

**PREP Research Associate
CHIPS Funded Project**

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:

Nanometer-Scale Planar Reference Materials (U.S. Citizens Preferred)

The work will entail:

The Material Measurement Laboratory of the National Institute of Standards and Technology is seeking qualified persons (U.S. Citizens preferred) to join a team of researchers within the NIST/CHIPS Nanometer-Scale Planar Reference Materials project working with advanced metrology methods to characterize local physical and chemical properties and map any variation in these properties of thin, nanometer-scale films deposited on Si (and SiC) wafers. The candidate will measure and analyze these wafers using X-ray and optical methods to determine, through hybrid metrology, structural maps for wafers with thin films of interest to the semiconductor community.

U.S. Citizen Preferred

Key responsibilities will include but are not limited to:

- Plan and conduct research on advanced X-ray metrologies to determine structural (physical and chemical) properties of blanket (non-patterned) thin films on Si and SiC wafers
- Use lab-based and synchrotron X-ray characterization methods, to determine the structural properties of thin film samples
- Use open-source (python) fitting methods to constrain structural models, determine uncertainties, and combine these properties into a hybrid metrology digital wafer
- Perform wafer dicing, cleaning, and packaging of samples for distribution as Research Grade Test Materials
- Publish results in archival scientific journals and present results at topical meetings

Qualifications

- Ph. D in physics, materials science, or another related field
- Background in X-ray measurement technique(s) required, either:
 - X-ray reflectivity, X-ray fluorescence, or X-ray photoelectron spectroscopy
- Background in programming and/or data modeling using python recommended.
- Familiarity with thin film deposition and clean room access protocols, preferred
- 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 the 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. By applying to a CHIPS-funded PREP opportunity, you also acknowledge that participation in the project requires signing a Non-Disclosure Agreement (NDA) prior to beginning any work.