



Electronic Materials and Applications (EMA 2025)

**February 25-28, 2025
Denver, CO, USA**

ceramics.org/ema2025

The
American
Ceramic
Society
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SAVE THE DATE

ACERS SPRING MEETING

APRIL 12-16, 2026

BELLEVUE, WASHINGTON, USA

ceramics.org/acersspring

Welcome

On behalf of The American Ceramic Society's Electronics and Basic Science Divisions, welcome to the 2025 Conference on Electronic Materials and Applications (EMA 2025). We are glad you could join us for this international conference focused on fundamental properties and processing of ceramic and electroceramic materials and their applications in electronic, electro/mechanical, magnetic, dielectric, and optical components, devices, and systems.

As in past years, the 2025 technical program includes plenary talks, invited lectures, contributed papers, poster presentations and open discussions. A full schedule is included here, as well on our EMA 2025 app (QR codes included on the front of this guide). You will find symposia focused on Energy Application, Quantum/Computing, Nanomaterials/2D, Additive Manufacturing, Complex Oxides, Microelectronics/Transport, AI/Theory/Computation, Structure-Property/Interface/Boundary, and Emerging Properties-Magnetic/Superconducting/Ferroic.

We would also like to call your attention to the multiple networking opportunities available to facilitate collaborations for scientific and technical advances related to materials, components, devices, and systems.

Pick up your conference badge and greet old and new friends on Tuesday, February 25, 2025 at the Colorado School of Mines Welcomes You to Denver Reception from 5 – 6:30 p.m. in Colorado F.

Two tutorials are available to all meeting registrants. Tuesday, February 25, 2025, 6:30 – 8:30 p.m. join the Basic Science Division for the BSD Tutorial. And new this year, Symposium 18 Characterization of Structure-Property Relationships in Functional Ceramics is hosting the S18 Tutorial: A brief primer on electron ptychography of ceramic materials on Wednesday, February 26, 2025 from 7- 9 p.m in Colorado D.

Mingle with the poster presenters at the Poster Reception on Wednesday, February 26, 2025, 5:30 – 7 p.m. in the Penrose Ballroom. And gather for some fun and refreshments at the Conference Reception on Thursday, February 27, 2025, 7- 9 p.m. in Colorado F.

The grand finale of the meeting will again be the popular “Failure: The Greatest Teacher” where established researchers discuss the great ideas that they’ve had that did not work out for one reason or another. We hope to see you there!

Thank you for your participation.

Mina Yoon, Oak Ridge National Laboratory (Electronics Division)
Reeja Jayan, Carnegie Mellon University (Electronics Division)
Fei Peng, Clemson University (Basic Science Division)
Ming Tang, Rice University (Basic Science Division)

Welcome from ACerS

The ACerS community is open to all, and we're happy to have you with us. ACerS values diverse and inclusive participation within the field of ceramic science and engineering. We strive to promote involvement and access to leadership opportunity regardless of race, ethnicity, gender, religion, age, sexual orientation, nationality, disability, appearance, geographic location, career path or academic level.

If you are a new member or joining us for the first time, please see the events available for you on page iv, or visit the ACerS registration desk to learn more.

For all guests, if you have special needs, please ask us at the ACerS registration desk. For childcare services, please check with the hotel concierge for a listing of licensed and bonded caregivers.

We hope you enjoy the conference and want you to know that all individuals are welcome at ACerS conferences and events.

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During oral sessions conducted during Society meetings, unauthorized photography, videotaping, and audio recording is strictly prohibited for two reasons:

- (1) conference presentations are the intellectual property of the presenting authors and as such are protected, and
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Basic Science Division and Electronics Division Leadership

2024–2025 Basic Science Division Officers

Chair: Amanda Krause | Carnegie Mellon University

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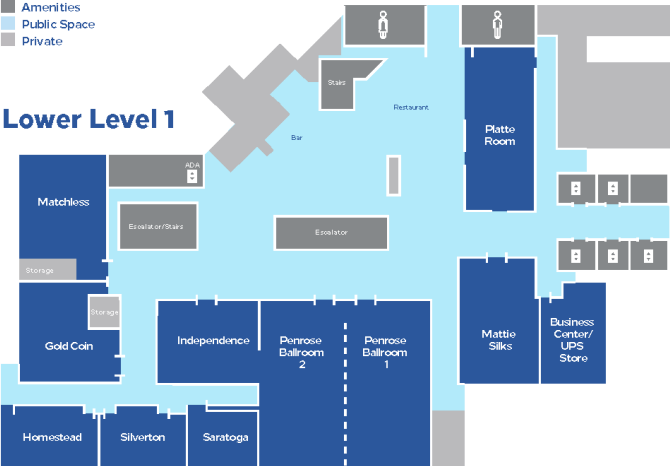
2024–2025 Nominating Committee Members: Eric Newman | Sandia National Laboratory; Jon Ihlefeld | University of Virginia

Conference & Events Rooms Floor Maps

FLOOR MAPS KEY

- Meeting/Conference Rooms
- Amenities
- Public Space
- Private

Lower Level 1



Lower Level 2



2nd Floor



3rd Floor



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bulletin





Jian Luo

University of
California, San Diego

**Wednesday,
February 26,
2025**

8:30 – 9:30 a.m.
Colorado E

Computing Grain Boundary Phase (Complexion) Diagrams and Controlling Microstructures with Electric Fields

The materials science community has long recognized that grain boundaries (GBs) can be treated as two-dimensional (2D) interfacial phases, which were also named as “complexions” to differentiate them from bulk phases. Such 2D interfacial phases can process distinct interfacial structures that are neither observed nor stable as bulk phases [see, e.g., a recent perspective article: *Science* 368, 381 (2024)]. As bulk phase diagrams are arguably the most useful materials science tool, this presentation will first review a series of our studies to compute the GB phase (complexion) diagrams via thermodynamic models, atomistic simulations, and machine learning [as summarized by a review and perspective article: *Interdisciplinary Materials* 2:137 (2023)]. In addition to temperature and chemical potentials, an applied electric field can induce a GB transition electrochemically [Nature Communications 12:2374 (2021)]. Recent studies further utilized electrochemically induced GB transitions to tailor microstructural evolution and create graded microstructures [Materials Today 73:66 (2024) and unpublished results].

Biographical Sketch

Jian Luo graduated from Tsinghua University with dual Bachelor's degrees: one in Materials Science and Engineering and another in Electronics and Computer Technology. After receiving his M.S. and Ph.D. degrees from M.I.T., Luo worked in the industry for over two years with Lucent Technologies Bell Laboratories and OFS. In 2003, he joined Clemson University, where he served as an Assistant/Associate/Full Professor of Materials Science and Engineering. Since 2013, he is a Professor of Chemical and Nano Engineering and Professor of Materials Science and Engineering at the University of California, San Diego (UCSD). Luo group's current research focuses on interfaces in ceramics and metals, high-entropy and compositionally complex ceramics, ultrafast sintering and other novel ceramic processing technologies, high-temperature nanocrystalline alloys, and advanced materials for batteries and other energy-related applications. Luo received a National Science Foundation CAREER award in 2005 and an AFOSR Young Investigator award in 2007. He is a Vannevar Bush Faculty Fellow (2014), a Fellow of the American Ceramic Society (2016), a Minerals, Metals & Materials Society (TMS) Brinacombe Medalist (2019), a Fellow of the ASM International (2022), and an Academician of the World Academy of Ceramics (2021). Luo served as the Chair for the Basic Science Division of the American Ceramic Society for 2012-2013 and chaired the Solid Studies of Ceramics Gordon Research Conference in 2018.



