

# FRANK THORNE

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## *Contact Information:*

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*Last updated: November 25, 2016.*

**Employment** Assistant Professor, University of South Carolina, Fall 2011-present.

NSF Postdoctoral Fellow, Stanford University, 2008-2011.

Mentor: Kannan Soundararajan.

### *Short term:*

Research Member, Mathematical Sciences Research Institute, Berkeley, CA, Spring 2017.

**Education** Ph.D., University of Wisconsin, Madison, WI, 2008.

Dissertation under the supervision of Prof. Ken Ono: 'Extensions of results on the distribution of primes.'

Rice University, Houston, TX.

B.A. summa cum laude in Mathematics, May 1999.

**Research Interests** Number theory; distribution of primes, field discriminants, class numbers, and broadly related questions; prehomogeneous vector spaces and their zeta functions.

**Publications** (Separate bibliography attached.)

## **Awards, Grants, and Prizes**

- Invited Participant, Math Olympiad Summer Program.

*Participated, all expenses paid, in the summer training camp for the IMO.*

- Top 75, Putnam Examination.

- NSF VIGRE (Graduate) Merit Fellowship, Spring 2007, Fall 2007, Spring 2008.

- Letters and Science Teaching Fellow, Fall 2007.

*Was selected as one of fifteen students (and one of two math students) to plan and lead orientation for new teaching assistants in the fall.*

- (Graduate Student) Excellence in Mathematical Research Award, University of Wisconsin, Spring 2008.

- NSF Postdoctoral Fellowship, 2008-2011.

- NSF Grant DMS-1201330, Zeta Functions and the Distribution of Field Discriminants (PI), \$144,926, 2012-2015.

- NSF Grant DMS-1201126, Southeastern Number Theory Meetings (co-PI), \$12,012, 2012-2013.

- NSA Grant, Southeastern Number Theory Meetings (co-PI), \$14,942, 2012-2013.

- NSF Grant DMS-1303254, Southeast Number Theory Meetings (co-PI), \$12,696, 2013-2014.

- NSF Grant DMS-1404714, Southeastern Number Theory Meetings (PI), \$13,360, 2014-2016.

- NSA Grant, Southeastern Number Theory Meetings (PI), \$14,670, 2014-2015.

- NSF Grant DMS-1502293, Southeastern Number Theory Meetings (co-PI), \$13,615, 2015-2016.

- NSA Grant, Analytic Methods in Arithmetic Statistics, \$40,000 (\$20,000 committed to date), 2016-2018.

- NSA Grant, Southeastern Number Theory Meetings (co-PI), \$14,695, 2016-2017.
- NSF Grant DMS-1601239, Southeastern Number Theory Meetings (co-PI), \$14,695, 2016-2017.

*Pending: An NSF CAREER proposal, an ordinary NSF proposal, and a Simons Fellowship application (all as PI), and a further conference grant (as co-PI).*

### **Students Supervised**

- Richard Oh, Ph. D., Summer 2014.  
*Thesis:* Fake Real Quadratic Orders.  
*First Job:* National Security Agency.
- Daniel Kamenetsky, M. S., Fall 2016.
- Harsh Mehta, Ph. D. candidate (2016).
- Matthew Corley, USC undergraduate (worked on a research project with me).
- David Stoner and Esme Bajo, local high school students.

