

**Matt Roscoe**  
Associate Professor  
University of Montana  
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(406)-243-6689

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**EDUCATION**

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**Ph.D. Mathematics** (May, 2011)

University of Montana, Missoula, MT

Dissertation: *Informal Mathematics Activities and the Beliefs of Elementary Teacher Candidates*

**M.A. Education, Curriculum and Instruction, Math Education** (May, 2001)

University of Montana, Missoula, MT

Thesis: *Enhancing Instruction in Undergraduate Precalculus with Laboratory Investigations*

**Secondary Mathematics Teaching Certification** (May, 2000)

University of Montana, Missoula, MT

**B.S. Mechanical Engineering** (May, 1993)

University of Notre Dame, Notre Dame, IN

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**PROFESSIONAL EXPERIENCE**

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| 2018-     | <b>Associate Professor</b><br>University of Montana, Department of Mathematical Sciences   |
| 2012-2018 | <b>Assistant Professor</b><br>University of Montana, Department of Mathematical Sciences   |
| 2011-2012 | <b>Faculty Associate</b><br>University of Wisconsin-Madison, Curriculum and Instruction<br>Director of the Middle School Mathematics Specialist Program.<br>Responsibilities included the design and instruction of a program of five graduate-level mathematics courses for in-service middle school teachers.                                |
| 2003-2007 | <b>Director of Developmental Mathematics</b><br>University of Montana, Department of Mathematical Sciences<br>Directed a remedial program in mathematics with an enrollment of 1500 students per academic year. Responsibilities included design of curriculum and assessment, management of tutoring services and supervision of instruction. |
| 2002-2003 | <b>Mathematics Teacher</b><br>Sentinel High School, Missoula, MT<br>Instructed integrated algebra, geometry and probability.   |
| 2001-2002 | <b>Mathematics Teacher</b><br>Hellgate High School, Missoula, MT<br>Instructed integrated algebra, geometry and probability.   |

2000-2001     **Mathematics Teacher**  
Clinton Elementary School, Clinton, MT  
Instructed middle school mathematics.

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**POST-SECONDARY TEACHING EXPERIENCE**

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2012-            **Assistant/Associate Professor**  
University of Montana, Department of Mathematical Sciences  
*M605 – Learning Theories in Mathematics*  
*M596 – Research in Mathematics Education*  
*M595 – Teaching Geometry from a Problem Solving Perspective*  
*M572 – Algebra for Middle School Teachers*  
*M570 – Calculus for Middle School Teachers*  
*M439 – Euclidean and Non-Euclidean Geometry*  
*M429 – History of Mathematics*  
*STAT 341 – Introduction to Probability and Statistics*  
*M326 – Number Theory*  
*M301 – Teaching Mathematics with Technology*  
*M291 – Probability and Statistics for Elementary School Teachers*  
*M291 – Teaching MathCounts*  
*M234 – Higher Mathematics for Elementary School Teachers*  
*M 133 – Geometry and Measurement for Elem School Teachers*  
*M132 – Arithmetic for Elementary School Teachers*  
*M171 – Calculus I*  
*M 115 – Probability and Linear Mathematics*

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**PUBLICATIONS**

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Roscoe, M. (8/2020 Under Revision). Encouraging multiplicative thinking with symmetric dot patterns. *Mathematics Teacher Learning and Teaching PK-12*.

Grener, N., Peck, F. & Roscoe, M. (8/2020 Under Review). Circles with no center: On the benefits of circles without facilitators. *MTCircular*.

Wickstrom, M.H. & Roscoe, M. (2020). Geometric modeling: Determining the largest lake. *Mathematics Teacher Learning and Teaching PK-12*, 113(8), p. 643-650. Feldman, Z. & Roscoe, M. (2018). Encouraging teachers to make use of multiplicative structure. *Mathematics Teacher Educator*, 7(1), p. 60-85.

Feliciano-Semidei, R. & Roscoe, M. (2017). Preservice Teachers exploring prime factorization. In T. A. Olson & L. Venenciano (Eds.), *Proceedings of the 44<sup>th</sup> Annual Meeting of the Research Council on Mathematics Learning*, Fort Worth, TX.

Luebeck, J., Diemert, C., Cobbs, G., Roscoe, M. & Scott, L. (2017). Re-envisioning technology as a medium for learning in mathematics: Teachers' performance, perceptions, and practice in blended professional development. *Journal of Technology and Teacher Education*, 25(3): 273-299.

