Ayushman Choudhury

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EDUCATION _____

University of Chicago   *2025 - present*
PhD in Geophysical Sciences
- Studying Ocean Alkalinity Enhancement (OAE). Advised by Professor B. B. Cael

Brown University, Providence, RI   *2021 - 2025*
Sc.B. with Honors in Applied Mathematics — Computer Science, A.B. with Honors in Music
- Applied Mathematics Honors Thesis: "Mesoscale Eddies as a Mechanism for Fluxes in the Southern Ocean." Advised by Professor Mara Freilich and Dr. Lily Dove.
- Music Honors Thesis: "PyMusic: Musical explorations in Python." Advised by Professor Lu Wang.

RESEARCH EXPERIENCES _____

Laboratoire de Météorologie Dynamique, ENS-PSL (Paris, France)   *January - March 2026*
- Advisors: Professor Laurent Bopp, Dr. Lester Kwiatkowski
- Researching tradeoffs between efficacy of Ocean Alkalinity Enhancement (OAE) at Ocean Deacidification and Marine Carbon Dioxide Removal (mCDR)
- Utilizing NEMO-PISCES 1-D column models and output from 3-D simulations

Freilich Lab, Brown University (Providence, RI, USA)   *January 2024 - May 2025*
- Advisors: Professor Mara Freilich, Dr. Lily Dove
- Researched mesoscale eddies along Antarctic Circumpolar Current near Southeast Indian Ridge
- Aligned surface-visible eddy data from Copernicus and AVISO satellites, with subsurface eddy data from BGC Argo floats and undersea SWOT glider
- Presented thesis at inaugural DEEPS Dive Undergraduate Research Symposium in April 2025

CausAI Lab, Washington University School of Medicine (St. Louis, MO, USA)   *May - August 2024*
- Advisor: Professor Linying Zhang
- Researched causal links between patient socio-economic indicators and quality of treatments for Food Allergy and Food Anaphylaxis events at BJC Hospital
- Delivered internal talks on Causal Inference, presented poster at end-of-internship event

AWARDS/HONORS _____

University of Chicago
McCormick Fellowship   *2025-2027*

Brown University
Jerome L. Stein Memorial Award   *April 2025*
                        For Undergraduate Interdisciplinary Excellence in Applied Mathematics
Data Science Fellow, Data Science Institute   *Fall Semester, 2024*
Undergraduate Teaching and Research Award (UTRA) recipient   *Spring Semester, 2024*

PUBLICATIONS / PRESENTATIONS _____

Choudhury, A., Dove, L., Freilich, M., & Bergen, K. (2025). Mesoscale Eddies as a Mechanism for Fluxes in the Southern Ocean. *Applied Mathematics Theses and Dissertations.* Brown Digital Repository. Brown University Library. https://doi.org/10.26300/qgv9-vz76.

Choudhury, A., Dove, L., & Freilich, M. (2025, April 25). *Eddies as a mechanism for carbon and heat fluxes in the Southern Ocean*. DEEPS Dive Undergraduate Research Symposium, Brown University, Providence, RI, United States.

Salap-Ayca, S., **Choudhury, A.**, & Song, J. (2025, March 24-28). *Mappy Python Diaries: A Living Textbook for Spatial Data Science Education*. American Association of Geographers Annual Conference, Detroit, MI, United States.

Thompson, A., Dove, L., Herraiz-Borreguero, L., Pena-Molino, B., Legresy, B., Tranchant, Y., **Choudhury, A.**, Bai, Y., Freilich, M., & Flexas, M. (2024, December 9-13). *The dynamics of Southern Ocean deep subduction events from coincident SWOT and glider observations*. American Geophysical Union, Washington, DC, United States.

Choudhury, A. & Zhang, L. (2024, July 31). *Socio-economic factors exhibit mixed effects on diagnosis and treatment of food allergy events*. Institute for Informatics, Data Science, and Biostatistics event, Washington University School of Medicine, St. Louis, MO, United States.

Choudhury, A., Dove, L., & Freilich, M. (2024, April 23). *Investigating Ocean Flux Dynamics in the Southern Ocean*. UTRA Elevator Pitch event, Brown University, Providence, RI, United States.

Wisialowski, K., **Choudhury, A.**, & Cocomello, J. (2023, December 8). *Mathematical Models of Disease Spreading.* Directed Reading Program presentation event, Department of Applied Mathematics, Brown University, Providence, RI, United States.

TEACHING _____

Curriculum development, upcoming Advanced GIS course   *September 2024 - August 2025*
- Worked with Professor Seda Salap-Ayca, Dept. of Earth, Environmental, Planetary Sciences
- Developed interactive Python exercises in Jupyter Notebooks to replace ArcGIS Pro assignments

Head TA, "Computers, Freedom, and Privacy" (CSCI 1805)   *August - December 2024*
- Worked with Professor Timothy Edgar, Dept. of Computer Science
- Managed staff of 10 TAs, course of 115 students - grading, attendance, project mentoring

Head TA, "Data, Ethics, and Society" (DATA 0080)   *August - December 2023*
- Worked with Professor Linda Clark, Data Science Institute
- Managed staff of 6 TAs, course of 100 students - grading, TA-led activities & simulations