

Sarah Ritchey Patterson

Mathematician

Contact Information

Email pattersonse@vmi.edu
Website sarahritchee.weebly.com

Education

2014–2019	PhD in Mathematics Advisor Anita Layton Certificate in College Teaching	Duke University
2011–2014	BS in Mathematics BS in Computer Science	Youngstown State University

Research Interests

Computational fluid dynamics, scientific computing, numerical analysis, mathematical modeling

Publications

2020	Computing Viscous Flow Along a 3D Open Tube Using the Immersed Interface Method (in prep) International Journal for Numerical Methods in Biomedical Engineering
2020	Computing Viscous Flow Along a 2D Open Channel Using the Immersed Interface Method (submitted) International Journal for Numerical Methods in Biomedical Engineering
2019	Thanos Population Dynamics Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations (SIMIODE)
2019	Thanos Population Dynamics Competing Species Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations (SIMIODE)
2019	Extensions of the Immersed Interface Method to Open Tube Interfaces and Hemodynamic Models Dissertation
2014	Inscribed Equilateral Triangles: Where Geometry and Number Theory Collide Pi Mu Epsilon Journal
2014	Generating Duplicate Bug Datasets MSR 2014 Proceedings of the Conference on Mining Software Repositories
2014	Classification Algorithms for Detecting Duplicate Bug Reports in Large Open Source Repositories MSR 2014 Proceedings of the Conference on Mining Software Repositories

Programming Languages and Software

MatLab, Python, C++, Java, Julia, \LaTeX , TikZ, Maple, R, XPPaut, Microsoft Office, GeoGebra

Teaching Experience

2019-2020	Assistant Professor MA 311: Elementary Differential Equations MA 110: Mathematical Software MA 102: Math that Matters 2 MA 101: Math that Matters 1	Virginia Military Institute
2019	Instructor Go with the flow!	Duke Summer Workshop in Math
2016-2018	Instructor of Record Math 111L: Laboratory Calculus 1 Math 105L: Laboratory Calculus and Functions 1 Math 106L: Laboratory Calculus and Functions 2	Duke University
2016-2018	Curriculum Developer and Co-instructor Codebreakers: Mathematics of Espionage Puzzles and Problem Solving Tiles and Tessellations	Duke TIP Academic Adventures
2017	Curriculum Developer and Instructor An Information Age: Math and Technology of Data	Duke TIP Scholar Weekends
2017	Curriculum Developer and Instructional Counselor From Startups to World Hunger: A Mathematical Perspective	Duke TIP Field Studies
2014-2015	Teaching Assistant Math 111L: Laboratory Calculus 1 Math 105L: Laboratory Calculus and Functions 1	Duke University

Relevant Experiences and Training

2019-2020	Assistant Professor	Virginia Military Institute
2020	Project NEXT improving the teaching and learning of mathematics engaging in research and scholarship finding exciting and interesting service opportunities and participating in professional activities.	MAA
2019	Lean Forward Professional Development Accelerated Professional and Personal Growth Staff and Faculty Development Center for leadership and Ethics	Virginia Military Institute
2014-2019	Certificate in College Teaching Teaching College Mathematics College Teaching and Visual Communication Teaching Triangles Peer Observation Program	Duke University
2016-2019	Graduate Research Assistant Performed research on numerical methods for immersed boundary problems	Duke University
2014-2019	Responsible Conduct in Research MentorUp MentorDown Workshop Applications of Text Encoding Initiative for Research Caring and Sharing the Stress Load RCR Orientation for PhD Students	Duke University

2013–2014	Collaborative Research Experience for Undergraduates Performed research on machine learning classification algorithms for detecting duplicate bug reports in large open source repositories	Youngstown State University
2012	Mathematical Biology Undergraduate Research NSF-funded interdisciplinary research to develop a mathematical model for measuring butanol produced by bacteria.	Youngstown State University
2013	Peer Tutor Choose Ohio First Peer Tutor and Mathematics Assistance Center Tutor	Youngstown State University
2013	Student Classroom Technology Support Assistant Troubleshoot in-classroom teaching stations and distance learning classrooms	Youngstown State University
2011–2012	L^AT_EX Typesetter and Editorial Assistant Used LaTeX to typeset manuscript, “The Joys of Haar Measure.”	Angela Spalsbury and Joseph Diestal
2011–2012	Student Assistant Recoded membership dues and mailed merchandise	Pi Mu Epsilon National Honor Society

Presentations

2019	Matlab use for Modeling Biological Processes Invited Lecturer: 42201 Introduction to Numerical Computing I	Kent OH
2019	Extensions of Immersed Interface Method for Hemodynamic Models CAIMS Annual Meeting	Whistler BC
2019	Extensions of Immersed Interface Method to Open Interfaces and Hemodynamics Joint Mathematics Meeting	Baltimore MD
2018	Applications of the Open Immersed Interface Method to Renal Hemodynamics Triangle Area Graduate Mathematics Conference	Durham NC
2018	An Information Age NCCTM Eastern Regional Conference	Greenville NC
2018	Extensions of the Immersed Interface Method for Hemodynamics AWM Triangle Conference	Chapel Hill NC
2018	From Startups to World Hunger: A Mathematical Perspective Joint Mathematics Meeting	San Diego CA
2017	Numerical Methods for Immersed Interface Problems Duke Math Slam Recruitment Event	Durham NC
2017	Tiles and Tessellations NCCTM State Conference	Greensboro NC
2017	Operator Splitting Approach to the Solution of Fluid-Structure Interaction Problems Duke Biomath Seminar Discussion	Durham NC
2016	Modeling Blood Flow with Immersed Interface Method Triangle Area Graduate Mathematics Conference	Durham NC
2016	Immersed Interface Method in an Open Tube Triangle Area Graduate Mathematics Conference	Chapel Hill NC
2013	Residue Number System Algorithms MAA Summer MathFest	Hartford CT
2013	Prime Time Algorithms: Prime Number Generation MAA Ohio Sectional Meeting	Denison OH
2012	Finding Points on a Circle with Integer Distances with Respect to Equilateral Triangles MAA Summer MathFest	Madison WI
2012	Inscribed Equilateral Triangles: Where Geometry and Number Theory Collide Pi Mu Epsilon Regional Conference	Youngstown OH

