

Larry Rolen

Curriculum vitae

School of Mathematics
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Education, Research and Professional Experience

- 08/2017–05/2018 **Visiting Assistant Professor**, *Georgia Institute of Technology*, Atlanta, GA.
- 09/2016 – Present **Ussher Assistant Professor in Number Theory & Cryptography**, *Trinity College Dublin*, Dublin, Ireland.
- 08/2015 – 08/2016 **Research Associate**, *The Pennsylvania State University*, State College, PA, USA.
Mentor: George Andrews
- 08/2013–07/2015 **Postdoc**, *University of Cologne*, Germany.
Mentor: Kathrin Bringmann
- 08/2013 **PhD in Mathematics**, *Emory University*, Atlanta, GA, USA.
Dissertation in number theory on "Maass Forms and Quantum Modular Forms"
Advisor: Ken Ono
- Summer 2011 **National Science Foundation Research Experience for Undergraduates in Number Theory**, *Emory University*, Atlanta, GA, USA.
- 05/2011 **Bachelor of Arts in Mathematics with Honors**, *University of Wisconsin–Madison*, Madison, WI, USA.
- Summer 2010 **National Science Foundation Research Experience for Undergraduates in Combinatorics and Number Theory**, *Clemson University*, Clemson, SC, USA.
- 06/2007 **High School Diploma**, *Wausau West High School*, Wausau, WI, USA.
Valedictorian

Grants and Financial Support

- 04/2017 **SFI Conference & Workshop Programme grant, joint with Jan Manschot**, 6.000 Euro
- 04/2014 **University of Cologne Postdoc Grant**, 60.000 Euro, duration 2 years.
- 08/2012 **National Science Foundation Graduate Fellowship**, 32.000 USD per year, duration 3 years (only 1 year used due to early graduation).
- 08/2011 **Woodruff Fellowship**, Stipend and graduate fees covered, duration of PhD program (only 1 year used due to NSF fellowship).

2009 **VIGRE**, National Science Foundation undergraduate research grant.

Awards

- 2016 Nominated by the Trinity College Dublin student body in the “Thank Your Lecturer!” survey
- 2011 Mathematical Association of America Undergraduate Poster Session (Joint Meetings) Prize Winner.
- 2010 Young Mathematicians Conference Outstanding Presentation, second place.
- 2010 Frank D. Cady Scholarship from the University of Wisconsin—Madison Department of Mathematics.
- 2009 Lawrence Young Memorial Scholarship from the University of Wisconsin—Madison Department of Mathematics.
- 2006 Wisconsin Mathematics, Science & Engineering Talent Search honor for achievement.

Refereeing and Reviewing Work

Acta Arithmetica, Advances in Mathematics, Annali dell’Università di Ferrara, Archiv der Mathematik, Annals of Combinatorics, Aurum Mathematicae, Bulletin of the London Mathematical Society, Communications in Number Theory and Physics, Discrete Mathematics, Forum Mathematicum, International Journal of Number Theory, Journal of Combinatorial Theory, Series A, Journal of Number Theory, Journal of Physics A: Mathematical and Theoretical, Mathematics, NSA grant reviewing, Proceedings of the American Mathematical Society, Quarterly Journal of Mathematics, The Ramanujan Journal, Research in the Mathematical Sciences, Research in Number Theory, Women In Numbers Proceedings, and Zentralblatt Math.

Invited Talks

- 12/2017 Trends in Modular forms, National Institute of Mathematical Sciences “Hot Topics Workshops”, Daejeon, South Korea.
- 09/2017 Conference on Number Theory, Geometry, Moonshine and Strings, Simons Foundation, NY.
- 04/2017 British Mathematics Colloquium, Durham, England.
- 02/2017 Mathematics Society, Trinity College Dublin.
- 11/2016 Number Theory Seminar, University College Dublin
- 11/2016 Series of lectures at the Conference School on mock theta functions and related topics in Fukuoka, Japan
- 10/2016 Maths/physics journal club, Trinity College Dublin
- 02/2016 Number Theory Seminar, The Pennsylvania State University