Roscoe, M. (2016). Quilt while you're ahead: Investigating quilt block symmetries. *MTCircular*, Summer/Autumn: 4-7.

Roscoe, M. & Zephyrs, J. (2016). Quilt block symmetries. *Mathematics Teaching in the Middle School*, 22(1): 19-27.

Roscoe, M. (2016). A vehicle for bivariate data analysis. *Mathematics Teaching in the Middle School*, 21(6): 348-356.

Sriraman, B. & Roscoe, M. (2015). Interdisciplinary perspectives to the development of high ability in the 21st century [Commentary on *Borrowing insights from other disciplines to strengthen the conceptual foundations for gifted education* by D. Ambrose ]. *The International Journal for Talent Development and Creativity*, 3(2), 147-152.

Roscoe, M & Feldman, Z. (2015). Strengthening prospective elementary teachers' understanding of factors. In Che, S. M. and Adolphson, K. A. (Eds.). *Proceedings of the 42nd Annual Meeting of the Research Council on Mathematics Learning*. Las Vegas, NV.

Roscoe, M. & Pelikan, S. (2015). Palette of problems. *Mathematics teaching in the middle school*, 21(1), 14-15; 21(2), 82-83; 21(3), 140-141; 21(4), 206-205; 21(5), 270-271; 21(6), 330-331; 21(7), 396-397; 21(8), 458-459; 21(9), 524-525.

Roscoe, M. (2014). Reasoning and sense making with Pythagoras. *Mathematics Teacher*, 108(3), 176-182.

Amidon, J. & Roscoe, M. (2014). Palette of problems. *Mathematics teaching in the middle school*, 20(1), 14-15, 20(2), 82-83, 20(3), 142-143, 20(4), 210-211, 20(5), 276-277, 20(6), 332-333; 20(7), 398-399; 20(8), 458-459; 20(9), 520-521.

Amidon, J. & Roscoe, M. (2013). Palette of problems. *Mathematics teaching in the middle school*, 19(1), 20-21, 19(2), 82-83. 19(3), 146-147, 19(4), 206-207, 19(5), 270-271, 19(6), 334-335, 19(7), 404-405, 19(8), 466-467, 19(9), 530-531, 20(1), 14-15.

Roscoe, M. (2012). Discovering the inscribed angle theorem: A means of developing mathematical reasoning. *Mathematics Teacher*, 105(7), 514-519.

Haverhals, N. & Roscoe, M. (2012). Transitioning students to calculus: Using history as a guide. In *Crossroads in the History of Mathematics and Mathematics Education*. (Ed.) B. Sriraman. Charlotte, NC: Information Age Publishing. PP. 41-69.

Haverhals, N. & Roscoe, M. (2012). The history of mathematics as a pedagogical tool: Teaching the integral of the secant via Mercator's projection. In *Crossroads in the History of*

*Mathematics and Mathematics Education.* (Ed.) B. Sriraman. Charlotte, NC: Information Age Publishing. PP. 139-170.

Roscoe, M., & Sriraman, B. (2011). A quantitative study of the effects of informal mathematics activities on the beliefs of preservice elementary school teachers. *ZDM*, 43(4), 601-615.

Sriraman, B., Roscoe, M. & English, L., (2010). Politicizing Mathematics Education. Has Politics Gone Too Far? Or Not Far Enough? In *Theories of Mathematics Education: Seeking New Frontiers.* (Eds.) B. Sriraman and L. English. Berlin/Heidelberg: Springer Science. 621-638.

Haverhals, N., & Roscoe, M. (2010). The history of mathematics as a pedagogical tool: Teaching the integral of the secant via Mercator's projection. *The Montana Mathematics Enthusiast*, 7(2-3), 339-368.

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## PROFESSIONAL PRESENTATIONS

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### Professional Presentations at Meetings

*Motivating Investigations of Probability With Russian Egg Roulette.* (Co-Presented with Fred Peck) 2018 NCTM Annual Meeting, Washington, DC, April 26, 2018.

*Supporting Statistical Literacy with GeoGebra.* The Montana ActiveStatistics Conference. Carrol College, Helena, MT, June 29, 2018.

*Mathematical Modeling for Montana's High School Classrooms.* MEA-MFT Montana Educators' Conference, Missoula, MT October 19, 2017.

*Russian Egg Roulette: A Rich Probability Setting.* MEA-MFT Montana Educators' Conference, Missoula, MT October 19, 2017.

