

NanoFab News

Vol. 1, Ed. 2

We are pleased to distribute the *NanoFab News* for current and potential users of the NanoFab at the [NIST Center for Nanoscale Science and Technology](#) (CNST). This quarterly newsletter is intended to keep users up to date on our fabrication process development, tool installations, safety and access policies, and other notable news. This newsletter is for you, so if you have suggestions for improving it, please let us know via [email](#).

People

Please welcome [Eileen Sparks](#), the newest member of the NanoFab staff. Eileen has 30 years of experience in semiconductor process development, materials characterization, and contamination control. She earned B.S. and M. Ph. degrees in Chemistry from George Washington University. Prior to joining NIST, Eileen led surface analysis research at Comsat, characterizing III-V semiconductor-based materials and devices, including failure analysis, and later developed, installed, and qualified downstream microwave and ozone ashing processes for residue removal in OEMs and foundries world-wide. Eileen also worked at ATMI with major chipmakers on wafer cleaning and residue removal for CMOS, MEMS, and MRAM applications. Eileen is assisting the NanoFab with base-line process development and industrial outreach. Welcome, Eileen!



A business-card sized version of our traveling exhibit display.

NanoFab Outreach

The [CNST](#) and NanoFab staff have begun a coordinated effort to identify and reach out to potential research collaborators and NanoFab users. In March, four staff members, including the CNST Deputy Director, traveled to Pittsburgh for the APS March Meeting to inaugurate the CNST's first exhibition booth. In May, three staffers worked the booth with other NIST representatives at the MRS Spring Meeting in San Francisco. Our outreach campaign continues at [Nanotech](#) in Houston, [EIPBN](#) in Marco Island, Florida, and at [SEMICON West](#) in San Francisco.

Users Meeting

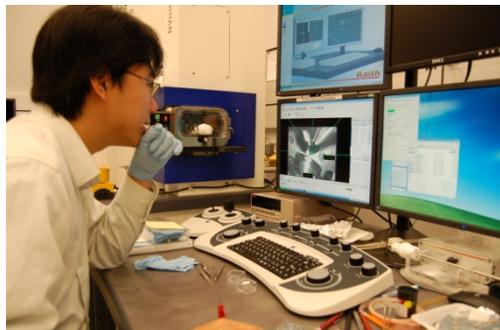
NanoFab Manager [Vince Luciani](#) and facility coordinator [Jeff Pasternak](#) held their first NanoFab User meeting in March. Vince spent several minutes outlining the latest purchase plan for the NanoFab, which includes a new mask rotor plate for the SRD, converting the current thermal evaporator system to electron beam, and buying a new HMDS vapor prime system. The 40 or so users who attended were given equipment wish list surveys to express their views. Vince will present the results after May 1st and hopes to hear continually from all users.

NanoFab Tool Updates

There's exciting news coming from the G corridor in Building 216 outside the cleanroom. The new [JEOL JBX-6300FS E-beam lithography tool](#) is on the verge of full operational capability. JEOL representatives have successfully written several images to the company's specifications and are now working toward satisfying the CNST's requirements for writing nanoscale sized features. CNST physical scientist [Mike Hernandez](#) is helping to develop user protocols during the first week of April and anticipates conducting user training soon. If everything proceeds as planned, the JEOL E-beam should go online in mid-May.



The new [Heidelberg DWL 66FS maskless laser lithography system](#) is also about to become fully available in the cleanroom. Tool managers [Rich Kasica](#) and [Marc Cangemi](#) are working toward placing the Heidelberg on Coral-ready status in early May. The Heidelberg will also get a new 4 mm, large-format write head soon which should reduce some image writing times by more than 50%.



The CNST's focused ion beam/scanning electron microscope currently housed in E-102 will move in the near future. NanoFab Manager Vince Luciani plans to create a more user-friendly environment when the dual-beam system is relocated to G-103. In addition to moving the work station, the tool managers will place the Gemini column on active vibration cancellation pillars in the hope of increasing the tool's ability to generate cleaner images at higher magnifications.

Gas plumbing is underway to complete installation of the CNST's new [Oxford ALD/RIE systems](#). In addition, our facilities teams are installing new toxic gas monitoring systems to the ALD/RIE rooms. Both the plumbing and gas monitoring systems should be completed in time for testing in May. If all goes well, NanoFab management expects to place both tools on line in mid-June.

Coming Soon: New tools

Funding from the recent [American Recovery and Reinvestment Act](#) will provide some new capabilities at the CNST. The process is underway to procure a new TEM workstation which will be located outside the cleanroom, a new focused ion beam system which also will go outside the cleanroom, and a new i-line 5x reduction stepper. Along with the Heidelberg mask writer, the stepper will create enhance the NanoFab's capability for sub-micrometer photolithography. We'll update you on the status of these new tool purchases in the next *NanoFab News*. Below is a complete list of new tools in the pipeline.

Item	Description	Status
1	3-D software for Stress Measuring Tool	INSTALLED
2	JEOL 6300 E-Beam Lithography system	Installation in progress, target Date July 15
3	Oxford RIE #1	Installation in progress, target Date July 15
4	Oxford RIE #2	Installation in progress, target Date July 15
5	Atomic Layer Deposition System	Installation in progress, target Date August 18
6	Labware washer	DELIVERED
7	4mm Write lens for Heidelberg	On Order
8	Pressure uniformity sensor (for NIL process)	On Order
9	Upgrade Thermal evaporator to e-beam	On Order
10	Nanospec 6100 or equivalent	On Order
11	HMDS vapor prime system	On Order
12	i-line Stepper	Market Research
13	TEM	Market Research
14	Focused Ion Beam (FIB)	Market Research