

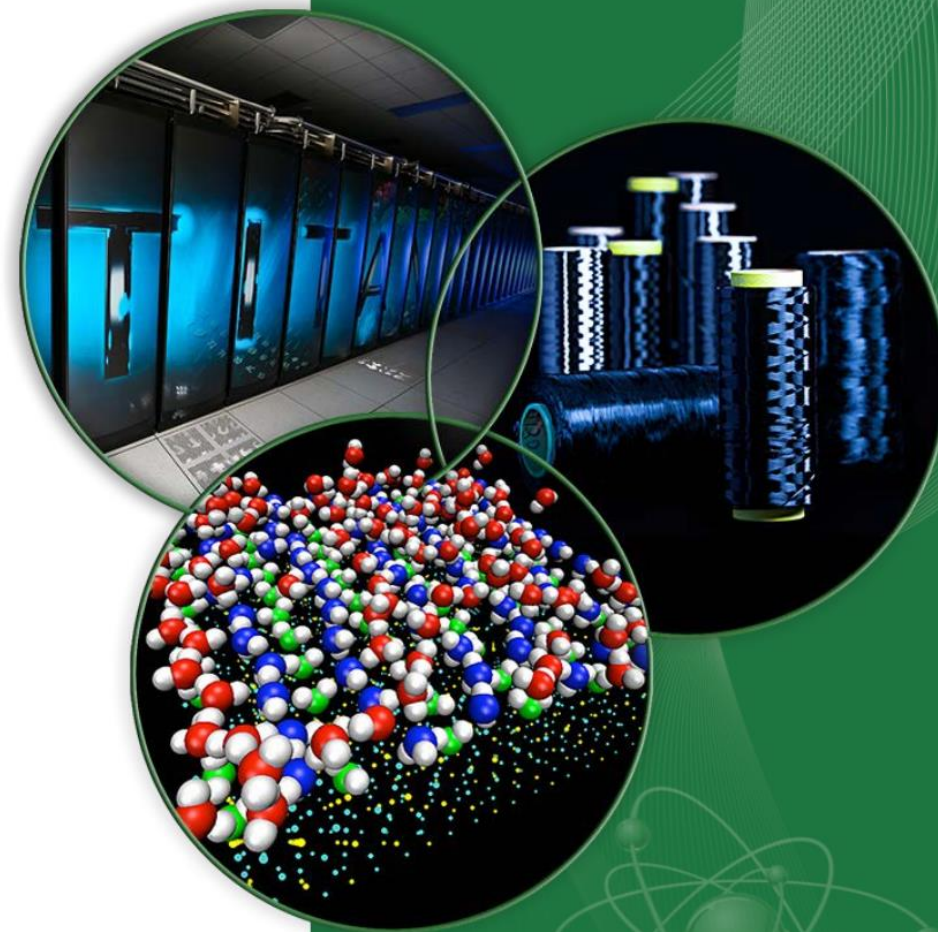
CNMS Town Hall Meeting

Wednesday, August 10, 2022

Starts at 2:00 PM EDT

Shengxi Huang

Chair of the User Executive Committee
Assistant Professor, Rice University



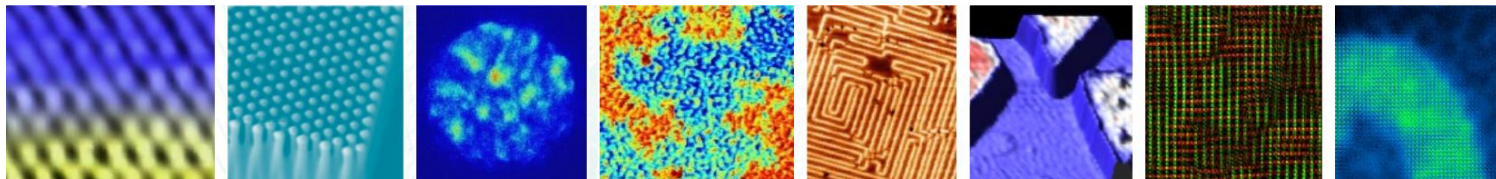
CNMS is a national user facility with a mission to advance nanoscience

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

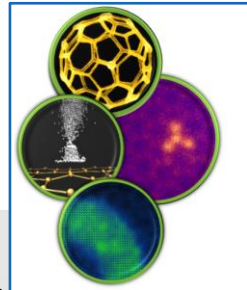
Research Expertise and Capabilities:

