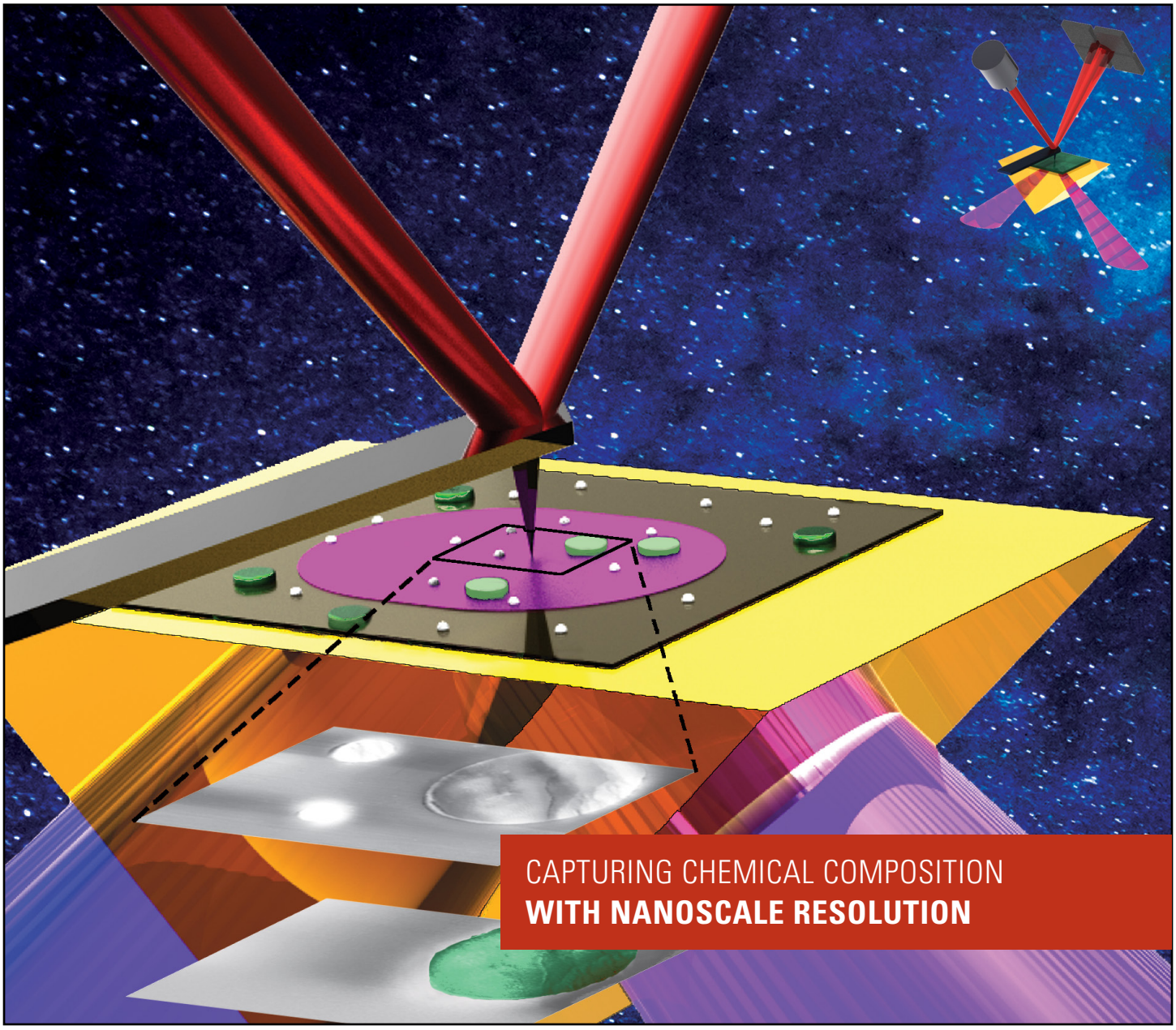
# THE CNST NEWS

WINTER 2013



## CAPTURING CHEMICAL COMPOSITION **WITH NANOSCALE RESOLUTION**

## INSIDE



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# NEW TOOLS IN THE NANOFAB

## Photoresist Stabilization System

The CNST ha s installed a new B&A Associates LS-200FSX deep ultraviolet (UV) flood exposure system which is now available to users for curing photoresists on substrates up to 200 mm in diameter. Located in cleanroom bay A105, the system facilitates easier resist stripping after processing, improves resist stability, and increases etch selectivity. The device uses a hotplate combined with UV flood exposure to cause polymer molecules in the photoresist to cross-link, enabling the resist to hold up better to processes such as ion beam etching, reactive ion beam etching, and ion implantation. For more information, contact Liya Yu, 301-975-4590, liya.yu@nist.gov.

