

# Colin Roberts

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Colorado State University  
Department of Mathematics  
1874 Campus Delivery  
Fort Collins, CO 80523

colin.roberts@rams.colostate.edu

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## Education

### Graduate Education

Aug. 2017 - Present

Colorado State University  
*Mathematics Ph.D. Program*

### Undergraduate Education

Aug. 2012 - May 2017

Colorado State University  
*Bachelor of Science in General Mathematics & Physics*

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## Published Works

3. A. Albarakati, M. Budisic, R. Crocker, J. Glass-Klaiber, S. Iams, J. Maclean, N. Marshall, C. Roberts, and E. S. Van Vleck, *Model and Data Reduction for Data Assimilation: Particle Filters Employing Projected Forecasts and Data with Application to a Shallow Water Model*, (2021) submitted.
2. Brooks Adams, Henry Adams, and Colin Roberts, *Sweeping Costs of Planar Domains*, In Erin W Chambers, Brittany T Fasy, and Lori S Ziegelmeier, eds., *Research in Computational Topology*, pages 71-92, AWM Springer series, volume 13, 2018.
1. Jonathan Gilbert, Colin Roberts, and Jacob Roberts, *Near-Resonant Light Propagation in an Absorptive Spatially Anisotropic Ultracold Gas*, Journal of the Optical Society of America B, pages 718–723, volume 25, number 4, 2018.

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## Research Experience

*AIM Summer School on Dynamics, Data, and the COVID-19 Pandemic* - Supported by the NSF, 2020.

*Mathematics and Climate Research Network Summer School and Academic Year Engagement Program* - Supported by the NSF and AIM, 2019.

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## Organization and Service

Graduate Student Council Representative	Aug. 2020 - Present
Liaison for SIAM Chapter at Colorado State University	Aug. 2019 - May 2020
Presenter for Math Jam Junior at Windsor Charter Academy	Dec. 19, 2019.
Mentor Meetup with Graduate Center for Inclusive Mentoring at Colorado State University	Nov. 4, 2019
Mentor for Association for Women in Mathematics at Colorado State University	Aug. 2019 - Dec. 2019
Organizer for Lie Theory Reading Group	Oct. 2019 - Dec. 2019
Founder/Organizer of the Mathematical Physics Lab	Aug. 2018 - May 2019
Co-organizer for the Greenslopes graduate seminar	Jan. 2019 - May 2019
President of the Society of Physics Students chapter at Colorado State University	Aug. 2016 - May 2017
Voting member for physics for the College Council for the College of Natural Sciences	Aug. 2015 - Dec. 2016
Tutor for the physics department at Colorado State University	Mar. 2015 - May 2016

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## Research Talks

*Model and Data Reduction Techniques for Data Assimilation.* SIAM Northern States Sections Student Chapters Conference (NSS-SC), October 16<sup>th</sup>, 2020.

*A Multiscale Approach to Modeling University Impact on municipal COVID-19 dynamics.* Greenslopes graduate student seminar at Colorado State University, August 27<sup>th</sup>, 2020.

*Model and Data Reduction Techniques for Data Assimilation.* SIAM Mathematics of Planet Earth (MPE20), August 11<sup>th</sup>, 2020.

*Riemannian Geometry for Dummies.* Greenslopes graduate student seminar at Colorado State University, January 30<sup>th</sup>, 2020.

*Geometric Algebra and Spinors.* Solving Problems in Applied Mathematics at Colorado State University, October 21<sup>st</sup>, 2019.

*Information and Entropy.* Data Science Seminar at Colorado State University, September 19<sup>th</sup>, 2019.

*Differential Forms and Stokes' Theorem in  $\mathbb{R}^3$ .* Greenslopes graduate student seminar at Colorado State University, September 6<sup>th</sup>, 2019.

*Tensor Structures on Manifolds.* Tensors: Algebra-Computation-Applications (TACA-2019), June 13<sup>th</sup>, 2019.

