

# RYAN SHIJIE DU

The Center for Atmosphere Ocean Science (CAOS)  
Courant Institute of Mathematical Sciences, New York University  
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## EDUCATION

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<b>New York University</b> PhD. in Atmosphere Ocean Science and Mathematics Advisor: Oliver Bühler, Shafer Smith	2020 - Present
<b>University of California, Los Angeles</b> B.S. Applied Mathematics (Specializing in Computing); Minor in Philosophy Honors Program in Applied Mathematics, College Honors Program, summa cum laude	2016 - 2020

## PUBLICATIONS

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3. Du, R.S., Bühler, O. *Spectra of the Majda-McLaughlin-Tabak (MMT) model: theory and numerical experiment*. In Preparation.
2. 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.
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

## PRESENTATION

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The 72nd Annual Meeting of the American Physical Society's Division of Fluid Dynamics (DFD)  
Poster, *Modeling Systems of Drop Carrier Particles Through Energy Minimization*, (Nov 2019).

## RESEARCH

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<b>1D Wave Turbulence.</b> <i>Graduate Student Researcher</i> <u>Advisor:</u> Oliver Bühler	2021-Present CAOS, Courant Institute, NYU
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- Developed and numerically tested a new theory for the turbulent spectra of the Majda-McLaughlin-Tabak (MMT) model.
- Numerical experiments were run on NYU HPC cluster Greene.

<b>Lagrangian Filtering for Mean-Wave Separation.</b> <i>Graduate Student Researcher</i> <u>Advisor:</u> Shafer Smith	Summer 2021 CAOS, Courant Institute, NYU
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- Tested the technique of Lagrangian Filtering for mean-wave separation of geophysical flows by comparing the algorithm output with theoretically known mean flow.

<b>Modeling Systems of Drop Carrier Particles Through Energy Minimization.</b> <i>Student Researcher</i> <u>Advisor:</u> Andrea Bertozzi, Claudia Falcon	2019-2021 Applied Math REU Program, UCLA
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- Studied the properties of Drop Carrier Particles, a new experimental tool in biotechnology, through calculus of variation, probability, and lab experiment.

## Predicting Changes in the LA Homeless Population.

2018-2019

*Student Researcher*

*Department of Mathematics, UCLA*

*Advisor: Michael Lindstrom*

- Constructed machine learning architecture (in Tensorflow) aiming at predicting changes in homeless population in LA from local geographic features.

## LEADERSHIP AND SERVICE

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### NYU SIAM Student Chapter.

2020-Present

*Founding Board Member*

*Courant Institute of Mathematical Sciences, NYU*

- Founded the NYU student Chapter of Society for Industrial and Applied Mathematics (SIAM).
- Organized events that are accessible to both the undergraduate and graduate student bodies of Courant, to enrich their education experience and foster bonds between them.

### Planetary Scale Ocean Circulation Course.

2020-2021

*Teaching Assistant*

*World Science Scholars program, World Science Foundation*

*Instructor: David Holland*

- Assisted in developing and teaching a 3-hours course on the mathematics and physics behind ocean circulations and showcased methods of mathematical analysis, numerical simulation, and lab experiment.
- Conducted “ocean gyres in rotating tank” experiment in Environmental Fluid Dynamics Lab, NYU.

### New Student Adviser and New Student Mentor.

2018

*New Student & Transition Programs, UCLA*

- Advised over 150 new undergraduates in curriculum, student services, and personal issues related to transitioning to university.
- Facilitated group discussions on topics ranging from the academic environment, student diversity, Title IX/sexual violence, alcohol and substance abuse, and sexual health.

## TECHNICAL STRENGTHS

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### Languages

English, Chinese (Mandarin)

### Programming Languages

MATLAB, Python (including FEniCS, Tensorflow), C++

### Software

L<sup>A</sup>T<sub>E</sub>X, Inkscape, Slurm, Qt (in Python and C++), QGIS

## WEBSITES

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### Personal Website

[sites.google.com/view/ryan-shijie-du](https://sites.google.com/view/ryan-shijie-du)

### GitHub

[github.com/Empyreal092](https://github.com/Empyreal092)