

# Matthew P. Young

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**Research Interests:** Analytic number theory,  $L$ -functions, elliptic curves, random matrix theory.

**Education:** **Ph.D. in Mathematics**, May 2004; advisor: Henryk Iwaniec.  
**Rutgers University**, New Brunswick, New Jersey, 9/99-5/04.

**Bachelor of Science in Mathematics**  
**University of Minnesota**, Minneapolis, Minnesota, 9/96-6/99.  
Honors Program; graduated *summa cum laude*.

**Publications:** **Growth and nonvanishing of restricted Siegel modular forms arising as Saito-Kurokawa lifts.** 28 pages, submitted for publication. Joint with Sheng-Chi Liu.

**Additive twists of Fourier coefficients of symmetric-square lifts.** 13 pages, submitted for publication. Joint with Xiaoqing Li.

**The  $L^2$  restriction norm of a  $GL_3$  Maass form.** 42 pages, accepted for publication by Compositio Math. Joint with Xiaoqing Li.

**The prime geodesic theorem.** 13 pages, accepted for publication by Crelle. Joint with Soundararajan.

**A short proof of Levinson's theorem.** 7 pages, Arch. Math. (Basel) 95 (2010), no. 6, 539–548.

**More than 41% of the zeros of the zeta function are on the critical line.** 23 pages, accepted for publication by Acta Arithmetica. Joint with Hung Bui and Brian Conrey.

**The second moment of quadratic twists of modular  $L$ -functions.** J. Eur. Math. Soc. (JEMS) 12 (2010), no. 5, 10971116. Joint with K. Soundararajan.

**The second moment of  $GL(3) \times GL(2)$   $L$ -functions, integrated.** 17 pages, Adv. Math. 226 (2011), no. 4, 3550–3578.

**The second moment of  $GL(3) \times GL(2)$   $L$ -functions at special points.** 17 pages, submitted.

**The first moment of quadratic Dirichlet  $L$ -functions,** Acta Arithmetica 138 (2009), no. 1, 73-99.

**Mean values with cubic characters,** Journal of Number Theory 130 (2010), no. 4, 879–903. Joint with Stephan Baier.

**The reciprocity law for the twisted second moment of Dirichlet  $L$ -functions,** to appear in Forum Mathematicum, 12 pages.

**Moments of the critical values of families of elliptic curves, with applications,** Canad. J. Math. 62 (2010), no. 5, 1155–1181.

- Publications continued**
- The twisted fourth moment of the Riemann zeta function**, J. Reine Angew. Math. 641 (2010), 203–236. Joint with Chris Hughes.
  - The fourth moment of Dirichlet L-functions**, Ann. of Math. (2) 173 (2011), no. 1, 1–50.
  - Analytic number theory and ranks of elliptic curves**, Ranks of elliptic curves and random matrix theory, 71–91, London Math. Soc. Lecture Note Ser., 341, Cambridge Univ. Press, Cambridge, 2007.
  - On the nonvanishing of elliptic curve L-functions at the central point**, Proc. London Math. Soc. (3) 93 (2006), no. 1, 1–42.
  - Lower-order terms of the 1-level density of families of elliptic curves**, Int. Math. Res. Not., 10 (2005), 587–633.
  - Low-lying zeros of families of elliptic curves**, J. Amer. Math. Soc. 19 (2006), no. 1, 205–250.
  - Random matrix theory and families of elliptic curves**, Ph.D. thesis, Rutgers University, 2004.
- External funding:**
- National Science Foundation DMS-1101261**, \$129,996, 9/11-8/14.
  - National Science Foundation DMS-0758235**, \$120,000, 9/08-8/11.
- Awards and Honors:**
- Member, Institute for Advanced Study**, *Spring 2010*.
  - National Science Foundation Postdoctoral Fellowship**, 8/04-8/07.
  - Clay Mathematics Institute Liftoff Fellow**, 6/04.
  - Rutgers University and Louis Bevier Research Fellowship**, 9/03-5/04.
  - Excellence Fellowship for Graduate Students at Rutgers**, 9/02-5/03.
  - VIGRE Fellow**, 9/99-5/01.

