RACHEL BAILEY

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341 Mansfield Road U1009, Storrs, CT 06269

EDUCATION

University Of Connecticut, Doctoral Candidate, Mathematics — *F'19 - Present*
Advisors: Masha Gordina and Maxim Derevyagin

University of Connecticut Bachelor of Arts, Mathematics — *F'16-F'18*
Minor in statistics

Three Rivers Community College — *Sp'15 -Sp'16*

WORK EXPERIENCE

UConn Mathematics REU Graduate Mentor* — *Su'23*
Laplacian Eigenmaps

UConn Mathematics REU Graduate Mentor * — *Su'22*
Fractional Gaussian Fields on Surfaces and Graphs

Complex Analysis (Graduate) Grader — *Sp'22*

University of Connecticut Complex Analysis (Graduate) Preliminary Exam Tutor — *W'20, W'21*

UConn Instructor/ Teaching Assistant — *F'19-Present*

Undergraduate Math tutor at UConn Q-Center Tutoring — *Sp'18, F'18*

**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.*

TEACHING EXPERIENCE

MATH 2410Q Elementary Differential Equations — *Sp'23*
primary instructor

MATH 2110Q Multivariable Calculus — *F'22*
teaching assistant

MATH 1132Q Calculus 2 — *F'21*
teaching assistant

MATH 1060Q Pre Calculus — *F'20*
primary instructor

MATH 1132Q Calculus 2 — *Sp'20*
teaching assistant

MATH 1131Q Calculus 1 — *F'19*
teaching assistant

HONORS AND AWARDS

Louis J. Deluca Memorial Award: Excellence in Teaching — *Sp'23*

Connie Strange Graduate Community Award — *Sp'23*

UConn Provost "Excellence In Teaching" — *Sp'20, F'20*

UConn Babbidge Scholar — *Feb . '17*

UConn Aetna Award nominee for *The Language of Mathematics* — *Jan. '17*

SERVICE

UConn Directed Reading Program *Sp'23*
Mentored an undergraduate student through a semester-long independent study on random walks on graphs

MathCounts *Feb. '23*
Volunteer grader

UConn SIGMA Organizer *F'22-Sp'23*
Organized speakers for the weekly SIGMA seminar

Volunteer math tutor for the UConn Women in Math, Science and Engineering learning community *Sp'22, F'22*

Vice President of AMS Graduate Student Chapter *F'20-Present*

Graduate Student Mentor *F'20-Present*
Mentored first year graduate students

UCONN AMS Integration Bee *Oct. '19, March '20, Oct. '21, and Oct. '22*
Organized and judged the integration bee for undergraduate students both online and in person

PAPERS

DEK-Type Exceptional Orthogonal Polynomials and a Modification of the Christoffel Formula (with Maxim Derevyagin, submitted)
arXiv:2110.03038

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

RESEARCH EXPERIENCE

Research Assistant supported by NSF DMS grant no. 2008844 *Su'21, Sp'22*

Research Assistant through Research Excellence Program Award for 2020–2021 *Sp'21, Su'21*
Padé approximation in noise filtering, $19,243

Research on Coxeter groups and cluster algebras *Su'18*

INVITED TALKS

SIAM Quantum Walks on Graphs Workshop *Apr. '23*
"Orthogonal Polynomials and Quantum Walks on Graphs"

JMM Special Session: Orthogonal Polynomials and their Applications III *Jan. '23*
"A Modification of the Christoffel Formula"

Bridgewater State University Math Seminar *Dec. '22*
"Darboux Transformation and Exceptional Orthogonal Polynomials"

Advances In Operator Theory and Applications to Mathematical Physics *Nov. '22*
"Modification of the Christoffel Formula"

UConn Math Club *Sept. '22*
"An Introduction to Orthogonal Polynomials"

SIAM Quantum Computing Workshop *Mar. '22*
"Probability in Quantum Computing"

UConn SIGMA Seminar *Mar. '22*
"Orthogonal Polynomials and the Christoffel Formula"

AMS Spring Eastern Sectional Meeting *Mar. '22*
"The Dubov-Eleonskii-Kulagin Polynomials and a Modification of the Christoffel Formula"

UConn Mathematics Continued Conference *Oct. '21*
"Orthogonal Polynomials: When Analysis Meets Linear Algebra"

Formal Power Series and Algebraic Combinatorics *July '19*
Presented "Cluster Algebras and Binary Words" poster

WIMIN at Smith College *Sept. '18*
"Binary Words and Antichains of Posets"

ORGANIZATIONS

Member of AWM *F'22-Present*

Member of Pi Mu Epsilon Mathematical Society *Inducted Apr. '19*

CONFERENCES AND WORKSHOPS

JMM 2023 *Jan. '23*

UConn Teaching Seminar *F'22*

UConn Mathematics Continued Conference *Oct. '22*

Radboud Summer School (Nijmegen, Netherlands) *Aug. '22*
Orthogonal Polynomials, Special Functions and their Applications

MSRI Workshop: A Celebration for Women in Mathematics *May '22*

SIAM Quantum Computing Workshop *Mar. '22*

UConn Mathematics Continued Conference *Oct. 21*

Analysis learning seminar- University of Connecticut *F'20*

Binghampton University Graduate Conference in Algebra and Topology *Nov. '20*

Formal Power Series and Algebraic Combinatorics (Ljubljana, Slovenia) *July '19*

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.