Sergei V. Kalinin
University of
Tennessee, Knoxville
and Pacific Northwest
National Laboratory

Thursday,
February 27,
2025
8:30 – 9:30 a.m.
Colorado E

Closing the Materials Discovery Loop via ML-Assisted Characterization: Building Optimized Rewards

The lesson of the past two decades is that scaling computation or synthesis individually by many orders of magnitude is insufficient to expedite materials discovery. The key is accelerating the iterative loop between theory and hypothesis making, experiment planning, synthesis, and characterization with subsequent update of theoretical models. Theory scales independently of material classes and can be leveraged universally through high performance computing and machine learning, fueling the recent advances from Google, Microsoft, and Meta. Synthesis can be scaled within certain material classes (or more specifically, within the synthesis method); whereas characterization remains a highly heterogeneous process with various tools, latencies, costs, and types of data generated. Currently, characterization is the bottleneck – while synthesis can be scaled to 1000s compositions per day, the sequential structural, functional, and chemical probing still require hours and days. However, this latency bottleneck is also intrinsically connected with the interpretability bottleneck, namely integration of the multidimensional measurement and imaging results back into theoretical predictive frameworks. This challenge is almost unaddressed by the AI4Science community of today.

We explore the bottom-up approach to build the single- and multi-instrument synthesis and characterization workflows based on the reward function concept. We present our latest advancements in the development of autonomous research systems based on electron and scanning probe microscopy, as well as for automated materials synthesis. We identify several categories of reward functions that are discernible during the experimental process, encompassing fundamental physical discoveries, the elucidation of correlative structure-property relationships, and the optimization of microstructures. The operationalization of these rewards function on autonomous microscopes is demonstrated, as well as the need and strategies for human in the loop intervention. Utilizing these classifications, we construct a framework that facilitates the integration of multiple optimization workflows, demonstrated through the synchronous orchestration of diverse characterization tools across a shared chemical space, and the concurrent navigation of costly experiments and models that adjust for epistemic uncertainties between them. Our findings lay the groundwork for the integration of multiple discovery cycles, ranging from rapid, laboratory-level exploration within relatively low-dimensional spaces and strong basic physics priors to more gradual, manufacturing-level optimization in highly complex parameter spaces underpinned by poorly known and phenomenological physical models. The very tempting opportunity this research opens is further use of the LLMs for creation of the probabilistic reward functions.

Biographical Sketch

Sergei Kalinin is a Weston Fulton chair professor at the University of Tennessee, Knoxville. In 2022 – 2023, he has been a principal scientist at Amazon special projects (moon shot factory). Before then, he has spent 20 years at Oak Ridge National Laboratory where he was corporate fellow and group leader at the Center for Nanophase Materials Sciences. He received his MS degree from Moscow State University in 1998 and Ph.D. from the University of Pennsylvania (with Dawn Bonnell) in 2002. His research focuses on the applications of machine learning and artificial intelligence methods in materials synthesis, discovery, and optimization, automated experiment and autonomous imaging and characterization workflows in scanning transmission electron microscopy and scanning probes for applications including physics discovery, atomic fabrication, as well as mesoscopic studies of electrochemical, ferroelectric, and transport phenomena via scanning probe microscopy. When at ORNL, he led several major programs integrating the ML and physical sciences and instrumentation, including the Institute for Functional Imaging of Materials (IFIM 2014-2019), the first program in DOE integrating ML and physical sciences, and the microscopy effort in INTERSECT program that realized first ML-controlled scanning probe and electron microscopes. At UTK MSE, he participated in building one of the first efforts in the country on ML-driven materials exploration. At UTK, his team has now realized fully AI-controlled SPM and STEM systems and co-orchestration workflows between multiple characterization tools for scientific discovery. He has also taught multiple courses on the ML for materials science and microscopy including Bayesian optimization methods. Sergei has co-authored >650 publications, with a total citation of ~55,000 and an h-index of ~116. He is a fellow of AAAS, RSC, AAIA, MRS, APS, IoP, IEEE, Foresight Institute, and AVS; a recipient of the Adler Lectureship (APS 2025), Duncumb Award (MSA 2024), Medard Welch Award (AVS 2023), Orton Lectureship (ACerS 2023), Feynmann Prize of Foresight Institute (2022), Blavatnik Award for Physical Sciences (2018), RMS medal for Scanning Probe Microscopy (2015), Presidential Early Career Award for Scientists and Engineers (PECASE) (2009); Burton medal of Microscopy Society of America (2010); 5 R&D100 Awards (2008, 2010, 2016, 2018, and 2023); and a number of other distinctions. As part of his professional services, he organized many professional conferences and workshops at MRS, APS and AVS; for 15 years organized workshop series on PFM, and served/s on multiple Editorial Boards including NPJ Comp. Mat., J. Appl. Phys., and Appl. Phys Lett.

Plenary & Symposia

Plenary—Computing Grain Boundary Phase (Complexion) Diagrams and Controlling Microstructures with Electric Fields

Wednesday, February 26, 2025
8:30 – 9:30 a.m. • Colorado E

Plenary—Closing the Materials Discovery Loop via ML-Assisted Characterization: Building Optimized Rewards

Thursday, February 27, 2025
8:30 – 9:30 a.m. • Colorado E

Symposium 1: Ceramics for Hydrogen Economy

Ceramic processing and manufacturing techniques for hydrogen applications

Thursday, February 27, 2025
2 – 5:30 p.m. • Colorado J

Ceramic components for solid oxide cells, including electrolytes, electrodes, and sealants

Friday, February 28, 2025
8:30 a.m. – 12:30 p.m. • Colorado J

Symposium 2: Electronic and Ionic Materials for Energy Storage and Conversion

Characterizations, mechanics, and development of advanced electrodes, electrolytes, and interfaces

Thursday, February 27, 2025
10 a.m. – 12:45 p.m. • Colorado I

Computational and experimental advances in mixed electronic and ionic conductors for energy storage and conversion systems

