

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:

Experimental Quantum Network Metrology, Physicist

The work will entail:

The candidate will work on the NIST campus in Gaithersburg, Maryland, within the Quantum Information Groups (QIG) [Quantum Communication and Networking Project](#), and work with experts at NIST in the field of quantum information, our collaborators in academia and industry, and will have the opportunity to make use of cutting-edge equipment, such as photon-number resolving detectors and extremely high-quality single-photon sources and will be part of and work on the ongoing effort to develop new measurement science and devices for quantum networks, including sources, detectors, memories, transducers, metrology, and protocols. U.S. citizenship is preferred.

U.S. Citizen Preferred

Key responsibilities will include but are not limited to:

- Work with NIST researchers, academia, and industry to develop and test QN components.
- Develop methods and protocols for verification and validation of entanglement links using entangled states of light within the (metropolitan) quantum network testbed.
- Synchronization of network nodes to sub-10 ps levels on metropolitan scales.
- In-situ characterization of fiber-links, *e.g.* polarization, optical path length, loss, noise, etc.
- Calibration and characterization of single-photon detectors and sources.
- Implementation of QN component software agents into QN control manager.
- Prepare high-quality scientific publications on performed work.
- Present results to supervisors, management, stakeholders and conferences.

Qualifications

- US citizenship is preferred
- Must have a PhD in Physics with 2 or more years of relevant experience.
- Proven background and experience in quantum information science and QNs.
- Proven experience using single-photon sources and detectors for quantum measurements.
- Demonstrated ability to conduct independent, collaborative, multi-disciplinary research
- Must have an aptitude and patience to perform precision measurements
- Extensive skills in Matlab and Python for data analysis, data taking and system automation.
- 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.