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



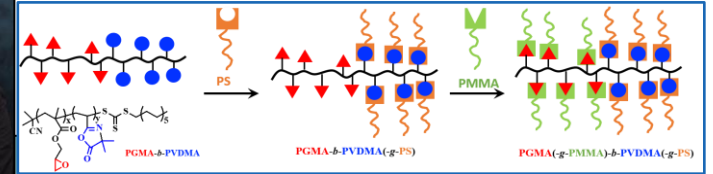
Theme Science

Novel nanofabrication
approaches with atomic
precision to understand
how matter can be
transformed locally



**Directed
Nanoscale
Transformations**

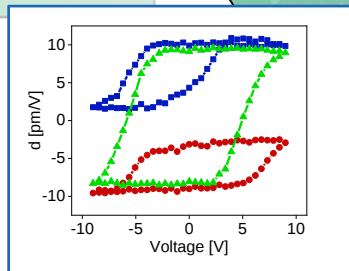
Complexity: Develop
new techniques for
creating materials
and structures



**Harnessing
Complex
Macromolecular
Conformations**

Understanding
*structural and
polarization dynamics*
in polar polymers

New metastable states
using hysteretic
response of material to
applied forces



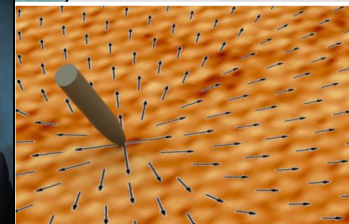
**Metastability in
Nanomaterials**



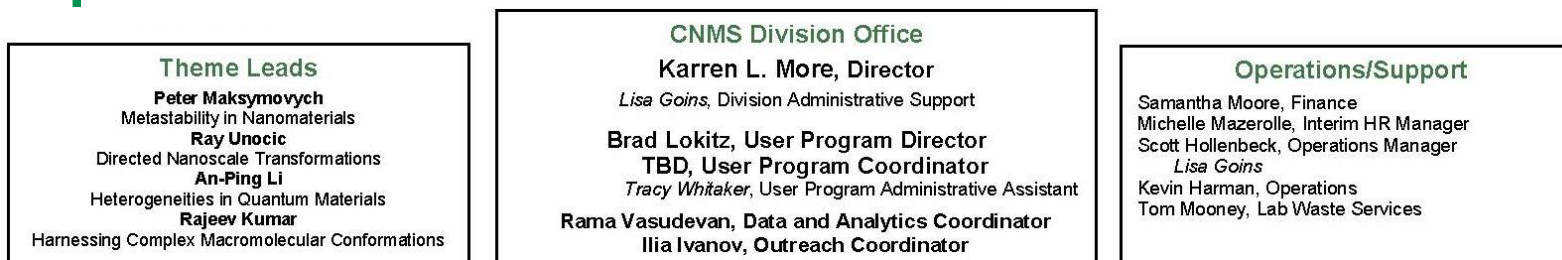
Control: Use new
techniques to explore
materials properties

