NWNLA 2021 Agenda- Version 2

The Northwest Nanotechnology Laboratory Alliance (NWNLA), a joint NNCI initiative with the Montana Nanotechnology Facility (MONT), is a regional platform for exchange on laboratory experiences and best practices. NWNLA will offer biennial workshops, alternating with the University/Government/Industry Micro/Nanotechnology (UGIM) symposium, for facility staff in Idaho, Montana, Oregon, Washington, Wyoming, Alberta, and British Columbia.

November 8th	Room1	Room2	Room3	Room4
8:45 AM PST	Introduction			
9:00 AM PST	Fabrication/Processing Roadmaps	Imaging/Analysis Vendor Talk		
10:00 AM PST	Setting Rates	Vacuum Systems		
11:00 AM PST	Equipment Training	Collaboration	Hiring and Retaining Staff	Educating Users
12:00 PM PST	Tool Advertising (Breakouts)			
November 9th	Room1	Room2	Room3	Room4
9:00 AM PST	Imaging/Analysis Technical Talk	Fab/Processing Vendor Talk		
10:00 AM PST	Legal - NDAs, IP, Agreements, etc.	Gas Plumbing		
11:00 AM PST	Professional Develoment	Standard Processes	Training on Imaging/Analysis Tools	Contamination
12:00 PM PST	Wrap Up			
12:15 PM PST	Vendor Tradeshow (Breakouts)			
1:00 PM PST	Overtime1	Overtime2	Overtime3	Overtime 4
2:00 PM PST				

Introduction

Welcome! We will cover the schedule, etiquette, how to enter or change rooms, how to ask questions, and what to expect from the workshop.

Discussions

Equipment Training and Available Resources

Training individuals to use scientific equipment involves two parts: theory and practice. How do we balance the two? Does it make sense to teach detailed physics and chemistry to individual users? For example, does it make sense to cover the physics of a metal deposition or the physics of electron-surface interactions during hands-on training? How can we leverage available educational materials to address theory without having to redo work? Can we create a shared list of resources or best reads? How often are requalification trainings necessary?

Improving Collaboration

Working together and learning from one another is a worthwhile endeavor, but we are all over-booked. How can we improve collaboration without excessive overhead? What are concrete steps we can take? Frequent, small meetings to discuss problems? Focus groups to tackle specific problems? Staff exchanges? How do we effectively route users to different facilities when necessary?

Hiring and Retaining Staff

Bring your hiring successes and failures so we can all learn from them. What does it take to find people willing to take less pay for the benefits of working at an academic institution? How well do your job descriptions match the work required for the position? How do you sell your institution? Do you have

standardized interview processes? What have you done to successfully retain staff during pay and hiring freezes? How do you balance experience versus necessary training when hiring? How have you successfully increased diversity? Why do employees leave?

Educating Users on Imaging and Analysis Techniques

Choosing an appropriate imaging or analysis technique requires understanding the capabilities and limitations of a wide variety of possible options. Should we attempt to build a concise document comparing different imaging and analysis techniques that you can take back to share with your lab? Could we expand on the information in the following websites, and potentially create something similar for the NWNLA?
https://www.eag.com/techniques/
https://www.materialinterface.com/analytical-services/comparison-analysis-methods/

Tool Advertising (Breakouts)

Many participating facilities have cutting-edge equipment with unique capabilities. This is your opportunity to advertise your latest and greatest to the community. Please email andrew.lingley@montana.edu if you would like to present your equipment or capabilities in a breakout room.

Professional Development

It is important to develop employees' technical skills, interpersonal skills, and customer service. How do you balance this development with a normal workload? Should these skills be developed internally or are outside sources a better option? What are some best practices we can implement easily, and what are overlooked resources available at large institutions (e.g. https://hr.uw.edu/pod/)? How can we use professional development to retain employees and improve efficiency? Can we create a list of references or a reading list?

Standard Processes for Micro and Nanofabrication Facilities

Standard processes can make it much easier for lab users to succeed. What types of processes can be successfully standardized? How are these processes maintained? Can we develop an overview of the most common process, along with their uses and limitations? For example, should we have a list of standard processes for thin and thick positive resist, lift-off resists, and resists for microfluidics, along with information beyond what is covered in technical datasheets? What information is most valuable for users and how can we concisely convey it?

Training on Imaging and Analysis Equipment

Training on imaging and analysis equipment is specialized, often with different challenges than are encountered with semiconductor processing equipment. The procedures can be less linear, and there are often a variety of ways to achieve similar results. What methods have you found successful? How much flexibility do you allow users in exploring equipment capabilities? What are the common problems you encounter when training users? This will be a venue to share tips and techniques, discuss the feasibility of videos and quizzes, and to discuss the utility of using standardized samples to demonstrate specific tool capabilities.

