

Benjamin Aaron Storer

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Education

2013–2018 Ph. D., Applied Mathematics, University of Waterloo
Thesis: *Development and Application of Models and Diagnostics for Geophysical Fluid Flows*
Supervisor: Francis Poulin
2008–2013 B. Math, Honours Pure Mathematics with distinction
Co-operative Program, Applied Mathematics Minor
University of Waterloo

Teaching

2019-2022	ME201, Applied Boundary Value Problems	Univ. of Rochester	Co-instructor
2016	MATH127, Calculus 1 for the Sciences	Univ. of Waterloo	Instructor
2011	TMAT100, Technical Mathematics	Humber College	Instructor

Academic Positions

Feb 2023 - Present	Research Associate	University of Rochester	Mentor: Hussein Aluie
Feb 2019 - Jan 2022	Postdoctoral Research Associate	University of Rochester	Mentor: Hussein Aluie

Software Development

FlowSieve Role : primary developer

Description: Highly parallelized HPC codebase for analysing multi-scale energetics of oceanic flows, and is broadly applicable to flows in other spherical settings (atmospheric, stellar, etc). Works in spherical geometries and has built-in diagnostics for extracting metrics of energy and enstrophy cascades. Includes Helmholtz decomposition tools for analysing general flow fields.

Links: [Documentation](#), [Github Repository](#)

Grants / Funding

- [1] ACCESS Maximize Computing Grant (EES220052) Role: P.I.
- 6-month preliminary, awarded 8 million core hours. Estimated value of \$33,280.00 USD.
 - 12-month renewal, awarded 58 million core hours. Estimated value of \$268,885.00 USD.

Publications

- [1] Buzzicotti, M., **Storer, B. A.**, Khatri, H., Griffies, S. M., & Aluie, H. (2023). *Spatio-Temporal Coarse-Graining Decomposition of the Global Ocean Geostrophic Kinetic Energy*. Journal of Advances in Modeling Earth Systems, 15(6).
- [2] **Storer, B. A.** & Aluie, H. (2023). *FlowSieve: A Coarse-Graining Utility for Geophysical Flows on the Sphere*. Journal of Open Source Software, 8(84), 4277
- [3] **Storer, B. A.**, Buzzicotti, M., Khatri, H., Griffies, S. M., & Aluie, H. (2022). *Global energy spectrum of the general oceanic circulation*. Nature Communications, 13(1), 5314.
- [4] Magill M., Coutino A., **Storer, B. A.**, Stastna, M., & Poulin, F. J. (2019). *Dynamics of nonlinear Alfvén waves in the shallow water magnetohydrodynamic equations*. Physical Review Fluids, 4(5), 053701.
- [5] **Storer, B. A.**, Poulin, F. J., & Ménesguen, C. (2018). *The Dynamics of Quasigeostrophic Lens-Shaped Vortices*. Journal of Physical Oceanography, 48, 937–957.
- [6] Poulin, F. J., Borrisov, A., **Storer, B. A.**, & Stastna, M. (2018). *A shallow water model of the solar tachocline: A numerical approach to determine wave structure*. Dynamics of Continuous, Discrete and Impulsive Systems Series B: Applications and Algorithms, 25(3–4), 219–231.
- [7] Willick, K., **Storer, B. A.**, & Wesolkowski, S. (2013). *A new principal curve algorithm and standard deviation clouds for non-parametric ordered data analysis*. In 2013 IEEE Congress on Evolutionary Computation, CEC 2013 (pp. 1459–1466).

Conference Organization

Tutorial Session “Coarse-graining: blurring complex oceanic flows for insight”
Chairs : Aluie, H., **Storer, B.**
Biennial Ocean Sciences Meeting, Honolulu, Hawaii, February 2022.

Community Engagement and Outreach

Flower City Pride Band An LGBTQ+ community band based in Rochester, NY
501(c)(3) registered charitable organization
Role: Assistant Artistic Director (2022 - present)
Board of Directors (Secretary) (2022 - present)
Band member (2019 - present)

Technical Skills

- Programming Languages
 - Highly skilled in Python and Matlab, particularly in scientific and computational applications
 - Experienced in computational applications of and developing in C++
 - Experienced with parallel computation in Python (MPI) and C++ (MPI, OpenMP, and hybrid parallelization)
 - Skilled in bash scripting, including developing efficient work-flows for high-powered computing environments
 - Familiar with Fortran
- Data Processing and Visualization
 - Experience writing functions to read various output types into usable structures (e.g. reading binary outputs in python), as well as converting outputs into more user-friendly formats (e.g. NetCDF)
 - Highly skilled with one- and two-dimensional graphics in Python
 - Experienced in using three-dimensional visualization tools *VisIt* and *ParaView*
 - Experience generating interactable three-dimensional *stl* objects
- Laboratory Skills
 - Experience designing and implementing basic experimental equipment for rotating and non-rotating tank set-ups, including computer fans for wind forcing, lighting grids for improved visualization, and recording equipment.
 - Experience post-processing experiment recordings to produce presentable and informative videos

Soft Skills

- During my doctoral studies I had the opportunity to work with several undergraduate research assistants. In many cases I assisted the students in understanding some of the technical material relevant to their work, and occasionally guided students on possible directions for their investigations
- Through lecturing, co-lecturing, and several conference presentations, I have developed strong communication skills, particularly with presenting technical information to a non-specialist audience.
- Experience working and writing with collaborators in other cities / countries

Conference Presentations

- [1] **Storer, B. A.** & Aluie, H. (November 2019). Baroclinic Energy Transfer in the Ocean. Oral Presentation. *American Physical Society's Division of Fluid Dynamics*, Seattle, Washington, USA.
- [2] **Storer, B. A.**, Poulin, F. J., & Menésghen, C. (February 2018). The Dynamics of Quasi-geostrophic Lens-Shaped Vortices. Poster presentation. *Ocean Sciences*, Portland, Oregon, USA.
- [3] **Storer, B. A.**, Poulin, F. J., & Menésghen, C. (June 2017). The Dynamics of Quasigeostrophic Lens-Shaped Vortices. Oral presentation. *Canadian Meteorological and Oceanographic Society*, Toronto, Ontario, Canada.

- [4] **Storer, B. A.**, Poulin, F. J., & Subich, C. (June 2017). QG SPINS: A Parallel, Spectral, Three-Dimensional Quasi-Geostrophic Model with Channel and Doubly-Periodic Geometries. Poster presentation. *Canadian Meteorological and Oceanographic Society*, Toronto, Ontario, Canada.
- [5] **Storer, B. A.** & Poulin, F. J., (June 2015). The occurrence of Yanai Waves in Constrained Geometries. Poster presentation. 20th *Conference on Atmospheric and Oceanic Fluid Dynamics*, Minneapolis, Minnesota, USA.
- [6] **Storer, B. A.**, Poulin, F. J., (June 2014). Large-Scale Coriolis Effects and Model Comparisons. Poster presentation. *International Workshop on Modelling the Oceans*, Halifax, Nova Scotia, Canada.