

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:

- Stabilized fiber links for clock comparisons and quantum networks

The work will entail:

- This position involves implementing phase noise cancelation over km-scale fiber links. The project will explore the use of multicore and hollow-core fiber for quantum interconnects, conduct classical-quantum existence studies, and test and implement novel noise cancelation schemes for use in both quantum networks and classical ultrastable optical frequency dissemination. This work involves designing and building low-noise optical interferometers, building phase-locked loops using analog or digital servos, performing phase noise measurements, and characterizing and splicing novel optical fibers. This position involves teamwork within a diverse scientific community, active collaboration with groups within NIST, excellent oral communication, and the generation of written publications.

Key responsibilities will include but are not limited to:

- Establish noise-cancelled fiber links at very low light levels using state-of-the-art methods, measure noise and fully characterize the link.
- Study coexistence of classical and quantum light over novel optical fibers for quantum networks.
- Present results as appropriate at internal meetings, meetings with external stakeholders, and at technical conferences.

Qualifications

- **U.S. Citizen Preferred**
- PhD degree in physics, engineering or related fields
- 3+ years of experience with optical systems
- Preferred: familiarity with fiber optics, fiber link stabilization techniques, ultrastable lasers, phase-locked loops, fiber splicing and characterization, phase noise measurement.
- 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.