### **Professional Service**

- Referee, Proceedings of the American Mathematical Society (19 articles), Journal of Number Theory (9 articles), American Mathematical Monthly (5 articles), Compositio Mathematica (2 articles), Mathematische Zeitschrift (2 articles), Acta Arithmetica (2 articles), Integers (2 articles), Ramanujan Journal (2 articles), Inventiones Mathematicae, Duke Mathematical Journal, Transactions of the American Mathematical Society, Algebra and Number Theory, Canadian Journal of Mathematics, Mathematics of Computation, Journal of the London Mathematical Society, Forum of Mathematics - Sigma (2 articles), International Mathematics Research Notices. Quarterly Journal of Mathematics, Research in Number Theory, International Journal of Number Theory, Communications in Number Theory and Physics, American Journal of Mathematics, Acta Mathematica Sinica, Journal Abhandlungen aus dem Mathematischen Seminar der Universität Hamburg, Boletín de la Sociedad Matemática Mexicana (Tercera Serie), Mathematics (MDPI)
- Panelist, National Science Foundation (details omitted by NSF request).
- Reviewer, MathSciNet / Mathematical Reviews (25 reviews).
- Reviewer, NSA Mathematical Sciences Grant Program (3 proposals).
- Volunteer, Mega Math Meet and Sidewalk Math, University of Wisconsin.
- Volunteer, Julia Robinson Math Festival, Stanford, Spring 2010.
- Volunteer Speaker, Columbia (High School) Math Circle, Summer 2012.
- Organizer, Stanford Analytic Number Theory Seminar, 2008-2011.
- Organizer, South Carolina Number Theory Seminar, 2011-present.
- Organizer, Informal Pretentious Number Theory Seminar, USC, Spring 2012.
- Organizer, Informal Schemes and Algebraic Geometry Seminar, USC, Spring 2013.
- Organizer, Informal Analytic Number Theory Seminar, USC, Spring 2013.
- Reviewer, DOD SC Junior Science & Humanities Symposium, December 2011.
- Committee Member, South Carolina State High School Math Contest, 2011-present.
- Guest Lecturer/Teachers' Preparation, USC AP Calculus Practice Exam, April 2012.
- Hiring Committee, USC, 2012-2013, 2013-2014, 2014-2015.
- Liaison to USC (with Jesse Kass), Columbia Math Circle, Fall 2016-present.
- (other committee service at USC as well)

### **Conferences Organized**

- Midwest Number Theory Conference for Grad Students V, University of Wisconsin, November 2007.
- Mathematics Research Community on "The Pretentious View of Analytic Number Theory", Snowbird, UT, June-July 2011.
- AIM SQuaRE on "Four Perspectives on Secondary Terms in the Davenport-Heilbronn Theorem", Palo Alto, CA, Oct.-Nov. 2012., Oct. 2013, and May 2015.

*The SQuaRE was a small workshop with seven mathematicians (including myself). I wrote a proposal which led to full funding of the workshop by the American Institute of Mathematics; participants ranged from a graduate student to a Princeton professor and came from the US, Britain, and Japan.*

- Palmetto Number Theory Series, University of South Carolina, December 2012.
- AMS Special Session on Modern Methods in Analytic Number Theory, University of Mississippi, Oxford, MS, March 2013.
- Palmetto Number Theory Series, South Carolina State University, September 2014.
- Palmetto Number Theory Series, University of South Carolina, December 2014.
- Palmetto Number Theory Series, University of South Carolina, December 2016.
- AMS Special Session on Analytic Number Theory and Arithmetic, Joint Math Meetings, Atlanta, GA, January 2017.

## Research Talks

*Asterisks indicate contributed talks. I have also given additional lectures at my home universities, not listed.*

- \*Midwest Number Theory Conference for Grad Students IV, UIUC, October 2006.
- Special Session on Analytic Number Theory and Modular Forms, AMS Sectional Meeting, University of Arkansas, November 2006.
- Number Theory Seminar, University of Wisconsin, December 2006.
- Number Theory Seminar, University of Illinois at Urbana-Champaign, April 2007.
- \*Illinois Number Theory Fest, University of Illinois at Urbana-Champaign, May 2007.
- Number Theory Seminar, University of South Carolina, October 2007.
- Number Theory Seminar, Stanford University, October 2007.
- Integers Conference, University of West Georgia, October 2007.
- \*Palmetto Number Theory Series, Furman University, February 2008.
- Colloquium, University of South Carolina, February 2008.
- \*22nd Annual Workshop on Automorphic Forms and Related Topics, Texas A&M, March 2008.
- Zeta Function Days, Yonsei University (Seoul, South Korea), September 2009.
- \*Palmetto Number Theory Series, University of South Carolina, December 2009.
- Kobe Number Theory Workshop, Kobe University (Japan), January 2010.
- RIMS Symposium on automorphic forms, automorphic representations and related topics, University of Tokyo, January 2010.
- Colloquium, Kinki University (Osaka, Japan), January 2010.
- ICM Satellite Conference in Analytic and Combinatorial Number Theory, Chennai, India, August 2010.
- Number Theory Seminar, University of Georgia, January 2011.
- Number Theory Seminar, Emory University, January 2011.
- Workshop on Arithmetic Statistics, MSRI, Berkeley, CA, January 2011.
- Analytic Aspects of  $L$ -functions and Applications to Number Theory, Calgary, May-June 2011.
- Special Session on  $L$ -functions and Number Theory, Meeting of the Canadian Mathematical Society, June 2011.
- \*Palmetto Number Theory Series, Emory University, Atlanta, GA, September 2011.
- Special Session on Modular Forms, Elliptic Curves, and Related Topics, AMS Sectional Meeting, Wake Forest University, September 2011.
- Plenary Speaker, Integers Conference 2011, Carrollton, GA, October 2011.
- Number Theory Seminar, Clemson University, November 2011.

