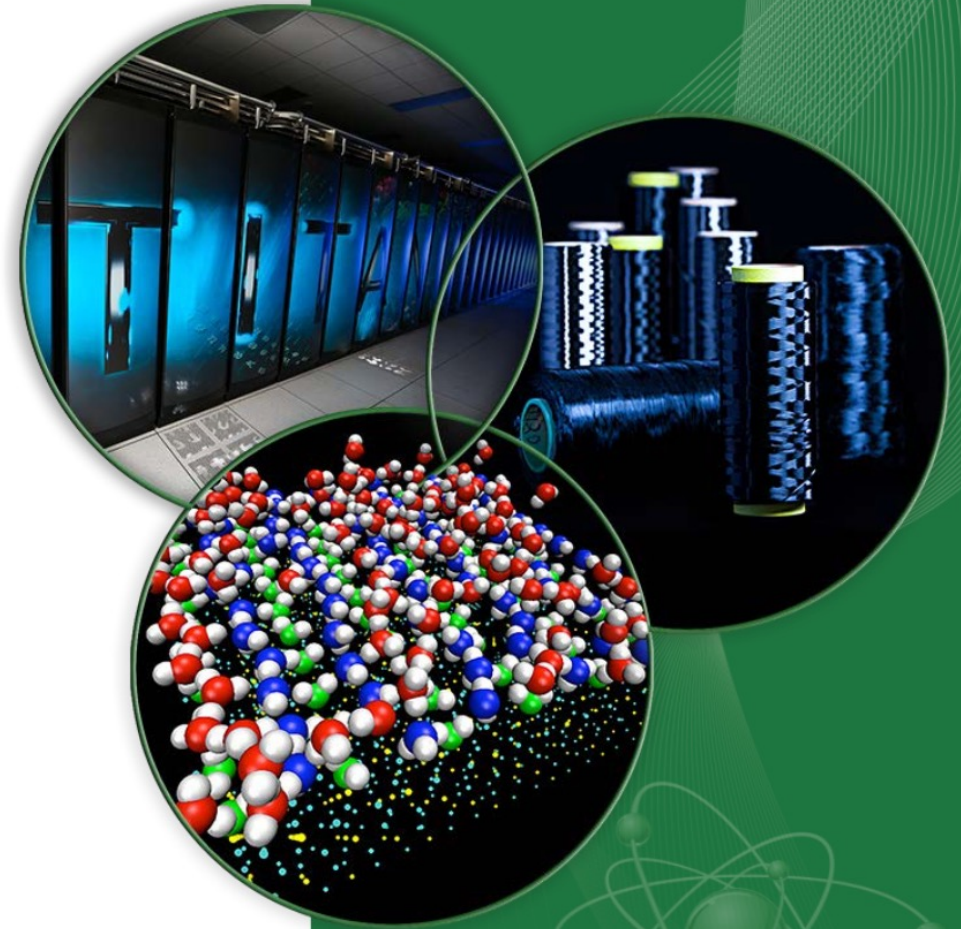


# CNMS Town Hall Meeting

Wednesday, August 9, 2023

**Zachary Hood**

Chair of the User Executive Committee  
Materials Scientist, Argonne National Laboratory



