Opportunity Title: Engineering: Computational Fluid Dynamics
Opportunity Reference Code: ERDC-CHL-2025-0004

Organization U.S. Department of Defense (DOD)

Reference Code ERDC-CHL-2025-0004

How to Apply Click on *Apply* now to start your application.

Application Deadline 5/16/2025 3:00:00 PM Eastern Time Zone

Description The U.S. Army Engineer Research and Development Center's Coastal & Hydraulics Laboratory (CHL) performs research on ocean, estuarine, riverine, and watershed systems in support of the U.S. Army Corps of Engineers (USACE) and the Department of Defense (DOD). A multi-disciplinary team of scientists, engineers, and support personnel work in CHL's internationally known, unique facilities. This team has developed state-of-the-art experimental and computational models for solving water resource problems worldwide. CHL research and development addresses water resource and navigation challenges in a variety of hydrodynamic systems including aquifers, watersheds, rivers, reservoirs, lakes, estuaries, harbors, coastal inlets, and wetlands. Physical facilities of approximately 1.7 million square feet and high-performance computing facilities at the DOD Supercomputing Research Center.

What will I be doing?

Under the guidance of a mentor, you will research on advanced numerical modeling techniques to address fluid dynamics challenges in riverine and coastal environments. This research will focus on enhancing simulation capabilities used to model riverbank stability, particularly in the context of the Adaptive Hydraulics (AdH) framework, as well as advancing high-fidelity computational fluid dynamics (CFD) methods for free-surface and multiphase flow simulations. Activities may include improving and testing numerical schemes for solving fluid-structure interaction problems, with a focus on high-resolution modeling of fluid flows interacting with natural features such as riverbanks. You will contribute to the development of discretization techniques, the implementation of efficient solvers, and the refinement of stability criteria for complex flow conditions. Research will involve both theoretical analysis and computational work, including validation against experimental data and application to real-world scenarios.

Additionally, you will have the opportunity to advance CFD methods, exploring cutting-edge techniques such as turbulence modeling, interface tracking, and solution acceleration, which are relevant to both riverine and broader fluid dynamics applications. Collaboration with interdisciplinary teams will provide exposure to a range of problems related to water resources, environmental sustainability, and engineering challenges. This project will offer you hands-on experience in numerical modeling, scientific computing, and solver development, allowing you to leverage your background in fluid dynamics and computational methods while contributing to meaningful research within a national laboratory setting.

Why should I apply?

This fellowship provides the opportunity to independently utilize your skills and engage with experts in innovative ideas to move the proposed research forward.

Where will I be located? Vicksburg, Mississippi

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What is the anticipated start date? June 2025

Exact start dates will be determined at the time of selection and in coordination with the selected candidate.

What is the appointment length?

This appointment is a full-time twelve-month research appointment. Appointments may be extended depending on funding availability, project assignment, program rules, and availability of the participant.

What are the appointment provisions?

You will receive a stipend to be determined by ERDC-CRREL. Stipends are typically based on a participant's academic standing, discipline, experience, and research facility location. Other provisions may include the following:

- Health Insurance Supplement (*Participants are eligible to purchase health insurance through ORISE)*
- Relocation Allowance
- Training and Travel Allowance

About ORISE

This program, administered by Oak Ridge Associated Universities (ORAU) through its contract with the U.S. Department of Energy (DOE) to manage the Oak Ridge Institute for Science and Education (ORISE), was established through an interagency agreement between DOE and DoD. Participants do not enter into an employee/employer relationship with ORISE, ORAU, DoD or any other office or agency. Instead, you will be affiliated with ORISE for the administration of the appointment through the ORISE appointment letter and Terms of Appointment. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE. For more information, visit the ORISE Research Participation Program at the U.S. Department of Defense.

Qualifications

The ideal candidate will have skills and knowledge in researching with computational fluid dynamic software. Numerical modeling or engineering background is preferred.

Application Requirements

A complete application consists of:

- Zintellect Profile
- Educational and Employment History
- Essay Questions (goals, experiences, and skills relevant to the opportunity)
- Resume (PDF)
- Transcripts/Academic Records - Please upload a copy of a transcript for your current or most recent degree program that meets the disciplinary qualifications of the opportunity. Click here for detailed information about acceptable transcripts.
- One recommendation. We encourage you to contact your recommender(s) as soon as you start your application to ensure they are able to complete the recommendation form and to let them know to expect a message from Zintellect. Recommenders will be asked to rate your scientific capabilities, personal

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characteristics, and describe how they know you. You can always log back in to your Zintellect account and check the status of your application.

Submitted documents must have all social security numbers, student identification numbers, and/or dates of birth removed (blanked out, blackened out, made illegible, etc.) prior to uploading into the application system. All documents must be in English or include an official English translation. If you have questions, send an email to USACE@orise.orau.gov. Please list the reference code of this opportunity in the subject line of the email. Please understand that ORISE does not review applications or select applicants; selections are made by the sponsoring agency identified on this opportunity. All application materials should be submitted via the “Apply” button at the bottom of this opportunity listing. Please do not send application materials to the email address above.

Connect with ORISE...on the GO! Download the new ORISE GO mobile app in the Apple App Store or Google Play Store to help you stay engaged, connected, and informed during your ORISE experience and beyond!

Point of Contact Debbie

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Associate's Degree, Bachelor's Degree, Master's Degree, or Doctoral Degree received within the last 60 months or currently pursuing.
- **Minimum Overall GPA:** 3.00
- **Discipline(s):**
  - **Engineering** (11 👁)
- **Age:** Must be 18 years of age