Opportunity Title: Effect of Aerosol Particle Morphology on Reaction Dynamics
Opportunity Reference Code: ICPD-2023-29

Organization Office of the Director of National Intelligence (ODNI)

Reference Code ICPD-2023-29

How to Apply

Create and release your Profile on Zintellect – Postdoctoral applicants must create an account and complete a profile in the on-line application system. **Please note: your resume/CV may not exceed 2 pages.**

Complete your application – Enter the rest of the information required for the IC Postdoc Program Research Opportunity. The application itself contains detailed instructions for each one of these components: availability, citizenship, transcripts, dissertation abstract, publication and presentation plan, and information about your Research Advisor co-applicant.

Additional information about the IC Postdoctoral Research Fellowship Program is available on the program website located at: https://orise.orau.gov/icpostdoc/index.html.

If you have questions, send an email to ICPostdoc@orau.org. Please include the reference code for this opportunity in your email.

Application Deadline 2/28/2023 6:00:00 PM Eastern Time Zone

Description

Research Topic Description, including Problem Statement:

The properties and dynamics of mixed aerosol particles depend on their phase, chemical composition, and morphology. The rates of reactions strongly depend on whether the condensed-phase reacting substances are available on the particle surface or obscured by non-reactive substances, or fully encapsulated by a protective shell. In particular, the chemical and physical processes associated with secondary organic aerosol (SOAs) formation are complex and varied with several knowledge gaps remaining. SOAs account for a significant fraction of ambient aerosols and so an understanding of their formation, properties, and dynamics is needed to address both climate change and human health. Additionally, accurate identification of aerosols in complex environments is vital to national security as many chemical threats are, or could be, delivered as aerosols. Understanding the role of particle morphology in the properties and dynamics of aerosols is critical to assessing threats in a timely manner. This solicitation seeks an approach for characterizing the morphology of aerosol particles to study how that effects chemical reaction dynamics and physical changes.

Example Approaches:

The focus of this effort is on developing an understanding of the role morphology plays in reaction dynamics of particle mixtures. Approaches may include experimental methods and/or computational approaches (compared to available experimental data for validation wherever possible). Relevant data and techniques may include aerosol mass spectrometry, electron resonance spectroscopy, photochemical aging processes, or other approaches. Variables to be considered include chemical composition, temperature variation, humidity levels, and particle formation methods.

Relevance to the Intelligence Community (IC):

Develop/enhance capabilities to detect and identify chemical agents, and associated delivery systems. Develop/enhance capabilities to rapidly characterize the release of chemical, biological, radiological, nuclear, and/or related hazardous materials. Develop/enhance capabilities to conduct detailed sampling and chemical analysis across all states of matter.

Qualifications

Postdoc Eligibility

- U.S. citizens only

Opportunity Title: Effect of Aerosol Particle Morphology on Reaction Dynamics
Opportunity Reference Code: ICPD-2023-29

- Ph.D. in a relevant field must be completed before beginning the appointment and within five years of the application deadline
- Proposal must be associated with an accredited U.S. university, college, or U.S. government laboratory
- Eligible candidates may only receive one award from the IC Postdoctoral Research Fellowship Program

Research Advisor Eligibility

- Must be an employee of an accredited U.S. university, college or U.S. government laboratory
- Are not required to be U.S. citizens

Key Words: Aerosols, Environmental Science, Chemistry, Physical Chemistry, Physics, Kinetics, Thermodynamics, Microphysics

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12 👁)
  - **Communications and Graphics Design** (6 👁)
  - **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 👁)
  - **Other Non-Science & Engineering** (2 👁)
  - **Physics** (16 👁)
  - **Science & Engineering-related** (1 👁)
  - **Social and Behavioral Sciences** (29 👁)