Thursday, February 27, 2025
2 – 5:15 p.m. • Colorado I

Next generation electrodes and electrolytes

Friday, February 28, 2025
8:30 a.m. – 12:15 p.m. • Colorado I

Symposium 3: Nano4Neuro - Mechanisms and Materials for Next Generation Computing

Materials that compute

Thursday, February 27, 2025
10 a.m. – 12:30 p.m. • Colorado C

Phase transitions for information

Thursday, February 27, 2025
2 – 5:30 p.m. • Colorado C

Neuroinformatics and architectures

Friday, February 28, 2025
8:30 a.m. – 12:30 p.m. • Colorado C

Symposium 4: Oxide Quantum Materials: Synthesis, Properties, and Applications

Materials synthesis

Wednesday, February 26, 2025
10 a.m. – 12:30 p.m. • Colorado B

Oxide electronics

Wednesday, February 26, 2025
2 – 3:15 p.m. • Colorado B

Superconductivity

Wednesday, February 26, 2025
3:15 – 5 p.m. • Colorado B

Quantum Electromagnetism

Thursday, February 27, 2025
10 a.m. – 12:30 p.m. • Colorado B

Symposium 4: Oxide Quantum Materials: Synthesis, Properties, and Applications

Advanced Characterization

Thursday, February 27, 2025
2 – 3:30 p.m. • Colorado B

Theory and Calculations

Thursday, February 27, 2025
3:30 – 5:30 p.m. • Colorado B

Symposium 5: In-Situ/Operando Characterization of Nanomaterials

In situ/Operando Study of Quantum and Topological Materials

Wednesday, February 26, 2025
10 a.m. – 12:30 p.m. • Colorado E

In situ/Operando Study of Energy and Functional Materials

Wednesday, February 26, 2025
2 – 5:30 p.m. • Colorado E

Symposium 6: Two-Dimensional Quantum Materials: Synthesis, Theories, Properties, and Applications

Two dimensional quantum materials: Synthesis, theories, properties & applications I

Wednesday, February 26, 2025
2 – 4:30 p.m. • Gold Coin

Two dimensional quantum materials: Synthesis, theories, properties & applications II

Thursday, February 27, 2025
10 a.m. – 12:30 p.m. • Colorado G

Two dimensional quantum materials: Synthesis, theories, properties & applications III

Thursday, February 27, 2025
2 – 5 p.m. • Colorado G

Two dimensional quantum materials: Synthesis, theories, properties & applications IV

Friday, February 28, 2025
8:30 – 9:30 a.m. • Colorado G

Symposium 7: Additive Manufacturing for Power Sources in Electronics

AM for Lithium Batteries I

Thursday, February 27, 2025
10 a.m. – 12:30 p.m. • Colorado E

AM for Lithium Batteries II

Thursday, February 27, 2025
2 – 5:30 p.m. • Colorado E

AM for Lithium Batteries and Beyond

Friday, February 28, 2025
8:30 a.m. – 12:30 p.m. • Colorado E

Symposium 8: New Frontiers and Science in Additive Manufacturing of Ceramic Materials

Additive Manufacturing of Ceramics

Wednesday, February 26, 2025
10 a.m. – 12:40 p.m. • Matchless

Symposium 9: Data-Driven and Model-Supported Structure-Property Relationships in Complex Electroceramics

Data-driven & Model-supported structure- property relationships in complex electroceramics I

Friday, February 28, 2025
8:30 – 10:30 a.m. • Colorado B

Plenary & Symposia

Symposium 9: Data-Driven and Model-Supported Structure-Property Relationships in Complex Electroceramics

Data-driven & Model-supported structure-property relationships in complex electroceramics II

Friday, February 28, 2025

10:30 a.m. – 12:30 p.m. • Colorado B

Symposium 10: Structure, Dynamics, and Functionalities in High-Entropy and Compositionally Complex Oxides

Structure, dynamics, and functionalities in high-entropy and compositionally complex oxides I

Wednesday, February 26, 2025

10 a.m. – 12:30 p.m. • Colorado D

Structure, dynamics, and functionalities in high-entropy and compositionally complex oxides II

Wednesday, February 26, 2025

2 – 5:15 p.m. • Colorado D

Symposium 11: Complex Oxide Thin Films and Heterostructures: From Synthesis to Strain/Interface-engineered Emergent Properties

Freestanding Metal Oxide Membranes

Wednesday, February 26, 2025

2 – 3:15 p.m. • Colorado A

Emergent phenomena in complex oxide thin films I

Wednesday, February 26, 2025

4 – 5:30 p.m. • Colorado A

Ferroelectric Oxide Thin Films and Heterostructures

Thursday, February 27, 2025

10 a.m. – 12:30 p.m. • Colorado A

Emergent phenomena in complex oxide thin films II

Thursday, February 27, 2025

2 – 5 p.m. • Colorado A

Functional Properties and Applications of Oxides

Friday, February 28, 2025

8:30 – 11:30 a.m. • Colorado A

Symposium 12: Advanced Semiconductors and Microelectronics

Semiconducting thin films I

Wednesday, February 26, 2025

10 a.m. – 1 p.m. • Colorado G

Semiconducting thin films II

Wednesday, February 26, 2025

2 – 4 p.m. • Colorado G

Characterization and applications of semiconducting materials

Wednesday, February 26, 2025

4 – 5:45 p.m. • Colorado G

Symposium 13: Defects and Transport in Ceramics

Defects and Transport in Ceramics I

Wednesday, February 26, 2025

10 a.m. – 12:30 p.m. • Colorado H

Defects and Transport in Ceramics II

Wednesday, February 26, 2025

2 – 3:30 p.m. • Colorado H

Defects and Transport in Ceramics III

Wednesday, February 26, 2025

3:30 – 5:30 p.m. • Colorado H

Symposium 13: Defects and Transport in Ceramics

Defects and Transport in Ceramics IV

Thursday, February 27, 2025

10 a.m. – 12:15 p.m. • Colorado H

S14-AI in materials research: from data analysis, autonomous experimentation, to human AI cooperation

AI for data analysis and simulation

Thursday, February 27, 2025

10 – 11:45 a.m. • Matchless

AI for smart lab and microscopy

Thursday, February 27, 2025

2:30 – 3:30 p.m. • Matchless

Automated synthesis and characterization of 2D materials

Thursday, February 27, 2025

3:30 – 5 p.m. • Matchless

Symposium 15: High-Performance Computational Design and Discovery of Electronic Materials

Computational Material Design and Discovery

Wednesday, February 26, 2025

2 – 5 p.m. • Matchless

Symposium 16: Controlling Grain Boundary Structure, Chemistry, and their Network as a Function of Material Processing

Microstructure evolution

Wednesday, February 26, 2025

10 – 11:30 a.m. • Colorado C

Processing parameters

Wednesday, February 26, 2025

11:30 a.m. – 12:45 p.m. • Colorado C

Interface structure and chemistry

Wednesday, February 26, 2025

2 – 5:45 p.m. • Colorado C

Symposium 17: Emerging Semiconductor Materials and Interfaces

2D Materials

Wednesday, February 26, 2025

10 – 11:15 a.m. • Colorado I

Wide bandgap (WBG) and ultra-wide bandgap (UWBG) materials I

Wednesday, February 26, 2025

11:15 a.m. – 12:30 p.m. • Colorado I

Wide bandgap (WBG) and ultra-wide bandgap (UWBG) materials II

Wednesday, February 26, 2025

2 – 5:30 p.m. • Colorado I

Symposium 18: Characterization of Structure - Property Relationships in Functional Ceramics

Integrating computational-imaging techniques and machine-learning into the structural measurement workflow