**Teaching:** Department of Mathematics, Texas A&M University  
Fourier series and wavelets, Spring 2011,  
Linear algebra, Fall 2009  
Modular forms, Spring 2009  
Modern algebra II, Spring 2009  
Modern algebra I, Fall 2008,  
Analytic Number Theory, Spring 2008, Fall 2010  
Cryptography, Fall 2007, Fall 2010  
Department of Mathematics, Stanford University  
Set Theory, 1/07-3/07,  
Modern Algebra, 9/06-12/06,  
Linear Algebra and Differential Calculus of Several Variables, 1/06-3/06,  
Honors Multivariable Mathematics III, 3/05-6/05.

Department of Mathematics, Rutgers University, Piscataway, New Jersey  
Teaching Assistant for Differential Equations for Engineers and Scientists, 1/02-5/02,  
Teaching Assistant for Calculus I, 9/01-12/01

**Mentorship:** American Institute of Mathematics, Palo Alto, California  
Research advisor at the Research Experience for Undergraduates, 6/05-8/05  
I worked with David Farmer on advising a group of undergraduate students on research. In particular, I created one of the projects involving computational aspects of elliptic curves.

**Invited Lectures:** Summer School and Conference on Random Matrices and Number Theory, *Lecture series* on elliptic curves and moments of  $L$ -functions, University of Rochester, June 2006.

**Selected  
Seminar  
Talks:**

- Seminar* presented at the Stanford number theory seminar, May 2011.
- Seminar* presented at the Stanford number theory seminar, November 2010.
- Seminar* presented at the Canadian Number Theory Association, July 2010.
- Seminar* presented at the joint Princeton/Institute for Advanced Study Number Theory Seminar, November 2009.
- Seminar* presented at the Quebec-Vermont number theory seminar, February 2009.
- Seminar* presented at the Joint Meetings special session on Automorphic Forms, January 2009.
- Seminar* presented at the University of Texas Number Theory Seminar, December 2008.
- Seminar* presented at the Canadian Number Theory Association X Meeting, University of Waterloo, July, 2008.
- Seminar* presented at the Automorphic Forms Workshop, Texas A&M University, March, 2008.
- Seminar* presented at the Texas A&M Number Theory Seminar, October 2007.
- Seminar* presented at the Texas A&M Number Theory Seminar, March 2007.
- Research Colloquium*, University of Missouri, February 2007.
- Research Colloquium*, Georgia Tech University, February 2007.
- Research Colloquium*, Texas A&M University, February 2007.
- Research Colloquium*, Vanderbilt University, January 2007.
- Seminar* presented at the joint American Institute of Mathematics/Stanford Number Theory Seminar, Palo Alto, California, October 2006.
- Seminar* presented at the University of California, Los Angeles Number Theory Seminar, November 2005.
- Seminar* presented at the University of Illinois Number Theory Seminar, November 2005.
- Seminar* presented at the University of Michigan Number Theory Seminar, November 2005.
- Seminar* presented at the Workshop on Number Theory and Random Matrix Theory, University of Waterloo, June, 2005.
- Seminar* presented at the Automorphic Forms Workshop, University of North Texas, March, 2005.
- Seminar* presented at the joint American Institute of Mathematics/Stanford Number Theory Seminar, Palo Alto, California, November 2004.
- Seminar* presented at the Special Session in Automorphic Forms and Analytic Number Theory, AMS Eastern Sectional Meeting, Lawrenceville, New Jersey, April 2004.

**Outreach  
and  
public  
lectures:**

- Cryptography mini-course* given at the Texas A&M SEE-Math program, summer 2009. Co-organized with Matt Papanikolas.
- Codes and Secrets* public lecture presented at the Texas A&M Math mini-fair, spring 2009.
- Codes and Secrets* public lecture presented at the Texas A&M SEE-Math open house, summer 2009.