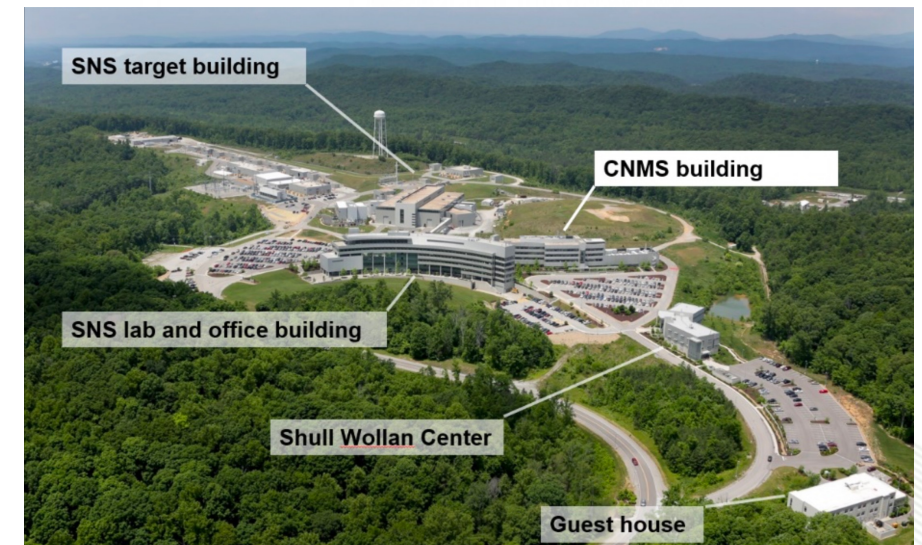
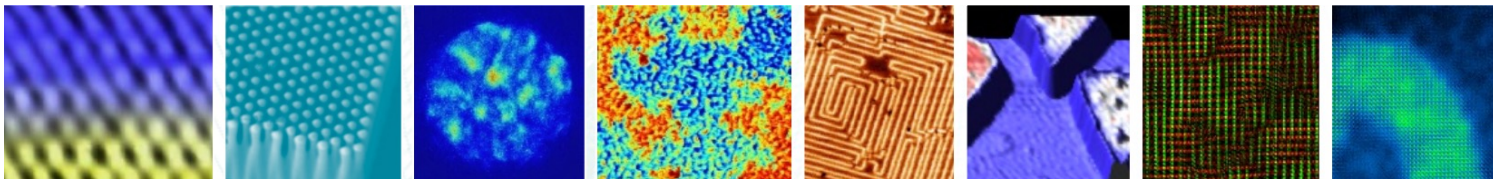
# CNMS is a national user facility with a mission to advance nanoscience

## About CNMS:

- Free access to staff expertise and equipment (if intent is to publish)
- Two proposal calls per year; proposals for short-term projects accepted continuously
- Short proposal process, and online submission portal
- Joint proposals with SNS and HFIR

## Research Expertise and Capabilities:

- Imaging, microscopy, and nanoscale characterization
- Theory, modeling, and simulation
- Synthesis and fabrication
- Soft matter synthesis and characterization
- Functional characterization of nanomaterials





# CNMS – Future Science Strategy

**Complexity** Develop new techniques for creating materials and structures

**Control** Use new techniques to explore materials properties

**Infrastructure** Investments being made to advance SC initiatives (microelectronics, QIS, AI/ML, clean energy)

Harnessing  
Complex  
Macromolecular  
Conformations

Understanding  
**structural and  
polarization  
dynamics** in polar  
polymers

Develop materials  
design framework **for  
incorporating  
spatio-temporal  
dynamics** for on-  
demand materials  
functions

Multiscale  
Dynamics



Heterogeneities  
in Quantum  
Materials

Discovering,  
understanding, and  
controlling  
**quantum  
materials** behavior  
induced by  
heterogeneities

Science portfolio underpinned by CNMS strengths in AI/ML (data analytics, autonomous experiments, etc.), theory, precision synthesis, and imaging (scanning probes, electron, ion)



U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science

# **\*\*LIVE POLL FROM THE AUDIENCE**

## **What do you like most about the CNMS?**

Collaborative culture

Free Coffee

Staff member expertise

Best scientists in the world who take great care in getting best results

Group speed dating

Great staff

Expert staff

Exceptional staff

Staff is very helpful

Access to world class scientists

Exceptional staff

location

The experimental capabilities and scientists and access to them!

Technical expertise

State of the art scientific tools

Willingness to help users, even when they aren't our direct host.

The UEC is fantastic

Great staff



**OAK RIDGE**  
National Laboratory

CENTER FOR  
NANOPHASE  
MATERIALS SCIENCES

# \*\*LIVE POLL FROM THE AUDIENCE

## What do you like most about the CNMS?

^

Group speed dating	Exceptional staff	Great staff
Great staff	location	The UEC is fantastic
Instruments	access to instruments not at my institution	Great staff
State of the art technology	Collaboration	I like the collaborative work
Collection of unique capabilities	Great staff	Staff
Nice staff, very collaborative environment	Users	The technical expertise of teams

# Leadership and Structure

Click on individual names to link  
to view ORNL Staff Profile.