- Quebec-Vermont Number Theory Seminar, Concordia University, November 2011.
- MAA Invited Paper Session on the Beauty and Power of Number Theory, AMS/MAA Joint Meetings, Boston, MA, January 2012.
- Number Theory Seminar, Emory University, January 2012.
- Special Session on Automorphic and Modular Forms, AMS Sectional Meeting, University of Hawaii, March 2012.
- \*Southeast Regional Meeting on Numbers, Western Carolina University, April 2012.
- Number Theory Seminar, Texas A&M, April 2012.
- Number Theory Seminar, University of Wisconsin, April 2012.
- \*Synergies and Vistas in Analytic Number Theory, Oxford University, September 2012.
- Workshop on Zeta Functions (two lectures), Tokyo Institute of Technology, September 2012.
- Special Session on Harmonic Maass Forms and  $q$ -series, AMS Sectional Meeting, University of Arizona, October 2012.
- ‘Baby’ Number Theory Seminar, University of Oxford, March 2013.
- Atkin Workshop, University of Illinois at Chicago, May 2013.
- Colloquium, Dartmouth College, May 2013.
- Number Theory Seminar, Dartmouth College, May 2013.
- Colloquium, Hong Kong University of Science and Technology, May 2013.
- Number Theory Seminar, Kobe University, May 2013.
- Number Theory Seminar, Tohoku University (Sendai, Japan), June 2013.
- Workshop on Automorphic Forms, RIMS, Kyoto, Japan, June 2013.
- Number Theory Seminar, École Polytechnique Fédérale de Lausanne, June 2013.
- Number Theory Seminar, Duke University, October 2013.
- \*Palmetto Number Theory Series, Clemson, December 2013.
- Pro- $p$  groups and arithmetic (two lectures), Besançon, December 2013.
- Automorphic Forms and Arithmetic, Göttingen, February 2014.
- \*Southeast Regional Meeting on Numbers, Wofford College, April 2014.
- Undergraduate Colloquium, Ursinus College, May 2014.
- Summer School on Counting Arithmetic Objects, Montreal, June-July 2014.
- Number Theory Seminar, Emory University, September 2014.
- Special Session on Connections in Number Theory, AMS Sectional Meeting, Greensboro, NC, November 2014.
- Special Session on Galois Theory and Its Interactions with Algebra and Number Theory, AMS Sectional Meeting, Greensboro, NC, November 2014.
- Workshop on Counting Arithmetic Objects (Ranks of Elliptic Curves), Montreal, November 2014.
- Number Theory Seminar, University of Illinois at Chicago, March 2015.
- \*Southeast Regional Meeting on Numbers, Winthrop University, March 2015.
- Kobe Number Theory Mini-Workshop, Kobe University (Japan), May 2015.
- Number Theory Seminar, Joetsu University of Education (Joetsu, Japan), June 2015.
- REU in Number Theory, Emory University, June 2015.
- REU in Number Theory, Wake Forest University, July 2015.
- Number Theory Seminar, Boston University, November 2015.
- Computational Aspects of  $L$ -Functions, ICERM, November 2015.
- Colloquium, Brandeis University, January 2016.

