

Opportunity Title: Direct Air Capture - Postdoctoral Research

Opportunity Reference Code: NETL-PGRP-2023-BreaultDAC

Organization National Energy Technology Laboratory (NETL)

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How to Apply A complete application consists of:

- An application, including academic history, work history experiences, and honors/awards
- Description of your goals, related experience, and related skills – refer to NETL's Core Competencies and ongoing projects when applicable
- Transcripts – [Click here for detailed information about acceptable transcripts](#)
- A current resume/CV, including academic history, employment history, relevant experiences, and publication list
- Two educational or professional recommendations
You must provide contact information for at least two recommenders in your application. The first two recommendations received will be attached to your application for review by NETL. You may click the "send" (paper airplane) button to send the recommendation request email immediately after entering their information prior to submitting your application; if not, a request will automatically be sent when you submit your application. Your recommenders will receive an email with a subject line of "[Your Name] - ORISE Recommendation Request - [your email]", from Zintellect@orau.org. This email will include information on the opportunity to which you have applied, as well as a secure link to submit a recommendation for you for this application. If you ask the same person to submit a recommendation for you for multiple applications in Zintellect, they must click the unique link in each email request, but will be given the opportunity to copy over what they had previously submitted.

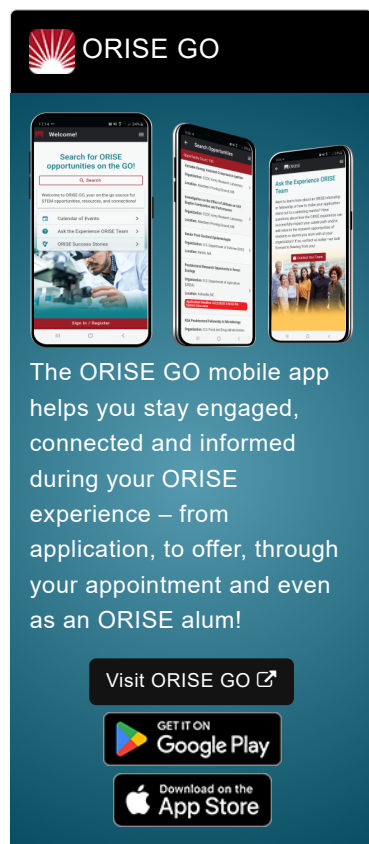
All documents must be in English or include an official English translation.

If you have questions about the application process, contact NETLinfo@orau.org.

After you have submitted an application in Zintellect, you may reach out to internship.program@netl.doe.gov to request to talk with the hosting researcher if you would like additional information on the project or to express particular interest. You must have a completed application in Zintellect to receive a response.


Application Tips


NETL values a combination of academic success, experience, and leadership potential as demonstrated in all aspects of your application. NETL's goal is to create, maintain, and support a [diverse environment](#) that encourages creative ideas and leadership. In the words of [Lab Director Brian Anderson](#), "our differences make us stronger and we're united in fostering inclusivity in all aspects of our research to drive innovation and deliver solutions for an environmentally sustainable and prosperous energy future." In your application, show us




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who you are!

To increase your chances of being selected for an appointment, we recommend:

1. Tailoring your responses to align with the project. What parts of the project are most interesting to you?
2. Spending sufficient time on your essay responses and your resume. Give yourself time to review your writing!
3. Ensuring that everything you submit is grammatically correct and clearly expressed.
 - Consider using a word processor to draft your answers and then copy and paste into the application.
 - Review and edit repeatedly until you have a strong response.
 - Ask someone whose judgement you trust to proofread it and make suggestions for improvement.
 - Efficient writing is valued over quantity of writing.
4. Submitting the application -- we can't select you if you don't submit an application!
 - To be considered for this opportunity, you must hit the "Save & Next" button after providing email addresses for your recommenders, then review the information on the Submit page. Mark if you agree to the listed terms, then click the final "Submit" button. You will receive an e-mail once the application is submitted, and the application will show it has a "Submitted" status on your Zintellect dashboard under "My Applications".
 - Your application will not be considered complete until the required recommendations have been received. You can check the status of your recommendations on your Zintellect dashboard under "My Applications". You may "Manage" your recommendations to verify or update contact information, add another recommender, and resend the recommendation request email, as needed.

Selection Decisions

Selection decisions are made directly by NETL researchers and staff looking to host an internship. Your application will be available to the hosting mentor(s) for up to 12 months after you apply. You may withdraw your application at any time. Applications may be reviewed and selected on a rolling basis or the hosting mentor(s) may choose to wait until after the application deadline before reviewing all applications simultaneously. A final decision of non-selection may not be confirmed for several months after the listed application deadline.

Application Deadline 1/1/2024 12:00:00 AM Eastern Time Zone

Description The National Energy Technology Laboratory's (NETL's) record of success has been built on understanding the future of energy and the technologies required to make that future possible. We've long touted our success in developing the technologies that took on acid rain in the 1970s and mercury in the early 2000s. More recently, NETL has a leading role in

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President Biden's ambitious climate goals, including a carbon emission-free power sector by 2035 and a net-zero economy by 2050.

