

COLIN ROBERTS

Fort Collins, CO

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PROFESSIONAL SUMMARY

Mathematical physicist with a diverse background interested in using geometric, topological, algebraic, and analytic tools to build novel computational methods for models that incorporate real world data. I am eager to explore new content and improve my technical skills and collaborative abilities in order to solve challenging problems.

RELEVANT SKILLS

Applied math: Data assimilation, dimension reduction, geometric algebra, tensors, multiscale modeling

Communication: Teaching, delegation, research presentations, technical writing, remote collaboration.

Programming and software: Python, Matlab, Java, Git, \LaTeX , Linux

Packages: Parallel computing toolbox, Numpy, Pandas, Matplotlib, TensorFlow

RELEVANT EXPERIENCE

Graduate Student | Collaboration, Research, and Teaching

08/2017 – Present

Colorado State University, Fort Collins, CO

- **Thesis:** Using Clifford Analysis to Study Inverse Tomography
- Author of *A Gelfand Transform for Spinor Fields on Embedded Riemannian Manifolds*. [\[Preprint\]](#)

Ongoing collaboration with NASA

- Networking with experts in the field of topological electromagnetism.
- Writing a paper describing the practical reasons for using of Clifford algebras in (co)homology which include providing new proofs and new results.
- Writing a paper describing the topological properties of electrical components and measurement devices.

Ongoing collaboration in Data Assimilation

- Furthering development of our code base and apply our code to ocean-atmosphere models to analyze our algorithm's performance, probe non-Gaussian behavior, and explore the coupling in the sea-surface. [\[Github\]](#)

Teaching Background

- Taught 10 semesters, taught 7 different courses, and developed the content of 4 courses. [\[Materials\]](#)
- Developed an open source textbook with Matlab tools catered to the applied mathematics for chemists course sequence at Colorado State University. [\[Github\]](#)

NASA: Internship Program [↗](#) | Topological Plasmas

06/2021 – 08/2021

NASA Glenn Research Center, Cleveland, OH (Remote)

- Brought together topological electromagnetism and topological fluid dynamics to develop a framework for the Vlasov equation for application in plasma physics in group collaboration and presented our work.

AIM: Summer Program on COVID-19 Modeling [↗](#) | Multiscale Modeling

06/2020 – 07/2020

American Institute of Mathematics, San Jose, CA (Remote)

- Developed a multiscale epidemic model to predict the spread of COVID-19 in communities with schools. Presented our group's work and interviewed with American Institute of Mathematics [\[Github\]](#) [\[Link\]](#)
- Provided our codebase and insight for JBS Foods in Greeley, CO.

AIM: Engagement Program with MCRN [↗](#) | Data Assimilation

07/2019 – Present

Raleigh, NC & Remote

- Worked collaboratively to develop novel data assimilation software for high dimensional nonlinear systems and presented this work at numerous conferences. [\[Publication\]](#)

EDUCATION

Colorado State University, Fort Collins, CO, USA

08/2012 – Present

Doctor of Philosophy, Mathematics

Expected May 2022

Bachelor of Science, Mathematics & Physics

May 2017

Hobbies

Outside of my professional experience, I am an avid hiker and mountain biker. I also aspire to be a better chef, baker, and equity trader.