

KATHERINE E. STANGE

UNIVERSITY OF COLORADO, BOULDER
math.colorado.edu/~kstange

RESEARCH AREAS

Algebraic number theory and arithmetic geometry, including Kleinian groups, elliptic curves and abelian varieties, integer sequences, cryptography, arithmetic dynamics.

EDUCATION

Ph.D. 2008 Brown University
under Joseph H. SILVERMAN

M.Sc. 2003 Brown University

B.Math. 2001 University of Waterloo

HISTORY

<i>Current Position</i>	2012-present	The University of Colorado, Boulder Assistant Professor
<i>Postdoctoral Experience</i>	2011-2012	Stanford University NSF Postdoctoral Fellow
	2009-2011	Simon Fraser University, Pacific Institute for the Mathematical Sciences, and the University of British Columbia NSERC/PIMS/NSF Postdoctoral Fellow
	2008-2009	Harvard University NSF Postdoctoral Fellow and Junior Lecturer

RESEARCH AWARDS

<i>Grants</i>	2017-2022	NSF CAREER, CNS-1652238, \$450K
	2016-2018	NSF EAGER, DMS-1643552, \$200K
	2016-2017	NSA, Young Investigators, \$40K
	2014-2015	NSA, Young Investigators, \$40K
<i>Postdoctoral Awards</i>	2008-2012	NSF MSPRF, \$108K
	2009-2011	NSERC (Canada) Postdoctoral Fellowship, \$80K "Most outstanding candidate at the Postdoctoral level, Mathematics"
	2009-2011	PIMS Postdoctoral Fellowship

PUBLICATIONS

<i>Transactions of the AMS</i>	The Apollonian structure of Bianchi groups (2017) Katherine E. STANGE To appear, 44 pages. arXiv:1505.03121
<i>SAC 2016</i>	Vulnerable Galois RLWE Families and Improved Attacks (2017) Hao CHEN, Kristin LAUTER and Katherine E. STANGE To appear, 15 pages. IACRpreprint:2016/193
<i>International Mathematics Research Notices</i>	Visualising the arithmetic of imaginary quadratic fields (2017) Katherine E. STANGE <i>International Mathematics Research Notices</i> , Advance access, 22 pages. doi:10.1093/imrn/rnx006

- Expositiones Mathematicae* **The sensual Apollonian circle packing** (2016)
Katherine E. STANGE
Expositiones Mathematicae, 34.4, pp. 364-395.
[doi:10.1016/j.exmath.2016.01.001](https://doi.org/10.1016/j.exmath.2016.01.001)
- Research Directions in Number Theory* **RLWE Cryptography for the Number Theorist** (2016)
Yara ELIAS, Kristin E. LAUTER, Ekin OZMAN and Katherine E. STANGE
Research Directions in Number Theory: Proceedings of the 2014 WIN₃ Workshop, vol. 3 of *Association for Women in Mathematics Series*, pp. 271–290.
[doi:10.1007/978-3-319-30976-7](https://doi.org/10.1007/978-3-319-30976-7)
- International Mathematics Research Notices* **Arithmetic properties of the Frobenius traces defined by a rational abelian variety** (2016)
Alina COJOCARU, Rachel DAVIS and Alice SILVERBERG and Katherine E. STANGE with two appendices by J-P. SERRE
International Mathematics Research Notices, Advance Access, 38 pages plus appendices. [doi:10.1093/imrn/rnw058](https://doi.org/10.1093/imrn/rnw058)
- Canadian Journal of Mathematics* **Integral points on elliptic curves and explicit valuations of division polynomials** (2016)
Katherine E. STANGE
Canadian Journal of Mathematics, 68.5, pp. 1120–1158.
[doi:10.4153/CJM-2015-005-0](https://doi.org/10.4153/CJM-2015-005-0)
- CRYPTO 2015 **Weak instances of Ring-LWE** (2015)
Yara ELIAS, Kristin E. LAUTER, Ekin OZMAN and Katherine E. STANGE
Advances in Cryptology – CRYPTO 2015, Part I, vol. 9215 of *Springer Lecture Notes in Computer Science*, pp. 63–92. [doi:10.1007/978-3-662-47989-6_4](https://doi.org/10.1007/978-3-662-47989-6_4)
- Proceedings of the AMS* **A duality principle for selection games** (2013)
Lionel LEVINE, Scott SHEFFIELD and Katherine E. STANGE
Proceedings of the American Mathematical Society, 141, pp. 4349-4356.
[doi:10.1090/S0002-9939-2013-11707-7](https://doi.org/10.1090/S0002-9939-2013-11707-7)
- American Mathematical Monthly* **How to make the most of a shared meal: plan the last bite first** (2012)
Lionel LEVINE and Katherine E. STANGE
American Mathematical Monthly, 119.7, pp. 550-565.
[doi:10.4169/amer.math.monthly.119.07.550](https://doi.org/10.4169/amer.math.monthly.119.07.550)
- Journal of the Australian Mathematical Society* **Algebraic divisibility sequences over function fields** (2012)
Patrick INGRAM, Valéry MAHÉ, Joseph H. SILVERMAN, Katherine E. STANGE and Marco STRENG
Journal of the Australian Mathematical Society (special issue dedicated to Alf van der Poorten) 92.1, pp. 99-126. [doi:10.1017/S1446788712000092](https://doi.org/10.1017/S1446788712000092)
- Canadian Mathematical Bulletin* **Character sums with division polynomials** (2012)
Igor E. SHPARLINSKI and Katherine E. STANGE
Canadian Mathematical Bulletin, 55, pp. 850-857. [doi:10.4153/CMB-2011-126-x](https://doi.org/10.4153/CMB-2011-126-x)
- Algebra & Number Theory* **Elliptic nets and elliptic curves** (2011)
Katherine E. STANGE
Algebra & Number Theory 5.2, pp. 197-229. [doi:10.2140/ant.2011.5.197](https://doi.org/10.2140/ant.2011.5.197)
- Experimental Mathematics* **Amicable pairs and aliquot cycles for elliptic curves** (2011)
Joseph H. SILVERMAN and Katherine E. STANGE
Experimental Mathematics 20.3, pp. 329-357. [doi:10.1080/10586458.2011.565253](https://doi.org/10.1080/10586458.2011.565253)
- Acta Arithmetica* **Terms in elliptic divisibility sequences divisible by their indices** (2011)
Joseph H. SILVERMAN and Katherine E. STANGE
Acta Arithmetica 146.4, pp. 355-378. [doi:10.4064/aa146-4-4](https://doi.org/10.4064/aa146-4-4)
- Women in Numbers* **Pairings on hyperelliptic curves** (2011)
Jennifer BALAKRISHNAN, Juliana BELDING, Sarah CHISHOLM, Kirsten EISENTRÄGER, Katherine E. STANGE and Edlyn TESKE
WIN – Women in Numbers: Research Directions in Number Theory, Fields Institute Communications 60, pp. 87-120.