- 02/2016 Undergraduate math club lecture, The Pennsylvania State University
- 12/2015 Combinatorics/Partitions Seminar, The Pennsylvania State University
- 11/2015 Number Theory Seminar: Talk for students, University of Illinois at Urbana-Champaign
- 11/2015 Number Theory Seminar, University of Illinois at Urbana-Champaign
- 10/2015 Mass Colloquium Speaker (program for advanced undergraduates), The Pennsylvania State University
- 10/2015 Number Theory Seminar, The Pennsylvania State University
- 10/2015 Number Theory Seminar, Brigham Young University
- 07/2015 Undergraduate talk, Amherst College
- 07/2015 Number Theory Seminar, Universität Heidelberg
- 06/2015 13th International Symposium on Orthogonal Polynomials, Special Functions, and Applications, National Institute of Standards and Technology, USA
- 05/2015 Automorphic Forms: Advances and Applications, Luminy Institute of Mathematics, France
- 03/2015 Geometric Methods in Representation Theory Seminar, University of North Carolina at Chapel Hill
- 03/2015 UNC-Duke Number Theory Seminar, University of North Carolina at Chapel Hill
- 03/2015 Algebra and Number Theory Seminar, Emory University
- 12/2014 Colloquium, Center for Communications Research–Princeton
- 12/2014 Max Planck Institute for Mathematics Number Theory Lunch Seminar
- 10/2014 Number Theory Seminar, Technische Universität Darmstadt
- 07/2014 Center for Advanced Mathematical Sciences Seminar, American University of Beirut, Lebanon
- 02/2014 Seminar Aachen-Köln-Lille-Siegen on Automorphic Forms, University of Cologne
- 12/2013 International Conference on Number Theory and Galois Representations, Sastra University, India
- 08/2013 Max Planck Institute for Mathematics Number Theory Lunch Seminar

Selected Contributed Talks

- 03/2016 The 2016 Gainesville International Number Theory Conference, in honor of Krishna Alladi's 60th birthday, University of Florida, Gainesville
- 07/2014 Exciting New Faces in Analytic Number Theory, Hausdorff Center for Mathematics
- 04/2013 SouthEast Regional Meeting on Numbers, High Point University

- 11/2012 Ramanujan 125, University of Florida–Gainesville
- 10/2012 Fall Western Sectional Meeting of the American Mathematical Society, University of Arizona–Tucson
- 09/2012 Palmetto Number Theory Seminar XVIII, Wake Forest University
- 08/2012 Building Bridges: First EU-US Conference on Automorphic Forms and Related Topics
- 04/2012 SouthEast Regional Meeting on Numbers, Western Carolina University
- 03/2012 Symposium, Mock Modular Forms, Mock Theta Functions, and Applications, Cologne, Germany
- 12/2011 Palmetto Number Theory Seminar XVII, Clemson University
- 10/2011 Integers Conference, University of West Georgia
- 09/2011 Palmetto Number Theory Seminar XVI, Emory University
- 01/2011 Joint Mathematics Meeting Poster Session, New Orleans, USA
- 08/2010 Young Mathematicians Conference, Ohio State University

Other Selected Professional Activities

- 04/2018 SQUARE Workshop, American Institute of Mathematics (Applied for and received funding)
- 03/2018 Modular Forms and Quantum Knot Invariants, Banff International Research Station, Alberta, Canada, March 2018.
- 02/2017 HMI Mini-conference, Hamilton Mathematics Institute, Trinity College Dublin
- 01/2016 Joint Math Meetings, Seattle, Washington
- 07/2014 Emerging Leaders and Evolving Frontiers in Analytic Number Theory, Hausdorff Center for Mathematics
- 04/2014 Oberwolfach Conference on Modular Forms (invited participant)
- 04/2014 Applications of Automorphic Forms in Number Theory and Combinatorics, Louisiana State University–Baton Rouge
- 02/2014 Automorphic Forms and Arithmetic, Göttingen University
- 08/2013 Mock Modular Forms, Moonshine, and String Theory, Stony Brook University
- 03/2013 Arizona Winter School 2013: Modular Forms and Modular Curves, University of Arizona–Tucson

Organizational Activities

- 2017 Organizer for the “Hamilton Trust Summer Internship Programme 2017” at Trinity College Dublin
- 2017 Co-organizer for Hamilton Mathematics Institute Workshop “Indefinite theta functions and applications in physics and geometry”, Dublin, June 2017.

