TITLE: Research scientist: Optical trapping and sensing of nanoparticles (U.S. Citizens preferred)

Overview

The Materials Measurement Laboratory of the National Institute of Standards and Technology (NIST) is seeking qualified persons (U.S. Citizens preferred) to work on a NIST CHIPS R&D Metrology project that aims at developing measurement methodologies for the detection and identification of very low concentration of contaminants in liquid environments. The focus area includes optimizing photonic enhancement techniques for improving the optical scattering of single impurity particles. In this regard, surface engineering methods, theoretical modeling and optical microscopy are employed to design robust sensors for detection of sub-20 nm particles.

Duties

- Fabrication of optical cavities in a cleanroom/nanofabrication facility
- Simulation of optical micro- and nano-cavities for optical traps for nanoparticle sensing
- Construct/adapt optical microscopes for optical trapping and dark-field optical microscopy
- Perform single particle detection and spectroscopy in a microfluidic setup
- Perform different microscopies including scanning electron microscopy (SEM), and optical microscopy (OM) equipped with a cryogenic stage for surface analysis
- Develop computer code (e.g. Python) for the development and analysis of optical cavities

Required Skills, Expertise and Qualifications

- PhD degree in Materials, Electrical Engineering, or a related field
- Skilled in micro-fabrication, optical- and microfluidics, and optical sensing of particles
- Highly experienced in designing nanoparticle trapping techniques using optical methods
- Skilled in modeling electro-optical nano-systems to predict properties and fluid dynamics.
- Highly skilled in multiple scripting languages, including MATLAB, Python, Optiwave (FDTD), COMSOL, Proteus, Lumerical and LaTeX
- Demonstrated ability to develop prototype sensors integrated with optical fibers and detectors needed to detect and analyze the related data

Employment Terms: This opportunity is to be an associate researcher in the NIST Materials Measurement Science Division for a term of 1 year, with options to renew. Associate researchers are NOT Federal Employees, but they work alongside NIST researchers and with NIST's world class instrumentation. Relocation expenses will not be provided. U.S. Citizens hired into associate positions may have the opportunity to seek longer term Federal Employment.

Salary: $90,000-$100,000 (depending on qualifications)

How to express interest: Persons (U.S. Citizens Preferred) who meet all of the required qualifications and who would be interested in taking this position are invited to express their interest by sending an email that briefly describes their qualifications along with a CV to 643assoc@nist.gov. US Citizens should note "US Citizen" and the opportunity title in the email subject line. All others should note "Non-US Citizen" and the opportunity title in the email subject line.