Wednesday, February 26, 2025

10 a.m. – 12:15 p.m. • Colorado J

Addressing open questions in functional ceramics

Wednesday, February 26, 2025

2 – 4 p.m. • Colorado J

Advances in connecting local and global structure to properties

ix Wednesday, February 26, 2025

4 – 5:30 p.m. • Colorado J

Plenary & Symposia

Symposium 18: Characterization of Structure - Property Relationships in Functional Ceramics

Advances in scattering, imaging, and analytical techniques

Thursday, February 27, 2025

10 a.m. – 12:30 p.m. • Colorado J

Symposium 19: Frontiers in Ferroic ceramics: Synthesis, Properties, and Applications

Frontiers in Ferroic Ceramics: Synthesis, properties and applications I

Thursday, February 27, 2025

2 – 5:30 p.m. • Colorado H

Frontiers in Ferroic Ceramics: Synthesis, properties and applications II

Friday, February 28, 2025

8:30 a.m. – 12:45 p.m. • Colorado H

Symposium 20: Magnetic and Superconducting Materials: From Basic Science to Applications

Low Dimensional Correlated Magnetic Materials I

Thursday, February 27, 2025

10 a.m. – 12:45 p.m. • Colorado D

Novel applications of magnetic materials

Thursday, February 27, 2025

2 – 6 p.m. • Colorado D

Superconductivity and Other Correlated Systems

Friday, February 28, 2025

8:30 a.m. – 12:45 p.m. • Colorado D

Failure: The Greatest Teacher

Friday, February 28, 2025

2 – 3:30 p.m. • Colorado E

Symposium 22: Advanced Electronic Materials: Processing Structures, Properties, and Applications

Advanced electronic materials, including ferroelectric, piezoelectric, dielectric, electrostrictive, and pyroelectric materials I

Wednesday, February 26, 2025

10 a.m. – 12:45 p.m. • Colorado F

Advanced electronic materials, including ferroelectric, piezoelectric, dielectric, electrostrictive, and pyroelectric materials II

Wednesday, February 26, 2025

2 – 5:15 p.m. • Colorado F

Advanced electronic materials, including ferroelectric, piezoelectric, dielectric, electrostrictive, and pyroelectric materials III

Thursday, February 27, 2025

10 a.m. – 12:30 p.m. • Colorado F

Schedule of Events

Tuesday, February 25, 2025

Registration	5 – 6:30 p.m.
Colorado School of Mines	
Welcomes You to Denver Reception	5 – 6:30 p.m.
Basic Science Division Tutorial	6:30 – 8:30 p.m.

Wednesday, February 26, 2025

Registration	7:30 a.m. – 5:30 p.m.
Plenary Session 1	8:15 – 9:30 a.m.
Coffee Break	9:30 – 10 a.m.
Technical Sessions	10 a.m. – 12:30 p.m.
Lunch On Own	12:30 – 2 p.m.
Technical Sessions	2 – 5:30 p.m.
Coffee Break	3:30 – 4 p.m.
PCSA Info Session	4:30 – 5:20 p.m.
Poster Session & Reception	5:30 – 7 p.m.
NEW THIS YEAR	
Symposium 18 Special Lecture	7 – 9 p.m.

Thursday, February 27, 2025

Registration	8 a.m. - 5:30 p.m.
Plenary Session 2	8:30 - 9:30 a.m.
Coffee Break	9:30 - 10 a.m.
Technical Sessions	10 a.m. - 12:30 p.m.
Lunch On Own	12:30 - 2 p.m.
Technical Sessions	2 - 5:30 p.m.
Coffee Break	3:30 - 4 p.m.
Student and Young Professional Reception	5:30 - 6:30 p.m.
Celebration of EMA Reception	7 - 9 p.m.

Friday, February 28, 2025

Registration	8 a.m. - 12:30 p.m.
Technical Sessions	8:30 a.m. - 12:30 p.m.
Coffee Break	10 - 10:30 a.m.
Lunch on Own	12:30 - 2 p.m.
Failure: The Greatest Teacher	2 - 3:30 p.m.

Special Events

Tuesday, February 25, 2025

Colorado School of Mines Welcomes You to Denver Reception

5 – 6:30 p.m.

- Come network with attendees at the opening reception with drinks and light Hors D'oeuvres

Basic Science Division Tutorial

6:30 – 8:30 p.m.

- All conference attendees are welcome to join the Basic Science Division Tutorial. Pizza and drinks will be provided!



Wednesday, February 26, 2025

PCSA Information Session

4:30 – 5:20 p.m.

- Come learn all about the PCSA at this session

Poster Session & Reception

5:30 p.m. – 7 p.m.

- Join us into the evening on night two as the poster presenters discuss their research

Symposium 18: Characterization of Structure–Property Relationships in Functional Ceramics

7 p.m. – 9 p.m.

- New this year, join us for this exciting new tutorial at EMA

Thursday, February 27, 2025

Student and Young Professional Reception

5:40 – 6:30 p.m.

- Come network with other students and young professionals in the industry, drink ticket will also be provided

Celebration of EMA Reception

7 p.m. – 9 p.m.

- Join us for this celebration featuring live music, fun games, heavy Hors D'oeuvres and drinks



COLORADO SCHOOL OF MINES

Shaping the future of ceramic engineering

Mines has been powering industry, Colorado and the future since 1874.

The new Bachelor of Science in Ceramic Engineering program provides students with a fundamental knowledge to prepare them for careers in both technical and traditional ceramics.

The ceramic engineering program at Mines builds on the university's long-standing expertise in materials science and engineering, as well as Mines' cutting-edge ceramics research and facilities and strong relationships with industry. Developed in consultation and partnership with industry, this program has a strong focus on technical ceramics and glass.

Colorado School of Mines: At a Glance



**R1 classification
by Carnegie**



**\$95M in total research
awards during FY22**



**16:1 student-to-faculty
ratio**



Program scope

This program is housed within the Department of Metallurgical and Materials Engineering (MME), and is complementary to the existing MME degree.

Students receive hands-on training in ceramic processing, sintering, glass science and mechanical and electrical properties, with a particular emphasis on the materials' unique thermal properties. Four core laboratory classes starting in the second year ensure robust, hands-on experiences. Students also have access to innovative undergraduate research opportunities and makerspaces, including Mines' on-campus glass hot shop.