- 2017 Co-organizer for School "Modular forms are everywhere," Max Planck Institute for Mathematics in Bonn, Germany
- 2016 Organizer for Modular forms seminar, Trinity College Dublin
- 2015 Organizer for Cologne Young Researchers in Number Theory Program 2015.
- 03/2015 Co-organizer for Spring School on "Characters of Representations and Modular Forms," Max Planck Institute for Mathematics in Bonn, Germany
- 08/2014–07/2015 Co-organizer for Algebra and Number Theory Seminar, University of Cologne

Advising

The following students were advised in the Hamilton Trust Summer Internship Programme 2017 at Trinity College Dublin

1. Taillte May
2. Conall McCabe
3. Ronan O’Gorman

The following projects were advised in my Cologne Young Researchers in Number Theory Program 2015.

1. Alexandru Ciolan and Robert Neiss, *On the convergence of the Rogers-Ramanujan continued fraction and its generalization*, Research in Number Theory, (2015) 1:15.
2. Minjoo Jang and Steffen Löbrich, *Radial Limits of the Universal Mock Theta Function g_3* , Proceedings of the American Mathematical Society, accepted for publication.
3. Joschka Braun, Johannes Buck, and Johannes Girsch, *Class invariants for non-holomorphic modular functions arising from modular forms of negative weight*, Research in Number Theory, (2015) 1:21.

All of the following students were advised with Professor Bringmann:

Phd Thesis Defense Committees	René Olivetto, September 2014 Michael Mertens, June 2014
Diploma Theses	Johanna Dahlem, 2013-2014 Ben Engel, 2013-2014
Master’s Theses	Miriam Weingarten, Spring 2014 Roland Mainka, Winter 2013
Bachelor’s Theses	Dennis Khaskin, Summer 2014

Other students advised:

1. Yeong-Wook Kwon (Ph.D. student at Sungkyunkwan University)

Teaching

- Fall 2017 Instructor: Graduate Algebra I, Georgia Tech
- Fall 2017 Instructor: Foundations of Mathematical Proof, Georgia Tech
- Hilary (Spring) 2017 Instructor: Advanced Calculus, Trinity College Dublin
- Michaelmas (Fall) 2016 Instructor: Linear Algebra I, Trinity College Dublin
- Spring 2016 Instructor: Discrete Mathematics (intro to proofs, number theory, and groups), The Pennsylvania State University
- Fall 2015 Instructor: Calculus 1, two sections, The Pennsylvania State University
- Spring 2015 Creator and Instructor: Cologne Young Researchers in Number Theory Program 2015
- Spring 2015 Co-Organizer for Seminar: Modulformen (Modular Forms), University of Cologne
- Spring 2015 Co-Organizer for Pro-Seminar: Erzeugende Funktionen (Generating Functions), University of Cologne
- Winter 2014 Co-Organizer for Seminar: L -Funktionen (L -Functions), University of Cologne
- Winter 2014 Instructor: Elliptic Functions and Related Objects, University of Cologne
- Summer 2014 Co-Organizer for Seminar: Asymptotische Entwicklungen von Modulformen (Asymptotic Expansions of Modular Forms), University of Cologne
- Summer 2014 Co-Organizer for Pro-Seminar: Partitionen (Partitions), University of Cologne
- Winter 2013 Co-Organizer for Seminar: Elliptische Kurven (Elliptic Curves), University of Cologne
- Summer 2013 Instructor: National Science Foundation Research Experience for Undergraduates in Number Theory at Emory University
- Spring 2013 Instructor: Calculus 1, Emory University
- Fall 2012 Instructor: Calculus 1, Emory University

Books

1. K. Bringmann, A. Folsom, K. Ono, and L. Rolén, *Harmonic Maass forms and mock modular forms: theory and applications*, AMS Colloquium Series, to appear in 2017.

