NMSU | NIST PREP Program

Quantum Nanophotonics Group | Postdoctoral Researcher

The National Institute of Standards and Technology (NIST), Boulder, Colorado, Physical Measurements Laboratory (PML) has a postdoctoral research position available immediately. The position includes activities in quantum optics, semiconductor nanostructures, precision spectroscopy, and optical system design.

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.

Postdoc Position Description:
Our group has recently demonstrated hybrid systems combining semiconductor optical quantum dots (QDs) and acoustic resonators as a promising platform for quantum information processing and transmission. All aspects of this work are performed 'in house' using NIST's state-of-the-art nanofabrication, molecular beam epitaxy, and low-temperature optical spectroscopy tools. The successful candidate will help lead this project, building on recent accomplishments, towards the goal of generating remote entanglement between superconducting qubits.

General Duties and Responsibilities:
- Design and construct GHz frequency acoustical resonators in Gallium Arsenide.
- Precision spectroscopy of Indium Arsenide quantum dots (QDs) embedded in acoustical resonators.
- Analyze and interpret the microwave and optical characteristics of the hybrid microwave/optical system.
- Work as a member of a collaborative, interdisciplinary team.
- Provide technical input to research problems which have been recognized as critical obstacles to progress in areas of exceptional interest.
- Prepare and review journal publications, contributing important advancements to quantum optics, quantum networking, optical communications, and optical measurement techniques.
- Attend research conferences and present technical results.

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Knowledge, Skills, and Abilities:

·Experience with design and spectroscopy of semiconductor nanostructures.

·Experience with optical measurement techniques such as: coherent detection, resonance florescence, confocal microscopy, laser diagnostics, noise characterization, and statistical optics.

·Experience in cryogenic measurements, with dilution refrigerator experience a plus.

·Ability to code with, or learn to code with:MATLAB, LabView, and Python is required.

·Experience with modern nanofabrication techniques such as electron beam lithography and plasma etching is desirable

·Experience with cryogenic microwave circuit design and testing is a plus.

NIST Sponsor Name: Kevin L. Silverman (kevin.silverman@nist.gov)

Level of Appointment: Postdoc

- The candidate shall have completed a Ph.D. degree in Physics, engineering, computer engineering or a related area within the past 5 years or will receive a Ph.D. degree by November 1st 2024.
- The candidate must be eligible to work in the U.S.A. by time of application.

Salary Determination: $82,000 - $85,000

Length of Term:

- Start dates : 2024-11-01
- End Date : 2026-10-31

For possible consideration and to apply to this position, qualified candidates should send a current CV, including contact information for three references and a publication list, to Associate Dean, Patricia A. Sullivan (patsulli@nmsu.edu)

NMSU PREP posting:

https://engr.nmsu.edu/students/career-development/nist-prep.html

To Apply: Qualified candidates should send a current CV, including contact information for three references and a publication list, to Dr. Patricia Sullivan (patsulli@nmsu.edu).