Updated: 6/23/2023



## Theme Leads

**Peter Maksymovych**  
Multiscale Dynamics  
**An-Ping Li**  
Heterogeneities in Quantum Materials  
**Rajeev Kumar**  
Harnessing Complex Macromolecular Conformations

## CNMS Division Office

**Karren L. More**, Division Director  
*Liz Lee*, Division Administrative Support  
**Brad Lokitz**, User Program Director  
**Lisa Goins**, User Program Coordinator  
**Rama Vasudevan**, Data and Analytics Coordinator  
**Iliia Ivanov**, Outreach Coordinator  
**Liam Collins**, Post-doc Coordinator

## Operations/Support

Samantha Moore, Finance  
Andrea Green Browning, HR  
Kevin Harman, Operations Manager  
*Liz Lee*  
Zachary Gosser, Operations Support  
Tom Mooney, Lab Waste Services

## Nanomaterials Characterization – Stephen Jesse

*Laura Wallace*

### Scanning Transmission Electron Microscopy (STEM)

**Andy Lupini**  
*Ana Robbins*

Jefferey Baxter      Ondrej Dyck  
Albina Borisevich      Jordan Hachtel  
Miaofang Chi      Chris Nelson  
                                 Steffi Woo  
  
Eric Hoglund, Hwangsun (Sunny) Kim,  
Abinash Kumar, Elizaveta Tiukalova

### Materials MicroAnalysis (MMA)

**Ray Unocic**  
*Ana Robbins*

Matthew Boebinger      Kinga Unocic (reports  
James Burns      to Karren More)  
David Cullen      Alexis Williams  
Jon Poplawsky      Haoran Yu  
Shawn Reeves      Michael Zachman  
  
Lynda Amichi, Qingqiang (QQ) Ren, Biva  
Talukdar, Yajie Zhao

### Functional Atomic Force Microscopy (F-AFM)

**Neus Domingo**  
*Laura Wallace*

Liam Collins      Peter Maksymovych  
Anton Ievlev      Sabine Neumayer  
Kyle Kelley      Wan-Yu Tsai (CSD)  
  
Marti Checa Nualart, Olya Popova, Shiva  
Raghuraman, Sang Yong Song

### Scanning Tunneling Microscopy (STM)

**An-Ping Li**  
*Laura Wallace*

Art Baddorf      Saban Hus  
Zheng Gai      Jewook Park  
  
Hoyeon Jeon

## Nanomaterials Synthesis/Nanofabrication – Scott Retterer

*Lacey Pack*

### Functional Hybrid Nanomaterials (FHN)

**Dave Geohegan**  
*Amber Laymance*

Iliia Ivanov  
Ben Lawrie (MSTD)  
Alex Puzetzy  
Chris Rouleau  
Ivan Vlassiuk  
Zili Wu (CSD)  
Kai Xiao  
  
SeokJoon Yun

### Macromolecular Nanomaterials (Macro)

**Gobet Advincula**  
*Amber Laymance*

Peter Bonnesen  
Jihua Chen  
Jong Keum (NScD)  
Brad Lokitz  
Yue Yuan  
Hanyu Wang  
Yangyang Wang  
Honghai Zhang  
  
Panagiotis Christakopoulos

### Nanofabrication Research Laboratory (NRL)

**Steven Randolph**  
*Lacey Pack*

Dayrl Briggs  
Pat Collier  
Sujoy Ghosh  
Dale Hensley  
Ivan Kravchenko  
Nick Lavrik  
Kevin Lester  
Bernadeta Srijanto  
Leslie Wilson  
  
Yi-Syuan Guo

## Theory & Computation – Bobby Sumpter

*Brianna Holder*

### Nanomaterials Theory Institute (NTI)

**Panchapakesan Ganesh**  
*Lacey Pack*

Tom Berlijn      Paul Kent (CSED)  
Jan-Michael Carrillo      Rajeev Kumar  
Peter Doak (CSED)      Liangbo Liang  
Addis Fuhr      David Lingerfelt  
Jingsong Huang      Thomas Maier (CSED)  
Jacek Jakowski (CSED)      Eva Zarkadoulas  
  
Gani Annaberdiyev, Michael Jacobs, John (Jack)  
Villanova, Shuaifang Zhang, Qinyu Zhu

