Join the NIST EUV Scatterometry Team!

A multi-laboratory, multi-disciplinary team of experimentalists and theorists has recently received funding to develop a revolutionary tool that will use extreme-ultraviolet (EUV) radiation to inspect integrated circuits (ICs) on the nanometer scale. The tool will be built and evaluated at the National Institute for Standards and Technology (NIST) on the Synchrotron Ultraviolet Radiation (SURF III) light source. It will be further developed and refined to use a high-harmonic-generation (HHG) source, making it suitable for use in an IC fabrication facility. This new technique will fill a critical gap in existing measurement solutions by characterizing next generation structures with both chemical sensitivity and sub-nm precision. This will extend light-based chip inspection for several years beyond its current viability.

We are seeking 5-6 new team members with expertise in one or more of the following areas: simulation and analysis of light interactions with patterned materials; design, construction, automation, and operation of complex optical and mechanical equipment; commissioning and operation of ultrafast laser systems; ultrahigh vacuum systems; optical properties of materials and interaction of light with matter. Potential roles include:

1. Electromagnetic simulations to understand interactions of EUV radiation with materials.
2. Experiments at SURF-III where the novel scatterometer will be designed and constructed for spectroscopic ellipsometry.
3. Experiments in a new NIST laboratory-based VUV+EUV high harmonic generation (HHG source) where techniques from SURF-III will be expanded upon to make measurements of patterned nanoscale semiconductors.
4. Computations of electromagnetic scattering from patterned semiconductors to determine the dimensional and materials properties from the measured data (an inverse problem).
5. Investigations into the role that transition edges at sub-50 nm wavelengths can play in decoupling parametric correlations among materials, to better solve for these nanoscale dimensions quantitatively.

The Department of Commerce is an equal opportunity employer. This research will be performed at the NIST campus in Gaithersburg, MD, USA.

If you or someone you know is interested in joining our multidisciplinary team, or if you would like further information, please contact Dr. Bryan Barnes (bmbarnes@nist.gov, 301-975-3947).