

**TAMARA B. VEENSTRA**  
**CURRICULUM VITAE**  
tamarabveenstra.com

**EDUCATION**

**Dartmouth College**, Ph.D. Mathematics, 1997, A.M. Mathematics, 1994

Dissertation: *Characterizing Siegel Modular Forms*

Advisor: Thomas Shemanske

**University of North Carolina at Chapel Hill**, B.S. Mathematics, 1992

**PROFESSIONAL EXPERIENCE**

*Mathematical Researcher*, Institute for Defense Analyses – Center for Communications Research, La Jolla, full-time research staff member, June 2023-present, part-time SCAMP participant, most summers, 2007-2022.

Conduct mathematical research on problems with important applications to national security. Topics include cryptology, cryptanalysis, machine learning, high-performance computing, and network security, as well as related areas of pure and applied mathematics.

*Full Professor*, University of Redlands, 2011-2023, *Associate Professor*, 2003-2011, and *Assistant Professor*, 2001-2003.

Research interests included number theory, mathematical cryptology and communications security, machine learning and data science especially computational projects involving SageMath and Python.

Taught undergraduate mathematics courses focusing on active learning strategies and ranging in level from general education to upper-level such as First Year Seminars, Calculus, Abstract Algebra, Number Theory, Complex Analysis, Geometry and Machine Learning.

Designed and taught non-standard mathematics courses and interdisciplinary courses. Mathematics courses include mathematical cryptology (sophomore math major level), the mathematics of origami (general education level), and the mathematics of symmetry and pattern (general education level). Interdisciplinary courses include historical codes and ciphers (general education level and senior interdisciplinary honors [Prouidian program] level) and a first year seminar course analyzing fantasy novels (general education level).

Supervised numerous independent studies and student research projects involving the mathematics of cryptology, elliptic curves, mathematical origami, and other areas.

*Senior Staff*, Hampshire College Summer Studies in Mathematics, Amherst, MA, Summer 2004.

Taught 3-week course in number theory including algebraic number rings, elliptic curves, and modular forms for an intensive residential math enrichment program for high-school students.

*Assistant Professor*, University of Northern Iowa, 1997-2001.

Taught a wide variety of undergraduate courses, supervised independent studies and student research projects.

## HONORS AND AWARDS

*Virginia Hunsaker Innovative Teaching Award*, University of Redlands Faculty Award, 2018.

*Digital and Online Learning Grant*, for “Technology Support to Enhance Online Learning in Calculus I”, University of Redlands President’s Task Force for Digital and Online Learning, Spring 2015.

*Faculty Research Grant*, “Historical Cryptology Research Trip”, University of Redlands, 2014.

*Invited Speaker and Travel Grant Recipient*, AAAS (American Association for the Advancement of Science) Symposium on "Mathematics of Origami: From the Joys of Recreation to the Frontiers of Research", February 2009.

*Cryptography Workshop Funding Recipient*, Institute for Pure and Applied Mathematics, UCLA. Selected to participate in workshop on open problems and research in cryptography. Fall 2006.

*Project NExT Fellow*, 1997-1998: Chosen to be a member of a national program sponsored by MAA and Exxon. The focus of this program is to support young mathematics faculty in their effort to improve the teaching and learning of undergraduate mathematics.

## SELECTED PUBLICATIONS

“Machine Learning the Vanishing Order of Rational L-functions”, with Joanna Bieri, Giorgi Butbaia, Edgar Costa, Alyson Deines, Kyu-Hwan Lee, David Lowry-Duda, Tom Oliver, and Yidi Qi, in submission, [arxiv.org/abs/2502.10360](https://arxiv.org/abs/2502.10360), 2025

“Learning Fricke signs from Maass Form Coefficients”, with Joanna Bieri, Giorgi Butbaia, Edgar Costa, Alyson Deines, Kyu-Hwan Lee, David Lowry-Duda, Tom Oliver, and Yidi Qi, in submission, [arxiv.org/abs/2501.02105](https://arxiv.org/abs/2501.02105), 2025.

*Cryptology by Discovery: An Introduction to Conjecture and Proof*, Open-source textbook, <https://tamarabveenstra.com/textbook.html>, Fall 2020.

"Do the Twist! (on polygon-base boxes)," with s-m belcastro, *College Mathematics Journal*, November 2016, Vol 47, No 5, pp 341-345.

“Fujimoto, Number Theory, and a New Folding Technique,” *Origami<sup>4</sup>: Proceedings of the Fourth International Meeting of Origami Science, Mathematics, and Education*, AK Peters, Natick, MA, 2009.

“Constructing Regular n-gonal Twist Boxes,” with s-m belcastro, *Origami<sup>4</sup>: Proceedings of the Fourth International Meeting of Origami Science, Mathematics, and Education*, AK Peters, Natick, MA, 2009.

“The Matrix Connection: Fibonacci and Inductive Proof,” with C. Miller, *Mathematics Teacher*, December 2005, Vol 99, No. 5, pp 328-333.

“Fibonacci: Beautiful Patterns, Beautiful Math,” with C. Miller, *Mathematics Teaching in the Middle School*, January 2002, pp 298-305.

“Siegel Modular Forms, L-functions, and Satake Parameters,” *Journal of Number Theory* **87**, March 2001, pp. 15-20.

## SELECTED PRESENTATIONS

*Machine Learning Applied to L-functions of Maass Forms*, West Coast Number Theory Conference, December 2024 and WiMSoCal, February 2025.

*Panel Discussion: Options after Graduate School*, Conference on Strengthening Community in Research Mathematics, Pomona, CA, February 2023.

*Alan Turing and his Contributions to Cryptology*, AMS/MAA National Meetings, Atlanta, Georgia, January 2017.

*Cryptology By Discovery: Favorite Inquiry-Based Activities*, AMS/MAA National Meetings, San Antonio, Texas, January 2015.

*Investigating the Mathematics of Folding Regular-Polygon-Base Boxes*. AMS/MAA National Meetings, San Antonio, Texas, January 2015.

*The appeal of Origami from a Mathematician's Perspective*, faculty forum, University of Redlands, February 2010 and modified for presentation to guests of Board of Trustees, Morey Mansion, February 2010.

*Paper folding, Orders of Elements, and Binary Representations of Fractions*, MAA invited paper session, AMS/MAA National Meetings, San Francisco, CA, January 2010.

*How a Mathematician Looks at Origami and Finds Prime Numbers*, invited speaker, AAAS National Conference, Chicago IL , February 2009.

*The Vigenere Cipher: A Historical Cipher with a Modern Day Application*, AMS/MAA National Meetings, Washington DC , January 2009.

*Generalizing Twist Boxes*, 4OSME Conference (4<sup>th</sup> International Conference on Origami in Science, Mathematics and Education), Pasadena CA, September 2006.

*A Number Theory Application to Origami*, AMS/MAA National Meetings, January 2006, California State Polytechnic University at Pomona, April 2006, 4OSME, Pasadena, September 2006, and CSUB September 2007.

## PROFESSIONAL SERVICE

Professional Memberships: AMS, MAA, AWM

- *AMS-Simons Research Enhancement Grants for Primarily Undergraduate Institution (PUI) Faculty*, February 2025 to January 2028.
- *MAA Science Policy Committee*, July 2024 to June 2027.
- *MAA Committee on Panels, Poster Sessions, and Workshops*, Chair: February 2017-January 2020, Member: January 2012-2017.
- *Data Collector* for AWM's Notable Women in Mathematics Playing Card Project, spring 2022.