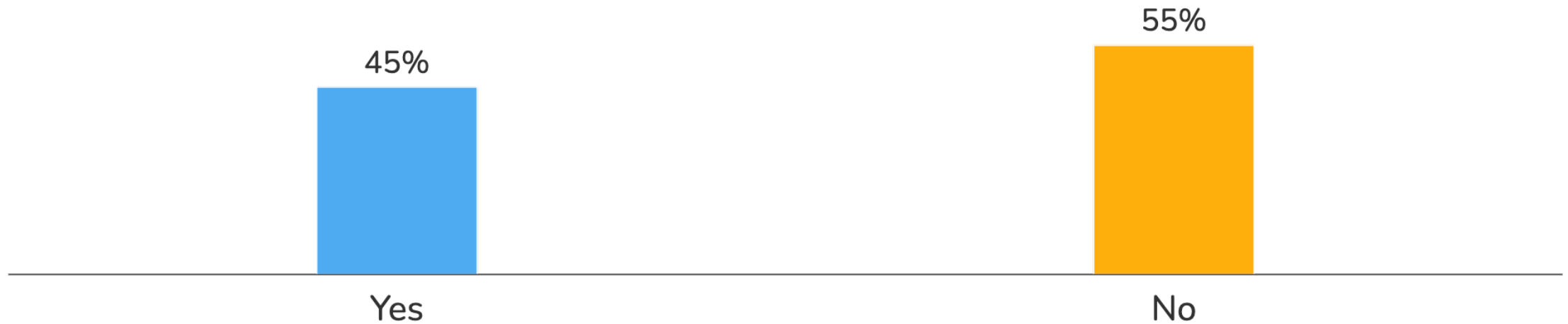
### Data NanoAnalytics (DNA)

**Rama Vasudevan**  
*Brianna Holder*

Miguel Fuentes-Cabrera  
Sumner Harris  
Yongtao Liu  
Kevin Roccapiore  
Maxim Ziatdinov (CSED)  
  
Arpan Biswas, Ganesh  
Narasimha

## **\*\*LIVE POLL FROM THE AUDIENCE (40 responses)**

**Are you familiar with the role of the CNMS User Executive Committee?**





# External Advisory Committees

## CNMS Division Office

**Karren L. More, Division Director**

*Liz Lee, Division Administrative Support*

**Brad Lokitz, User Program Director**

**Lisa Goins, User Program Coordinator**

**Rama Vasudevan, Data and Analytics Coordinator**

**Ilia Ivanov, Outreach Coordinator**

**Liam Collins, Post-doc Coordinator**

## Scientific Advisory Committee

Development of user capabilities, theme science

User access, experience, and equipment

## User Executive Committee



# CNMS UEC 2023 Members

<b>Chair:</b> Zachary Hood (Argonne National Lab)	2023
<b>Vice Chair:</b> Piran Kidambi (Vanderbilt U.)	2023
<b>Secretary:</b> Masoud Mahjouri-Semani (Auburn U.)	2023
<b>Past Chair:</b> Shengxi Huang (Rice U.)	2023

## At-Large Members

• Tatiana Allen (UT-Chattanooga)	2021-2023
• Liam Collins (ORNL)	2021-2023
• Ethan Self (ORNL)	2022-2024
• Jon Camden (U. Notre Dame)	2022-2024
• Wan-Yu Tsai (ORNL)	2022-2024

## CNMS Staff (non-members)

- **Brad Lokitz**
- **Lisa Goins**
- **Karren More**

**THANK YOU!**

<b>Industrial Liaison:</b> Jacob Swett (Recognition AnalytiX)	2021-2023
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# UEC Responsibilities

