

Jiarong Wu

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EDUCATION

Princeton University

Princeton, NJ

Ph.D. in Mechanical and Aerospace Engineering

2018–2023

Graduate certificate in Computational Science and Engineering

Tsinghua University

Beijing, China

B.S. in Mechanical Engineering, GPA: 90.4/100

2014–2018

RESEARCH EXPERIENCE

Courant Institute of Mathematical Sciences

New York, NY

Postdoctoral Research Associate with Prof. Laure Zanna

September 2023 - current

- Air-sea flux parameterization in climate models with a combination of physics-based and data-driven methods.
- Affiliated with LEAP (Learning the Earth with Artificial Intelligence and Physics) center at Columbia University

Center for Turbulence Research (CTR)

Stanford, CA

Participant (as project lead) of CTR Summer Program 2024

June - July 2024

- High fidelity two-phase numerical simulations of wind waves

Laboratory of Physical and Spatial Oceanography (LOPS - Ifremer)

Brest, France

Visiting scholar hosted by Dr. Bertrand Chapron

July - August 2023

- Wind wave characteristics for satellite scatterometer signal retrieval.

Princeton University

Princeton, NJ

Graduate research assistant advised by Prof. Luc Deike

2018 - 2023

- Thesis: Ocean Wave Dynamics with High Fidelity Numerical Simulations

PUBLICATIONS

1. **Wu, J.**, Popinet, S., and Deike, L. (2023). Breaking wave field statistics with a multilayer numerical framework. *Journal of Fluid Mechanics*. **2023 JFM Emerging Scholars Best Paper Prize Honorable Mention**. DOI: <https://doi.org/10.1017/jfm.2023.522>
2. **Wu, J.**, Popinet, S., and Deike, L. (2022). Revisiting wind wave growth with fully coupled direct numerical simulations. *Journal of Fluid Mechanics*. DOI: <https://doi.org/10.1017/jfm.2022.822>
3. **Wu, J.** and Deike, L. (2021). Wind wave growth in the viscous regime. *Physical Review Fluids*. DOI: <https://doi.org/10.1103/PhysRevFluids.6.094801>
4. **Wu, J.**, and Hwang, H.. High-fidelity simulation of boundary layer flow over waves. *Proceedings of the 2024 CTR Summer Program*.
5. Scapin, N., **Wu, J.**, Farrar, J. T., Chapron, B., Popinet, S. and Deike, L., (2024). Momentum fluxes in wind-forced breaking waves. *Journal of Fluid Mechanics*. In press.

Submitted

1. **Wu, J.**, Perezhugin, P., Gagne, D. J., Reichl, B. G., Subramanian, A. C., Thompson E. J., and Zanna, L.. Data-Driven probabilistic air-sea flux parameterization. Submitted to *Geophysical Research Letter*. <https://www.arxiv.org/abs/2503.03990>.
2. **Wu, J.**, Popinet, S., Chapron, B., Farrar, J. T., and Deike, L.. Turbulence and energy dissipation from wave breaking. Submitted to *Journal of Physical Oceanography*. <https://arxiv.org/abs/2503.03009>.

WORKSHOPS AND SUMMER SCHOOLS

Boulder Summer School for Condensed Matter and Materials Physics Hydrodynamics Across Scales	Boulder, CO July 2022
US CLIVAR Working Group Summer School Ocean Uncertainty Quantification	Miami, FL July 2024

SCHOLARSHIPS AND AWARDS

- JFM Emerging Scholar Best Paper Prize: Honourable Mention 2024
- Princeton School of Engineering and Applied Science Award for Excellence 2022
- Princeton MAE Britt and Eli Harari Fellowship 2021
- Princeton MAE Second Year Fellowship 2019

TEACHING AND MENTORING

- **Teaching Assistant** at Princeton University Spring 2023, Fall 2020/2021
 - MAE 501 - Methods of Engineering Analysis I
 - ENV 330/MAE 330 - Ocean Waves
- **Undergrad research mentoring** at Princeton University
 - Lucy Madden, PRISM Summer Program, Summer 2021
 - Sonika Bagchi, Princeton Physics Department Junior and Senior Paper, 2021-2023

SERVICE AND VOLUNTEERING

- Session chair for *Fluxes, Surface Waves, and Physical Processes at the Air-Sea Interface* at OSM 2024
- Reviewer for Journal of Fluid Mechanics, Journal of Atmospheric and Oceanic Technology
- Member of MAE Climate and Inclusion Committee 2019–2022
Assist survey, office hour, and department-wise open discussion as a graduate student committee member.
- Volunteer at weekly help sessions of Princeton Research Computing (PICSciE) 2022-2023
Providing technical supports on software engineering, cluster usage, and visualization related questions.

SELECTED TALKS AND POSTERS

1. Data-Driven probabilistic air-sea flux parameterization, **CESM Ocean Model Working Group Meeting**, Boulder, CO, 2025
2. Ocean Wave Dynamics with High Fidelity Numerical Simulations, **Physical Oceanography Dissertation Symposium (PODS)**, Lihue, HI, 2024
3. Data-driven probabilistic air-sea flux model using in-situ direct measurements, **Observing Air-sea Interactions Strategy (OASIS) webinar**, online, 2024
4. Ocean Wave Dynamics with High Fidelity Numerical Simulations, **Invited talk at Hong Kong University of Science and Technology (HKUST)**, Guangzhou, 2023
5. **AGU Ocean Sciences Meeting** - 2020/2022/2024
6. **APS Division of Fluid Dynamics Meeting** - 2019/2020/2021/2022
7. **Wind Waves in the Earth System (WISE) Workshop** - 2022/2023
8. **APS March Meeting** - 2023
9. **Basilisk User Forum** - 2023
10. **International Congress of Theoretical and Applied Mechanics (ICTAM)** - 2021