*Mathematical Tasks that Promote Prospective Elementary Teachers' Attention to and Use of Multiplicative Structure.* Association of Mathematics Teacher Educators Annual Conference, Orlando, FL February 9, 2017

*Strengthening Prospective Teachers' Knowledge of Divisibility: An Interventional Study,* NCTM Research Conference, San Francisco, CA April 12, 2016.

*3-Act Modeling in 5-12 Mathematics,* MEA-MFT Montana Educators' Conference, Helena, MT October 20, 2016.

*A Measurement Approach to Right Triangle Trigonometry,* MEA-MFT Montana Educators' Conference, Helena, MT October 20, 2016.

*Strengthening Multiplicative Reasoning with Prime Numbers*, NCTM General Conference, San Francisco, CA April 15, 2016.

*A Technology-Assisted, Inquiry-Based Approach to Teacher Education Using GeoGebra*, Joint Mathematics Meetings of the American Mathematical Society and the Mathematical Association of America, Seattle, WA, January 8, 2016.

*Using R Simulation to Encourage Creativity in an Introductory Probability Course*, Joint Mathematics Meetings of the American Mathematical Society and the Mathematical Association of America, Seattle, WA, January 6, 2016.

*Quilt Pattern Symmetries*, MEA-MFT Montana Educators' Conference, Billings, MT October 15, 2015.

*3D Printing to Support Mathematical Learning*, MEA-MFT Montana Educators' Conference, Billings, MT October 14, 2015.

*Prospective Elementary School Teachers' Reconceptualization of Factors*, Annual Meeting of the Pacific Northwest Section of the Mathematical Association of America, University of Washington Tacoma, April 11, 2015.

*Strengthening Prospective Elementary School Teachers' Conception of Factors*, Annual Conference of the Research Council on Mathematics Learning, Las Vegas, NV, February 28, 2015.

*Using Transparent Representations to Promote Prospective Teachers' Re-conceptualization of Factors*, Annual Meeting of the Pacific Northwest Section of the Mathematical Association of America, Missoula, MT July 27, 2014.

*A "Vehicle" for Common Core Statistics*, MEA-MFT Montana Educators' Conference, Missoula, MT October 16-17, 2014.

*Watch Me Move: GPS Watch as Mathematics Manipulative*, MEA-MFT Montana Educators' Conference, Missoula, MT October 16-17, 2014.

*Making Factors and Multiples "Transparent" to Learners*, MEA-MFT Montana Educators' Conference, Missoula, MT October 16-17, 2014.

*Exploring the Coordinate Plane with Desmos*, MEA-MFT Montana Educators' Conference, Belgrade, MT October 18-19, 2013.

*Join the Gears Revolution*, MEA-MFT Montana Educators' Conference, Belgrade, MT October 18-19, 2013.

*Using GeoGebra in the Middle Grades*, MEA-MFT Montana Educators' Conference, Billings, MT October 18-19, 2012.

*Frieze Pattern Symmetries in the Middle Grades*, MEA-MFT Montana Educators' Conference, Billings, MT October 18-19, 2012.

*GeoGebra Freeware = Powerful Mathematics Visualizations*. MEA-MFT Montana Educators' Conference, Missoula, MT October 19, 2018.

*Math Wrangle: Where Mathematics is a Spectator Sport*. MEA-MFT Montana Educators' Conference, Missoula, MT October 20, 2018.

*The City of Numbers: Seeing the Power of Prime Factorizations*. MEA-MFT Montana Educators' Conference, Missoula, MT October 18, 2019.

*Bike Parts Spirographs = Beautiful Math*. MEA-MFT Montana Educators' Conference, Missoula, MT October 17, 2019.

*Math Wrangle: Where Mathematics is a Spectator Sport*. MEA-MFT Montana Educators' Conference, Missoula, MT October 18, 2019.

*Transforming Modeling Education: Mathematical Modeling Initiative*. American Mathematics Teacher Educators Annual Conference, Orlando, FL, February 7, 2019.

*Creating Opportunities to Learn for Rural and Isolated Teachers: Effective Strategies for Blended and Face-to-Face and Online Professional Learning*. National Council of Supervisors of Mathematics Annual Conference, San Diego, CA, April 1, 2019 Co-presented with Dr. Jennifer Luebeck of Montana State University.