## Automated Spectroscopic Ellipsometer

The recently installed Woollam M-2000 spectroscopic ellipsometer in cleanroom bay B103 provides fast and accurate thin film characterization over a wide spectroscopic range. The systems high speed CCD collects data automatically in a fraction of a second at hundreds of wavelengths, ranging from infrared to deep ultraviolet, and at multiple angles. This information can be used to determine film thickness, index of refraction, and extinction coefficient on single or multilayer film stacks using the systems user-friendly modeling software. For more information, contact Marc Cangemi, 301-975-5993,marc.cangemi@nist.gov.

## Laser Pattern Generator Upgrade

The CNST is installing a new Heidelberg Instruments DWL 2000 laser pattern generator in cleanroom bay A103 which is expected to be available to users by the end of March. The new system is faster and more flexible than the laser pattern generator it replaces and can expose substrates up to 200 mm x 200 mm, with feature resolution down to 700 nm. This laser pattern generator can expose photomasks for both contact and stepper lithography at speeds up to 110 mm $^2$ per minute, and has the ability to write patterns directly on substrates. For more information, contact Marc Cangemi, 301-975-5993, marc.cangemi@nist.gov.

## Electron Backscatter Diffraction System

A new Oxford Instruments Electron Backscatter Diffraction (EBSD) system has been integrated into the NanoFabs Helios 650 Dual Beam FIB/SEM System, located in room 216/G113. This addition increases the capability of the FIB system to provide material crystallographic information, such as crystal orientation mapping, phase identification, grain boundaries, and localized strain. For additional information, please contact Joshua Schumacher, 301-975-8065, joshua.schumacher@nist.gov.


The new Heidelberg Instruments DWL 2000 laser pattern generator can expose substrates up to 200 mm x 200 mm for use in the stepper or for contact lithography, and has the ability to write patterns directly on substrates. It can expose photomasks with feature resolution down to 700 nm at speeds up to 110 mm$^2$ per minute.

## Secondary Ion Mass Spectrometer for Ion Milling System

A new Hiden Analytical IMP 301 secondary ion mass spectrometer (SIMS) has been integrated into the NanoFabs 4Wave Ion Milling System, located in cleanroom bay A106. The module can reliably determine the etching endpoints at or near the interface of almost any two dissimilar materials, allowing users to terminate etches with better than 0.2 nm accuracy. The SIMS can be programmed for multi-step processes, and detects the composition of ion mill by-products for up to four materials at one time. For more information, contact Gerard Henein, 301-975-5645, gerard.henein@nist.gov.

## Flip Chip Bonder

The CNST has purchased a Tresky T-3000-FC3-HF die bonder which will be available to users in Spring 2013. The bonder is a versatile manual tool that allows users to permanently attach chips onto semiconductor, opto-electronic, and other packages; it is a capable of eutectic, ultrasonic, thermo-compression, and epoxy bonding with 1 m placement accuracy. For additional information, please contact Gerard Henein, 301-975-5645, gerard.henein@nist.gov.

## Solvent Lift-Off Tool

Located in cleanroom bay A102, the new Modular Process Avenger heated spray solvent metal lift-off tool provides users with automatic recipe control and reduces lift-off time from hours to minutes. The tool removes unwanted target material on samples ranging from 150 mm-diameter wafers down to 25 mm-on-a-side squares. Its dry wafer in and dry wafer out processing provides cleaner sample finishing than manual lift-off processes, while reducing user exposure to solvents. For more information, contact Jerry Bowser, 301-975-8187, jerry.bowser@nist.gov.

## Parametric Test Station

The CNSTs new Keithley 4200 parametric test system provides users with in-line electrical characterization capabilities, including the ability to measure capacitance at multiple frequencies, and to measure both DC and ultra-fast pulsed currents and voltages. The system features a dark box for light sensitive measurements and a heated chuck to allow measurements up to 300 C. For more information, contact Jerry Bowser, 301-975-8187, jerry.bowser@nist.gov.