Articles

1. T. Anderson, L. Rolén, and R. Stoehr, *Benford's Law for Coefficients of Modular Forms and Partition Functions*, Proceedings of the American Mathematical Society, **139** (2011), 1533–1541.
2. N. Amersi, J. Beyerl, J. Brown, A. Proffer, and L. Rolén, *Pullbacks of Siegel Eisenstein Series and Weighted Averages of Critical L-Values*, The Ramanujan Journal, **27**, No. 2 (2012), 151–162.
3. L. Rolén, *A Generalization of the Congruent Number Problem*, International Journal of Number Theory, **7**, No. 8 (2011), 2237–2249.
4. E. Larson and L. Rolén, *Progress Towards Counting D_5 Quintic Fields*, Involve, **5**, No. 1 (2012), 91–97.
5. E. Larson and L. Rolén, *Upper Bounds for the Number of Number Fields with Alternating Galois Group*, Proceedings of the American Mathematical Society, **141** (2013), 499–503.
6. E. Larson and L. Rolén, *Integrality Properties of the CM-values of Certain Weak Maass Forms*, Forum Mathematicum, **27**, No. 2 (2015), 961–972.
7. M. Griffin and L. Rolén, *On Matrices Arising in the Finite Field Analogue of Euler's Integral Transform*, Mathematics, **1**, No. 1 (2013), 3–8.
8. M. Griffin and L. Rolén, *Integrality Properties of Class Polynomials for Non-Holomorphic Modular Functions*, Journal of the Ramanujan Math Society, **30**, No. 1 (2015), 83–99.
9. L. Rolén and R. Schneider, *A "Strange" Vector Valued Quantum Modular Form*, Archiv der Mathematik, **101** (2013), 43–52.
10. M. Griffin, K. Ono, and L. Rolén, *Ramanujan's Mock Theta Functions*, Proceedings of the National Academy of Sciences USA, **110**, No. 19 (2013), 7592–7594.
11. V. Dose, N. Green, M. Griffin, T. Mao, L. Rolén, and J. Willis, *Singular Moduli for a Distinguished Non-Holomorphic Modular Function*, Proceedings of the American Mathematical Society, **143**, No. 3 (2015), 965–972.
12. K. Bringmann, T. Creutzig, and L. Rolén, *Negative Index Jacobi Forms and Quantum Modular Forms*, Research in the Mathematical Sciences, **1** (2014), 1:11.
13. C. Alfes, M. Griffin, K. Ono, and L. Rolén, *Weierstrass Mock Modular Forms and Elliptic Curves*, Research in Number Theory, (2015) 1:24.
14. P. Guerzhoy, Z. Kent, and L. Rolén, *Congruences for Taylor Expansions of Quantum Modular Forms*, Research in the Mathematical Sciences, **1** (2014), 1:17.
15. K. Ono, L. Rolén, and S. Trebat-Leder, *Classical and Umbral Moonshine: Connections and p -adic Properties*, Journal of the Ramanujan Math. Soc. **30**, No.2 (2015), 135–159.