**Heterogeneities in
Quantum
Materials**

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

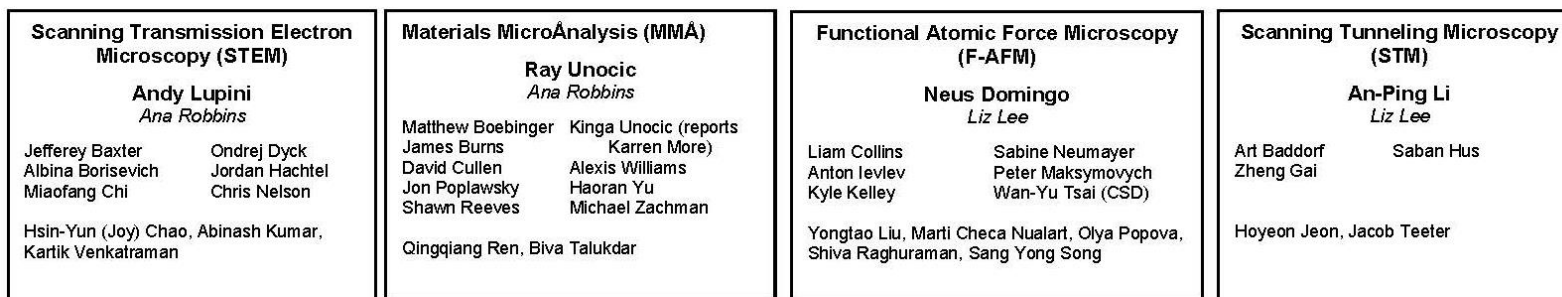


Leadership and Structure



Nanomaterials Characterization – Stephen Jesse

Liz Lee



Nanomaterials Synthesis/Nanofabrication – Scott Retterer

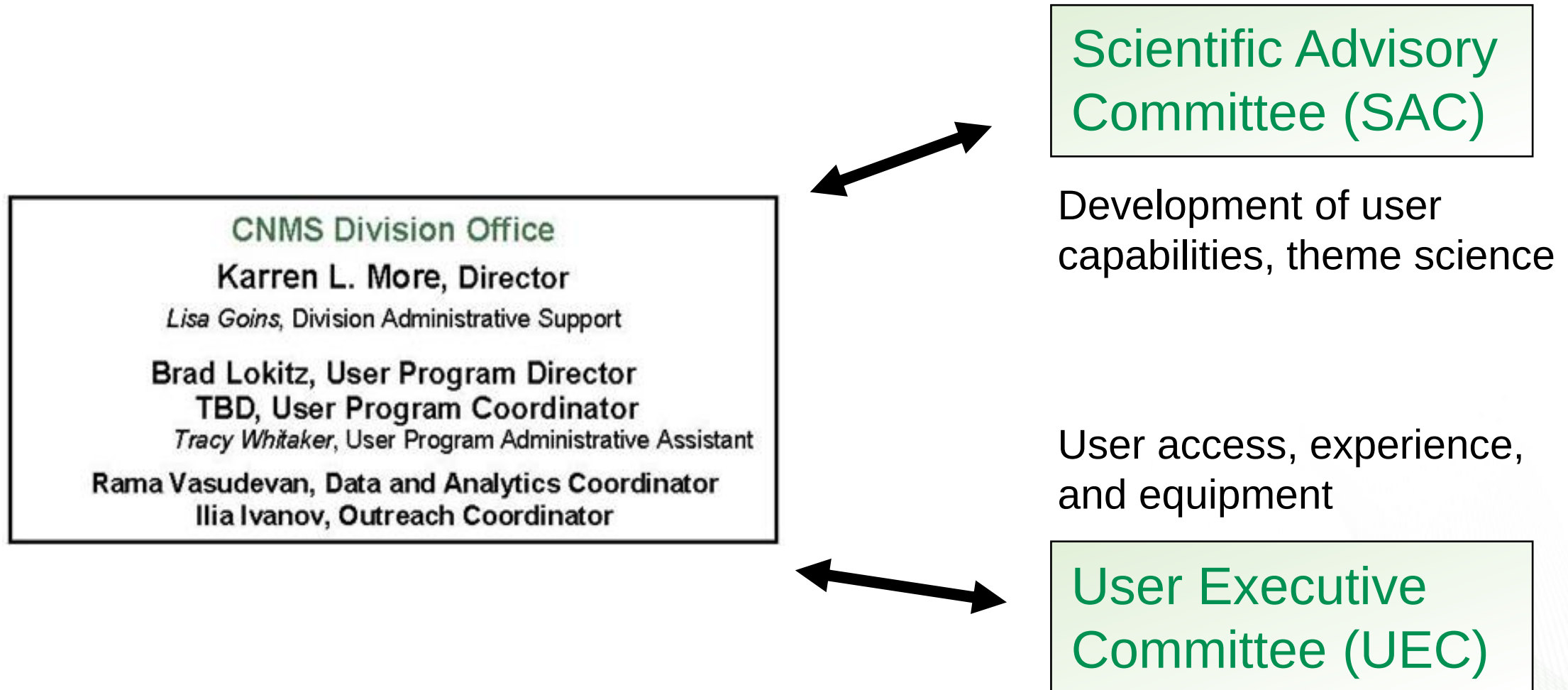
Lacey Pack

Theory & Computation – Bobby Sumpter

Amber Laymance



External Advisory Committees



CNMS User Executive Committee 2020 Members

Chair: Shengxi Huang (Rice U.) 2022

Vice Chair: Zach Hood (Argonne NL) 2022

Sec: Masoud Mahjouri-Samani (Auburn U.) 2023

Past Chair: Josh Agar (Lehigh U.) 2022

At-Large Members

- Tatiana Allen (U. Tennessee-Chattanooga) 2023
- Liam Collins (ORNL) 2023
- Piran Kidambi (Vanderbilt U.) 2022
- Peter Moeck (Portland State U.) 2022
- Michael Naguib (Tulane U.) 2022
- Ethan Self (ORNL) 2022
- Jacob Swett (Recognition AnalytiX)* 2023

CNMS Staff (non-members)

- Brad Lokitz
- Tracy Whitaker
- Karren More

THANK YOU!

