

**Opportunity Title:** EPA Air Quality Modeling Fellowship  
**Opportunity Reference Code:** EPA-ORD-CEMM-AESMD-2020-10-A

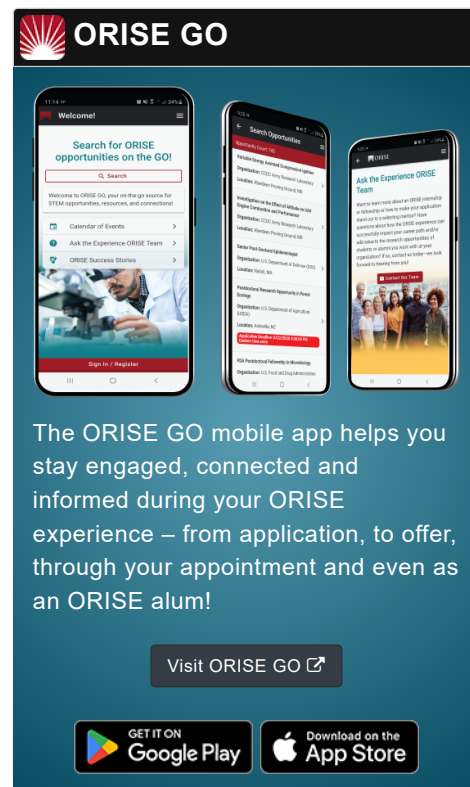
<b>Organization</b>	U.S. Environmental Protection Agency (EPA)
<b>Reference Code</b>	EPA-ORD-CEMM-AESMD-2020-10-A
<b>How to Apply</b>	<p><b>Connect with ORISE...on the GO!</b> Download the new ORISE GO mobile app in the <a href="#">Apple App Store</a> or <a href="#">Google Play Store</a> to help you stay engaged, connected, and informed during your ORISE experience and beyond!</p> <p>A complete application consists of:</p> <ul style="list-style-type: none"> <li>• An application</li> <li>• 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 <a href="#">here</a> for detailed information about acceptable transcripts.</li> <li>• A current resume/CV, including academic history, employment history, relevant experiences, and publication list</li> <li>• Two educational or professional recommendations. Click <a href="#">here</a> for detailed information about recommendations.</li> </ul> <p>All documents must be in English or include an official English translation.</p>
<b>Application Deadline</b>	5/1/2021 3:00:00 PM Eastern Time Zone
<b>Description</b>	<p><b>*Applications may be reviewed on a rolling-basis and this posting could close before the deadline.</b> Click <a href="#">here</a> for information about the selection process.</p>


**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), Atmospheric Chemistry and Aerosols Branch (ACAB) located in Research Triangle Park, North Carolina.

**Research Project:** The focus of this research project is updating the Regional Atmospheric Chemistry Mechanism version 2 (RACM2) to include recent advances in chemical reactions such as those for halogen species, organic nitrate, and secondary aerosols.

The Community Multiscale Air Quality (CMAQ) modeling system, developed and maintained by the U.S. Environmental Protection Agency (EPA), is a state-of-the-science three-dimensional chemical transport model widely used in both regulatory and research applications. It simulates the impacts of emissions, chemistry, and physics of the atmosphere on air quality. The current version of the model (CMAQv53) contains three different gas-phase chemical mechanisms: Carbon Bond, State Air Pollution Research Center (SAPRC) chemical mechanism, and









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the Regional Atmospheric Chemistry Mechanism (RACM). A user may choose any of the three chemical mechanisms in CMAQ for simulating the effect of gas-phase atmospheric chemistry on air quality. The first version of the RACM was developed in 1997. The second version of the RACM (RACM2) mechanism was developed in 2013, consists of 363 chemical reactions, and can simulate remote to polluted conditions of the atmosphere. RACM2 was first incorporated into CMAQv5.1 and has been included in subsequent CMAQ releases. However, the mechanism in the released version of CMAQ has not been updated in the last few years and lags behind several updates in other chemical mechanisms.

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

- Performing model simulations with the original and the updated RACM2
- Conducting analysis and comparing model results with available observed data
- Presenting results of the research efforts at a conference
- Preparing article describing the research results for publishing in a peer-reviewed journal article

**Learning Objectives:** The research participant will have the opportunity to gain knowledge by collaborating with a diverse, multidisciplinary team of EPA researchers. Through regular interactions with this team, the research participant will gain insight into the CMAQ modeling system. Specifically, one of the three different gas-phase chemical mechanisms - RACM2. The participant will learn to perform model simulations with the original and the updated RACM2, perform analysis, and compare model results with available observed data. The research participant will have an opportunity to communicate their findings through publication of manuscripts and participation in scientific conferences. The research participant is encouraged to collaborate on writing of manuscripts for publication and project reports.

**Mentor(s):** The mentor for this opportunity is Golam Sarwar ([sarwar.golam@epa.gov](mailto:sarwar.golam@epa.gov)). If you have questions about the nature of the research please contact the mentor(s).

**Anticipated Appointment Start Date:** Winter/Spring 2021. 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

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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.

**Questions:** Please see the [FAQ section](#) of our website. After reading, if you have additional questions about the application process please email [EPArpp@ornl.gov](mailto:EPArpp@ornl.gov) 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 a the degree with completion by May 2021. Degree must have been received within five years of the appointment start date.

Preferred skills:

- Excellent written and oral communication skills
- Experience in atmospheric chemistry modeling
- Experience working in high performance computing environments
- Experience with chemical transport models (e.g. the CMAQ model, or the Weather Research and Forecasting model coupled with chemistry (WRF-Chem))
- Proficiency in Fortran and data analysis languages such as R or Python
- Experience with file management systems and repository hosting services such as Git and its repository hosting services

## Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree received within the last 60 months or anticipated to be received by 5/7/2021 11:59:00 AM.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12 )
  - **Earth and Geosciences** (21 )
  - **Engineering** (27 )
  - **Environmental and Marine Sciences** (14 )
  - **Mathematics and Statistics** (10 )
  - **Physics** (16 )
- **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).