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

Current Position

2012-present The University of Colorado, Boulder
Assistant Professor

Postdoctoral Experience

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

Grants

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

Postdoctoral Awards

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

SIAM Journal of Applied Algebra and Geometry

Attacks on the Search-RLWE problem with small errors
Hao Chen‡, Kristin Lauter and Katherine E. Stange
To appear, 14 pages plus appendices. IACReprint:2015/971

Transactions of the AMS

The dynamics of super-Apollonian continued fractions
Sneha Chaubey‡, Elena Fuchs, Robert Hines‡ and Katherine E. Stange
To appear, 41 pages. arXiv:1703.08616

Transactions of the AMS

The Apollonian structure of Bianchi groups
Katherine E. Stange
To appear, 44 pages. arXiv:1505.03121

SAC 2016

Vulnerable Galois RLWE Families and Improved Attacks
Hao Chen, Kristin Lauter and Katherine E. Stange
To appear, 15 pages. IACReprint:2016/193

International Mathematics Research Notices

Visualising the arithmetic of imaginary quadratic fields (2017)
Katherine E. Stange
International Mathematics Research Notices, Advance access, 22 pages.
doi:10.1093/imrn/rnx006

New York Journal of Mathematics

Index divisibility in dynamical sequences and cyclic orbits modulo p (2017)
Annie S. Chen*, T. Alden Gassert†† and Katherine E. Stange
New York Journal of Mathematics, 2017.23, pp. 1045–1063.
http://nyjm.albany.edu/j/2017/23-45.html

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, 2017.12, pp. 3557–3602.
doi:10.1093/imrn/rnw058

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

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

Canadian Journal of Mathematics

Integral points on ellitic 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

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

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

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

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

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

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

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

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

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
Graduating Advising Workshop, U. Michigan, Spring 2017
TRESTLE Scholar, CU Boulder, Spring 2017
Inquiry Based Learning Workshop, Summer 2016
Faculty Teaching Excellent Program Summer Insitute, 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, 5 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
Contributer to Sage Mathematics Software
Group leader at Sage Days 33: Women in Sage

Early Research Experiences

Mathematics Lab Project Leader, 2017
Summer REU/G group leader, 2015, 2016, 2017
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

September 19, 2017