SAC 2008

The elliptic curve discrete logarithm problem and equivalent hard problems for elliptic divisibility sequences (2008)

Kristin LAUTER and Katherine E. STANGE

Selected Areas in Cryptography 2008, vol. 5381 of *Springer Lecture Notes in Computer Science*, pp. 309-327. doi:10.1007/978-3-642-04159-4_20

PAIRING 2007

The Tate pairing via elliptic nets (2007)

Katherine E. STANGE

Pairing-Based Cryptography – PAIRING 2007, vol. 4575 of *Springer Lecture Notes in Computer Science*, pp. 329-348. doi:10.1007/978-3-540-73489-5_19

OTHER ACTIVITIES

Teaching

University of British Columbia Postdoctoral Teaching Award, 2011

Brown University Mathematics Outstanding Teaching Award, 2008

TRESTLE Scholar, CU Boulder, Spring 2017

Inquiry Based Learning Workshop, Summer 2016

Faculty Teaching Excellent Program Summer Institute, Summer 2014

Sheridan Center Teaching Certificate, Brown University, 2005

Standards Based Grading in a First Proofs Course, presentation at JMM 2017

Co-creator of an online database for multivariable calculus (MathDL, MAA)

Developer of resources (online videos (via ASSETT grant), course materials)

Taught 14 undergraduate courses, 4 graduate courses

Selected Talks

Upcoming · Invited Address, AMS Spring 2019 Joint Central and Western Sectional

2016/03 · Plenary, Alberta Number Theory Days

2016/04 · Plenary, SouthEast Regional Meeting on Numbers

2015/09 · Invited, ECC 2015

2007/09 · Invited, ECC 2007

44 other conference presentations

Selected Press

Featured on AMS Blog *Visual Insight*, 2015, work on Schmidt Arrangements

Featured in *New Scientist Magazine*, 2011, work in game theory

Writing Award

2013 Paul R. Halmos - Lester R. Ford Award for outstanding paper in *The American Mathematical Monthly*, awarded for joint paper with Lionel LEVINE, *How to make the most of a shared meal: plan the last bite first*

Women in Mathematics

Co-organizer and refereed proceedings editor, Women in Numbers 3

Project Leader at Women in Numbers 4 (upcoming)

Women in Number Theory Steering Committee member, webmaster

Research mentor to women through AWM and at JMM events

Software and Visualization

Author of publicly available research scripts

Contributor to Sage Mathematics Software

Group leader at Sage Days 33: Women in Sage

Early Research Experiences

Mathematics Lab Project Leader, 2017

Summer REU group leader, 2015 and 2016

Advisor of high school student research, 2015-16

Honours Thesis advising, 2015-16

Currently starting a Mathematics Lab for undergraduate involvement in research and outreach at CU Boulder

Outreach

CU Science Ambassador, 2016

Julia Robinson Math Festival, 2012

Workshop Leader, A Taste of Pi, 2010

Supervision

Postdoctoral 2014-2016, T. Alden Gassert

Ph.D. 2014, Amy Feaver

M.A. 2016, Elizabeth Parsons

May 3, 2017