Research areas

- Electrical behavior
- Thin films
- Processing
- Mechanical behavior
- Microscopy
- Computation



Learn more

For more information visit ceramics.mines.edu or metallurgy.mines.edu/undergraduate-program

Symposium Organizers

Organizing Committee

Mina Yoon, Oak Ridge National Laboratory, Electronics Division
Reeja Jayan, Carnegie Mellon University, Electronics Division
Fei Peng, Clemson University, Basic Science Division
Ming Tang, Rice University, Basic Science Division

Symposium 1: Ceramics for the Hydrogen Economy

Till Frömling, Fraunhofer IWKS, Hanau, Germany; Ming Li, University of Nottingham, United Kingdom

Symposium 2: Electronic and ionic materials for energy storage and conversion systems

Hui (Claire) Xiong, Boise State University, USA; Hua Zhou, Argonne National Lab, USA; Nicola Perry, University of Illinois Urbana-Champaign, USA; Fudong Han, Rensselaer Polytechnic Institute, USA; Ming Tang, Rice University, USA

Symposium 3: Nano4Neuro-Mechanisms and Materials for Next Generation Computing

Petro Maksymovych, Oak Ridge National Laboratory, USA; Yiyang Li, University of Michigan, USA

Symposium 4: Oxide Quantum Materials: Synthesis, properties, and applications

Seung Sae Hong, University of California, Davis, USA; Jennifer Fowle, Northwestern University, USA; Ho Nyung Lee, Oak Ridge National Laboratory, USA; Elizabeth Nowadnick, University of California, Merced, USA

Symposium 5: In-Situ/Operando Characterization of Nanomaterials

Di Zhang, Los Alamos National Laboratory, USA; Hao Zheng, Argonne National Laboratory, USA; Alessandro Mazza, Los Alamos National Laboratory, USA; Katharine Harmon, Stanford University, USA

Symposium 6: Two-dimensional quantum materials: Synthesis, theories, properties, & applications

Haozhe Wang, Duke University, USA; Cheng Gong, University of Maryland, USA; Diana Qiu, Yale University, USA

Symposium 7: Additive manufacturing for power sources in electronics

Jianchao Ye, Lawrence Livermore National Laboratory, USA; Kun Fu, University of Delaware, USA; Bin Li, Oak Ridge National Laboratory, USA

Symposium 8: New Frontiers and science in additive manufacturing of ceramic materials

Bai Cui, University of Nebraska-Lincoln, USA; Fei Peng, Clemson University, USA; Matjaz Spreitzer, University of Ljubljana, Slovenia; Mina Yoon, Oak Ridge National Laboratory, USA; Klaus van Benthem, University of California, Davis, USA; Amanda Krause, Carnegie Mellon University, USA

Symposium 9: Data-driven and model-supported structure-property relationships in complex electroceramics

Antonio Feteira, Sheffield Hallam University; Prasanna V. Balachandran, University of Virginia, USA; Jiri Hlinka, Institute of Physics, Academy of Sciences of the Czech Republic, Czech Republic; Cristina Pascual-Gonzalez, Material Science Institute of Madrid, ICMN-CSIC, Spain

Symposium 10: Structure, dynamics, & functionalities in high-entropy & compositionality complex oxides

Raphael Hermann, Oak Ridge National Laboratory, USA; Zac Ward, Oak Ridge National Laboratory, USA; Megan Butala, University of Florida, USA

Symposium 11: Complex thin films and heterostructures: From synthesis to strain/interface-engineered emergent properties

Sundar Kunwar, Los Alamos National Laboratory; Jon-Paul Maria, Pennsylvania State University, USA; James Rondinelli, Northwestern University, USA; Judith L. MacManus-Driscoll, University of Cambridge, United Kingdom; Elizabeth Paisley, Sandia National Laboratories, USA; Weiwei Li, Nanjing University of Aeronautics and Astronautics, China;

Symposium 11: Complex thin films and heterostructures: From synthesis to strain/interface-engineered emergent properties

Yingge Du, Pacific Northwest National Laboratory, USA; Hyoungjeen Jeon, Pusan National University, Korea

Symposium 12: Advanced semiconductors and microelectronics

Wanyi Nie, SUNY University at Buffalo, USA; Aiping Chen, Los Alamos National Laboratory, USA

Symposium 13: Defects and transport in ceramics

Yanhao Dong, Tsinghua University, China; Till Frömling, Technical University of Darmstadt, Germany; Tiffany Kaspar, Pacific Northwest National Laboratory, USA; Nicola Perry, University of Illinois Urbana-Champaign, USA; Xin Xu, Arizona State University, USA

Symposium 14: AI in Materials Research: From data analysis, autonomous experimentation, to human-AI Cooperation

Yongtao Liu, Oak Ridge National Laboratory, USA; Arpan Biswas, University of Tennessee Knoxville, USA; Yan Zeng, Florida State University, USA; Esther Tsai, Brookhaven National Laboratory, USA

Symposium 15: High-performance computational design and discovery of electronic materials

Kayahan Saritas, Oak Ridge National Laboratory, USA; Christian Carbogno, Fritz Haber Institute, Germany

Symposium 16: Controlling grain boundary structure, chemistry, and their network as a function of material processing

James Wollmershauser, U.S. Naval Research Laboratory, USA; Edward Gorzkowski, US Naval Research Laboratory, USA; Amanda Krause, Carnegie Mellon University, USA; Hadas Sternlicht, Pennsylvania State University, USA

Symposium 17: Emerging semiconductor materials and interfaces

Hari Nair, Cornell University, USA; Sang-Hoon Bae, Washington State University in St. Louis, USA; Nidhin Kurian Kalarickal, Arizona State University, USA

Symposium 18: Characterization of structure-property relationships in functional ceramics

Hadas Sternlicht, Penn State University, USA; Christopher Fancher, Oak Ridge National Laboratory, USA; James LeBeau, Massachusetts Institute of Technology, USA; Igor Levin, National Institute of Science and Technology, USA; Mehmet Gulgun, Sabanci University, Turkey; Megan Holtz, Colorado School of Mines, USA; Robert Hovden, University of Michigan, USA

Symposium 19: Frontiers in ferroic ceramics: Synthesis, properties, and applications

Jian Liu, University of Tennessee, USA; Ruijuan Xu, North Carolina State University, USA; Gang Cao, University of Colorado, Boulder, USA; Andrew Rappe, University of Pennsylvania, USA; Yu-Tsun Shao, University of Southern California, USA

Symposium 20: Magnetic and Superconducting Materials: From Basic Science to Applications

Lv Bing, University of Texas at Dallas, USA; Michael Susner, U. S. Air Force Research Laboratory, USA; Sara Mills, U.S. Naval Research Laboratory, USA; Jiamian Hu, University of Wisconsin, USA; Timothy Haugen, U. S. Air Force Research Laboratory, USA; Connor Smith, U.S. Naval Academy, USA

Symposium 21: Failure: The Greatest Teacher

Geoff Brennecke, Colorado School of Mines, USA

Symposium 22: Advanced Electronic Materials: Processing Structures, Properties, and Applications

Eric Patterson, U.S. Naval Research Lab., USA; Hana Uršič, Jožef Stefan Institute, Slovenia; Shujun Zhang, University of Wollongong, Australia; Satoshi Wada, University of Yamanashi, Kofu, Japan