## Primary Responsibilities

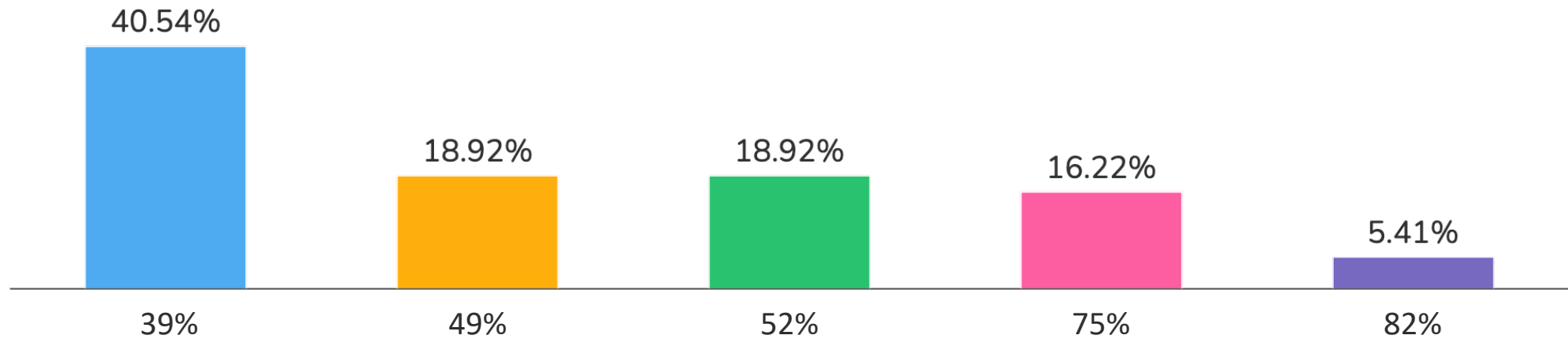
- Identify user issues and provide input to CNMS administration on behalf of users
- Review User Satisfaction Survey and make recommendations to CNMS
- Advise on Strategic Plan updates

## Other Important Responsibilities

- Organize annual User Meeting
- Provide oversight for proposal process
- UEC elections
- Represent users at BES on-site reviews (Triennial Review happened in summer 2019)
- Attract new users to CNMS

## \*\*LIVE POLL FROM THE AUDIENCE (41 responses)

What is the current response rate for the user satisfaction survey?



# User Satisfaction Survey

## **Very positive response overall this year (49% response rate)**

- 94% generally satisfied with operating schedule, availability of instrumentation, and experiment timing
- 91% generally satisfied with facility performance
- 94% generally satisfied with staff support

## **Key issues noted by users**

- See Notes For Issues From Survey to pick from

## **Opportunities to provide feedback to the CNMS:**

- Town Hall
- Suggestion Box (link on CNMS website) or reach out to UEC member and/or CNMS staff
- Thank a staff (link on CNMS website)