Program Goals

The NETL Postgraduate Research Program (PGRP) is a high-intensity program designed to identify recent Master's and Doctoral graduates of high promise and to foster advanced skill development. It allows the postgraduate to systematically outline career goals and helps provide the means of achieving these goals. NETL principal investigators and leads serve as mentors to PGRP participants during the program. This interaction affords the postgraduate a unique opportunity to develop critical skills needed to become an independent professional.

The program goals include providing the opportunity to participants to:

- Develop skills and knowledge in their field of study
- Engage with new areas of basic and applied research
- Network with world-class scientists
- Exchange ideas and skills with the Laboratory community
- Use state-of-the-art equipment
- Contribute to answers for today's pressing scientific questions
- Collaborate with the broader scientific and technical communities

Project Details

Through the Oak Ridge Institute for Science and Education (ORISE), this posting seeks a post-Doctoral researcher to engage in projects with the Research Innovation Center (RIC) at the National Energy Technology Laboratory (NETL) in the area of direct air capture (DAC), under the mentorship of Ronald Breault. This project will be hosted at the NETL [Morgantown, WV](#) campus.

The overall objective of this project is to focus and coordinate NETL Research and Innovation Center efforts toward the development of a Direct Air Capture (DAC) demonstration module for testing in the DAC center for carbon dioxide removal. This integrated experience will be accomplished by optimizing the properties of an NETL-developed DAC sorbent, designing a DAC process that capitalizes on the strengths of the sorbent and culminating with a prototype process at a scale appropriate to the DAC center. Testing of the subscale module assemblies in will provide validation data for computational fluid dynamics (CFD) and systems studies guiding the research. The end goal of the overarching project is a design for a 3000 scfm module for testing in the DAC center.

This posting is an opportunity for a recent graduate to join the DAC project. If selected, you would leverage and expand on your skills while learning to:

1. conduct open ended research
2. write journal and conference papers
3. give presentations at conferences
4. apply various analysis techniques for data analysis
5. extrapolate/extend findings to other reactor configurations.

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Stipend: The selected participant will receive a monthly stipend commensurate with educational level and experience.

- Post-Master's stipends start at \$3,720 per month.
 - Post-Doctoral stipends start at \$5,518 per month.
- Actual stipend rate offered may be increased based on experience.

Deliverables: To document the effectiveness of the program, participants are required to submit a pre-appointment and post-appointment survey, as well as a reflection on their appointment experience when they renew or end their appointment. The reflection should summarize their project(s), additional activities, and overall experience. Details are provided as the appointment end date approaches.

Participants may also have the opportunity to contribute to manuscripts, journal articles, book chapters, conference presentations, posters, patents, and other publications as a part of their appointment. Such achievements should also be reported to ORISE; additional details are provided after an offer has been accepted.

The National Energy Technology Laboratory (NETL), part of the U.S. Department of Energy (DOE) national laboratory system, is owned and operated by the DOE. NETL supports the DOE mission to advance the energy security of the United States. This is an educational opportunity offered by NETL and administered by the Oak Ridge Institute for Science and Education. Participants in the program are not considered employees of NETL, DOE, the program administrator, or any other office or agency.

Qualifications To be eligible, you must have received a Doctoral degree within the last five years *or* be currently enrolled in a Doctoral degree program and complete the degree prior to the appointment start date.

Alternative eligibility: you are also eligible to apply for this opportunity if you have completed a Master's degree within the last three years *or* are currently enrolled in a Master's degree program and complete the degree prior to the appointment start date. Post-Master's-level applicants should describe 2+ years of related coursework or other experience in addition to their Bachelor's and Master's coursework within their application materials.

The ideal candidate would have some, but not necessarily all, of the following:

- Advanced degree in Chemical Engineering or closely related field
- Experience in solid-gas systems, e.g., CO₂ capture with solid sorbents
- Experience in building reactor devices with particle or structured sorbents or solid reactants
- Hands-on experience with comfort in assembling various reactor configurations
- Experience testing various reactor configurations

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- Familiarity with
 - Bayesian statistical and other AI analysis techniques to optimize the configuration
 - Python programming language
 - Time series analysis techniques

- Eligibility Requirements**
- **Citizenship:** LPR or U.S. Citizen
 - **Degree:** Master's Degree or Doctoral Degree received within the last 60 months or currently pursuing.
 - **Discipline(s):**
 - **Chemistry and Materials Sciences** ([7](#) 👁)
 - **Computer, Information, and Data Sciences** ([8](#) 👁)
 - **Earth and Geosciences** ([5](#) 👁)
 - **Engineering** ([15](#) 👁)
 - **Environmental and Marine Sciences** ([3](#) 👁)
 - **Mathematics and Statistics** ([5](#) 👁)
 - **Physics** ([4](#) 👁)
 - **Science & Engineering-related** ([1](#) 👁)
 - **Age:** Must be 18 years of age

Affirmation I certify that I attend or attended a regionally accredited college or university and:

- Have an earned a Doctoral degree no more than five years before the date of application.
- OR
- Have earned a Master's degree no more than three years before the date of application.
- OR
- Will receive a Doctoral or Master's degree by the appointment start date