### **Colloquia, Seminars, Workshops and Trainings**

*Math Teachers' Circle Activities: Quilt Pattern Symmetries, Prime Landscapes*. Navajo Nation Math Teachers' Circle Immersion Workshop. Greyhills Academy, Tuba City, AZ, July 15, 2017. (Role: presenter).

*Math Circle Activities: Prime Landscapes, Tenzy, Quilt Pattern Symmetries, Mathematical Origami*. Baa Hozho Summer Camp. Dine College, Tsaile, AZ, July 10-14, 2017. (Role: presenter).

*Math Teachers' Circle Trainings: Quilt Pattern Symmetries, Mathematical Origami, and Prime Landscapes*. Universidad Nacional Autonoma de Mexico. Mexico City, Mexico, March 21-24, 2017. (Role: presenter).

*Math Circle Activities: Prime Landscapes, Mathematical Origami*. Math Teachers' Circle Summer Retreat. Canyon Ferry, MT, June 25-July 1, 2017. (Role: workshop co-organizer, presenter).

*Math Teachers' Circle Activities*. Cuarto Encuentro Nacional de Juegos Cooperativos para una Cultura de Derechos Humanos. Queretaro, Mexico, March 18-20, 2017. (Role: presenter).

*Enagaging in Mathematical Modeling*. STREAM Project Summer Academy. Canyon Ferry, MT, June 19, 2017. (Role: workshop co-organizer, presenter).

*STREAM Mathematical Modeling Initiative Workshop*. Fairmont Hot Springs, MT, February 24-25, 2017. (Role: workshop co-organizer, presenter).

*A Continuum of Mathematical Modeling*. STREAM Project Midyear Workshop. Bozeman, MT, February 4, 2017. (Role: workshop co-organizer, presenter).

*STREAM Essentials: Mathematical Modeling*. STREAM Project Launch Workshop. Bozeman, MT, October 24, 2016. (Role: workshop co-organizer, presenter).

*Sneaky Segments*. Montana Math Meet. Butte, MT, August 10-11, 2016. (Role: presenter).

*Math Circle Activities: G. Hart Dodecahedron, Modular Origami*. Math Teachers' Circle Summer Retreat. Canyon Ferry, MT, July 7-9, 2016. (Role: workshop co-organizer, presenter).

*A Challenge in Mathematical Modeling*. STREAM Project Summer Academy. Canyon Ferry, MT, June 15, 2016. (Role: workshop co-organizer, presenter).

*"Canned" Mathematics: How 3D Printing Can Support Mathematical Learning*. South East Ohio Math Teachers' Circle Summer Immersion. Athens, OH, June 7, 2016. (Role: presenter)

*The Landscape of the Primes*. South East Ohio Math Teachers' Circle Summer Immersion. Athens, OH, June 7, 2016. (Role: presenter)

*Quilt Pattern Symmetries*. South East Ohio Math Teachers' Circle Summer Immersion. Athens, OH, June 6, 2016. (Role: presenter)

*Mathematical Modeling 101*. STREAM Project Midyear Workshop. Bozeman, MT, February 27, 2016. (Role: workshop co-organizer, presenter).

*STREAM Essentials: Modeling*. STREAM Project Launch Workshop. Bozeman, MT, October 24, 2015. (Role: workshop co-organizer, presenter).

*Active Learning with Gears*. University of Montana Noyce Scholar Symposium. Missoula, MT, August 1, 2017. (Role: presenter).

*Designing Standards-Based Assessments*. Missoula County Public Schools Assessment Institute, Missoula, MT. June 10, 2015. (Role: presenter).

*Guided Reinvention: The Case for Technology in the Mathematics Education Classroom*. University of Montana Department of Mathematical Sciences Colloquium Series, Missoula, MT. October 28, 2013.

*Basic, Applied and Pedagogical Content Knowledge of Preservice Elementary School Teachers*. Montana State University Mathematics Education Colloquium, Bozeman, MT, March 6, 2013

*The Montana Common Core Standards for Mathematical Practice and Content.* Sentinel High School, Missoula, MT, February 14, 2013. February 28, 2013

*Transforming Modeling Education: Mathematical Modeling Initiative.* SUMMIT Conference, Fairmont Hot Springs, MT, March 28, 2019.

*Challenges for Teacher Recruitment.* SUMMIT Conference, Fairmont Hot Springs, MT, March 27, 2019.

*Triangle Partitioning,* Montana Math Teachers' Circle Summer Retreat on Canyon Ferry Lake, MT on June 29, 2019.

