

Manufacturing Science and Technology Group Room 103C - Session MS-TuB

Working with Government Labs and other User Facilities

Moderator: Bridget Rogers, Vanderbilt University

10:00am **MS-TuB-1 Joining the Research Community at the Cornell NanoScale Science and Technology Facility, *Michael Skvarla***, Cornell University

The Cornell Nanoscale Science and Technology Facility (CNF) is one of network of open-access shared facilities partially subsidized by the US National Science Foundation to provide researchers with rapid, affordable, shared access to advanced nanofabrication tools and associated staff expertise. Projects can be accomplished either hands-on or remotely. Hundreds of engineers and scientists worldwide, from throughout academia, industry, and government, utilize CNF to make structures and systems from the nanometer scale to the centimeter scale. All users are welcome; no experience in nanofabrication is necessary and a central part of CNF's mission is to assist users from "non-traditional" fields seeking assistance to implement nanofabrication techniques for the first time. CNF's user program is designed to provide the most rapid possible access (as little as 2 weeks from first contact) with the lowest possible barriers to entry (users retain full control of their IP, with no entanglement by CNF or Cornell University). CNF offers unique capabilities in world-leading electron-beam lithography, advanced stepper photolithography, dedicated facilities for soft lithography, and direct-write tools for rapid prototype development, along with the flexibility to accommodate diverse projects through the ability to deposit, grow, and etch a wide variety of materials. CNF's technical staff is dedicated full-time to user support, providing one-on-one help with process development, tool training, and troubleshooting. They can offer expertise for a wide range of fabrication projects, including electronics, nanophotonics, magnetics, MEMS, thermal and energy systems, electrochemical devices, fluidics, and basic studies in physics, chemistry, and the life sciences (30% of CNF's users now come from the biology/bioengineering fields). This talk will explore the tools, services, and advice available to CNF users, and present examples of ongoing work with the hope of stimulating ideas and possibilities. CNF is a member of the National Nanotechnology Coordinated Infrastructure (NNCI) program, a new NSF-sponsored network of shared facilities. We invite you to explore the CNF and NNCI, and discuss ways we can help bring your research visions to fruition. The CNF technical staff meets every Wednesday afternoon for conference calls where we welcome questions about any topic related to nanofabrication and can provide detailed processing advice and cost estimates for potential new projects. Visit cnf.cornell.edu to contact us and get started.

10:20am **MS-TuB-2 Opportunities at DOE Nanoscale Science Research Centers, *Arthur Baddorf***, Oak Ridge National Laboratory

DOE Nanoscale Science Research Centers (NSRCs) were established for use by the international science community to advance scientific and technical knowledge in nanoscale science. The mission of the NSRCs is twofold: to enable the external scientific community to carry out high-impact nanoscience projects through an open, peer-reviewed user program, and to conduct in-house research to discover, understand, and exploit functional nanomaterials. To fulfill this mission, the NSRCs house the most advanced facilities for nanoscience research and employ world-class scientists who are experts in nanoscience and enjoy working with external users. Access to these centers is through a simple, peer-reviewed proposal process and is free-of-charge if the user intends to publish the research results in open literature.

As an example, the Center for Nanophase Materials Sciences (CNMS) at Oak Ridge National Laboratory (ORNL) provides access to expertise and equipment for a broad range of nanoscience research, including nanomaterials synthesis, nanofabrication, imaging/characterization, and theory/modeling/simulation. CNMS also acts as gateway for the nanoscience community to benefit from ORNL's neutron sources and computational resources. In addition to a broad assortment of nanomaterials characterization tools, the CNMS has specific expertise in the following capabilities:

- Nanofabrication
- Bio-Inspired Nanomaterials
- Inorganic and Hybrid Nanomaterials Synthesis

- Macromolecular Nanomaterials Synthesis
- Chemical Imaging
- Electron and Atom Probe Microscopy
- Scanning Probe Microscopy
- Nanomaterials Theory

This talk will provide a broad overview of opportunities at NSRCs and how to take advantage of their capabilities and expertise through user programs. More information can be found at <https://nsrcportal.sandia.gov/>

Author Index

Bold page numbers indicate presenter

— B —

Baddorf, A: MS-TuB-2, **1**

— S —

Skvarla, M: MS-TuB-1, **1**