Oral Presenters

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A					D				
Agar, J.	26-Feb	10:45AM	Colorado J	8	Das, N.	26-Feb	5:15PM	Colorado I	14
Agyekum, K.	26-Feb	4:00PM	Colorado J	14	Deary, W.J.	26-Feb	11:30AM	Colorado D	6
Ahadi, K.	26-Feb	11:30AM	Colorado B	5	DeBastiani, B.	26-Feb	10:45AM	Colorado F	9
Ahadi, K.	27-Feb	12:00PM	Colorado D	20	Defferriere, T.	26-Feb	4:00PM	Colorado H	12
Ahammad, J.	26-Feb	12:15PM	Colorado B	5	Deibert, W.	27-Feb	2:30PM	Colorado J	21
Aidhy, D.	26-Feb	2:30PM	Colorado D	10	Dickey, E.	26-Feb	4:30PM	Colorado C	13
Akhbarifar, S.	27-Feb	5:15PM	Colorado B	23	Dolgos, M.	26-Feb	2:45PM	Colorado F	15
Akinwande, D.	26-Feb	3:30PM	Gold Coin	10	Domingo Marimon, N.	27-Feb	11:30AM	Colorado F	21
Algueró, M.	26-Feb	4:00PM	Colorado F	15	Douglas, T.C.	28-Feb	12:15PM	Colorado J	26
Ali, A.	26-Feb	5:30PM	Colorado G	12	Dryzhakov, B.	26-Feb	12:15PM	Colorado F	9
Almishal, S.S.	26-Feb	12:00PM	Colorado D	6	Du, Y.	28-Feb	10:45AM	Colorado A	29
Amorin, H.	28-Feb	12:00PM	Colorado B	28	Dugu, S.	28-Feb	11:00AM	Colorado H	29
Aramberri, H.	28-Feb	9:00AM	Colorado B	28	Dunn, B.	28-Feb	8:30AM	Colorado E	27
Arenella, Z.S.	26-Feb	11:15AM	Colorado C	7	E				
Arndt, N.	26-Feb	5:00PM	Colorado D	11	Ebert, J.N.	27-Feb	5:00PM	Colorado J	21
Aronson, B.L.	27-Feb	11:00AM	Colorado A	19	Enright, L.	27-Feb	12:00PM	Colorado F	21
Ayyagari, S.	26-Feb	4:15PM	Colorado J	14	F				
B					Fancher, C.	26-Feb	3:15PM	Colorado J	14
Bae, S.	26-Feb	3:00PM	Gold Coin	10	Farhan, A.	26-Feb	2:45PM	Colorado D	11
Baiutti, F.	27-Feb	10:30AM	Colorado H	19	Fassler, A.	28-Feb	10:30AM	Colorado E	28
Bandaru, P.	26-Feb	10:30AM	Colorado C	7	Fields, S.	28-Feb	11:30AM	Colorado D	30
Barber, J.	26-Feb	4:30PM	Colorado D	11	Fop, S.	28-Feb	9:00AM	Colorado J	26
Barton, D.	27-Feb	11:30AM	Colorado A	19	Fowle, J.	26-Feb	5:00PM	Colorado A	11
Baucom, G.	26-Feb	11:45AM	Colorado J	8	Franklin, A.D.	26-Feb	2:00PM	Gold Coin	10
Behrendt, D.	27-Feb	2:45PM	Colorado C	22	Frano, A.	26-Feb	10:30AM	Colorado B	5
Bejger, G.R.	26-Feb	4:45PM	Colorado D	11	Frömling, T.	26-Feb	11:00AM	Colorado H	7
Bergmann, F.	26-Feb	4:45PM	Colorado A	11	Frye, M.	27-Feb	12:15PM	Colorado G	18
Bernstein, N.	26-Feb	10:30AM	Colorado F	9	Fuller, E.J.	27-Feb	4:30PM	Colorado C	22
Birol, T.	27-Feb	4:00PM	Colorado B	23	G				
Blum, V.	26-Feb	4:30PM	Matchless	13	Gadea, E.D.	28-Feb	11:00AM	Colorado A	29
Brahlek, M.	26-Feb	10:00AM	Colorado G	6	Gao, T.	28-Feb	10:30AM	Colorado I	26
Bramak, K.	26-Feb	10:00AM	Colorado C	7	Garcia, R.	26-Feb	5:15PM	Colorado C	13
Braun, P.V.	27-Feb	11:30AM	Colorado E	18	Garten, L.M.	26-Feb	11:15AM	Colorado F	9
Bučar, L.	26-Feb	11:30AM	Colorado G	6	Georgescu, A.	27-Feb	4:30PM	Colorado B	23
Bucci, G.	28-Feb	9:00AM	Colorado E	27	Gilgenbach, C.	26-Feb	10:30AM	Colorado J	8
Buontempo, J.	26-Feb	4:30PM	Colorado I	14	Gonzalez Rivas, M.	26-Feb	11:00AM	Colorado D	6
Burriel, M.	27-Feb	10:00AM	Colorado H	19	Gonzalez, S.N.	26-Feb	11:45AM	Colorado D	6
Butala, M.M.	28-Feb	9:30AM	Colorado I	26	Gopalan, V.	28-Feb	9:00AM	Colorado H	29
C					Grajkowski, F.	27-Feb	3:15PM	Colorado I	22
Cady, N.	27-Feb	11:30AM	Colorado C	17	Gregorczyk, K.E.	26-Feb	3:00PM	Colorado C	13
Calderon, S.	26-Feb	11:30AM	Colorado E	5	Grünebohm, A.	28-Feb	10:30AM	Colorado B	28
Cao, H.	27-Feb	10:00AM	Colorado D	20	Gulgun, M.A.	26-Feb	2:45PM	Colorado J	14
Cao, T.	28-Feb	9:00AM	Colorado G	27	Gunay, E.	26-Feb	4:30PM	Colorado J	14
Caprio, L.	28-Feb	11:00AM	Colorado E	28	Guo, Q.	27-Feb	2:00PM	Colorado G	23
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Cendejas, A.J.	26-Feb	2:30PM	Colorado C	13	Han, F.	28-Feb	12:00PM	Colorado I	26
Cesarano, J.	26-Feb	10:00AM	Matchless	5	Han, M.	27-Feb	2:30PM	Colorado H	25
Chae, S.	26-Feb	4:00PM	Colorado D	11	Harris, S.	27-Feb	4:30PM	Matchless	24
Chan, M.K.	27-Feb	10:30AM	Matchless	20	Hasin, K.	27-Feb	5:00PM	Colorado B	23
Checa, M.	28-Feb	12:30PM	Colorado H	29	Haugan, T.J.	28-Feb	10:30AM	Colorado D	29
Cheema, S.	28-Feb	12:00PM	Colorado H	29	Hedlund, D.	27-Feb	12:30PM	Colorado D	21
Chen, A.	26-Feb	11:00AM	Colorado B	5	Hellwig, J.	26-Feb	12:30PM	Colorado G	7
Chen, C.	26-Feb	10:30AM	Colorado G	6	Herath Mudiyanse, D.	26-Feb	2:30PM	Colorado I	14
Chen, C.	26-Feb	5:00PM	Colorado G	12	Hermann, R.	26-Feb	3:15PM	Colorado D	11
Chen, C.	28-Feb	10:30AM	Colorado J	26	Hersam, M.C.	26-Feb	2:30PM	Gold Coin	10
Chen, D.	27-Feb	11:15AM	Colorado H	19	Hersam, M.C.	27-Feb	10:00AM	Colorado C	17
Chen, D.	28-Feb	8:30AM	Colorado I	26	Hidalgo, J.	27-Feb	4:30PM	Colorado J	21
Chiabrera, F.	28-Feb	10:30AM	Colorado A	29	Hoglund, E.R.	27-Feb	2:30PM	Colorado B	23
Chin, J.R.	26-Feb	11:00AM	Colorado I	8	Hong, S.	26-Feb	2:00PM	Colorado A	11
Choi, Y.	27-Feb	10:45AM	Colorado A	19	Hong, X.	26-Feb	2:30PM	Colorado B	9
Chuong, K.	26-Feb	11:30AM	Colorado C	8	Hou, D.	26-Feb	4:45PM	Colorado H	12
Collins, K.	27-Feb	2:45PM	Colorado D	25	Hou, L.	27-Feb	11:30AM	Colorado G	18
Comes, R.B.	27-Feb	11:30AM	Matchless	20	Hu, J.	26-Feb	12:15PM	Colorado C	8
Cooper, V.R.	26-Feb	2:00PM	Colorado D	10	Hu, J.	27-Feb	10:30AM	Colorado D	20
Cotlet, M.	26-Feb	2:30PM	Colorado G	11	Hu, Z.	28-Feb	12:00PM	Colorado C	27
Crozier, P.	27-Feb	10:30AM	Colorado J	20	Huang, K.	28-Feb	11:00AM	Colorado J	26
Cui, B.	26-Feb	11:15AM	Matchless	6	Huang, S.	28-Feb	8:30AM	Colorado G	27
Cui, B.	26-Feb	12:25PM	Matchless	6					
Curtarolo, S.	26-Feb	2:00PM	Matchless	13					

