

Kirsten Eisenträger

Curriculum Vitae

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Education

- **University of California, Berkeley**, Ph.D., Mathematics, May 2003. *Hilbert's Tenth Problem and Arithmetic Geometry*. Advisor: Professor Bjorn Poonen.
- **University of California, Berkeley**, M.A., Mathematics, May 1998.
- **Eberhard-Karls-Universität Tübingen**, Germany, Vordiplom in Mathematics, August 1996.

Experience

- Associate Professor, The Pennsylvania State University, 2012-present.
- Assistant Professor, The Pennsylvania State University, 2007-2012.
- NSF Postdoctoral Fellow and T.H. Hildebrandt Assistant Professor, University of Michigan, 2005-2007.
- VIGRE Assistant Professor, University of Michigan, 2004-2005.
- Member at the Institute for Advanced Study, Princeton, 2003-2004.

Other Experience

- Visiting researcher at Microsoft Research in the Cryptography Group, Summer 2011.
- Visiting researcher at Microsoft Research in the Cryptography and Anti-Piracy Group, Summer 2003, and Summer 2004.
- Summer internship at Microsoft Research in the Cryptography and Anti-Piracy Group, Summer 2001, and Summer 2002.

Fellowships and Awards

- NSF CAREER Award, 2011-2015.
- Alfred P. Sloan Research Fellowship, 2008-2012.
- NSF Postdoctoral Fellowship, 2005-2009.
- Alexander Prize for outstanding Berkeley dissertation in pure mathematics, May 2003.
- Studienstiftung des Deutschen Volkes Fellowship 1995-1999.

Publications

1. Kirsten Eisenträger and Sean Hallgren. Computing the unit group, class group and compact representations in algebraic function fields. To appear in *Tenth Algorithmic Number Theory Symposium (ANTS X) Proceedings*, 2012.
2. Kirsten Eisenträger, Graham Everest, and Alexandra Shlapentokh, *Hilbert's Tenth Problem and Mazur's Conjectures in complementary subrings of number fields*. *Mathematical Research Letters* 18,

no. 06, 1141–1162, 2011.

3. Kirsten Eisenträger, *Hilbert's Tenth Problem for function fields of varieties over algebraically closed fields of positive characteristic*. *Monatshefte für Mathematik*, DOI: 10.1007/s00605-011-0364-7, 2011.
4. Jennifer Balakrishnan, Juliana Belding, Sarah Chisholm, Kirsten Eisenträger, Katherine Stange, and Edlyn Teske, *Pairings on Hyperelliptic Curves*. *WIN–Women in Numbers: Research Directions in Number Theory*, Fields Institute Communications, vol. 60, Amer. Math. Soc., Providence, RI, pages 87–120, 2011.
5. Kirsten Eisenträger and Sean Hallgren, *Quantum algorithms for ray class groups and some subfields of Hilbert class fields*. *Symposium on Discrete Algorithms (SODA) 2010*, Society for Industrial and Applied Mathematics (SIAM), pages 471–483, 2010.
6. Kirsten Eisenträger and Kristin Lauter, *A CRT algorithm for constructing genus 2 curves over finite fields*. *Arithmetic, Geometry and Coding Theory (AGCT-10)*, Séminaires et Congrès 21 (2009), pages 161–176 (electronic). Société Mathématique de France, Paris, 2009.
7. Kirsten Eisenträger and Alexandra Shlapentokh, *Undecidability in function fields of positive characteristic*. *Int. Math. Res. Not.*, Vol. 2009, Number 21, pages 4051–4086: article ID rnp079, 2009.
8. Kirsten Eisenträger and Graham Everest, *Descent on elliptic curves and Hilbert's Tenth Problem*. *Proc. Amer. Math. Soc.*, 137(6):1951–1959, 2009.
9. Kirsten Eisenträger, Dimitar Jetchev and Kristin Lauter, *Computing the Cassels pairing on Kolyvagin classes in the Shafarevich-Tate group*. *Pairing-Based Cryptography – Pairing 2008*, Springer LNCS volume 5209, 2008, pages 113-125.
10. Kirsten Eisenträger, *Hilbert's Tenth Problem for function fields of characteristic zero*. *Model Theory with Applications to Algebra and Analysis, Volume 2*, Cambridge University Press, 2008, pages 237-254.
11. Kirsten Eisenträger, *Hilbert's Tenth Problem for function fields of varieties over number fields and p -adic fields*. *J. Algebra*, 310(2007), pages 775-792.
12. Kirsten Eisenträger, *Integrality at a prime for global fields and the perfect closure of global fields of characteristic $p > 2$* . *J. Number*

Theory, Volume 114(1), 2005, pages 170-181.

