

NEMO User Meeting

October 5, 2026

Venue: Schwarzman College of Computing, Building 45, 8th Floor - <https://whereis.mit.edu/?go=45>
Click here to skip to abstracts

11:45 AM **Arrival and Registration**

12:00 PM **Lunch**

1:00 PM **Welcome**

Anna Osherov, Associate Director of Characterization.nano, MIT.nano
Jorg Scholvin, Associate Director of Fab.nano, MIT.nano

1:10 PM **NEMO Overview**

Mathieu Rampant, CEO and Co-Founder, Atlantis Labs

1:30 PM **User Experience and Facility Operations**

Alex Denton | Beyond the LED: Rich, Real-time Tool Status Where it Matters
Amir Zangiabadi | Beyond Go-Live: Migrating from Badger and Extending NEMO for Facility Workflows
Daniel Woodie | Integrated Real-time Process Charts in NEMO

2:30 PM **Break**

3:00 PM **Beyond Day-to-Day Operations**

David Barth | NEMO Chemical Requests Plugin
Brian Pepper | NEMO Customizations at JPL
Mathieu Rampant | NEMO Online Training Plugin

4:00 PM **Connecting NEMO to a Broader Ecosystem**

Anna Osherov | Hydra: Enabling Dynamic Regional Discovery of Research Capabilities
Josh Taillon | Research Data Management in Multi-User Characterization Facilities with NEMO: NexusLIMS v2.0
Abubaker Ahmadi | Secure and Automated NEMO Plugin and File Server Connection
Ryan White | NEMO Custom Forms – Improving Operational Efficiency

5:20 PM **Reception**

Glass House | 450 Kendall Street, Cambridge MA 02139

NEMO User Meeting October 6, 2026

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| 9:15 AM | Arrival and Breakfast |
| 9:55 AM | Opening Remarks |
| 10:00 AM | Meeting Unique Facility Needs
Jamie Ford The Power of the Jumbotron: Using Big TVs to Drive User Behavior
Joseph Velez osTicket Plugin
Aaron Kitzmiller A NICE use of NEMO |
| 11:00 AM | Break |
| 11:30 AM | Panel Discussion
NEMO's Role in the Future of Shared Facilities |
| 12:30 PM | Closing Remarks
Anna Osherov , Associate Director of Characterization.nano, MIT.nano
Jorg Scholvin , Associate Director of Fab.nano, MIT.nano
Mathieu Rampant , CEO and Co-Founder, Atlantis Labs |
| 12:45 PM | Lunch |
| 1:30 PM | Tours of MIT.nano
MIT.nano 60 Vassar Street (rear), Building 12 |

2026 NEMO User Meeting Abstracts

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Session 1: User Experience and Facility Operations

October 5, 2026 | 1:30 PM

Beyond the LED: Rich, Real-Time Tool Status Where It Matters

Alex Denton, Stanford University

Most shared labs only expose tool state in NEMO or a binary LED at the tool. This work streams tool enable/disable and operational events from NEMO to MQTT so displays at each tool can show current user, upcoming reservations, and up/down status in real time. It manages this using a durable queue + PostgreSQL LISTEN/NOTIFY bridge so that NEMO stays reliable while IoT stays responsive.

Beyond Go-Live: Migrating from Badger and Extending NEMO for Facility Workflows

Amir Zangiabadi, Columbia University

When the Columbia Nano Initiative (CNI) moved from Badger to NEMO, we first needed to convert and import legacy users, projects, accounts, tools, rates, and qualifications while preserving their relationships in NEMO.

After going live, several facility workflows still needed adjustment. We developed a collection of small applications around the NEMO API, including reporting, office-friendly invoicing, batch-management, and operational tools. This talk also talks about the Invoice Generator, which combines usage exports with NEMO API data, applies billing rules, groups charges by PI and month, and generates Excel and PDF invoices. I will share how these tools work, the key algorithms behind them, and lessons that may help other facilities migrate to or extend NEMO.

Integrated Real-time Process Charts in NEMO

Daniel Woodie, Princeton University

Keeping tool charts for users up to date such as process benchmarking runs or measurements of calibration standards can be a challenge. This presentation will show multiple methods to make for easy data collection and automatic updating of these charts posted on the NEMO tool pages. Full instructions and examples files will be shared via QR code at the end of the presentation for easy deployment at your facility.

Session 2: Beyond Day-to-Day Operations

October 5, 2026 | 3:00 PM

NEMO Chemical Requests Plugin

David Barth, University of Pennsylvania

The NEMO Chemical Requests plugin is intended to help streamline the review, transfer, organization, and life-cycle of user-owned chemicals in shared facilities, which is a common lab management pain point. I will introduce the plugin's functionality and also share some lessons learned in implementing the feature in two different ways at two different facilities. Since this was initially developed before the AI era and then updated more recently, I'll also share some thoughts on how LLMs have altered the development process.

NEMO Customizations at JPL

Brian Pepper, Jet Propulsion Laboratory

At NASA's Jet Propulsion Laboratory, NEMO is used with a number of custom plugins adapted to local use cases. We discuss these plugins, including RFID chemical inventory management, support for new sensor types, early warning analysis for sensor alerts, Jumbotron customizations, and more.

NEMO Online Training Plugin

Mathieu Rampant, Atlantis Labs

The NEMO Online Training Plugin was designed to enable prospective lab users to complete required prerequisite training efficiently and securely. It provides unique, time-limited email links to support secure access, tracks training completion times and responses for traceability, and offers both self-enrollment and manual assignment to accommodate different workflows. Additionally, the platform can create NEMO user accounts using information collected during registration, streamlining the onboarding process.

