Announcement for Post Doc. Associate Position

Position and Task

A Foreign Guest Researcher to do experiments in the NIST 193 nm microscopy lab for the research on critical dimension and defect measurements for semiconductor manufacturing process control.

Technical Aspects

- Experience and knowledge on optical metrology and imaging system using ccd camera
- Ability to use Matlab for data processing
- Ability to use Labview for controlling microscope facilities such as stages, actuators, cameras, etc.
- Optionally able to do the electromagnetic simulation or understand electromagnetic simulation procedure to learn

Language

NIST administration department requires Verification of English Language Proficiency
State Department regulations 22CFR§62.10(a)(2) Selection of exchange visitors states: "Sponsors must establish and utilize a method to screen and select prospective exchange visitors to ensure that the exchange visitor possesses sufficient proficiency in the English language, as determined by an objective measurement of English language proficiency, successfully to participate in his or her program and to function on a day to day basis. A sponsor must verify an applicant's English language proficiency through a recognized English language test, by signed documentation from an academic institution or English language school, or through a documented interview conducted by the sponsor either in-person or by videoconferencing, or by telephone if videoconferencing is not a viable option.

Compensation and Benefits

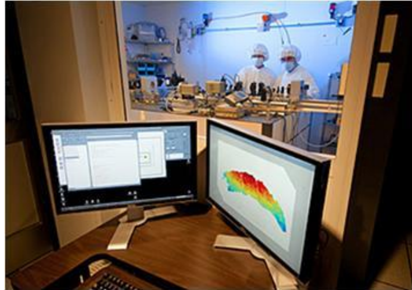
The compensation would be about $ 4~50,000 a year depending on the candidate. (Federal tax will be waived for several years for Koreans, but local tax will be about 10~20% depending on situation)
NIST does not provide health insurance, other insurances, transportation expenses, visa processing fees, or housing to foreign guest researchers.

Introduction to the NIST 193 nm microscopy lab

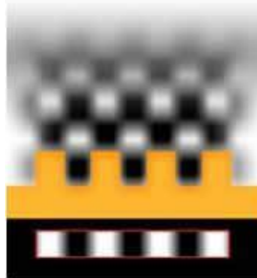
Optical Methods for 3-D Nanostructure Metrology Project develops new approaches to optical microscopy based on a high magnification optical platform that samples the full 3-D scattered field. Both the semiconductor industry and the evolving nanomanufacturing sector are facing enormous challenges measuring nanometer scale features over large areas, needed for effective manufacturing process control of products that incorporate billions of nanoscale features. Optical microscopy is a high-throughput metrology methodology that provides a unique advantage since it is a high-bandwidth measurement method that is inherently parallel.

Measurements with sensitivity to features less than one-twentieth the wavelength can be made by analysis of scattered light profiles and the use of physics-based modeling. Extensive electromagnetic modeling, developed in-house, enables quantitative metrology of nanoscale structures more than an order of magnitude below traditional resolution limits.

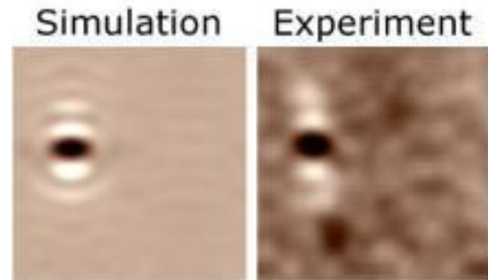
This project meets key NIST priorities in advanced manufacturing, energy, and photonics. We have had several contracts from the semiconductor industry as well as the Department of Energy for fuel-cell process control research. We have directly impacted semiconductor hardware platforms for optical overlay, defect, and critical dimension measurement. This project has also had a broad impact on the extensibility of optical methods for semiconductor manufacturing metrology.



NIST 193 nm Microscope



3D EM Scattering



Nanoscale Defects Measurement

Contact

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