- Number Theory Seminar, University of Michigan, April 2016.
- Undergraduate Colloquium, Oberlin College, April 2016.
- Colloquium, Chico State University, April 2016.
- Number Theory Seminar, Stanford University, May 2016.
- Number Theory Seminar, University of Bristol, June 2016.
- (\*) Arithmetic Statistics and the Cohen-Lenstra Heuristics, June 2016.
- Special Session on Algebraic Number Theory and Related Topics, Congreso Latinoamericano de Matemáticos, Barranquilla, Colombia, July 2016.
- Special Session on Varieties, Their Fibrations and Automorphisms in Mathematical Physics and Arithmetic Geometry, AMS Sectional Meeting, Raleigh, NC, November 2016.

(Invitations which I have accepted but not yet scheduled:)

- University of Wisconsin-Madison, to be scheduled.
- Tufts University, to be scheduled.
- American University of Beirut (Beirut, Lebanon), to be scheduled.
- Ulsan National Institute of Science and Technology (Ulsan, South Korea), to be scheduled.
- Kobe University (Kobe, Japan), Summer 2017.

## Teaching Experience

- Teaching Assistant, Talent Identification Program, Duke University, Summer 1998, 1999. *TIP is an intensive academic summer program for academically gifted seventh through tenth graders.*

- English Teacher, America Eigo Gakuin, Kyoto, Japan, 1999-2001.

*As a graduate student at the University of Wisconsin:*

- Teaching Assistant, Math 221 (Calculus I), Fall 2004.
- Teaching Assistant, Math 222 (Calculus II), Spring 2005.
- Teaching Assistant, Math 114 (Algebra and Trigonometry), Fall 2005.\*
- Instructor, Math 112 (College Algebra), Spring 2006.
- Instructor, Math 112 (College Algebra), Fall 2006.\*
- Instructor, REU in Number Theory, Summer 2007, 2008.

\* = teaching was judged as Superior by the TA Evaluation Committee.

*At Stanford University:*

- Instructor, Math 42 (Calculus II), two sections, Fall 2008.
- Teaching Assistant, Arizona Winter School, Tucson, AZ, March 2010.
- Instructor, Math 108 (Combinatorics), Fall 2010.
- Instructor, Math 249C (Topics in Number Theory: Additive Combinatorics), Spring 2011.

*At the University of South Carolina (all as instructor):*

- Math 141 (Calculus I), Fall 2011.
- Math 782 (Analytic Number Theory), Fall 2011.
- Math 574 (Discrete Math), Spring 2012.
- Math 141 (Calculus I), Fall 2012.
- Math 531 (Euclidean Geometry), Fall 2012.
- Math 788P (Topics in Algebraic Number Theory), Spring 2013.
- Math 142 (Calculus II), 2013.
- Math 580/780I (Elementary Number Theory), Fall 2013.
- Math 788G (The Geometry of Numbers), Spring 2014.
- Math 142H (Honors Calculus II), Fall 2014.

- Math 546H/701I (Honors Abstract Algebra I), Fall 2014.
- Math 374 (Discrete Structures, for CS majors), Spring 2015.
- Math 547H/702I (Honors Abstract Algebra II), Spring 2015.
- Math 141 (Calculus I), Fall 2015.
- Math 544 (Linear Algebra), Fall 2015.
- Math 788 (Elliptic Curves and Arithmetic Geometry), Spring 2016.
- Math 141 (Calculus I), Fall 2016.
- Math 735 (Lie Groups), Fall 2016.
- SCHC 212 (The Mathematics of Game Shows), Fall 2016.

*To my knowledge, no course on this topic has ever been taught at any university and I am developing it from scratch. I have written over 70 pages of typeset lecture notes and am considering eventually publishing them as a book.*

**Non-Academic Employment**

- English Teacher, America Eigo Gakuin, Kyoto, Japan, 1999-2001.  
*Responsible for curriculum design as well as classroom instruction; taught individuals and small and large groups from ages three to adult.*
- Software Developer, /n software, inc., Durham, NC, 2002-2004.  
*Was lead developer for multiple commercial software projects in Java, Delphi, and Microsoft .NET.*

**Personal**

- Proficient in German and Japanese (spoken and written).
- Black Belt in Shorin-Ryu Karate, April 2007.

**References**

- Available upon request.