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Huey, B.	26-Feb	4:30PM	Colorado G	12	Maksymovych, P.	28-Feb	9:30AM	Colorado D	29
Huey, B.	28-Feb	9:30AM	Colorado B	28	Mannix, A.J.	26-Feb	10:30AM	Colorado I	8
					Marinella, M.	28-Feb	10:30AM	Colorado C	27
		I			Marotta, A.R.	26-Feb	3:15PM	Colorado F	15
Iacomini, A.	27-Feb	10:00AM	Colorado F	21	Martin, J.	28-Feb	11:45AM	Colorado H	29
Ihlefeld, J.	27-Feb	4:00PM	Colorado C	22	May, A.	27-Feb	11:00AM	Colorado D	20
		J			Mazza, A.	26-Feb	10:30AM	Colorado D	6
					McIntosh, M.	27-Feb	5:45PM	Colorado D	25
Jalan, B.	26-Feb	10:00AM	Colorado B	5	McIntyre, P.	27-Feb	3:00PM	Colorado C	22
Jalan, B.	27-Feb	4:00PM	Colorado H	25	Mercer, I.	26-Feb	11:00AM	Colorado F	9
Jalbert, A.J.	27-Feb	11:15AM	Colorado C	17	Miao, L.	26-Feb	4:00PM	Colorado A	11
Jamer, M.E.	28-Feb	8:30AM	Colorado D	29	Mihalko, C.	27-Feb	2:30PM	Colorado A	24
Jariwala, D.	27-Feb	2:00PM	Colorado C	22	Mills, S.C.	27-Feb	5:00PM	Colorado D	25
Jariwala, D.	27-Feb	4:30PM	Colorado G	23	Minnich, A.	27-Feb	10:00AM	Colorado G	18
Jayathilake, B.S.	28-Feb	12:00PM	Colorado E	28	Mis, A.	27-Feb	11:00AM	Colorado J	20
Ji, X.	28-Feb	9:00AM	Colorado I	26	Moore, R.	27-Feb	2:30PM	Matchless	24
Johnston-Peck, A.	26-Feb	2:15PM	Colorado J	14	Morgan, D.	26-Feb	10:00AM	Colorado H	7
Joishi, C.	26-Feb	2:00PM	Colorado I	13	Morgan, D.	27-Feb	2:00PM	Colorado I	22
Jungwirth, N.	27-Feb	11:45AM	Colorado F	21	Mozur, E.	27-Feb	4:00PM	Colorado D	25
Jungwirth, N.	27-Feb	12:15PM	Colorado F	21	Musfeldt, J.	28-Feb	9:00AM	Colorado D	29
		K					N		

