Olivia Beckwith

CONTACT
INFORMATION

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RESEARCH
INTERESTS

- Number theory and combinatorics, in particular: integer partitions, quadratic forms, elliptic modular forms, Maass forms, L-functions, and elliptic curves.

EMPLOYMENT

University of Illinois at Urbana-Champaign, Urbana, Illinois

- August 25, 2019 - present.
- J.L. Doob Research Assistant Professor

University of Bristol, Bristol, United Kingdom.

- October 1, 2018 - August 23, 2019
- Heilbronn Research Fellow

EDUCATION

Emory University, Atlanta, GA

- Ph.D. Mathematics
- Graduation: August 2018
- Advisor: Ken Ono
- National Science Foundation Graduate Research Fellowship 2015-2018

Harvey Mudd College, Claremont, CA

- B.S. Mathematics
- Graduation: May 2013, with distinction in mathematics.

RESEARCH
PUBLICATIONS
AND PREPRINTS

1. *Scarcity of congruences for the partition function*, with Scott Ahlgren and Martin Raum. Submitted.

2. *Non-holomorphic Ramanujan-type congruences for Hurwitz class numbers*, with Martin Raum and Olav Richter. Proc. Natl. Acad. Sci. USA (PNAS), **117** (2020), no. 36, 21953-21961.

3. *Class number divisibility for imaginary quadratic fields*, Res. Number Theory 6 (2020), no. 1, Paper No. 13.

4. *Indivisibility of class numbers of imaginary quadratic fields*. Research in the Mathematical Sciences, **4** 20 (2017).

5. *Extracting Aggregation Free Energies of Mixed Clusters from Simulations of Small Systems: Application to Ionic Surfactant Micelles*, with Xiaokun Zhang, Lara Patel, Robert Schneider, and James Kindt. J. Chem. Theor. Comp. 13, p. 5195-5206 (2017).

6. *Asymptotic bounds for special values of shifted convolution Dirichlet series*. Proceedings of the American Mathematical Society, **145**, 2373-2381.

7. *On the number of parts of integer partitions lying in given residue classes* with Michael Mertens. Annals of Combinatorics **21** (2017), p. 507-517.

8. *The number of parts in certain residue classes of integer partitions* with Michael Mertens. Research in Number Theory, **1**, 11 (2016).

9. *Multiplicative properties of the number of k-regular partitions* with Christine Bessenrodt. Annals of Combinatorics, **20** (2016).

10. *Distribution of eigenvalues of weighted, structured matrix ensembles*. With Victor Luo, Steven Miller, Karen Shen, Nicholas Triantafillou. INTEGERS **15** (2015).

11. *The average gap distribution for generalized Zeckendorf decompositions*. With Amanda Bower, Louis Gaudet, Rachel Insoft, Shiyu Li, Steven J. Miller, Philip Tosteson. The Fibonacci Quarterly, **51** (2013).

12. *Minkowski length of 3D lattice polytopes* With Matt Grimm, Jenya Soprunova, Bradley Weaver. Journal of Discrete and Computational Geometry, **48** 4 (2012).

13. *Generalized Ramanujan Primes*. With Nadine Amersi, Steven J. Miller, Ryan Ronan, Jonathan Sondow. CANT 2011 and 2012 Proceedings.

PREPRINTS IN PREPARATION

1. **In preparation:** *Polyharmonic Maass forms and Hecke L-series*, with Gene Kopp.

2. **In preparation:** *Gauss composition with level structure*, with Gene Kopp.

3. **In preparation:** *Zero density estimates and the distribution modulo 1 of imaginary parts of zeros of L-functions*, with Di Liu, Jesse Thorner, and Alexandru Zaharescu.

AWARDS

Schoettle Graduate Research Award 2018 (from the Emory University Department of Math and CS).

NSF Graduate Fellowship Research Program 2015 -2018.

Honorable Mention for NSF Graduate Fellowship Research Program 2014 .

Giovanni Borelli Fellowship 2012 Honorable Mention for potential as mathematical researcher (from the Harvey Mudd College Department of Mathematics) .

