PREP Research Associate

This position is part of the National Institute of Standards and Technology (NIST) Professional Research Experience Program (PREP). NIST recognizes that its research staff may want to collaborate with researchers at academic institutions on specific projects of mutual interest and, therefore, requires those institutions to be recipients of a PREP award. The PREP program involves staff from a wide range of backgrounds conducting scientific research across various fields. Individuals in this position will perform technical work supporting the collaboration's scientific research.

Research Title: Vibrational micro-spectroscopist for detecting and identifying irregularly shaped particles (U.S. Citizens Preferred)

The work will entail:
The Materials Measurement Laboratory of the National Institute of Standards and Technology (NIST) is seeking qualified persons (U.S. Citizens preferred) to develop analytical tools needed to monitor and characterize micro and nanoplastic (MNP) particles. The applicant will use commercial optical photothermal infrared (OPTIR) microscopy and other vibrational spectroscopy and imaging methods to improve identification of irregularly shaped particles less than 10 μm.

U.S. Citizen Preferred

Key responsibilities will include but are not limited to:

- Develop methods using OPTIR microscopy to characterize nonspherical polymeric particles (<10 μm), including hyperspectral, imaging, and polarization-dependent approaches
- Design and evaluate experimental systems to examine signal origin, measurement artifacts, and depth-dependent compositional relationships in OPTIR with pristine and chemically modified control samples
- Develop performance metric benchmarks for OPTIR measurements that can be used for evaluating data and method transferability to widely used IR-based and Raman techniques
- Contribute to NIST efforts for evaluating and characterizing crystallinity, molecular structure, and composition of candidate reference materials, which include irregularly shaped, polymeric particles and asymmetric materials arrays

<u>Qualifications</u>

- Ph.D degree in physical sciences/materials engineering/chemical engineering
- Expertise in high-resolution chemical mapping of materials and tissues with OPTIR (preferred), Raman, or IR microspectroscopy
- Expertise in multivariate statistical methods used for evaluating vibrational spectroscopy data (OPTIR Preferred), including chemometrics, adapted ML tools, or other applied methods
- Demonstrate successful participation as a member to multidisciplinary research teams

Employment Terms:

This opportunity is to be an associate researcher in the NIST Materials Measurement Science Division for a term of 1 year, with options to renew. Associate researchers are NOT Federal Employees, but they work alongside NIST researchers and with NIST's world class instrumentation. Relocation expenses will not be provided. U.S. Citizens hired into associate positions may have the opportunity to seek longer term Federal Employment.

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.