

Job Title	Postdoctoral Researcher
PVN ID	NY-2510-007068
Category	Postdoctoral
Location	NYC COLLEGE OF TECHNOLOGY
Department	Physics
Status	Full Time
Annual Salary	\$75,000.00 - \$82,000.00
Hour(s) a Week	35
Closing Date	Dec 17, 2025 (Or Until Filled)

General Description

The Terra D2I (Data To Insights) lab at the CUNY New York City College of Technology, led by Dr. Viviana Acquaviva, is seeking a highly motivated postdoctoral researcher to join a growing research group for the project "From sparse data to full spatio-temporal fields: surface ocean carbon and beyond", sponsored by the Simons Foundation.

Project Overview

This project aims to reconstruct the global surface ocean pCO₂ field, starting from observations that are extremely sparse in space and time. Because of data sparsity, the reconstruction of the full field relies on additional information that can be measured from satellites, such as the temperature and salinity of the ocean. These become the features of a machine learning model that is trained to predict pCO₂ using the available observations as a learning set. The predictions for the ML model are then used for "infilling" or reconstructing the full pCO₂ field, which serves to estimate the global ocean carbon sink. This is a naturally difficult problem for ML methods, because there is an unsolvable distribution shift between the training domain (where observations are available) and the application domain (all other points in space and time). The project's objective is to improve this reconstruction, making it more accurate and robust.

The tools that we use include classical statistics, Bayesian parameter inference, and machine learning. We collaborate with a broad community of researchers, from statisticians to physical oceanographers to climate modelers to cosmologists.

Key responsibilities

The postdoctoral researcher will work on one or more of these aspects:

Efficient representation - What are the most informative features to use for this task? Can we generate new ones?

Better ML modeling - Everything about improving the machine learning modeling and making it more resilient to generalization, from new algorithms that capture relational inductive biases to domain adaptation strategies

to equation discovery.

Tests of Generalization - The predicted global pCO₂ field derived from the infilling is a crucial input for the Global Carbon Budget, but we can't test its accuracy directly. We use Earth System Models (ESMs) and Global Ocean Biogeochemistry Models (GOBMs) as testbeds to better understand the reconstruction process and to build resilience into our representation and ML modeling above.

Testing ESMs and GOBMs: Through our work on optimal representation, we also plan to develop custom metrics to assess how well the relationship between feature variables and pCO₂ is captured in the models, compared to the observations.

The lab also anticipates hiring a post-baccalaureate researcher in Fall/Winter 2025 and a Ph. D. student with starting date in Spring or Fall 2026 to work on related projects. The postdoc will participate in co-mentoring at least one junior researcher and will have many opportunities for further professional development, decided together with the PI and according to their professional goals and interests.

Additional responsibilities include occasional travel (once or twice a year) to conferences and workshops to present research.

Additional information

The target start date for this position is between January and March 2026. The contract is renewable on a yearly basis for up to 3 years of total duration. The starting salary range for this position is \$75,000-\$82,000, commensurate with experience and skills. An annual travel budget of \$8,000 and a separate budget for computer supplies and publication support are also available.

This is a full time, in-person position; candidates are expected to be in the office at least three days a week.

Application instructions

For full consideration, applicants should submit the following materials by November 15th, 2025:

- a Curriculum Vitae with a list of publications;
- a cover letter (no more than 2 pages) describing their research experience, available start date, career plans, and how their interests and skills would fit the project. Please also include the names of 3 references that could be contacted to request confidential letters of recommendation.

For additional information, please contact Dr. Viviana Acquaviva at vacquaviva@citytech.cuny.edu.

Other Duties

Qualifications

- Ph.D. in the physical or mathematical sciences, in climate science, or a closely related relevant discipline. Applicants may be ABD but must have received their degree by the appointment start date. While we consider all qualified candidates, preference will be given to those with a recent Ph.D. (2023 or later).
- Strong self-motivation, curiosity, a genuine interest in the topic of Climate Data Science, a collaborative

mindset, and the desire to join a truly interdisciplinary community.

- Strong programming experience in Python.
- Advanced mathematical modeling and statistical modeling skills.
- Familiarity with Machine Learning algorithms and pipelines (building, testing, and improving models) and/or geospatio-temporal data analysis.
- Excellent mastery of written and spoken English.
- A record of relevant publications in the peer-reviewed scientific literature appropriate to career stage.