Opportunity Title: EPA Fellowship on Modeling Chemical Process Environmental Releases and Exposures
Opportunity Reference Code: EPA-ORD-CESER-LRTD-2023-05

Organization U.S. Environmental Protection Agency (EPA)

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

A complete application consists of:

- An application
- Transcript(s) – For this opportunity, an unofficial transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted. All transcripts must be in English or include an official English translation. 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. Click here for detailed information about recommendations.

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

Application Deadline 3/1/2024 11:59:00 PM Eastern Time Zone

Description ***Applications may be reviewed on a rolling-basis and this posting could close before the deadline.** Click **here** for information about the selection process.

EPA Office/Lab and Location: Two research opportunities are currently available at the Environmental Protection Agency (EPA), Office of Research and Development (ORD), Center for Environmental Solutions and Emergency Response (CESER), Land Remediation and Technology Division (LRTD) located in Cincinnati, Ohio

Research Project: This research training opportunity will focus on modeling and methods to support the rapid estimation of chemical releases and exposures for chemical safety. This effort can have many facets, one of which is to develop methods to rapidly estimate chemical releases for manufacturing, processing, and using chemicals in models known as generic exposure scenarios. Generic exposure scenarios are equation-based models that describe the release of a chemical during a well-defined industrial activity or set of activities. The rapid estimation of chemical releases expands the system of interest beyond the equipment to worker exposure and ambient environments. This research project will answer questions about the amount and concentration of a chemical predicted to be in environmental exposure pathways such as water releases, indoor air, on surfaces, etc.

Modeling can include engineering approximations to equipment operation and release processes, estimating model inputs, and determining relationships between inputs and result uncertainty. Methods of collecting data from EPA databases and through automated data scraping will be developed based on model needs. Computer-based statistical methods will

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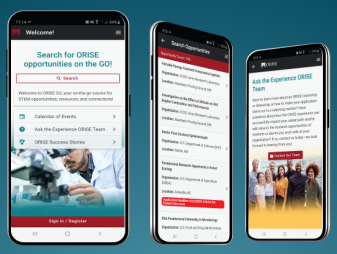

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be applied as fit for purpose, including machine learning techniques for clustering, classification, and regression. Development of a database and its use in predicting releases will be used as appropriate to extrapolate beyond the specific chemicals and circumstances studied in equation-based modeling.

The research participant will collaborate with scientific staff on the rapid estimation of releases and exposures.

Under the guidance of a mentor, research activities may include:

- Manufacturing process modeling, chemical use modeling, mass transfer modeling
- Modeling input estimation, uncertainty analysis, data source identification and data collection
- Statistics, computer programming, artificial intelligence, machine learning, knowledge discovery and data mining
- Prediction of chemical releases and concentrations for exposure and risk assessment purposes
- Contributing to the preparation of peer-reviewed journal articles and disseminating research results to project partners, stakeholders, and the research community
- Presenting research at regional, national, and/or international conferences and workshops

Learning Objectives: The research participant will be afforded the opportunity to collaborate with internationally recognized leaders, both within and outside the EPA, in chemistry, engineering, and the environment. The research participant will have the opportunity to publish original research. It is expected that this research training opportunity will provide an early career scientist with knowledge, skills, and abilities needed to apply new technologies and associated data to applied engineering, industrial hygiene / exposure, and environmental decision-making contexts and to pursue a professional career in engineering / applied sciences research.

Mentor(s): The mentor for this opportunity is Raymond Smith (smith.raymond@epa.gov). If you have questions about the nature of the research please contact the mentor(s).

Anticipated Appointment Start Date: February 1, 2024. All start dates are flexible and vary depending on numerous factors. Click **here** for detailed information about start dates.

Appointment Length: The appointment will initially be for one year and may be renewed up to three or four additional years upon EPA recommendation and subject to availability of funding.

Level of Participation: The appointment is full-time.

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Participant Stipend: The participant will receive a monthly stipend commensurate with educational level and experience. Click **here** for detailed information about full-time stipends.

EPA Security Clearance: Completion of a successful background investigation by the Office of Personnel Management (OPM) is required for an applicant to be on-boarded at EPA.

ORISE Information: This program, administered by 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 EPA. Participants do not become employees of EPA, DOE or the program administrator, and there are no employment-related benefits. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE.

ORISE offers all ORISE EPA graduate students and Postdocs a free 5 year membership to the National Postdoctoral Association (NPA).

The successful applicant(s) will be required to comply with Environmental, Safety and Health (ES&H) requirements of the hosting facility, including but not limited to, COVID-19 requirements (e.g. facial covering, physical distancing, testing, vaccination).

Questions: Please see the FAQ section of our website. After reading, if you have additional questions about the application process please email ORISE.EPA.ORD@orau.org and include the reference code for this opportunity.

Qualifications

The qualified candidate should have received a doctoral degree in one of the relevant fields or be currently pursuing the degree. Degree must have been received within the past five years.

Preferred Skills/Experience:

- Desired background and/or expertise includes process and fate & transport modeling, chemical industrial/occupational hygiene, data mining, statistics, machine learning, computer programming, and mathematics.
- Knowledge of factor analysis / least-squares statistics, methods such as base-case ratios / dimensionless quantities, and a desire to work on environmental problems is a minimum requirement.

Eligibility Requirements

- **Degree:** Doctoral Degree received within the last 60 months or currently pursuing.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (2 👁)
  - **Computer, Information, and Data Sciences** (3 👁)
  - **Engineering** (7 👁)
  - **Environmental and Marine Sciences** (2 👁)
  - **Life Health and Medical Sciences** (4 👁)
  - **Mathematics and Statistics** (11 👁)
  - **Other Non-Science & Engineering** (2 👁)

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- **Physics** (1 👁)

Affirmation I have lived in the United States for at least 36 out of the past 60 months. (36 months do not have to be consecutive.)