

Opportunity Title: EPA Fellowship for Network Models of Exposure Data to Support Exposure Forensics and Non-Targeted Analysis

Opportunity Reference Code: EPA-ORD-CCTE-CCED-2022-04

Organization U.S. Environmental Protection Agency (EPA)

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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.

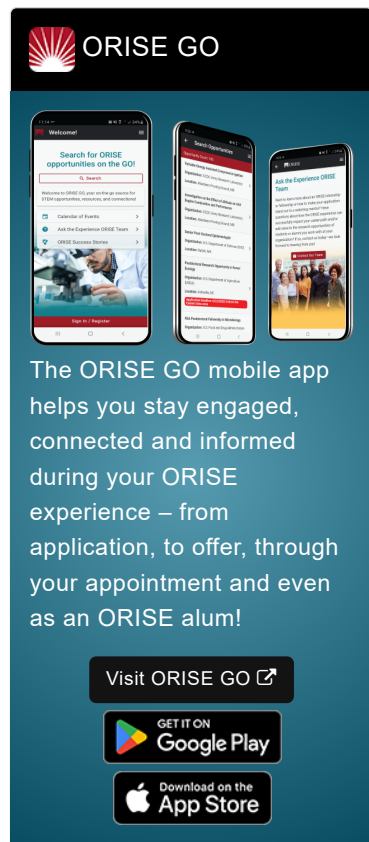
All documents must be in English or include an official English translation.

Application Deadline 12/26/2022 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 Computational Toxicology and Exposure (CCTE), Chemical Characterization & Exposure Division (CCED) located in Research Triangle Park, North Carolina.

Research Project: The EPA Center for Computational Toxicology and Exposure (CCTE) is responsible for developing new computational tools and providing quantitative analysis for improving public health and environmental risk assessments and regulatory decisions pertaining to chemical safety. The research participant will collaborate on developing computational models and databases that support the interpretation new non-targeted analysis (NTA) data. NTA technologies and supporting data analysis platforms hold great potential for identifying thousands of chemicals in environmental and biological samples. High-value applications of NTA include screening priority environmental samples to identify unknown or uncharacterized exposure sources (including those encountered by underrepresented or susceptible subpopulations). However, challenges in both identifying unknown molecular features in NTA and linking identified chemical substances with upstream exogenous sources must be addressed. Relationships that inform identification of unknown features and upstream exposure sources in NTA may include co-occurrence of chemicals within source (for example, within individual consumer products or product categories), within known environmental or industrial releases (for example, within chemical facilities, industries, or geographic



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regions), within previously-analyzed media samples (for example, water, air, biological media), or within receptors (for example, within individuals or populations).

The research participant will be a part of a multidisciplinary research team including scientists at in EPA's Office of Research and Development and partners in EPA's program offices. The research participant will be mentored by Dr. Kristin Isaacs. Collaborating research contributors will include investigators from CTE.

Learning Objectives: The research participant could be involved in the following research activities to characterize and explore these relationships and apply them to the analysis of NTA results:

- Performing statistical or other computational analyses of EPA data to identify existing relationships among chemicals and sources
- Developing new models and data schema for capturing and querying chemical co-occurrence relationships
- Developing network models for defining relationships among exposure pathway components
- Developing approaches and tools for visualizing relationships among chemicals with respect to exposure pathway or source
- Performing reviews of literature or other available data to support research hypotheses and results
- Developing conference presentations, reports, publications describing scientific activities and results.

Mentor(s): The mentor(s) for this opportunity is Kristin Isaacs (isaacs.kristin@epa.gov). If you have questions about the nature of the research please contact the mentor(s).

Anticipated Appointment Start Date: **October 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 one year and may be renewed up to three to four additional years 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

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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 (e.g. Chemical Engineering, Biomedical Engineering, Statistics, Physics, Chemistry, Mathematics, Exposure Science, Computer Science). Degree must have been received within five years of the appointment start date.

Preferred Skills:

- Significant programming experience (e.g. in Python R, Matlab, or other language) is highly desirable.
- Experience developing computational algorithms and codes for solving scientific problems is highly desirable.
- Experience with network modelings or other statistical data modeling approaches (such as advanced classification and regression tools, machine learning, or quantitative structure-activity relationship models), or experience with analytical chemistry data would be helpful.

- Eligibility Requirements**
- **Citizenship:** U.S. Citizen Only
 - **Degree:** Doctoral Degree received within the last 60 month(s).
 - **Discipline(s):**
 - **Chemistry and Materials Sciences** ([12](#) )
 - **Computer, Information, and Data Sciences** ([1](#) )
 - **Earth and Geosciences** ([2](#) )
 - **Engineering** ([27](#) )
 - **Environmental and Marine Sciences** ([2](#) )
 - **Life Health and Medical Sciences** ([6](#) )
 - **Mathematics and Statistics** ([11](#) )
 - **Physics** ([16](#) )