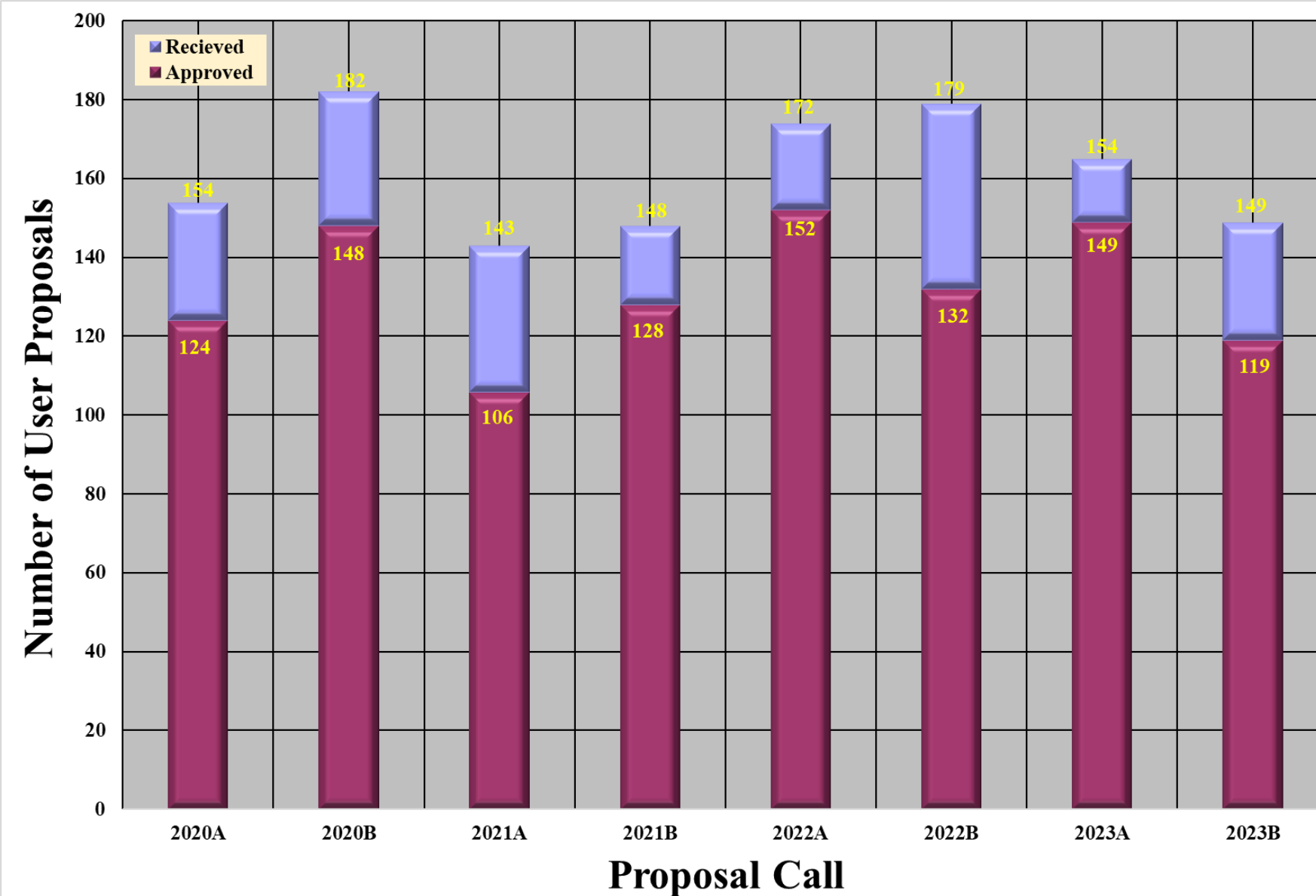


## \*\*LIVE POLL FROM THE AUDIENCE (39 responses)

How many active user projects were at the CNMS in FY22?



# Proposals Submitted and Approved



- **816 *unique users*** in FY22 → 656 in FY21
- **360 *publications*** in FY 22 → 409 in FY21
- **457 *user proposals*** received in FY21 (including 106 Rapid Access)
- **515 *active user projects*** during FY22 → 616 active projects during FY21

# Next CNMS Proposal Call – 2024A

Announced after User Meeting (Aug. 16, 2023)

**Deadline:** Wednesday, Oct. 18, 2023 12 pm EST

Notifications mid-December

**Project Start Date:** Thursday, Feb. 1, 2024

# UEC Election Nominations

## Nomination Procedure:

Send an email to [lokitzbs@ornl.gov](mailto:lokitzbs@ornl.gov) identifying the nominee(s) and the office(s) for which you are nominating them (Vice-Chair or Secretary or At-Large (3 spots open))\*.

To expedite your nomination, it is strongly suggested that you identify another CNMS user who is willing to second the nomination, CC that member on your nominating email, and ask them to confirm their support by a reply to [lokitzbs@ornl.gov](mailto:lokitzbs@ornl.gov).

**Nominations will be accepted through September 15, 2023.**

\*At-large positions should include at least 1 student (undergrad, grad, or postdoc) and 1 industry member

[cnms-uec@ornl.gov](mailto:cnms-uec@ornl.gov)



# Panel Discussion: CNMS Town Hall



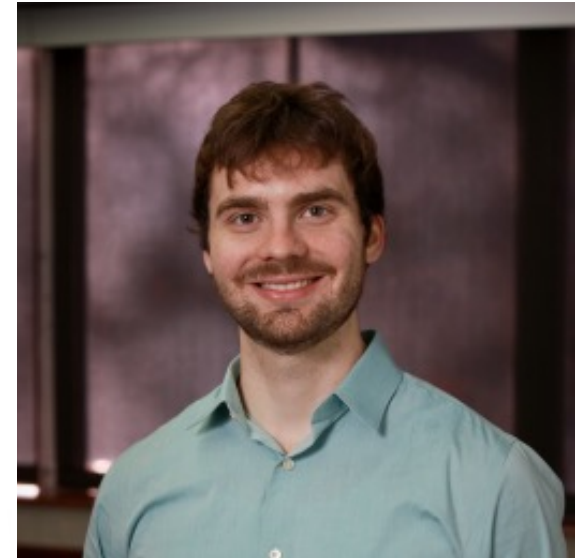
Karren More  
ORNL



Brad Lokitz  
ORNL



Jon Camden  
University of Notre Dame



Ethan Self  
ORNL

# \*\*LIVE POLL FROM THE AUDIENCE

## CNMS Town Hall: Do you have questions for the CNMS?

Do you encourage a faculty sabbatical at CNMS? What are the mechanisms?

