Opportunity Title: EPA Improving Atmospheric Chemical Mechanisms Fellowship
Opportunity Reference Code: EPA-ORD-CEMM-AESMD-2022-02

Organization	U.S. Environmental Protection Agency (EPA)
Reference Code	EPA-ORD-CEMM-AESMD-2022-02

ORISE

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

6/20/2022 3:00:00 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: A research opportunity is available at the Environmental Protection Agency (EPA), Office of Research and Development (ORD), Center for Environmental Measurement and Modeling (CEMM), Atmospheric and Environmental Systems Modeling Division (AESMD) located in Research Triangle Park, North Carolina.

Scientists in the CEMM AESMD develop and apply multi-scale comprehensive atmospheric systems to study various aspects of air pollution.

Research Project: This research project will involve developing scientific hypotheses and performing data analysis to investigate how organic compounds as well as their oxidation products evolve in the atmosphere. This research project has the potential to inform chemical transport model methodologies and/or to identify priority areas for development of mechanisms.

Anthropogenic activity releases chemicals into the air that can directly affect human health or react and transform into secondary products with health impacts. EPA develops tools in support of clean air and chemical safety regulation to mitigate human health impacts of emissions to air. Specifically, EPA's Office of Research and Development develops the state-of-the-science Community Multiscale Air Quality (CMAQ) model (https://www.epa.gov/cmaq). This chemical transport model represents the lifecycle of organic and inorganic compounds from release into the atmosphere, through chemical and physical processing, to removal by deposition. This framework allows for predictions of ambient concentrations of criteria pollutants such as ozone and fine particles (PM2.5) as well as hazardous air pollutants (HAPs) and chemicals of concern such as those from volatile chemical products.

A critical component of any air quality model is the representation of atmospheric chemistry in the chemical mechanism. A chemical mechanism uses surrogate compounds to parameterize the full complexity of tropospheric chemistry. Mechanisms are expected to perform well in predicting ozone and PM2.5 under a variety of conditions including urban and remote, near surface and free troposphere, and winter and summer. Mechanisms were traditionally designed to capture ozone formation and species of emerging concern or important for secondary organic aerosol (SOA) are often neglected or treated in a way that is disconnected from the gas phase. Updated mechanisms are needed. As a result, EPA is leading development of a new chemical mechanism, the Community Regional Atmospheric Chemistry Multiphase Mechanism (CRACMM,

Opportunity Title: EPA Improving Atmospheric Chemical Mechanisms
Fellowship
Opportunity Reference Code: EPA-ORD-CEMM-AESMD-2022-02

Fact sheet available: https://www.epa.gov/cmaq/cmaq-fact-sheets).

Under the guidance of a mentor, the research participant may be involved in the following research activities:

- Determination of chemical reaction products
- Box modeling
- Emission inventory analysis
- Regional chemical transport modeling with CMAQ
- Interpretation of field and laboratory data

Learning Objectives: The research participant will have the opportunity to learn how information flows from emission inventories through chemical mechanisms to policy analysis. The research participant will collaborate with a team of internal and external researchers and balance detail and computational efficiency in algorithm development. The research participant may have the opportunity to participate in conferences to present ORISE research project results.

Mentor(s): The mentor(s) for this opportunity is Havala Pye (pye.havala@epa.gov). If you have questions about the nature of the research please contact the mentor(s).

Anticipated Appointment Start Date: September 1, 2022. 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 three months and may be renewed up to one year upon EPA recommendation and subject to availability of funding.

Level of Participation: The appointment is full-time.

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 be currently pursuing or have received an associate's, bachelor's, master's, or doctoral degree in one of the relevant fields. Degree must have been received within five years of the appointment start date.

Preferred skills:
- Knowledge of a data processing/data analysis language (MATLAB, R, Fortran, Python, etc)

Opportunity Title: EPA Improving Atmospheric Chemical Mechanisms
Fellowship
Opportunity Reference Code: EPA-ORD-CEMM-AESMD-2022-02

- Familiarity with chemical transport modeling is not necessary. Participant will learn about the Community Multiscale Air Quality (CMAQ) model and how different aspects of atmospheric science (field, laboratory, and modeling work) interact
- Familiarity with atmospheric chemistry fundamentals or computational methods

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.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12 👁)
  - **Computer, Information, and Data Sciences** (17 👁)
  - **Earth and Geosciences** (21 👁)
  - **Engineering** (27 👁)
  - **Environmental and Marine Sciences** (14 👁)
  - **Life Health and Medical Sciences** (48 👁)
  - **Mathematics and Statistics** (11 👁)
  - **Physics** (16 👁)