for Advanced Study, October 2005.

Arizona Winter School: Fundamental Groups in Arithmetic, University of New Mexico, March 2005.

Canadian Number Theory Association XIII, University of Toronto, June 2004.

## Personal

Canadian citizen.

Born: Hamilton, Canada.