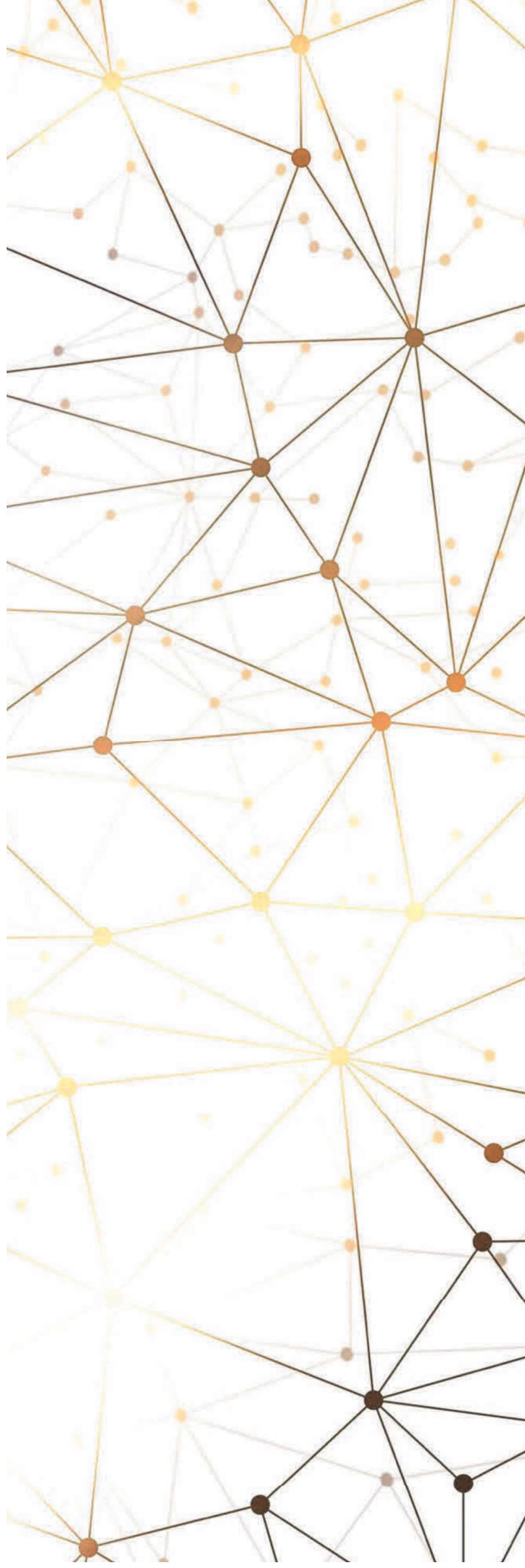




Update from the Condensed Matter and Materials Research Committee (CMMRC)

LESLIE MOMODA,
CMMRC CHAIR

MAY 1, 2025

Representation to NACM Board of Directors and Academic Senate

CMMRC 2025: Highlight – Workshop Planning

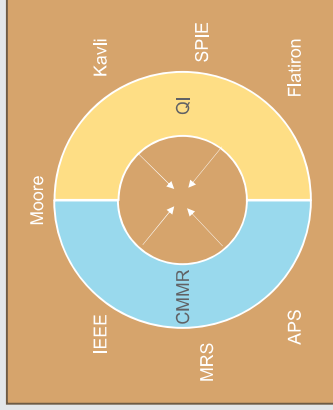
- 2025 workshop “Learning Materials” planning: adding more “books” to the “bookshelf”
 - Workshop planning committee approved. Chair: M. Lisa Manning
 - Target workshop for October or November 2025
 - Scope: Physical learning - Integrated sensing and adaption *insitu* to create materials that can learn. No external processors – potentially lower power, more robust, especially in harsh environments. Seek guiding principles, theories for design. Explore materials with complex energy landscapes
 - Ex: mechanical metamaterials, biomaterials.



