RYAN SHÌJIÉ DÙ

Department of Geophysics, Colorado School of Mines
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EDUCATION

New York University, Ph.D. in Mathematics and Atmosphere Ocean Science 2020 - 2025
Center for Atmosphere Ocean Science (CAOS), Courant Institute of Mathematical Sciences
Advisors: Oliver Bühler, Shafer Smith

University of California, Los Angeles, B.Sc. in Applied Mathematics 2016 - 2020
Honors Program in Applied Mathematics, minor in Philosophy, summa cum laude

PROFESSIONAL APPOINTMENTS

Post-doctoral fellow, Colorado School of Mines, Department of Geophysics 2025 - Present
Mentor: Bia Villas Bôas

REFEREED PUBLICATIONS

Submitted

S.4. Dù, R.S., Smith K.S., 2025. *Emergent vorticity asymmetry of one and two-layer shallow water system captured by a next-order balanced model.* In revision at Journal of Fluid Mechanics.

S.3. Dù, R.S., Smith K.S., Bühler, O., 2025. *Next-order balanced model captures submesoscale physics and statistics.* In revision at Journal of Physical Oceanography.

Refereed

R.2. Dù, R.S., Bühler, O., 2023. *The Impact of Frequency Bandwidth on a One-Dimensional Model for Dispersive Wave Turbulence.* J Nonlinear Sci 33, 81.

R.1. Du, R.S., Liu, L., Ng, S., Sambandam, S., Hernandez Adame, B., Perez, H., Ha, K., Falcon, C., de Rutte, J., Di Carlo, D., Bertozzi, A.L., 2021. *Statistical energy minimization theory for systems of drop-carrier particles.* Phys. Rev. E 104, 015109.

Other

O.2. Dù, R.S., 2025. *Asymptotic corrections to linear models for the physical ocean at the submesoscale and smaller.* Ph.D. Thesis, New York University.

O.1. Lindstrom, M.R., Du, R.S., Ng, X.Y., Diaz, D., Koulikova, M., Nero, M., Ross, H., Shukla, S., Bertozzi, A.L., Brantingham, P.J., 2019. *Using local geographic features to predict changes in the Los Angeles homeless population.* UCLA CAM Reports 19-62.

SELECTED PRESENTATIONS

P.5. *Next-order in Rossby SQG^{+1} model for reconstructing velocity from sea surface height*
AGU Annual Meeting (AGU24), 2024

P.4. *Next-order balanced model for shallow water captures vorticity asymmetry*
AGU Annual Meeting (AGU24), 2024

P.3. *Next-order balanced model captures submesoscale physics and statistics*
AGU Ocean Sciences Meeting (OSM24), 2024

P.2. *SQG^{+1} as a Model for Submesoscale Asymmetry*
FilaChange Workshop, 2022

P.1. *Domain dependence of wave turbulence theory for the Majda-McLaughlin-Tabak (MMT) model*
Conf. on Atmo. and Oceanic Fluid Dynamics (AOFD22), 2022
2022 Gordon Conference: Ocean Mixing, 2022

AWARDS

- Thomas Tyler Bringley Fellowship, Courant Institute, NYU 2024
  for outstanding work in applied mathematics

MENTORING

- Mentor for Qi Liu 2024-2025
  Undergraduate research at NYU, now Ph.D. student at NYU CAOS
- Co-mentor for Kai Hung and Daniel Wang 2023
  NYU Applied Math Summer Undergraduate Research Experience (AM-SURE)
- Co-mentor for Andreas Louskos 2023
  Master student thesis at NYU

ACADEMIC AND UNIVERSITY SERVICE

- Peer reviewer for *Geophysical Research Letters* (GRL), *Journal of Advances in Modeling Earth Systems* (JAMES), *Journal of Geophysical Research* (JGR:Oceans), *Journal of Atmospheric and Oceanic Technology* (JTECH)
- Program co-coordinator for NYU Applied Math Summer Undergraduate Research Experience (AM-SURE) 2023
- Faculty adviser for the Mathematical Contest in Modeling (MCM) 2023-2024
- Member of the committee on reviewing the results of the Courant Ph.D. student survey 2024

TEACHING EXPERIENCES

- Guest lecturer for Columbia's Geophysical Fluid Dynamics course 2024
  on using Dedalus to simulate some classic simple models of GFD
- Teaching Assistant for Undergraduate courses at Courant, NYU
  Probability & Statistics Spring 2025
  Analysis Spring, Fall 2024
  Numerical Analysis Fall 2022, 2023
  Partial Differential Equations Spring 2023
  Introduction to Fluid Dynamics Spring 2023

OUTREACH

- Lecturer at Courant Splash (cSplash) to NYC high school students 2025, 2023
- Lecturer at NYU College & Career Lab to rising 8^{th} grade students 2023
- Founding board member of NYU SIAM student chapter 2020-2022
- Teaching assistant of a planetary scale ocean circulation course for the World Science Scholars program, led by Professor David Holland 2020-2021
- New Student Adviser and New Student Mentor at UCLA 2018

TECHNICAL STRENGTHS

Languages	English, Chinese (Mandarin)
Programming Languages	MATLAB, Python (including Dedalus, JAX, FEniCS), C++
Software	LaTeX, Inkscape, Qt (in Python and C++), QGIS