Opportunity Title: Fluid Dynamics Application Modeler
Opportunity Reference Code: EPA-NSSC-0007-77

Organization U.S. Environmental Protection Agency (EPA)

Reference Code EPA-NSSC-0007-77

How to Apply Click HERE to apply.

Description The EPA National Student Services Contract has an immediate opening for a full time Fluid Dynamics Application Modeler position with the Office of Research and Development at the EPA facility in Research Triangle Park, NC.

The Office of Research and Development at the EPA supports high-quality research to improve the scientific basis for decisions on national environmental issues and help EPA achieve its environmental goals. Research is conducted in a broad range of environmental areas by scientists in EPA laboratories and at universities across the country.

What the EPA project is about

The Center for Environmental Measurement and Modeling (CEMM) conducts research to advance the Agency's ability to measure and model contaminants in the environment, including research to provide fundamental methods and models needed to implement environmental statutes. Within CEMM, the Air Methods and Characterization Division (AMCD) develops, evaluates and applies advanced laboratory and field methods to measure, characterize, and analyze concentrations of pollutants in the air and at various emission sources.

As part of their mission, AMCD supports EPA's mission to protect human health and the environment by developing and applying methods to measure new chemicals and minimize their environmental impact. One group of chemicals, Per- and polyfluoroalkyl substances (PFAS), are a group of man-made chemicals that includes PFOA, PFOS, GenX, and many other chemicals. PFAS have been manufactured and used in a variety of industries around the globe, including in the United States since the 1940s. PFOA and PFOS have been the most extensively produced and studied of these chemicals. Both chemicals are very persistent in the environment and in the human body – meaning they don't break down and they can accumulate over time. There is evidence that exposure to PFAS can lead to adverse human health effects.

What experience and skills will you gain?

As a team member, you will provide modelling execution, laboratory support, data management, data visualization, and data analysis support for the study of PFAS in the environment and the success of various destruction techniques for PFAS-containing wastes. The model in question is a 3-D reacting flow model that includes the chemical mechanism for thermal decomposition of various PFAS compounds and their combustion by-products. This model, the Configured Fireside Simulator (CFS), contains modules for 2 EPA pilot-scale research combustors and 3 commercial

combustion facilities. CFS uses innovative computational techniques to run these 3D-reacting flow simulations on a standard PC in a reasonable amount of time (e.g., several hours). CFS uses thermodynamic and kinetic data in the Chemkin format. The team member will provide model execution, laboratory support, database management, file management, data curation and extraction, quality control, as well as performing qualitative and quantitative data analysis. The team member will collaborate with an EPA team of investigators who are identifying PFAS emissions from various sources.

Model Execution, Laboratory Support, Data Development and Analysis responsibilities will include:

- Applying creativity and intellect to solve complex problems and generate ideas for further investigation;
- Engaging with EPA's PFAS Thermal Treatment laboratory team to facilitate preparation of EPA's CFS model for modeling scenarios corresponding to laboratory experiments and potential field tests at full-scale facilities;
- Executing and interpreting output of EPA's CFS model, a combined computational fluid dynamics and kinetic modeling package;
- Developing and interpreting large multivariate datasets (~thousands of observations per sample) (e.g., searching for trends, relevancies, patterns, etc. in "-omics data");
- Generate reports and visualizations of model outputs via CFS for evaluation of model performance versus experimental measurements; Other laboratory support tasks; and
- Ensuring activities are in compliance with EPA ORD quality assurance (QA) requirements.

Communications-related responsibilities will include:

- Participating as a member of a PFAS research team;
- Interacting with other members of the research team as well as collaborating closely with other EPA scientists who are experts in engineering, chemistry, biology, pharmacokinetics, biological modeling, survey statistics, and risk assessment for supporting regulatory decision-making;
- Interacting with EPA's external research partners to coordinate efforts;
- Documenting methods and efforts;
- Presenting work performed at professional meetings or scientific conference as required; and
- Helping to prepare quality assurance project plans (QAPPs), operating procedures, presentations, EPA reports, conference papers, or manuscripts for publication in peer-reviewed journals.

Required Knowledge, Skills, Work Experience, and Education

- Demonstrated education and/or experience in fluid dynamics and chemical kinetics;

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- Prior experience with any computation fluid dynamics post processing software (for example: Paraview, Ansys Fluent, Tecplot);
- Demonstrated ability to interpret data and develop models to pose and test hypotheses; and
- Strong written, oral, and electronic communication skills.

Desired Knowledge, Skills, Work Experience, and Education

- Experience with Paraview is preferred;
- Prior experience with Chemkin and/or Cantera for kinetic modeling; and
- Experience in R and/or Python programming languages.

Location: This job will be located EPA's facility in Research Triangle Park, NC.

Salary: Selected applicant will become a temporary employee of ORAU and will receive an hourly wage of $30.76 for hours worked.

Hours: Full-time.

Travel: Occasional overnight travel may be required.

Expected start date: The position is full time and expected to begin October 2022. The selected applicant will become a temporary employee of ORAU working as a contractor to EPA. The contract renews each May through 2025.

For more information, contact EPANSSC@orau.org*. Do not contact EPA directly.*

Qualifications

- Be at least 18 years of age **and**
- Have earned at least a Master degree in the fields of mechanical engineering, chemical engineering, environmental engineering, chemistry, applied mathematics, polymer engineering, biochemistry, computational chemistry/biology, polymer chemistry, environmental chemistry, chemo-informatics or a related field from an accredited university or college within the last 24 months **and**
- Be a citizen of the United States of America or a Legal Permanent Resident.

EPA ORD employees, their spouses, and children are not eligible to participate in this program.

Eligibility Requirements

- **Citizenship:** LPR or U.S. Citizen
- **Degree:** Master's Degree received within the last 24 month(s).
- **Overall GPA:** 2.00
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (4 👁)
  - **Engineering** (4 👁)
  - **Mathematics and Statistics** (1 👁)

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Affirmation I certify that I am at least 18 years of age; a recent graduate with at least a Master degree in the fields of mechanical engineering, chemical engineering, environmental engineering, chemistry, applied mathematics, polymer engineering, biochemistry, computational chemistry/biology, polymer chemistry, environmental chemistry, chemo-informatics or a related field from an accredited university or college within the last 24 months; a citizen or a Legal Permanent Resident of the United States of America; and not a current employee of EPA ORD or the spouse or child of an EPA ORD employee.

Click HERE to apply.

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