16. K. Bringmann and L. Rolén, *Half-Integral Weight Eichler Integrals and Quantum Modular Forms*, Journal of Number Theory, special issue in honor of Winnie Li, **161** (2016), 240–254.
17. M. Mertens and L. Rolén, *On class invariants for non-holomorphic modular functions and a question of Bruinier and Ono*, Research in Number Theory, (2015) 1:4.
18. M. Mertens and L. Rolén, *Lacunary Recurrences for Eisenstein Series*, Research in Number Theory, (2015) 1:9.
19. L. Rolén, *A New Construction of Eisenstein's Completion of the Weierstrass Zeta Function*, Proceedings of the American Mathematical Society, **144** (2016) 1453–1456.
20. K. Bringmann, J. Duncan, and L. Rolén, *Maass-Jacobi Poincaré Series and Mathieu Moonshine*, Advances in Mathematics, **281** (2015), 248–278.
21. K. Bringmann and L. Rolén, *Radial Limits of Mock Theta Functions*, Research in the Mathematical Sciences, **2** (2015), 2:17.
22. K. Bringmann, L. Rolén, and S. Zwegers, *On the modularity of certain functions from the Gromov-Witten theory of elliptic orbifolds*, Royal Society Open Science **2**: 150310.
23. L. Rolén, *On t -core towers and t -defects of partitions*, Annals of Combinatorics, **21**, No. 1 (2017), 119–130.
24. K. Bringmann, L. Rolén, and S. Zwegers, *On the Fourier coefficients of negative index meromorphic Jacobi forms*, Research in the Mathematical Sciences (2016) 3: 5.
25. M. Krauel, L. Rolén, and M. Woodbury, *On a relation between certain q -hypergeometric series and Maass waveforms*, Proceedings of the American Mathematical Society, **145** (2017), 543–557.
26. K. Bringmann, J. Manschot, and L. Rolén, *Identities for generalized Appell functions and the blow-up function*, Letters in Mathematical Physics, **106**, no. 10 (2016), 1379-1395.
27. K. Ono, L. Rolén, and R. Schneider, *Explorations in the theory of partition zeta functions*, to appear in Exploring the Riemann Zeta Function, 190 years from Riemann's Birth, Springer, editors: H. Montgomery, A. Nikeghbali, and M. Rassias.
28. K. Ono, L. Rolén, and F. Sprung, *Zeta-polynomials for modular form periods*, Advances in Mathematics, **306** (2017), 328–343.
29. K. Bringmann, J. Lovejoy, and L. Rolén, *On some special families of q -hypergeometric Maass forms*, Int. Math. Res. Not., accepted for publication.

30. N. Andersen, K. Bringmann, and L. Rolén, *Images of Maass-Poincaré series in the lower half-plane*, Contributions in Mathematical and Computational Science, Springer, proceedings of *L-functions and automorphic forms*, accepted for publication.

Preprints

31. K. Bringmann, J. Kaszian, and L. Rolén, *Higher-depth mock modular forms arising in Gromov-Witten Theory of elliptic orbifolds*, submitted.
32. K. Bringmann, B. Kane, S. Löbrich, K. Ono, and L. Rolén. *On divisors of modular forms*, submitted.
33. K. Bringmann, L. Rolén, and M. Woodbury, *Formulas for Jacobi forms and generalized Frobenius partitions*, preprint.
34. K. Bringmann, B. Kane, S. Löbrich, K. Ono, and L. Rolén, *Number-theoretic generalization of the Monster denominator formula*, submitted.
35. N. Diamantis and L. Rolén, *Eichler cohomology and zeros of polynomials associated to derivatives of L-functions*, submitted.
36. N. Diamantis and L. Rolén, *Period polynomials, derivatives of L-functions, and zeros of polynomials*, submitted.

Media Publications Mentioning my Work

1. Science Daily, December 2012, "Math formula gives new glimpse into the magical mind of Ramanujan," by Carol Clark.
2. Scientific American, May 2014, "The Oracle," by Ariel Bleicher.
3. Kölner Wissenschaftsrunde, February 2014, "Mathematiker lösen ein Rätsel der String-Theorie," by Robert Hahn.

Languages

English	Native
German	A1 certified, "sehr gut"
Arabic	Basic knowledge
Spanish	Basic knowledge

References

Ken Ono, Emory University	ono@mathcs.emory.edu ++1 404-727-5120
George Andrews, The Pennsylvania State University	gea1@psu.edu ++1 814-865-6642
Kathrin Bringmann, University of Cologne	kbringma@math.uni-koeln.de ++49 0221 4704334