Honorable mention for Outstanding Presentation for *The distribution of generalized Ramanujan primes* presented by Ryan Ronan and Nadine Amersi, Young Mathematicians Conference, 2011

TEACHING	Instructor for Math 213 at UIUC, Fall 2020 (2 sections)
	Instructor for Math 347, Fundamentals of Mathematics, at UIUC, Fall 2019 (1 section), Spring 2020 (2 sections).
	Substitute lecturer for Foundations of Math and Intro to Number Theory courses at Emory, Fall 2015 - Spring 2017.
	Calculus Instructor for Emory University, Fall 2014 - Spring 2015.
	Grader and Calculus tutor for Emory University, 2013-2014.
ADVISING	Faculty Mentor for two undergraduate research projects at the Illinois Geometry Lab. Spring 2021.
	Faculty Mentor for undergraduate research at the Illinois Geometry Lab, *Exploring divisibility patterns in colored partitions*. Fall 2020.
	Adviser for Emory Research Experience for Undergraduates, Summer 2016. I mentored Sarah Fleming, 2017 Runner-up for the Schafer prize.
OUTREACH	Author of an article for *Theory Girls* community blog, *Where 1-2-3 Meets Quantum Gravity*, published August 8, 2020.
	Panelist for GROW 2019 for panels on getting into graduate school and life as a mathematician. October 5, 2019.
	Co-organizer for Women in Maths day at the University of Bristol. Held September 10-11, 2019 at the University of Bristol.
	Panelist for STEM Gems: Giving Girls Role Models in STEM Careers, March 16, 2017, at Emory Goizueta Business School.
	Coordinator for booth in Atlanta Science Festival representing Emory Department of Math and CS.
	• March 2016: Spirographs and divisibility
	• March 2017: Polyhedra
	Coordinator for Emory Math Circle. Fall 2016 (Euler Group), Spring 2016 and Fall 2017 (Groups D/C*).
	Panelist for Undergraduate Research Panel for Kennesaw Women in Mathematics Day, November 17, 2016.
	Instructor for Emory Math Circle. Spring 2014 - Spring 2016.
PROFESSIONAL SERVICE	Referee: Research in Number Theory (5 papers), The Ramanujan Journal (4 papers), Journal of Number Theory (2 papers), Annals of Combinatorics (2 papers), Mathematics of Computation, Mathematical Research Letters, International Journal of Number Theory, Proceedings of the London Mathematical Society, Philosophical Transactions A., Proceedings - Mathematical Sciences.
	Co-organizer of Linfoot Number Theory Seminar at the University of Bristol, October 2018 - June 2019.
	Coordinator for the Emory graduate student seminar in algebra and number theory. Spring 2016 - Fall 2016.

1. **Upcoming** *On the scarcity of congruences for $p(n)$*, 100 years of Mock Theta Functions conference at Vanderbilt University. May 18-19, 2021.

2. **Upcoming** Linfoot Number Theory Seminar, the University of Bristol, February 2, 2020. Online. Talk title TBD.

3. **Upcoming** *Ramanujan-type congruences for class numbers*, AMS Special Session on Quadratic Forms and Theta Functions. JMM 2021. Online.

4. *Divisibility properties of class numbers of imaginary quadratic fields*, UNT Seminar, October 30, 2020. Online.

5. *Polyharmonic Maass forms and real quadratic fields*, International Seminar on Automorphic Forms, May 27, 2020. Online.

6. CANCELED *Polyharmonic Maass forms and real quadratic fields*, special session on The Interface of Harmonic Analysis and Analytic Number Theory at the 2020 Spring Central Sectional Meeting, at Purdue University, April 4-5. 2020.

7. CANCELED *Polyharmonic Maass forms* AMS Special Session at the University of Virginia, March 13-15, 2020.

8. *Polyharmonic Maass forms and real quadratic fields*, AMS Special Session on the Analytic Theory of Automorphic Forms and L-Functions at the Joint Math Meetings in Denver, CO. January 2020.