*Using a Parabola to Help the Sun Cook a Hot Dog,* Montana Math Teachers' Circle Summer Retreat on Canyon Ferry Lake, MT on June 30, 2019.

*Mathematical Bubbles,* Montana Math Teachers' Circle Summer Retreat on Canyon Ferry Lake, MT on June 30, 2019.

*A Concept-Focused, Measurement Approach to Right Triangle Trigonometry,* MSU Mathematics Education Seminar, February, 21, 2019.

*The Menger sponge: An object of mathematical curiosity.* UM Math Day, October 12, 2018.

*Spirograph: A source for mathematical questioning.* UM Math Day, October 12, 2019.

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## GRANT ACTIVITY

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MT OCHE ITQ Title IIA: *Broadening Participation through Innovations in Concurrent Enrollment (BP-ICE).* Fred Peck (PI) David Erickson, Matt Roscoe and Ke Wu (Co-PIs) \$39,326 funded February 2018.

NSF-Noyce: Promoting Meaningful Mathematics with Learning Assistants, David Erickson (PI), Matt Roscoe, Fred Peck (Co-PIs), \$1,500,000, not funded November, 2017.

OCHE Title Iia: Problem Solving Pathways to Concurrent Enrollment Courses, Matt Roscoe (PI), Fred Peck, Ke Wu, David Erickson (Co-PIs), \$115,000, funded January, 2017.

DOE-MSP STREAM: *Standards-based Teaching Renewing Educators Across Montana,* Jennifer Leubeck (PI Montana State University) and Matt Roscoe (Co-PI), \$162,000, renewal July 2017.

NSF-DRK12: Studies of Teacher Renewal in Education and Mathematics (STREAM), Jennie Leubeck (PI Montana State University) and Matt Roscoe (Co-PI), \$2,983,000, not funded February 2017.



DOE-MSP STREAM: Standards-based Teaching Renewing Educators Across Montana, Jennie Leubeck (PI Montana State University) and Matt Roscoe (Co-PI), \$298,000, renewal July 2016.

NSF-DRK12: Studies of Teacher Renewal in Education and Mathematics (STREAM), Jennie Leubeck (PI Montana State University) and Matt Roscoe (Co-PI) \$2,919,000, not funded January 2016.

OCHE Title II Improving Teacher Quality State Grants, Montana Math Teachers' Circle, Wu (PI), Erickson, Peck and Roscoe (Co-PIs), \$109,000, funded December 2015.

DOE-MSP STREAM: Standards-based Teaching Renewing Educators Across Montana, Jennie Leubeck (PI Montana State University) and Matt Roscoe (Co-PI), \$320,000 funded July 2015.

EAGER NSF STEM Teacher Leader Initiative IMPACT, David Erickson (PI) and Matt Roscoe (Co-PI), \$283,000, not funded September 2015.

NSF CAREER: Developing Concept Connectedness via Measured Quantities in Trigonometry, Matt Roscoe (PI), \$421,292, not funded September 2013.

Seed Grant Math Teachers' Circle, Ke Wu (PI) and Matt Roscoe (Co-PI), \$2000, funded October 2013.

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### PROFESSIONAL MEMBERSHIP AND SERVICE

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Problem Reviewer, *National Science Bowl*, 2016-

Project Team Member, *Montana Math Teachers' Circle*

Member Board of Directors, *Montana Council of Teachers of Mathematics*

Panel Editor, *Mathematics Teaching in the Middle School* (2013-2016)

Fellow, *PNW-MAA Project NExT*

Collaborator, *Learning Mathematics for Teaching (LMT) Project*

Member, *Psychology of Mathematics Education, North American Chapter (PMENA)*

Member, *National Council of Teachers of Mathematics*

Peer Review Referee, *Mathematics Teacher, Mathematics Teaching in the Middle School,*

*Mathematics Teacher Educator, Research Council for Mathematical Learning*

Regional Competition Motivator, *MathCounts*

State of Montana Educator License, Mathematics Endorsement, Folio 68973, Class 1, Level 8

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### AWARDS AND RECOGNITION

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Rosenthal Prize for Innovation and Inspiration in Math Teaching, 1/2020

University of Montana Merit Award for Beyond Normal Performance 4/2015, 4/2017

Helen and Winston Cox Educational Excellence Award (5/2017)

University of Montana Merit Award for Beyond Normal Performance 2015-2016 (4/2017)

Dr. William A. Stannard Award for Excellence in Mathematics Teaching (9/2015)