***Industrial Representative**

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

User Satisfaction Survey

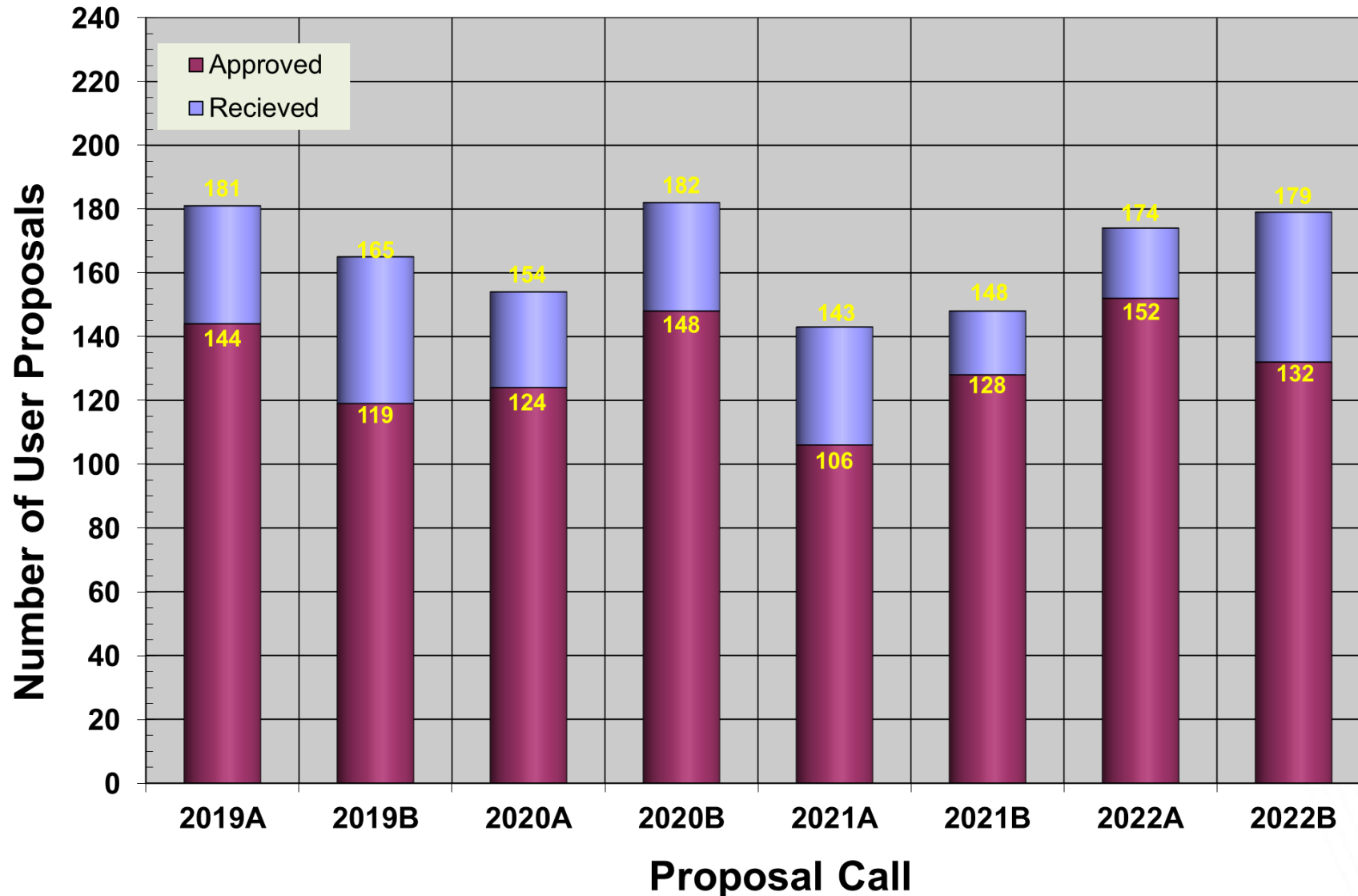
Very positive response overall this year (51% response rate)

- 96% generally satisfied with operating schedule, availability of instrumentation, and experiment timing
- 96% generally satisfied with facility performance
- 97% generally satisfied with staff support

