


# RACHEL BAILEY

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

 [rachel.bailey@uconn.edu](mailto:rachel.bailey@uconn.edu)

## EDUCATION

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<b>University Of Connecticut</b> , Doctoral Candidate, Mathematics <i>Advisors: Masha Gordina and Maxim Derevyagin</i>	<i>F'19 - Present</i>
<b>University of Connecticut</b> Bachelor of Arts, Mathematics <i>Minor in statistics</i>	<i>F'16-F'18</i>
<b>Three Rivers Community College</b>	<i>Sp'15 -Sp'16</i>

## WORK EXPERIENCE

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UConn Mathematics REU Graduate Mentor* <i>Laplacian Eigenmaps</i>	<i>Su'23</i>
UConn Mathematics REU Graduate Mentor * <i>Fractional Gaussian Fields on Surfaces and Graphs</i>	<i>Su'22</i>
Complex Analysis (Graduate) Grader	<i>Sp'22</i>
University of Connecticut Complex Analysis (Graduate) Preliminary Exam Tutor	<i>W'20, W'21</i>
UConn Instructor/ Teaching Assistant	<i>F'19-Present</i>
Undergraduate Math tutor at UConn Q-Center Tutoring	<i>Sp'18, F'18</i>
<i>*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.</i>	

## TEACHING EXPERIENCE

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MATH 1071Q Calculus for Business and Economics <i>primary instructor</i>	<i>F'23</i>
MATH 2410Q Elementary Differential Equations <i>primary instructor</i>	<i>Sp'23</i>
MATH 2110Q Multivariable Calculus <i>teaching assistant</i>	<i>F'22</i>
MATH 1132Q Calculus 2 <i>teaching assistant</i>	<i>F'21</i>
MATH 1060Q Pre Calculus <i>primary instructor</i>	<i>F'20</i>
MATH 1132Q Calculus 2 <i>teaching assistant</i>	<i>Sp'20</i>
MATH 1131Q Calculus 1 <i>teaching assistant</i>	<i>F'19</i>

## HONORS AND AWARDS

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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 <i>The Language of Mathematics</i>	Jan. '17

## SERVICE

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UConn Directed Reading Program	Sp'23
<i>Mentored an undergraduate student through a semester-long independent study on random walks on graphs</i>	
MathCounts	Feb. '23
<i>Volunteer grader</i>	
UConn SIGMA Organizer	F'22-Sp'23
<i>Organized speakers for the weekly SIGMA seminar</i>	
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
<i>Mentored first year graduate students</i>	
UConn AMS Integration Bee	Oct. '19, March '20, Oct. '21, and Oct. '22
<i>Organized and judged the integration bee for undergraduate students both online and in person</i>	

## PAPERS

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- 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

## RESEARCH EXPERIENCE

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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
<i>Padé approximation in noise filtering, \$19,243</i>	
Research on Coxeter groups and cluster algebras	Su'18

## INVITED TALKS

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JMM Special Session: Numerical Analysis, Spectral Graph Theory, Orthogonal Polynomials, and Quantum Algorithms	Upcoming Jan. '24
<i>"A new perspective on an old example"</i>	
AWM JMM 2024 Poster Session and Workshop	Upcoming Jan. '24
<i>"DEK-Type Orthogonal Polynomials"</i>	
SIAM Quantum Walks on Graphs Workshop	Apr. '23
<i>"Orthogonal Polynomials and Quantum Walks on Graphs"</i>	
JMM Special Session: Orthogonal Polynomials and their Applications III	Jan. '23
<i>"A Modification of the Christoffel Formula"</i>	

Bridgewater State University Math Seminar "Darboux Transformation and Exceptional Orthogonal Polynomials"	Dec. '22
Advances In Operator Theory and Applications to Mathematical Physics "Modification of the Christoffel Formula"	Nov. '22
UConn Math Club "An Introduction to Orthogonal Polynomials"	Sept. '22
SIAM Quantum Computing Workshop "Probability in Quantum Computing"	Mar. '22
UConn SIGMA Seminar "Orthogonal Polynomials and the Christoffel Formula"	Mar. '22
AMS Spring Eastern Sectional Meeting "The Dubov-Eleonskii-Kulagin Polynomials and a Modification of the Christoffel Formula"	Mar. '22
UConn Mathematics Continued Conference "Orthogonal Polynomials: When Analysis Meets Linear Algebra"	Oct. '21
Formal Power Series and Algebraic Combinatorics Presented "Cluster Algebras and Binary Words" poster	July '19
WIMIN at Smith College "Binary Words and Antichains of Posets"	Sept. '18

## ORGANIZATIONS

Member of AWM	F'22-Present
Member of Pi Mu Epsilon Mathematical Society	Inducted Apr. '19

## CONFERENCES AND WORKSHOPS

Joint Mathematics Meeting 2024	Upcoming Ja. '24
AWM Workshop: Women in Operator Theory	Upcoming Jan. '24
AWM Special Session on Mathematics in the Literary Arts and Pedagogy in Creative Settings	Upcoming Jan. '24
Séminaire de Mathématiques Supérieures 2023: Periodic and Ergodic Spectral Problems SLMath Summer School	July. '23
JMM 2023	Jan. '23
UConn Teaching Seminar	F'22
UConn Mathematics Continued Conference	Oct. '22
Radboud Summer School (Nijmegen, Netherlands) Orthogonal Polynomials, Special Functions and their Applications	Aug. '22
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
Binghamton University Graduate Conference in Algebra and Topology	Nov. '20
Formal Power Series and Algebraic Combinatorics (Ljubljana, Slovenia)	July '19

## HOBBIES

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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.