Which are the key indicators you use to evaluate the success of the User Program?

Do you do a follow up/evaluation of the projects with users/staff when completed?

Does CNMS consider/coordinate activities taking place at the other NSRCs when deciding on future capabilities and activities?

What pipelines are in place to turn science into startups/products?

Are instrumentation development opportunities open to users?

Do you do a follow up/evaluation of the projects with users/staff when completed?

# Poster Awards

# Best Student Presentation Award Winners

*All five students will receive a Best Poster Presentation Award*

- **Adam Dodson**, **Vanderbilt University**
  - *Temperature Dependence of the Dominant Visible Transitions of  $\text{Er}^{3+}$  in Single-Crystal  $\text{Er}_2\text{O}_3$*
- **Bogdan Dryzhakov**, **University of Tennessee - Knoxville**
  - *Heterostructured Ferroelectricity with Light-Emitting Properties by Intracrystalline Mixing of 2D- and 3D-Perovskite Phases*
- **Lynnica Massenburg**, **Penn State University**
  - *Structural Organization of *Physcomitrium patens* Cellulose Synthase 5 Homotrimeric Assemblies*
- **Vincenzo Musico**, **North Carolina State University**
  - *Lattice Flexibility During Ion Insertion in Tungsten Oxides*
- **Kyra Owensby**, **University of Tennessee - Knoxville**
  - *Lithium Morphology Evolution Through Crosslinked Poly(ethylene Oxide) Solid Polymer Electrolyte*



# Outstanding CNMS Staff Member Award

**Intention:** show appreciation from users for the expertise and assistance of CNMS Staff

## Judging process:

- Achievement and performance: important and significant research contributions; strong commitment to CNMS's mission and core values
- User service and interactions: positive, effective, and respectful work with others; foster collaboration with CNMS user community
- Support and initiative: initiative to enhance processes/systems; expands responsibilities and improves quality of CNMS's operation

A subcommittee of the UEC judged nominees.

“Thank a Staff Member” entries were used in the judging process.

# Outstanding CNMS Staff Member Award

2020 Liam Collins

2021 Jonathan Poplawsky

2022 Bernadeta Srijanto

# Outstanding CNMS Staff Member Award

## Michael Zachman

### Congratulations!

*“Michael is a highly meticulous scientist that goes the extra mile to support users in acquiring and interpreting STEM data. His dedication to providing exceptional assistance brings about a remarkable and comprehensive user experience.”*

*“Getting to interact with staff scientists like Michael is why I look forward to working with national labs!”*

*“Michael has been always responsive, critical thinking, and paying attention to the details of the research.”*

*“The students were very impressed by the CNMS research capabilities and level of support provided by Dr. Zachman.”*



# Goals of the CNMS User Meeting

- Learn about cutting-edge nanoscience/capabilities at the CNMS and advance your research
- Network with CNMS staff and facility users
- Attend topical workshops:
  - Autonomous Characterization and Synthesis
  - CryoEM
  - Novel Materials for Neuromorphic Computing
  - Understanding Structure and Dynamics of Charged Polymers
  - Chemical Characterization of Materials
- Provide additional input to CNMS operations and the user experience



# Agenda of the CNMS User Meeting

2023 CNMS User Meeting	
AGENDA	
Thursday, August 10 CNMS	
Workshops	
1:00 p.m. – 5:00pm ET	<b>Understanding Structure and Dynamics of Charged Polymers</b> Organizer: Rajeev Kumar Location: Building 8610 (CNMS), Executive Conference Room, L-183
1:00 p.m. – 5:00pm ET	<b>Chemical Characterization of Materials</b> Organizer: Anton Ievlev, Jon Poplawsky, Liam Collins Location: Building 4151, Room 265

# CNMS Town Hall Meeting

Wednesday, August 9, 2023

## Tour of the CNMS

Bus to leave Crowne Plaza at  
1:00 pm ET

