

“Novel Materials for Neuromorphic Computing”
2023 CNMS User Meeting Workshop, Monday, August 7th
Salon A, Crowne Plaza Knoxville, 401 W Summit Hill Dr SW, Knoxville, TN 37902

8:00-8:10 AM Opening Remarks – Liangbo Liang, Oak Ridge National Laboratory

Session 1 (Chair - Sabine Neumayer)

8:10-8:50 AM Alec Talin, Sandia National Laboratory, *“Dynamically Reconfigurable Electrochemical Random Access Memory (ECRAM)”*

8:50-9:20 AM Santanu Mahapatra, Indian Institute of Science (virtual talk), *“Generalized theory for nonvolatile resistive switching in 2D memristors”*

9:20-9:50 AM Pavan Nukala, Indian Institute of Science (virtual talk), *“Materials networks at criticality on 2D hBN platform”*

9:50 AM 15 min Break

Session 2 (Chair - Liangbo Liang)

10:05-10:45 AM Alejandro Strachan, Purdue University, *“Modeling electrochemical processes with large-scale reactive molecular dynamics”*

10:45-11:15 AM Panchapakesan Ganesh, Oak Ridge National Laboratory, *“Harnessing Electron Correlations and Anharmonicity for Energy Efficient Computing”*

11:15-11:45 AM Jerry Bernholc, North Carolina State University, *“Exascale Quantum Transport Simulations”*

11:45 AM-1:00 PM Lunch

Session 3 (Chair - Saban Hus)

1:00-1:40 PM Deji Akinwande, The University of Texas at Austin, *“Atomristors: Single-Atom Memristors and Low-Energy Electronic Systems”*

1:40-2:10 PM Peter Maksymovych, Oak Ridge National Laboratory, *“Multimodal microscopy for intrinsic dynamics of neuromorphic materials”*

2:10-2:40 PM Patrick Collier, Oak Ridge National Laboratory, *“Short-term, long-term, and heterosynaptic plasticity of memristive and memcapacitive lipid bilayer membranes for neuromorphic applications”*

2:40 PM 15 min Break

Session 4 (Chair - Peter Maksymovych)

2:55-3:25 PM Yiyang Li, University of Michigan, *“Why are memristors nonvolatile?”*

3:25-3:55 PM Nikhil Shukla, University of Virginia, *“Insights into the Electrical Stress Response and Endurance of Ferroelectric Hafnium Zirconium Oxide Thin Films”*

3:55-4:15 PM Michael Zachman, Oak Ridge National Laboratory, *“Electron Microscopy Capabilities at the CNMS”*

4:15-4:35 PM Sabine Neumayer, Oak Ridge National Laboratory, *“Functional atomic force microscopy for nanoscale neuromorphic characterization”*

4:35 PM Open Discussion