13. Kirsten Eisenträger, *Hilbert's Tenth Problem for function fields of varieties over \mathbb{C}* . *International Mathematics Research Notices*, Issue 59, 2004, pages 3191–3205.
14. Kirsten Eisenträger, Kristin Lauter, and Peter L. Montgomery, *Improved Weil and Tate pairings for elliptic and hyperelliptic curves*. *Algorithmic Number Theory, 6th International Symposium, ANTS-VI Proceedings*, 2004, pages 169–183.
15. Kirsten Eisenträger, *Hilbert's Tenth Problem for algebraic function fields of characteristic 2*. *Pacific J. Math.*, 210 (2), pages 261–281, 2003.
16. Kirsten Eisenträger, Kristin Lauter, and Peter L. Montgomery, *Fast elliptic curve arithmetic and improved Weil pairing evaluation*. *Topics in Cryptology-CT-RSA 2003*, pages 343–354.

Invited Talks

- Special Session on the life and legacy of Alan Turing, Annual Meeting of the American Mathematical Society (AMS) and of the Association for Symbolic Logic (ASL), Boston, January 2012.
- Special Session on Rational points on varieties, Annual Meeting of the American Mathematical Society (AMS), Boston, January 2012.
- ICERM workshop on Mathematical Aspects of P versus NP, Institute for Computational and Experimental Research Mathematics (ICERM), Providence, August 2011.
- Crypto Lunch Seminar, Microsoft Research, July 2011.
- Upstate New York Number Theory Conference, Cornell University, April 2011.
- Penn State Algebra and Number Theory Seminar, October 2010.
- Conference on Definability in Number Theory, Ghent University, Ghent, Belgium, August 2010.
- Canadian Number Theory Association meeting, Wolfville, Canada, July 2010.
- CRM workshop on Computer Security and Cryptography, Montreal, Canada, April 2010.
- Symposium on Discrete Algorithms (SODA) 2010, January 2010 (Sean Hallgren, presenter).
- The Diverse Faces of Arithmetic, Conference at the University of East Anglia, Norwich, United Kingdom, December 2009.

- Special Session on Function Fields and their Applications, AMS Eastern Section Meeting, Penn State University, University Park, October 2009.
- Penn State MASS Colloquium, September 2009.
- Hausdorff Research Institute for Mathematics, Bonn, Germany, January 2009.
- MAA Invited Paper Session on the Beauty and Power of Number Theory, Annual meeting of the AMS, Washington, DC, January 2009.
- University of Michigan, Group Theory - Lie Theory - Number Theory Seminar, November 2008.
- Banff Workshop, Women in Numbers, Banff International Research Station, Canada, November 2008.
- Penn State, Algebra and Number Theory Seminar, October 2008.
- Pairing 2008 conference, Royal Holloway, University of London, September 2008 (Kristin Lauter, presenter).
- Penn State, Algebra and Number Theory Seminar, November 2007.
- Clay Mathematics Institute, Cambridge, Workshop on Rational Curves and Diophantine Problems over Function Fields, November 2007.
- ICMS, Edinburgh, Workshop on Number Theory and Computability, June 2007.
- Clay Mathematics Institute, Cambridge, Workshop on Hilbert's Tenth Problem, March 2007.
- East Carolina University, Department Colloquium, February 2007.
- UIC, Department Colloquium, January 2007.
- UIUC, Department Colloquium, January 2007.
- Penn State, Combinatorics and Partitions Seminar, January 2007.
- University of Virginia, Department Colloquium, January 2007.
- UT Austin, Number Theory Seminar, December 2006.
- Southern California Number Theory Day, UC Irvine, October 2006.
- IPAM workshop on Number Theory and Cryptography - Open Problems, October 2006.
- University of Oxford, Number Theory Seminar, June 2006.
- University of Leuven (Belgium), Number Theory and Algebraic Geometry Seminar, May 2006.
- UIUC, Logic Seminar, May 2006.
- Special Session on Model Theory and Computability, AMS Central