Session 3: Connecting NEMO to a Broader Ecosystem

October 5, 2026 | 4:00 PM

Hydra: Enabling Dynamic Regional Discovery of Research Capabilities

Anna Osherov, Massachusetts Institute of Technology

Efforts to connect research facilities have traditionally relied on static directories and capability lists, which quickly become outdated. A more sustainable approach is to build on the live data already maintained in laboratory management systems such as NEMO, allowing information about capabilities, equipment, and access to remain current without creating an additional system of record.

Hydra is a new web application being developed to do exactly this. Hydra connects to NEMO and other laboratory management systems to create a dynamic, cross-facility view of research capabilities, equipment availability, and access. Rather than maintaining a separate database, Hydra aggregates information directly from participating facilities, making it possible to discover capabilities and availability using current operational data. Supported by funding from the Northeast Microelectronics Coalition (NEMC), Hydra is being developed as a foundation for connecting facilities across different LMS platforms and moving toward a more accessible and federated research infrastructure ecosystem.

Research Data Management in Multi-User Characterization Facilities with NEMO: NexusLIMS v2.0

Josh Taillon, datasophos

Shared-use characterization facilities face a persistent challenge: capturing rich, structured metadata about who collected data, on what instrument, and under what conditions, all without burdening users with manual record-keeping. NexusLIMS [1] is an open-source Laboratory Information Management System (LIMS) originally developed at NIST that addresses this by automatically linking instrument scheduling records to raw data files and extracting instrument-specific metadata, producing searchable experiment records aligned with FAIR data principles. At its core, this is enabled through extensive harvesting of information from the NEMO API, which helps bridge the gap between the physical and digital worlds, and allows the system to know who was on an instrument, for how long, and where their files should be located.

To further their data management capabilities, the Singh Center for Nanotechnology at the University of Pennsylvania has recently sponsored the open-source development of version 2.0 of NexusLIMS [2], resulting in drastically simplified deployment and configuration, serving to democratize advanced data management capabilities for their own users and throughout the wider characterization community. In addition, NexusLIMS now has a modern and flexible plugin architecture to enable metadata extraction from many more types of instruments and support has been added for multiple data repository export destinations. This talk will review these recent developments, as well as how NexusLIMS integrates with a NEMO installation to provide a seamless experience for facility end users. Finally, a brief "getting started" demonstration will illustrate how one can easily get started using NexusLIMS at their facility.

[1] Taillon, J. A. et al. *NexusLIMS: A Laboratory Information Management System for Shared-Use Electron Microscopy Facilities*. **Microscopy and Microanalysis** 27, 511–527 (2021).

[2] Taillon, J. A. *NexusLIMS* (Python, 2026). GitHub. <https://github.com/datasophos/NexusLIMS>

Secure and Automated NEMO Plug-in and File Server Connection

Abubaker Ahmadi, Mercer County Community College (MCCC)

Getting data to and from facility tools such as lithography systems, microscopes, and other measurement instruments while limiting security risks to these critical systems can be a challenge. The M&R Team, mentored by the Princeton MNFC, has developed a NEMO plug-in that integrates with an open-source software on a Linux file server to provide seamless, secure access to user- and group-specific storage space. The implementation incorporates encryption, authentication, storage quotas, session-based access control, periodic synchronization check, automated cleanup, documented backup and disaster recovery procedures, and user-configurable options. This presentation will discuss architecture, functionalities, security and reliability features, and provide instructions and links for source code access. The team welcomes feedback and collaboration from the community.

NEMO Custom Forms – Improving Operational Efficiency

Ryan White Ph.D., National Institute of Standards and Technology

The NEMO custom forms plugin acts as configurable PDF form filler with a built-in approval chain, including approval request notifications. The custom forms plugin also allows for the customized exporting of form records in .csv format for simplified tracking and record keeping. The NIST Boulder Microfabrication Facility (BMF) is currently using the NEMO Custom Forms plugin to manage credit card purchasing and approvals, which has reduced our purchasing timeline (submission to order) from 14 days to one day. This presentation will describe and discuss the use of the NEMO custom forms plugin including plans for expanded in the NIST BMF.

Session 4: Meeting Unique Facility Needs

October 6, 2026 | 10:00 AM

The Power of the Jumbotron: Using Big TVs to Drive User Behavior

Jamie Ford, University of Pennsylvania

One of the main reasons we made the Publications plugin was to make the standard NEMO informational jumbotrons a more dynamic and captivating experience. It was also a social experiment to see if our innate competitive spirit would drive others to do work for us. This talk will review participation in the Singh Center's publication tracking over the last 3 years and efforts to build an analogue in the NexusLIMS data management system.

osTicket plugin

Joseph Velez, University of Michigan

The osTicket plugin for NEMO lets the LNF at the University of Michigan promote proven communication with our lab users while minimizing complication for users and staff.

A NICE use of NEMO

Aaron Kitzmiller, Harvard University

Our effort to implement service request and billing applications across several instrument facilities at Harvard's Faculty of Arts and Sciences began some time before the widespread adoption of NEMO, so user management, billing, and user interface libraries were fairly mature when we started discussing use of NEMO. I'll describe how we incorporated NEMO into our Nanoscale Instrument Control Environment (NICE) as a Django plugin to provide instrument management and control.