


RACHEL BAILEY

 <https://rachelbailey3.github.io/RachelBailey.github.io/>

 rachel.bailey@uconn.edu

EDUCATION

University Of Connecticut , Doctoral Candidate, Mathematics <i>Advisors: Masha Gordina and Maxim Derevyagin</i>	<i>Fall 2019 - Present</i>
University of Connecticut Bachelor of Arts, Mathematics <i>Minor in statistics</i>	<i>Fall 2016-Fall 2018</i>
Three Rivers Community College	<i>Spring 2015 -Spring 2016</i>

PAPERS

- R. Bailey and M. Derevyagin. DEK-type orthogonal polynomials and a modification of the Christoffel formula. *Journal of Computational and Applied Mathematics*, (2023), 115561.
- R. Bailey and M. Derevyagin. Complex Jacobi matrices generated by Darboux transformations. *Journal of Approximation Theory*, 288 (2023), 105876.
- R. Bailey and E. Gunawan. Cluster Algebras and Binary Subwords. *Order*, 2021, DOI 10.1007/s11083-021-09562-7
- B. Akwei, B. Atkins, R. Bailey, A. Dalal, N. Dinin, J. Kerby-White, T. McGuinness, T. Patricks, L. Rogers, G. Romanelli, Y. Su, A. Teplyaev. Convergence, Optimization and Stability of Singular Eigenmaps. (preprint), 2023.
- R. Bailey, F. Baudoin, M. Gordina, T. Campos, A. Gannon, B. Hanzsek-brill, C. Marrs, A. Neuschotz, T. Rabe, and E. Winters. A Characterization of Fractional Gaussian Fields on S^1 and the d -Torus. (preprint), 2022.

RESEARCH EXPERIENCE

Research Assistant supported by NSF DMS grant no. 2246549	<i>Spring 2024</i>
Research Assistant supported by NSF DMS grant no. 2008844	<i>Summer 2021, Spring 2022</i>
Research Assistant through Research Excellence Program Award for 2020–2021 <i>Padé approximation in noise filtering, \$19,243</i>	<i>Spring 2021, Summer 2021</i>
Research on Coxeter groups and cluster algebras	<i>Summer 2018</i>

HONORS AND AWARDS

UConn Predoctoral Fellowship	<i>Spring 2024</i>
Louis J. Deluca Memorial Award: Excellence in Teaching	<i>Spring 2023</i>
Connie Strange Graduate Community Award	<i>Spring 2023</i>
UConn Provost “Excellence In Teaching”	<i>Spring 2020, Fall 2020</i>
UConn Babbidge Scholar	<i>February 2017</i>
UConn Aetna Award nominee for <i>The Language of Mathematics</i>	<i>January 2017</i>

WORK EXPERIENCE

UConn Mathematics REU Graduate Mentor* <i>Laplacian Eigenmaps</i>	Summer 2023
UConn Mathematics REU Graduate Mentor * <i>Fractional Gaussian Fields on Surfaces and Graphs</i>	Summer 2022
Complex Analysis (Graduate) Grader	Spring 2022
University of Connecticut Complex Analysis (Graduate) Preliminary Exam Tutor	Winter 2020, Winter 2021
UConn Instructor/ Teaching Assistant	Fall 2019-Present
Undergraduate Math tutor at UConn Q-Center Tutoring	Spring 2018, Fall 2018
*Duties included of teaching an introduction to probability, helping write abstracts for the Young Mathematicians Conference, and directing students through the process of research and writing a research paper.	