*The Principle of Least Action and Variational Methods.* Mathematical Physics Lab at Colorado State University, April 23<sup>rd</sup>, 2019.

*Tensors and Exterior Algebra.* Greenslopes graduate student seminar at Colorado State University, March 14<sup>th</sup>, 2019.

*Special Relativity.* Mathematical Physics Lab at Colorado State University, January 29<sup>th</sup>, 2019.

*Incompressible Fluid Flow: Arnold's Geometrical Approach.* Solving Problems in Applied Mathematics Seminar at Colorado State University, November 6<sup>th</sup>, 2018.

*Introduction to Riemannian Geometry, Part 2.* Mathematical Physics Lab at Colorado State University, October 16<sup>th</sup>, 2018.

*Introduction to Riemannian Geometry, Part 1.* Mathematical Physics Lab at Colorado State University, October 9<sup>th</sup>, 2018.

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## Teaching

<b>Instructor:</b> Chemistry 384, <i>Supervised College Teaching</i>	SP 2021
<b>Instructor:</b> Math 272, <i>Applied Mathematics for Chemists II</i>	SP 2021
<b>Instructor:</b> Math 271, <i>Applied Mathematics for Chemists I</i>	FA 2020
<b>Instructor:</b> Math 272, <i>Applied Mathematics for Chemists II</i>	SP 2020
<b>Instructor:</b> Math 271, <i>Applied Mathematics for Chemists I</i>	FA 2019
<b>Course Development:</b> Math 118, <i>College Algebra in Context II</i>	SM 2019
<b>Instructor:</b> Math 255, <i>Calculus for Biological Scientists II</i>	SP 2019
<b>Instructor:</b> Math 155, <i>Calculus for Biological Scientists I</i>	FA 2018
<b>Instructor:</b> Math 340, <i>Introduction to Ordinary Differential Equations</i>	SM 2018
<b>Instructor:</b> Math 160, <i>Calculus for Physical Scientists I</i>	SP 2018
<b>Instructor:</b> Math 161, <i>Calculus for Physical Scientists II</i>	FA 2017
<b>Learning Assistant:</b> PH 141, <i>Physics for Scientists and Engineers I</i>	FA 2015

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## Awards and Honors

Louis and Gladys Weber Scholarship	2016
Donovan B. and Sally S. Hicks Scholarship	2016
Colorado State Honors Scholarship	2012-2016
Western Undergraduate Exchange Scholarship	2012-2016
College of Natural Sciences Dean's List	Fall 2014, Fall 2015

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## Workshops and Research Meetings Attended

AIM Summer School on Dynamics, Data, and the COVID-19 Pandemic, 2020.

MCRN Summer School and Academic Year Engagement Program, 2019.

Biology, Analysis, Geometry, Energies, Links [BAGEL19]: A Program on Low-dimensional Topology, Geometry, and Applications, 2019.

Tensors: Algebra-Computation-Applications (TACA), 2019.

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## Professional Affiliations

**Member:** American Mathematical Society

**Member:** Society for Industrial and Applied Mathematics

**Member:** American Physical Society

**Member:** American Association for Physics Teachers

**Member:** Sigma Pi Sigma Honors Physics Fraternity.

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## Advisor

<b>Name</b>	Clayton Shonkwiler
<b>Department</b>	Colorado State Mathematics
<b>Position</b>	Assistant Professor
<b>Contact</b>	clayton.shonkwiler@colostate.edu

## Committee

<b>Name</b>	Henry Adams
<b>Department</b>	Colorado State Mathematics
<b>Position</b>	Assistant Professor
<b>Contact</b>	henry.adams@colostate.edu

<b>Name</b>	Wolfgang Bangerth
<b>Department</b>	Colorado State Mathematics
<b>Position</b>	Professor
<b>Contact</b>	wolfgang.bangerth@colostate.edu

<b>Name</b>	Jacob Roberts
<b>Department</b>	Colorado State Physics
<b>Position</b>	Professor, Department Chair
<b>Contact</b>	Jacob.Roberts@colostate.edu