9. *Polyharmonic Maass forms and real quadratic fields*, PANTHA (Purdue analytic number theory and harmonic analysis) seminar at Purdue University. December 4, 2019.

10. *Polyharmonic Maass forms and real quadratic fields*, special session "Experimental Mathematics in Number Theory and Combinatorics" at the AMS Fall Southeastern Sectional Meeting, held in Gainesville, Florida. November 2-3 2019.

11. *Indivisibility and divisibility of class numbers of imaginary quadratic fields*, TORA X, University of North Texas, April 5-7 2019. Plenary speaker.

12. *Indivisibility and divisibility of class numbers of imaginary quadratic fields*, Number theory seminar at the University of Nottingham, March 27, 2019.

13. *Indivisibility and divisibility of class numbers of imaginary quadratic fields*, Joint Math Meetings Special Session *Counting methods in number theory*, Baltimore Maryland, January 2019.

14. *Indivisibility and divisibility of class numbers of imaginary quadratic fields*, Number theory seminar, University of Cologne, December 11, 2018.

15. *Indivisibility and divisibility of class numbers of imaginary quadratic fields*, Number theory seminar, University College Dublin, November 14, 2018.

16. *Indivisibility and divisibility of class numbers of imaginary quadratic fields*, Number theory seminar, University of Oxford, November 8, 2018.

17. *Indivisibility and divisibility of class numbers of imaginary quadratic fields*, Number theory seminar, University of Warwick, November 4, 2018.

18. *Indivisibility of class numbers of imaginary quadratic fields*, Heilbronn Seminar, University of Bristol, March 14, 2018.

19. *Indivisibility of class numbers of imaginary quadratic fields*, in AMS Central Sectional Meeting, Special session on real-analytic automorphic forms, September 9, 2017, in Denton, Texas.

20. *Patterns in Integer Partitions*, In University of Pavia Dipartimento di Matematica seminar, July 4, 2017 in Pavia, Italy.

21. *Indivisibility of class numbers of imaginary quadratic fields*, In Wake Forest University colloquium. March 23, 2017.

22. *Patterns in Partitions*, In Kennesaw State University MathTalks weekly colloquium, February 22, 2017.

23. *Indivisibility of class numbers of imaginary quadratic fields*, In: Purdue University Automorphic Forms weekly seminar, January 27, 2017.

24. *The number of parts of integer partitions lying in given residue classes* In: AMS special session on experimental mathematics in Athens, Georgia. March, 2016.

25. *The distribution of parts of partitions in certain residue classes* In: SASTRA University, Kumbakonam, India. December 21, 2015.

26. *The distribution of parts of partitions in certain residue classes* In: Pennsylvania State University Partitions Seminar. October 27, 2015.

27. *Multiplicative Properties of the Number of k-regular partitions.* In: Joint Math Meetings, San Antonio Spring 2015.

28. *Multiplicative Properties of the Number of k-regular partitions.* In: Pennsylvania State University Partitions Seminar, 2014.

29. *Multiplicative Properties of the Number of k-regular partitions.* In: University of Florida Number Theory Seminar, 2014.

30. *Generalized Ramanujan Primes.* In: Ramanujan 125, Gainesville, Florida. November 2012.

ACADEMIC ACTIVITIES

Officer for Graduate Computer Science and Math Society at Emory University. August 2015-May 2016.

Park City Mathematics Institute Undergraduate school. July 2013.

Park City Mathematics Institute Undergraduate School. July 2012.

Budapest Semesters in Math, Fall 2011.

SMALL REU at Williams College. June-Aug, 2011.

Tutor and grader for Harvey Mudd College Department of Mathematics, 2010-2013.

REU at Kent State University. June-Aug, 2010.

Grader for Harvey Mudd College Department of Physics, 2011.

Tutor for Upward Bound, January - May 2010.

Ross Mathematics Program Counselor. June-Aug, 2009.

NONACADEMIC VOLUNTEER WORK

Big Brothers Big Sisters, December 2015 - August 2016.

Georgia Aquarium Volunteer, September 2016 - September 2018.