CMMRC 2025: Issue

- **Issue: 2026 workshop topic selection**
 - Multiple topic areas under development
 - *Artificial Intelligence for Materials Synthesis and Inverse Design*
 - *Mixed Ion Conductors with Iontronics and Hybrid Materials*
 - *Self-powered Nanomaterials*
 - *Surface Science to Block Gaseous Non-Sieverts Permeation*
 - Invited speakers on each topic at spring committee meeting in March
 - Difficult to downselect
-

CMMRC 2025: Highlight – Community Engagement and Workshop Dissemination Activity April 18, 2025



- **Objective: Keep momentum from October's workshop "Frontiers of Engineered Coherent Matter and Systems"**
 - Workshop identified common problems coming from condensed matter and materials research (CMMR) and quantum information (QI)
 - How to better tie communities together?
 - How to build a community aware of each other's work?
- **Engagement activity via Team call**
 - 20 participants: workshop speakers, workshop planning committee, CMMRC members and reps of technical societies & institutes (e.g. APS, MRS, SPIE, Kavli, Flatiron, Moore)
- **Potential follow up actions**
 - Bring divisions together (APS) for cross-disciplinary conf talks
 - Encourage joint theory-experimental programs
 - Establish foundries to support hardware development
 - Student funding for cross-disciplinary research

BACK UP

Committee Charge

Standing committee responsible for advising on the fields of condensed matter science and materials research, including physics, chemistry, and biological applications.

A principal role is to plan, develop programs, and oversee activities initiated under its auspices.

Hold discussions with researchers across the broad community (academics, industry, and government laboratories; research managers; policy leaders and federal agency representatives providing support for the CMMRC fields focusing on current programs, policies, trends, and issues.

The CMMRC plans and develops workshops carried out by appointed committees/panels resulting in Academies reports assessing areas of research areas with recommendations to facilitate scientific progress in the forefront areas of research in these fields.

The CMMRC may also track initial topics to consider as part of the decadal survey's Condensed Matter and Materials Physics (CMMP) volume.

Sponsors: NSF Department of Materials Research and DoE Materials Science and Engineering, Office of Basic Science

Committee Membership

2025: Call for Experts



- **Leslie Momoda, Chair (NAE):** Exec Vice President, HRL Laboratories
- **Raymundo Arroyave:** Prof & Presidential Impact Fellow, Materials Sci & Engineering, Texas A&M University
- **Maria K. Chan:** Scientist, Center for Nanoscale Materials, Argonne National Labs
- **Young-Kai Chen (NAE):** Deputy CTO, Coherent Inc.
- **Steve Granick (NAS):** Professor, Polymer Science & Engineering, U Massachusetts Amherst
- **Samson Jenekhe (NAE):** Chair & Professor, Chemical Engineering & Chemistry, U Washington
- **Eun-Ha Kim:** Professor, Physics, Cornell University
- **M. Lisa Manning:** Professor, Physics, Syracuse University
- **Jagdish (Jay) Narayan (NAE):** Chair & Prof, Materials Science & Engineering, North Carolina State U
- **Monica Olvera de la Cruz (NAS):** Prof, Materials Science & Engineering, Chemistry, Chemical & Biological Engineering, Physics & Astronomy & Director, Center for Computation & Theory of Soft Materials; Deputy-Director, Center for Bio-Inspired Energy Science, Northwestern U.
- **Michael Rubenstein:** Professor, Physics, Duke University
- **Jill E. Seebergh (NAE):** Principal Senior Technical Fellow, The Boeing Company
- **Subash Singhal (NAE):** Retired, former Battelle Fellow & Director, Pacific Northwest Nat Lab
- **Victor R. Vasquez:** Prof & Chair, Chemical & Materials Engineering Dept, Univ. Nevada, Reno
- **Steven Zinkle (NAE):** Professor, Nuclear & Materials Science & Engineering, U Tennessee at Knoxville