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2012	Modeling Butanol Production by <i>Clostridium beijerinckii</i> Society for Biology International Conference	Knoxville TN
2011	Putting Harmony into the Harmonic Series MAA Summer MathFest	Lexington KY
2010	Finding an nth Degree Polynomial Using Only Two Points Pi Mu Epsilon Regional Conference	Youngstown OH
2009	Selecting a Spouse, It's All in the Mathematics Pi Mu Epsilon Regional Conference	Youngstown OH
2008	An Anthropometric Analysis of Barbie: How Does She Stack Up? Pi Mu Epsilon Regional Conference	Youngstown OH

Service and Leadership Positions

2019-2020	Judge MCM	Virginia Military Institute
2019-2020	Committee Member Institute Honors Committee	Virginia Military Institute
2016-2019	Founding Officer and President SIAM Student Chapter	Duke University
2016-2019	Co-Organizer Noetherian Ring Female Mathematician Group	Duke University
2017-2018	Conference Organizer Triangle Area Graduate Mathematics Conference	Duke University
2018	Program Founder and Mentor Duke University Math Mentoring Program	Duke University
2015-2017	Seminar Organizer Graduate Faculty Seminar	Duke University
2016-2017	Math Department Representative Graduate and Professional Student Council	Duke University
2016-2017	Graduate Student Representative Duke Forest Committee	Duke University
2016-2017	Task Force Co-Chair Sustainability Task Force	Duke University
2016-2018	Event Organizer Math Slam Recruitment Event	Duke University
2015-2016	Second Year Graduate Student Representative Duke Mathematics Department	Duke University
2015	Student Organizer 100 Years of General Relativity Special Seminar	Duke University
2015	Conference Organizer South East Conference for Undergraduate Women in Mathematics	Duke University
2011-2014	Officer STEM Leadership Society	Youngstown State University
2011-2014	Officer YSU Association for Women in Mathematics	Youngstown State University

Awards and Grants

2019	AMS Grad Student Travel Grant to the Joint Mathematics Meeting
2018	SIAM Student Chapter Certificate of Recognition
2015–2018	Duke Graduate Assistantship
2015–2017	Duke Summer Research Fellowship
2015	Pi Mu Epsilon Richard V. Andree Award
2014	Youngstown State Summa Cum Laude
2014	B. J. Yozwiak Mathematics Scholarship
2014	Youngstown State Honors Convocation
2013–2014	Youngstown State Undergraduate Student Research Grant
2013	Youngstown State Student USE Fund Support Recipient
2013	William Lowell Putnam Mathematical Competition Top 23 Percentile
2013	COMAP Mathematical Contest in Modeling Meritorious
2013	Phi Kappa Phi Honor Society
2013	Clarence P. Gould Society
2013	Quest 2013 Dean’s Undergraduate Award
2013	Youngstown State Integration Bee 2nd place
2013	Youngstown State Calculus Competition 3rd place
2012	COMAP Mathematical Contest in Modeling Honorable Mention
2012	Youngstown State Integration Bee 1st place
2011–2014	Leslie H. Cochran University Scholars Program
2011–2014	Youngstown State University Honors Program
2011–2014	Youngstown State Deans List
2011–2014	STEM Leadership Society
2013	Pi Mu Epsilon Award for Excellence in Student Exposition and Research
2011	Knights of Columbus Scholarship
2011	CUR Poster on the Hill Honorable Mention

Professional Memberships

2018-2019	Association of Women in Mathematics Member	AWM
2015–2019	North Carolina Council of Teachers of Mathematics Member	NCCTM
2014–2019	American Mathematical Society Member	AMS
2014–2020	Society for Industrial and Applied Mathematics Member	SIAM
2011–2020	Pi Mu Epsilon Honorary National Mathematics Society Member	PME

Volunteering and Activities

2018	AWM Triangle Conference Applying to Grad School Panelist	UNC Chapel Hill
2016	Teaching Triangles Peer Teaching Observations	Duke University
2015	Dog Walker Volunteer	Animal Protection Society of Durham
2015	Duke in Durham Day Volunteer at Durham Rescue Mission	Duke University
2012–2014	William Lowell Putnam Mathematical Competition	Youngstown State University
2013	What Every Student Should Know about the JMM Panelist	Joint Mathematics Meeting
2013	ACM International Collegiate Programming Contest	Youngstown State University
2013	Math Fest Life as a Math Major Workshop Leader	Youngstown State University
2012–2013	Youngstown Habitat for Humanity Volunteer	Youngstown State University
2012	University Band	Youngstown State University
2011–2012	Sonia Kovalevsky Day for Women in Mathematics speaker	Youngstown State University
2012	Math Fest Cryptography Workshop Leader	Youngstown State University
2011–2012	Marching Band	Youngstown State University