- sectional meeting, Notre Dame, April 2006.
- Penn State, Algebra and Number Theory Seminar, April 2006.
- UC Berkeley, Number Theory Seminar, March 2006.
- AWM Workshop, San Antonio, January 2006.
- Special session on arithmetic geometry and modular forms, Annual meeting of the AMS, San Antonio, January 2006.
- Five College Number Theory Seminar, Amherst, November 2005.
- McMaster University, Model Theory Seminar, November 2005.
- Midwest Number Theory Day, University of Wisconsin, Madison, November 2005.
- Midwest Model Theory Meeting, The Ohio State University, Columbus, October 2005.
- UIC Model Theory Seminar, October 2005.
- Workshop on Recent Applications of Model Theory, Isaac Newton Institute, Cambridge, March 2005.
- Workshop on Extensions of Hilbert's Tenth Problem, AIM, March 2005.
- University of Michigan, Number Theory Seminar, December 2005.
- Special Session on automorphic forms and analytic number theory, AMS Eastern sectional meeting, Lawrenceville, April 2004.
- University of Pennsylvania, Number Theory Seminar, February 2004.
- Special session on arithmetic geometry, Annual meeting of the AMS in Phoenix, January 2004.
- Princeton/IAS Number Theory Seminar, October 2003.
- Texas A&M University, Number Theory Seminar, October 2003.
- Workshop on Hilbert's Tenth Problem, Mazur's Conjecture and Divisibility Sequences, Oberwolfach, January 2003.
- UC Berkeley, Number Theory Seminar, September 2002.

Other Talks

- Arizona Winter School, March 2002, part of student presentation on Variation of Hodge structures.
- Arizona Winter School, March 2001, part of student presentation on Euler Systems.

Graduate Students

- Nithya Vasudevan, M.A., May 2011.

Teaching

The Pennsylvania State University:

- Instructor for Math 567, Number Theory I, Fall 2012.
- Instructor for Math 311M, Honors Concepts of Discrete Mathematics, Fall 2011.
- Instructor for Math 597C, Topics in Number Theory, Spring 2011.
- Instructor for Math 596, Section 3, Individual Studies (Divisibility of Class Numbers), Spring 2011.
- Instructor for Math 567, Number Theory I, Fall 2010.
- Instructor for Math 596, Section 3, Individual Studies (Elliptic Curve Cryptography), Spring 2010.
- Instructor for Math 250, Section 3, Ordinary Differential Equations, Spring 2010.
- Course coordinator for Math 250, Spring 2010.
- Instructor for Math 536, Algebra, Spring 2010.
- Instructor for Math 568, Number Theory II, Spring 2009.
- Instructor for Math 497A, Elliptic Curves and Applications to Cryptography, Fall 2008.
- Instructor for Math 536, Algebra, Spring 2008.
- Instructor for Math 485, Graph Theory, Fall 2007.

University of Michigan:

- Instructor for Math 175, Introduction to Cryptology, Fall 2006.
- Instructor for Math 425, Introduction to Probability, Winter 2005.
- Instructor for Math 115, Calculus, Fall 2004.

University of California, Berkeley:

- Teaching Assistant for Math 185, Complex Analysis, Spring 2003.
- Teaching Assistant for Math 54, Linear Algebra and Differential Equations, Fall 2002.
- Teaching Assistant for Math 16A, Calculus for non-majors, Spring 2000.
- Teaching Assistant for Math 1B, Calculus, Fall 1999.
- Teaching Assistant for CS 170, Efficient Algorithms and Intractable Problems, Fall 1997, Spring 1998, Fall 1998 and Spring 1999.

Memberships

- AMS (American Mathematical Society).

Professional

Service

- National Science Foundation Review Panel, 2008 and 2011.
- Peer Reviewer for National Science Foundation (2007–present).
- Reviewer for Mathematical Reviews (2003–present).
- Reviewer for the following journals (2003–present): Proceedings of the American Mathematical Society (PAMS), Journal of Number Theory, Archiv der Mathematik, Journal für die reine und angewandte Mathematik (Crelle’s Journal), Algebra & Number Theory, Journal of the Australian Mathematical Society, Quaestiones Mathematicae.
- Reviewer for the following conferences: Post Quantum Cryptography 2011, Pairing 2008, Eurocrypt 2005.
- Organizer of special session on Function Fields and their Applications at AMS meeting at Penn State in October 2009.
- Association for Women in Mathematics, Joint Mathematics Meeting workshop committee (2011–present).