INVITED TALKS

JMM Special Session: Numerical Analysis, Spectral Graph Theory, Orthogonal Polynomials, and Quantum Algorithms "A new perspective on an old example"	Upcoming January 2024
AWM JMM 2024 Poster Session and Workshop "DEK-Type Orthogonal Polynomials"	Upcoming January 2024
SIAM Quantum Walks on Graphs Workshop "Orthogonal Polynomials and Quantum Walks on Graphs"	April 2023
JMM Special Session: Orthogonal Polynomials and their Applications III "A Modification of the Christoffel Formula"	January 2023
Bridgewater State University Math Seminar "Darboux Transformation and Exceptional Orthogonal Polynomials"	December 2022
Advances In Operator Theory and Applications to Mathematical Physics "Modification of the Christoffel Formula"	November 2022
UConn Math Club "An Introduction to Orthogonal Polynomials"	September 2022
SIAM Quantum Computing Workshop "Probability in Quantum Computing"	March 2022
UConn SIGMA Seminar "Orthogonal Polynomials and the Christoffel Formula"	March 2022
AMS Spring Eastern Sectional Meeting "The Dubov-Eleonskii-Kulagin Polynomials and a Modification of the Christoffel Formula"	March 2022
UConn Mathematics Continued Conference "Orthogonal Polynomials: When Analysis Meets Linear Algebra"	October 2021
Formal Power Series and Algebraic Combinatorics Presented "Cluster Algebras and Binary Words" poster	July 2019
WIMIN at Smith College "Binary Words and Antichains of Posets"	September 2018

CONFERENCES AND WORKSHOPS

Joint Mathematics Meeting 2024	<i>Upcoming January 2024</i>
AWM Workshop: Women in Operator Theory	<i>Upcoming January 2024</i>
AWM Special Session on Mathematics in the Literary Arts and Pedagogy in Creative Settings 2024	<i>Upcoming January 2024</i>
Séminaire de Mathématiques Supérieures 2023: Periodic and Ergodic Spectral Problems <i>SLMath Summer School</i>	<i>July 2023</i>
Joint Mathematics Meeting 2023	<i>January 2023</i>
UConn Teaching Seminar	<i>Fall 2022</i>
UConn Mathematics Continued Conference	<i>October 2022</i>
Radboud Summer School (Nijmegen, Netherlands) <i>Orthogonal Polynomials, Special Functions and their Applications</i>	<i>August 2022</i>
MSRI Workshop: A Celebration for Women in Mathematics	<i>May 2022</i>
SIAM Quantum Computing Workshop	<i>March 2022</i>
Analysis Learning Seminar- University of Connecticut	<i>Fall 2020</i>
Binghamton University Graduate Conference in Algebra and Topology	<i>November 2020</i>
Formal Power Series and Algebraic Combinatorics (Ljubljana, Slovenia)	<i>July 2019</i>

TEACHING EXPERIENCE

MATH 1071Q Calculus for Business and Economics <i>primary instructor</i>	<i>Fall 2023</i>
MATH 2410Q Elementary Differential Equations <i>primary instructor</i>	<i>Spring 2023</i>
MATH 2110Q Multivariable Calculus <i>teaching assistant</i>	<i>Fall 2022</i>
MATH 1132Q Calculus 2 <i>teaching assistant</i>	<i>Fall 2021</i>
MATH 1060Q Pre Calculus <i>primary instructor</i>	<i>Fall 2020</i>
MATH 1132Q Calculus 2 <i>teaching assistant</i>	<i>Spring 2020</i>
MATH 1131Q Calculus 1 <i>teaching assistant</i>	<i>Fall 2019</i>

SERVICE

UConn Directed Reading Program	Spring 2023
<i>Mentored an undergraduate student through a semester-long independent study on random walks on graphs</i>	
MathCounts	February 2023
<i>Volunteer grader</i>	
UConn SIGMA Organizer	Fall 2022-Spring 2024
<i>Organized speakers for the weekly SIGMA seminar</i>	
Volunteer math tutor for the UConn Women in Math, Science and Engineering learning community	
Spring 2022, Fall 2022	
Vice President of AMS Graduate Student Chapter	Fall 2020-Spring 2023
Graduate Student Mentor	Fall 2020-Present
<i>Mentored first year graduate students</i>	
UConn AMS Integration Bee	October 2019, March 2020, October 2021, and October 2022
<i>Organized and judged the integration bee for undergraduate students both online and in person</i>	

ORGANIZATIONS

Member of AWM	Current
Member of AMS	Current
Member of Pi Mu Epsilon Mathematical Society	Inducted April 2019

HOBBIES

I enjoy figure skating, bike riding (the Island Line Rail Trail in Burlington, VT is beautiful) and going on walks with my miniature dachshund, Chouffy. I also love to travel; my favorite places so far are Bruges, Vienna, Lille, Davos, and Freiburg.