BIANCA CHAMPENOIS

HMEI Postdoctoral Fellow, Princeton University

biancach.github.io ◇ LinkedIn ◇ Google Scholar

EDUCATION

PhD, Mechanical Engineering and Computation, MIT 2022 - 2025
Thesis: Physics-driven machine learning for applications in geophysical fluid dynamics

Master of Science, Mechanical Engineering, MIT 4.9/5.0 2020 - 2022
Thesis: Reconstructing 3D ocean temperature fields from real-time satellite and buoy surface measurements

Bachelor of Science, Mechanical Engineering, UC Berkeley 3.9/4.0 2016 - 2020

PUBLICATIONS

B. Champenois and T. P. Sapsis, What are the most informative data points for predicting extreme events?, *Nonlinear Dynamics*, 2025 (doi)

C. Xia, **B. Champenois**, F. Campuzano, and R. Mendes, Drifter Challenge: A Low-Cost, Hands-On Platform for Teaching Ocean Instrumentation and Sensing, *Oceanography (Ocean Education)*, 2025 (doi)

B. Champenois and T. P. Sapsis, Reconstructing Ocean Flow from Observed Lagrangian Trajectories. *IEEE OCEANS*, 2025 (doi)

B. Champenois, C. Bastidas, B. LaBash, and T. P. Sapsis, Data-Driven Modeling of 4D Ocean and Coastal Acidification in the Massachusetts and Cape Cod Bays From Surface Measurements, *AGU JGR: Biogeosciences*, 2025 (doi)

B. Champenois and T. P. Sapsis, Machine Learning Framework for the Real-Time Reconstruction of Regional 4D Ocean Temperature Fields from Historical Reanalysis Data and Real-Time Satellite and Buoy Surface Measurements, *Physica D: Nonlinear Phenomena*, 2024 (doi)

S. Guth, **B. Champenois**, and T. P. Sapsis, Application of Gaussian Process Multi-Fidelity Optimal Sampling to Ship Structural Modeling, *Proc. 34th Symposium on Naval Hydrodynamics*, 2022 (link)

A. Papalia, C. Dawson, **B. Champenois**, et al., A Roadmap for Climate-Relevant Robotics Research, *arXiv*, 2025 (preprint)

CONFERENCES

AGU, 2023; SIAM UQ, 2024; ENOC, 2024; GRC Machine Learning for Actionable Climate Science, 2025 — *Active Data Selection for Extreme Weather Events*

IEEE Oceans, 2025 — *Reconstructing Ocean Flow from Observed Ocean Lagrangian Trajectories*

ENOC, 2024 — *Data-Driven Modeling of Indicators for Ocean Acidification in the US Northeast Coast*

AGU, 2021 — *Multi-Fidelity Framework for Ocean Temperature Reconstruction*

SKILLS

Programming	Python, MATLAB, Java, High Performance Computing, Git
Software Libraries	NumPy, Pandas, scipy, TensorFlow, PyTorch, Keras, scikit-learn
Design Software	Adobe (Illustrator, Photoshop), AutoCAD, SolidWorks, Fusion, KiCad
Design Tools	3D Printing, Laser Cutter, Machine Shop Trained
Language	English (native), French (native), Spanish (proficient)

WORK, SERVICE, LEADERSHIP

Princeton - ENV 367 Observing and Modeling Climate Co-Instructor January 2026 - Present
- Developed interactive Jupyter notebooks to teach students about climate models and observations.
- Delivered lectures on gap filling, measurement uncertainty, and statistical methods in climate science.

MIT School of Engineering Communication Lab - Fellow June 2023 - October 2025
- Coached more than 75 students in one-on-one sessions focused on science communication.
- Created content on poster design for the online CommKit resource.
- Hosted technical communication workshops on writing fellowship applications.
- Completed a 20 hour training on effective coaching and communication strategies.

MIT MechE - 2.122 Stochastic Systems Teaching Assistant January 2022 - May 2022
- Wrote and graded problem sets and exams, and held weekly office hours and review sessions for a class of 38 undergraduate, graduate, and Navy/Coast Guard students.

MIT MechE ENGAGE - Peer Mentor September 2022 - August 2024
- Served as a mentor for incoming women and underrepresented first year graduate students.
- Facilitated weekly group discussions between 1 faculty, 4 first year students, and 2 peer mentors on career and research planning, health and wellness, advisor relationships, and perseverance.
- Organized semesterly workshops on resources for all first years. Offered ad hoc one-on-one meetings for individualized mentorship.

The Bike Lab - President and Founder June 2022 - June 2025
- Founded and led a student-run bike repair cooperative at MIT, raising funds, purchasing tools and parts, and recruiting and managing a team of 10 volunteers.
- Coordinated operations, set hours, and led bike repair tutorials, teaching over 200 individuals.

AWARDS

High Meadows Environmental Institute Postdoctoral Teaching Fellowship	2025
Martin A. Abkowitz International Fellowship Fund in Ocean Engineering	2025
Computational Science and Engineering Community Retreat Best Poster Prize	2024
2nd Place in the MechE De Florez Competition in the Category of Graduate Science	2024
2nd Place in the SIAM UQ Power of Diversity Poster Competition	2024
SIAM UQ Travel Award	2024
MIT MechE Graduate Travel Grant	2023
MIT Graduate Student Council Conference Grant	2023
Clement F. Burnap Award for Outstanding Master of Science in a Marine Field	2023
Meredith Kamm Award for Excellence in a Woman Graduate Student	2023
3rd Place in the MechE De Florez Competition in the Category of Graduate Science	2023
MIT EnergyHack 2nd Place (1st place in the McKinsey & Co challenge)	2022
Mechanical Engineering Research Exhibition Poster Competition: Runner Up	2021
MIT MechE Harrington Fellowship	2020
National Science Foundation Graduate Research Fellowship (NSF-GRFP)	2020

MEDIA AND REPORTS

Radio Canada Moteur de Recherche *Les modèles météorologiques sont-ils désuets?* July 2024.

MIT News *The MIT Bike Lab: A place for community, hands-on learning.* May 2024.

SIAM News *MIT SIAM Student Chapter Hackathon Utilizes Open-access Energy Data* April 2024.

Spectrum Magazine *Bianca Champenois Helps Model the Future for Coastal Industries.* Spring 2023.