

PREP Research Associate

This position is part of the National Institute of Standards (NIST) Professional Research Experience (PREP) program. NIST recognizes that its research staff may wish to collaborate with researchers at academic institutions on specific projects of mutual interest, thus requires that such institutions must be the recipient of a PREP award. The PREP program requires staff from a wide range of backgrounds to work on scientific research in many areas. Employees in this position will perform technical work that underpins the scientific research of the collaboration.

Research Title: Characterization for rechargeable battery fires

U.S. Citizen Preferred

This work will involve conducting research at different scales to characterize the generation of fires from rechargeable batteries. The researcher will conduct large- and bench-scale fire experiments using characterization technologies, including heat flux gauges, radiometers, thermal imaging cameras, and thermocouples. The goal of these experiments is to determine appropriate methods to characterize the ignition, heat transfer, and heat release rate of rechargeable batteries. In doing so, this work will advance the metrology needed to assess the hazard presented by rechargeable battery fires.

Key responsibilities will include, but are not limited to:

- Conducting experiments to assess the evolution of thermal runaway in a rechargeable battery and the resulting fire,
- Determining methods to collect, process, and analyze data generated from heat flux gauges, radiometers, thermal imaging cameras, and thermocouples,
- Assessing the uncertainty of measurements collected from experiments
- Use modeling tools to simulate the heat transfer of a rechargeable battery as it transitions to thermal runaway
- Presenting results at internal meetings and meetings with external stakeholders,
- Ensuring that results, protocols, software, and documentation have been archived and disseminated in archival journals

Qualifications

- A doctoral degree in Mechanical Engineering, Aerospace Engineering, Chemical Engineering, or Fire Protection Engineering, or a closely related field. The candidate must have a doctoral degree by the start of the appointment, or have a degree confirmation letter stating they have accomplished all requirements to receive the degree
- Expert experience in the following areas:
 - Convective and Radiative heat transfer
 - Heat release rate measurements using a cone calorimeter

- Dynamics of fires generated from battery energy storage systems or electric vehicles
- Familiarity with the use of computational fluid dynamics models (Fire Dynamics Simulator or FireFOAM)
- Demonstrated knowledge of data acquisition systems using National Instruments equipment
- Common scripting languages (Python, Matlab)
- Ability to develop research plans and document research results in journals
- Strong oral and written communication skills.

Privacy Act Statement

Authority: 15 U.S.C. § 278g-1(e)(1) and (e)(3) and 15 U.S.C. § 272(b) and (c)

Purpose: The National Institute for Standards and Technology (NIST) hosts the [Professional Research Experience Program \(PREP\)](#) which is designed to provide valuable laboratory experience and financial assistance to undergraduates, post-bachelor's degree holders, graduate students, master's degree holders, postdocs, and faculty.

PREP is a 5-year cooperative agreement between NIST laboratories and participating PREP Universities to establish a collaborative research relationship between NIST and U.S. institutions of higher education in the following disciplines including (but may not be limited to) biochemistry, biological sciences, chemistry, computer science, engineering, electronics, materials science, mathematics, nanoscale science, neutron science, physical science, physics, and statistics. This collection of information is needed to facilitate administrative functions of the PREP Program.

Routine Uses: NIST will use the information collected to perform the requisite reviews of the applications to determine eligibility, and to meet programmatic requirements. Disclosure of this information is also subject to all the published routine uses as identified in the Privacy Act System of Records Notices: NIST-1: NIST Associates.

Disclosure: Furnishing this information is voluntary. When you submit the form, you are indicating your voluntary consent for NIST to use of the information you submit for the purpose stated.