Key issues noted by users

- See Notes For Issues From Survey to pick from

Proposals Submitted and Approved



- **656 *unique users*** in FY21 → Projecting 578 in FY20
- **406 *publications*** in FY 21 → 423 in FY20
- **388 *user proposals*** received in FY21 (including 96 Rapid Access)
- **616 *active user projects*** during FY21 → 662 active projects during FY20

Equipment Update – FY20

DGX-2 AI System 4801220539	Anode for XR Generator 4000179173
Spectrometer 4000179985	Ion Pump Power Supply 4000179315
High Temperature Sample Holder 4000180271	Velion Raith 4000167491
NMR Upgrade 4000167386	Velion Raith 4000167491
Sinterit Lisa SLS 3D printer 4000177158	Hanbell Dry Screw Vacuum 4000178271
Form 3 & 3B printer package 4000177416	Hanbell Dry Screw Vacuum 4000179454
Ultimaker 2+ & 3 3D printer 4000177439	Double-Tilt Cooling holder 4000172422
SDS Printer 4000177190	Octane Elect Plus EDS System with APEX 4000175899
Funmat HT 3D Printer 4000177511	JEOL NeoArm Henny 4000172422
APSX-PIM Injection Machine 4000178758	Double Tilt Atoms Defend Holder 4000179156
Front Panel for Generator 4000176835	PLD Target Holder/Oscillator 4000168991
Gigabot X 40179081	QO-CryoAmp 4000172276
AIRID Granulate Dryer 4000179119	Differentially-pumped Rotary Platform 4000170005
Ellipsoidal Mirror 4000174575	Hybrid SEM 4000174779
DiffusIR, Mass Spec, IR Spectrometer	SEM Cathodoluminescence Microscope 4000174401
Impedance System	Thermo Fisher Quattro 4000174401
DiffusIR, heated chamber etc. 4000180071	Robotic Sample Holder 4000168991
AFM Cantilevers 4000176032	MultiMotion Stage
Wobble Stick 4000179017	mk-STM (FY20/FY21) 4000180325

Next CNMS Proposal Call – 2023A

Announced at User Meeting (Aug. 17, 2022)

Deadline: Thursday, Oct. 19, 2022 12pm EST

Notifications mid-December

Project Start Date: Monday, Feb. 1, 2023

UEC Election Nominations

Nomination Procedure:

Send an email to lokitzbs@ornl.gov identifying the nominee(s) and the office(s) for which you are nominating them (Vice-Chair or At-Large (4 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.

Nominations will be accepted through September 2, 2022.

See “Logistics” Tab on Whova for this information!

cnms-uec@ornl.gov

Open Floor for Questions

Comments or suggestions for the UEC?

cnms-uec@ornl.gov

Open Floor for Questions

- 1) What sort of working arrangements are possible for students – short and/or long term?
- 2) What are the best mechanisms for students to come to ORNL?
ORISE programs (HERE, SULI, GO! program), DOE programs (SCGSR), User Program, etc.
- 3) With the "Reimagining ORNL" initiative, what new scientific and organizational opportunities can help grow the user body at the CNMS?
- 4) If my research interests are or are not related to the Theme Science at ORNL, what is the best way to get involved in working with CNMS?
- 5) In the time of COVID, what can we do to better connect users and CNMS staff?

cnms-uec@ornl.gov

Poster Awards

Best Student Presentation Award Winners

All five students will receive a Best Poster Presentation Award

- Platinum Award (\$160) • Sophie van Vreeswijk, **Utrecht University**
- *Nanoscale Visualization of Carbon Deposits and Magnesium Clusters in Zeolites Active in the Methanol-to-Olefins Process*
- Gold Award (\$90) • Sandra Stangebye, **Georgia Institute of Technology**
- *Investigating Grain Growth in Nanocrystalline Aluminum through In Situ MEMS-based Nanomechanical Testing*
- Silver Award (\$60) • Luke Galuska, **University of Southern Mississippi**
- *Critical Role of Water on Correlated Structural and Mechanical Response of Water-supported and Free-Standing Ultrathin Film*
- Bronze Award (\$30) • Josh Allen, **Vanderbilt University**
- *Inverse Design of Bowtie Photonic Crystal to Achieve Increased Light-Matter Interaction*
- Tie*
- Bronze Award (\$30) • Tri Nguyen, **Lehigh University**
- *Image Similarity Latent Manifolds for Materials Microscopy*

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.

Outstanding CNMS Staff Member Award

Liam Collins
Congratulations!