Contamination in Cleanrooms and Processing Equipment

Where does contamination come from, where does it end up, and how is it measured? Can we make a list of situations where contamination has caused documented problems? Can we make a list of situations where contamination was blamed without proof? Have your cleanliness protocols hurt your business or become obsolete? Let's discuss mitigation methods, stories of unexpected impacts, and how to choose what is allowed or barred from different tools.

Presentations

Fabrication/Processing Roadmaps – Dr. Alissa M. Fitzgerald, A. M. Fitzgerald and Associates

Emerging Technologies and Trends in Microfabrication - Ideas for new microdevices are typically first realized in academic and small laboratories. In this talk, we'll provide an overview of emerging technologies and new microfabrication process trends at laboratories around the world. We'll discuss how those are enabling the next generation of MEMS devices and architectures for applications in medical, consumer and industrial markets. We will also provide an overview on how some new processes are being adopted in high volume foundry manufacturing.
https://www.amfitzgerald.com/

Image/Analysis Vendor Talk – Dr. Chris Own, Voxa

Voxa's Mochii "S" is the world's first field-portable electron microscope, able to take sophisticated laboratory analyses including chemical identification into new and extreme environments, including outer space. Because of its size, ruggedness, capabilities, and versatility, Mochii has been adopted by the International Space Station to help detect crew and vehicle mission threats, and perform novel microgravity science, and is the first instrument of its kind in space. The Voxa Blade™ is a customizable ultra-high-throughput imaging pipeline that enables the automation and scaling of nano-scale electron-optical imaging.
https://www.voxa.co/

Setting Rates – Kari Kelly and Zachary Belton, Huron Consulting Group

Setting rates for equipment and facility usage is complicated; there are federal regulations to follow, customers to satisfy, industries to avoid competing with, and so forth. Huron Consulting Group will give an overview of the relevant regulations and a framework for maintaining compliance.
https://www.huronconsultinggroup.com/

Vacuum Systems – J.R. Gaines, Kurt J Lesker

We all use vacuum systems. We all understand vacuum chambers, pumps, and gauges. We've invited Kurt J Lesker to give a high-level talk on the most common problems with vacuum systems that they encounter, common vacuum misunderstandings, and to give an overview of vacuum system troubleshooting. This information will be presented as an audit of real vacuum systems in the network, with discussions on how vacuum system design can have cascading impacts.
https://www.lesker.com/index.cfm

(Tentative) Imaging/Analysis Technical Talk – Physical Electronics

Elemental Nano-Volume Characterization of ALD Defect Particles by Auger Electron Spectroscopy

Fabrication/Processing Vendor Talk – Dr. Stephen Vargo, SPTS Technologies

End-point detection is essential for many wafer etch applications to ensure processes are carefully controlled and consistent, to ensure reliable results are achieved wafer-after wafer, and to optimize device yields. There are many methods used to end-point wafer processes and this talk aims to describe the techniques available for SPTS's range of etch modules. The techniques either monitor the wafer thickness, analyze changes in the chemical/optical properties of the plasma above the wafer, or monitor the system datalogs. The talk will provide an overall update to the latest and greatest offerings from SPTS on end-point technologies.
https://www.spts.com/

Legal - NDAs, IP, Agreements, etc. (speaker TBD)

Most academic and government facilities here work with external customers from other institutions and industries. What common legal issues arise in these situations? How can we reduce the barriers to entry for these customers?

Gas Plumbing – Marc Wilson, Swagelok

We all deal with gas distribution systems. We have all used Swagelok fittings, regulators, and tubing. We've invited Swagelok to give a high-level talk on the most common problems with high purity gas distribution system that they encounter, common misunderstandings, and to give an overview of proper system design and component selection.
https://www.swagelok.com/en

Wrap Up

What did we miss, and are there any major follow-ups required? Do we need overtime for any of our discussions? Do we need to create working groups?

Vendor Tradeshow (Breakouts)

- Film Sense: https://film-sense.com/
- Nanoscribe: https://www.nanoscribe.com/en/
- Microlight3D: http://www.microlight.fr/
- Voxa: https://www.voxa.co/
- Moov: https://www.moov.co/
- Exaddon: https://www.exaddon.com/
- Hummingbird Scientific: https://hummingbirdscientific.com/
- *We will add to this list*

Overtime

Did you think a useful discussion was cut short? Let us know and we can allocate a room for additional dialogue.