

**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:

Undergraduate research assistant

The work will entail:

The candidate will join a multidisciplinary team of scientists working to advance nondestructive defect detection metrology for advanced semiconductor packaging by developing reference artifacts and benchmark datasets. The candidate will contribute to the design of CAD models, run X-ray computed tomography/laminography (XCT/XCL) simulations, and perform XCT reconstructions to generate datasets. The candidate will support the development of a Python package to help automate these processes. The candidate may contribute to improving the surface meshing and voxel image conversion processes. The datasets will be used to evaluate defect detection and image segmentation algorithms, including those based on deep learning principles.

U.S. Citizen Preferred

Key responsibilities will include but are not limited to:

- Developing a Python package to help automate the creation of CAD models, generation of ground truth images, running XCT/XCL simulation software, and performing XCT reconstructions.
- Updating and maintaining codes in a GitLab repository.
- Using the software developed to create ground truth models and XCT reconstructions of them.
- Optimizing XCT reconstructions through adjustment of image acquisition parameters in the XCT simulation software.

Qualifications

- Current undergraduate student majoring in Computer Science, Engineering, Physics, or a related field.
- Familiarity with Python modular programming and use of configuration files.
- Experience with Git.
- Experience with running X-ray simulation software (e.g., aRTist).
- Experience with image processing and segmentation.

- Able to quickly learn and adapt to new fields or techniques
- 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.