Opportunity Title: Sustainable Distributed High-Value Chemical Manufacturing from Waste Greenhouse Gases
Opportunity Reference Code: DOE-MSIPP-23-2-INL

Organization U.S. Department of Energy (DOE)

Reference Code DOE-MSIPP-23-2-INL

How to Apply A complete application consists of the following:

- An online application completed through Zintellect
- Completed references
- Undergraduate and graduate transcripts (uploaded as part of the application)

Description

About EM Graduation Fellowship Program

The EM Graduate Fellowship Program (EMGFP), under the Department of Energy Office of Environmental Management's Minority Serving Institutions Partnership Program, is designed to provide science and engineering students and graduates from Minority Serving Institutions (MSIs) an opportunity for training and mentorship in targeted technical areas of interest and needs of the DOE-EM workforce.

Technical Areas of Interest for the fellowship will span across a range of topics, including:

- Environmental Remediation and Stewardship
- Nuclear Materials Processing and Disposition
- Cyber Security
- Advance Manufacturing
- Climate Change
- Deactivation & Decommissioning
- Robotics
- Artificial Intelligence

The desired outcome of the program is to develop exceptional graduate students into future leaders who pursue careers at the DOE, DOE National Laboratories, DOE Contractors, other federal agencies, or STEM related industry.

The year-long,paid fellowship will:

- Offer specialized training, leadership development, and professional networking.
- Provide extensive interaction and collaboration with leading DOE National Laboratory researchers, scientists, and engineers.
- Provide hands-on field research experience that could lead to a potential career opportunity within the DOE Complex.
- Stimulate the potential for an increase of minority students entering STEM careers at the graduate level.

Important Dates

- December 31, 2022 - Application deadline
- June 1, 2023 - Fellowship start date
- May 31, 2024 - Fellowship end date

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Fellowship Benefits

- Stipend
  - Master's in Progress - $60,000
  - Post-Master's - $72,000
- Training and associated travel allotment - $10,000/Fellow
- Onboarding incentive - $4,000/Fellow
- Professional trips allotment - $5,000/Fellow
- Comprehensive benefits for limited term employees
- Engagement with DOE-EM
- Professional development and networking opportunities

Important Information

- Telework is not available for this fellowship
- Housing and transportation are not provided

Project Description

The fellowship scope fits right in the alley of specialized training on catalysis science for energy and environmental applications. A year of hands-on experience on temporal analysis of products (TAP) reactor, and fundamental catalysis/chemical reaction engineering insights gained through collaborative research environment will prepare the fellow for a promising STEM career either on academic or industrial fronts. The fellowship allows for collaboration and professional networking with top-tier U.S. research universities, National Laboratories, and some of the leading professionals in the chemical industry. The fellowship includes: (a) Exhaustive training on safe conduct of research and designing work controls in a U.S. National Laboratory setting. (b) Hands-on training on Temporal Analysis of Products (TAP) reactor – currently the only one in the United States that provides advanced dynamic kinetic fingerprints of a catalyst. (c) Conducting TAP experiments for intrinsic kinetic measurements of methane activation on industrial Mo/H-ZSM5 catalysts with key focus on: (i) catalyst induction, reaction, deactivation, and regeneration phases (ii) prolonging catalyst lifetimes by strategic dose of oxidants, (iii) elucidating surface chemistry via isotopic experiments. (d) Performing bench-scale flow reactor experiments and chemisorption studies on pure and dopant-modified Mo/H-ZSM5 catalysts with attention to product yield, turnover frequencies, and selectivity. (e) Use of state-of-the-art data-science and machine learning tools for data analysis. (f) Direct interfacing with scientists with vast experimental and computational expertise for a thorough development on fundamentals of catalysis and chemical reaction engineering. (g) Training on preparation of effective presentations and reports for engaging in collaborative scientific discussions. (h) Dissemination of key research advances (new catalyst formulations, elucidating complex hydrocarbon reaction pathways, dynamic surface chemistry insights) through peer-reviewed publications, open-access journals for broader visibility, patents, and presentations in national and international conferences.

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Qualifications

Program Eligibility:

- Must be a U.S. citizen
- Must be eligible for a security clearance based on position requirements
- Must have earned or be working towards a STEM degree
- Must have graduated from or be enrolled at a Minority Serving Institution
- Education Requirements:
  - 1) Must be enrolled in a graduate program at the time of application AND have a current cumulative GPA of at least 3.0 on a 4.0 scale.
    OR
  - 2) Must have completed a graduate degree program AND must have a final cumulative GPA of at least 3.0 on a 4.0 scale.

Undergraduate cumulative GPA will be considered for applicants who have not officially started their graduate program.

Successful applicants who are pursuing a graduate degree will be expected to prioritize the GFP work assignment and maintain at least a 3.0 GPA. It is highly encouraged that Master's In Progress Fellows enroll in evening, virtual, and/or weekend courses while participating in the GFP.

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Master's Degree.
- **Overall GPA:** 3.00
- **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 👁)

Affirmation

Certification:

I certify that I am at least 18 years of age, a US citizen, and have either graduated from or am currently enrolled as a student in a degree-seeking graduate STEM field program at an accredited Minority Serving Institution (MSI). Click here to verify that you are enrolled or have graduated from a current MSI.