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Rost, C.M.	26-Feb	10:00AM	Colorado D	6	Tuller, H.L.	26-Feb	2:00PM	Colorado C	13
Rostaghi Chalaki, H.	26-Feb	2:30PM	Colorado A	11	Tuller, H.L.	27-Feb	4:00PM	Colorado J	21
Rozic, B.	27-Feb	10:30AM	Colorado F	21					
		S					U		
Salanova Giampaoli, A.	26-Feb	12:00PM	Colorado C	8	Uršič, H.	26-Feb	5:00PM	Colorado F	15
Salmani-Rezaie, S.	28-Feb	11:00AM	Colorado D	29			V		
Samanta, B.	28-Feb	12:30PM	Colorado D	30	Van der Ven, A.	27-Feb	2:30PM	Colorado I	22
Santamaria, J.	27-Feb	4:30PM	Colorado H	25	Vasiljevic, M.	27-Feb	12:00PM	Colorado A	19
Sardar, A.	26-Feb	12:15PM	Colorado I	8	Vervlied, J.	26-Feb	10:30AM	Matchless	5
Schleife, A.	26-Feb	4:00PM	Matchless	13	Vibhu, V.	28-Feb	11:30AM	Colorado J	26
Schwaigert, T.	26-Feb	12:00PM	Colorado B	5			W		
Schwartz, J.J.	28-Feb	9:30AM	Colorado E	27	Wang, B.	28-Feb	8:30AM	Colorado B	28
Segantini, G.	27-Feb	2:00PM	Colorado B	23	Wang, H.	26-Feb	4:00PM	Colorado E	10
Seidel, J.	28-Feb	9:30AM	Colorado A	28	Wang, J.	27-Feb	5:15PM	Colorado D	25
Sharma, C.	26-Feb	12:00PM	Colorado F	9	Wang, L.	28-Feb	8:30AM	Colorado A	28
Shin, D.	26-Feb	12:00PM	Colorado H	7	Wang, X.	27-Feb	11:30AM	Colorado D	20
Shin, D.	27-Feb	11:15AM	Colorado I	17	Wang, Y.	27-Feb	11:00AM	Matchless	20
Shin, D.	28-Feb	12:15PM	Colorado C	27	Ward, T.Z.	27-Feb	4:30PM	Colorado A	24
Shvilberg, L.	27-Feb	10:30AM	Colorado A	19	Weber, W.J.	26-Feb	3:15PM	Colorado H	12
Siebenhofer, M.	26-Feb	11:30AM	Colorado H	7	Woo, S.	27-Feb	11:15AM	Colorado J	20
Siebenhofer, M.	27-Feb	11:00AM	Colorado C	17	Wood, M.	27-Feb	4:30PM	Colorado E	24
Singh, A.	26-Feb	11:45AM	Colorado I	8	Woodward, P.	27-Feb	3:00PM	Colorado H	25
Singh, N.	28-Feb	11:30AM	Colorado B	28	Worsley, M.	27-Feb	12:00PM	Colorado E	18
Skinner, S.	26-Feb	10:30AM	Colorado H	7	Wu, Q.	27-Feb	12:00PM	Colorado B	18
Skinner, S.	28-Feb	8:30AM	Colorado J	26	Wu, Q.	27-Feb	4:00PM	Colorado E	24
Smaha, R.	26-Feb	12:00PM	Colorado J	9			X		
Smeaton, M.A.	27-Feb	11:45AM	Colorado J	20	Xu, R.	26-Feb	2:45PM	Colorado A	11
Son, M.	26-Feb	12:45PM	Colorado G	7	Xu, X.	27-Feb	2:00PM	Colorado A	24
Song, K.	27-Feb	5:00PM	Colorado E	24	Xu, X.	28-Feb	10:30AM	Colorado H	29
Song, W.	28-Feb	9:00AM	Colorado A	28	Xu, X.	28-Feb	11:30AM	Colorado I	26
Sood, A.	26-Feb	10:00AM	Colorado E	5			Y		
Spreitzer, M.	26-Feb	11:00AM	Colorado G	6	Yasuda, K.	26-Feb	10:00AM	Colorado I	8
Spurgeon, S.R.	26-Feb	10:00AM	Colorado J	8	Yates, L.	26-Feb	3:00PM	Colorado I	14
Staerz, A.F.	26-Feb	4:00PM	Colorado C	13	Yazawa, K.	26-Feb	10:00AM	Colorado F	9
Starchenko, V.	26-Feb	3:00PM	Colorado E	10	Ye, J.	28-Feb	11:30AM	Colorado E	28
Staruch, M.	26-Feb	12:30PM	Colorado F	9	Ye, P.	27-Feb	11:00AM	Colorado G	18
Sternlicht, H.	26-Feb	2:30PM	Colorado H	12	Yi, D.	27-Feb	2:00PM	Colorado H	25
Strkalj, N.	28-Feb	11:00AM	Colorado B	28	Yoo, S.	28-Feb	9:30AM	Colorado C	27
Su, C.	27-Feb	4:00PM	Colorado G	23	Yu, Y.	27-Feb	5:00PM	Colorado C	22
Suh, C.	27-Feb	10:00AM	Colorado E	18			Z		
Supple, E.	27-Feb	12:15PM	Colorado J	20	Zahler, P.	26-Feb	11:45AM	Colorado C	8
Susner, M.A.	28-Feb	12:00PM	Colorado D	30	Zahler, P.	26-Feb	5:00PM	Colorado C	13
Suzana, A.	26-Feb	5:00PM	Colorado E	10	Zhai, Z.	27-Feb	3:15PM	Colorado D	25
Suzuki, Y.	27-Feb	10:00AM	Colorado B	18	Zhang, D.	26-Feb	12:00PM	Colorado G	7
		T			Zhang, S.	26-Feb	12:15PM	Colorado H	7
Talin, A.A.	27-Feb	10:30AM	Colorado C	17	Zhang, X.	26-Feb	4:00PM	Gold Coin	10
Tang, M.	27-Feb	3:00PM	Colorado I	22	Zhang, Y.	26-Feb	11:00AM	Colorado E	5
Tanveer, R.	26-Feb	12:15PM	Colorado D	6	Zhang, Y.	26-Feb	2:00PM	Colorado G	11
Tarancon, A.	27-Feb	4:00PM	Colorado I	22	Zhang, Y.	26-Feb	3:00PM	Colorado B	9
Tasnim, T.	27-Feb	12:15PM	Colorado B	18	Zhao, H.	26-Feb	11:15AM	Colorado I	8
Taylor, O.	26-Feb	2:30PM	Colorado F	15	Zhao, K.	27-Feb	12:00PM	Colorado I	17
Thompson, L.	28-Feb	9:30AM	Colorado J	26	Zhou, H.	26-Feb	4:45PM	Colorado B	10
Toney, M.	27-Feb	10:00AM	Colorado I	17	Zou, K.	27-Feb	11:00AM	Colorado B	18
Tripathi, P.	26-Feb	5:00PM	Colorado I	14					
Tsur, Y.	27-Feb	12:00PM	Colorado H	19					
Tu, Q.	26-Feb	4:00PM	Colorado G	12					

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Astle, S.	26-Feb	5:30PM	Penrose Ballroom	15	L				
B					Lam, N.	26-Feb	5:30PM	Penrose Ballroom	16
Basak, R.	26-Feb	5:30PM	Penrose Ballroom	15	Levlev, A.V.	26-Feb	5:30PM	Penrose Ballroom	15
Bishop, S.	26-Feb	5:30PM	Penrose Ballroom	16	Loew, A.	26-Feb	5:30PM	Penrose Ballroom	16
Brown, M.	26-Feb	5:30PM	Penrose Ballroom	16	M				
C					McGinnis, R.	26-Feb	5:30PM	Penrose Ballroom	15
Chavez, H.	26-Feb	5:30PM	Penrose Ballroom	17	Miertschin, D.	26-Feb	5:30PM	Penrose Ballroom	16
Chery, P.	26-Feb	5:30PM	Penrose Ballroom	15	N				
Chong, J.	26-Feb	5:30PM	Penrose Ballroom	15	Neuman, E.	26-Feb	5:30PM	Penrose Ballroom	17
D					O				
Dursun, M.C.	26-Feb	5:30PM	Penrose Ballroom	16	Okafor, C.K.	26-Feb	5:30PM	Penrose Ballroom	16
E					Opatosky, B.	26-Feb	5:30PM	Penrose Ballroom	16
Ekdahl, B.X.	26-Feb	5:30PM	Penrose Ballroom	16	Orhan, A.	26-Feb	5:30PM	Penrose Ballroom	16
G					P				
Gandhi, S.	26-Feb	5:30PM	Penrose Ballroom	16	Peretti, A.	26-Feb	5:30PM	Penrose Ballroom	16
Giefke, R.	26-Feb	5:30PM	Penrose Ballroom	16	Piamonteze, C.	26-Feb	5:30PM	Penrose Ballroom	16
Guinan, G.	26-Feb	5:30PM	Penrose Ballroom	16	R				
H					Rafiq, K.	26-Feb	5:30PM	Penrose Ballroom	15
Hall, H.	26-Feb	5:30PM	Penrose Ballroom	16	Ramos Guzman, E.P.	26-Feb	5:30PM	Penrose Ballroom	16
Hope, A.	26-Feb	5:30PM	Penrose Ballroom	16	W				
I					Ward, E.G.	26-Feb	5:30PM	Penrose Ballroom	16
Isram, M.	26-Feb	5:30PM	Penrose Ballroom	16	Y				
J					Yeo, W.	26-Feb	5:30PM	Penrose Ballroom	16
Jacobson, C.L.	26-Feb	5:30PM	Penrose Ballroom	16					

Wednesday, February 26, 2025

Plenary Speaker- Jian Luo

Room: Colorado E

Session Chairs: Fei Peng, Clemson University

8:30 AM

(EMA-PLEN 01-001-2025) Computing Grain Boundary Phase (Complexion) Diagrams and Controlling Microstructures with Electric Fields

J. Luo^{*1}

1. University of California, San Diego, USA

S4 Oxide Quantum Materials: Synthesis, Properties and Application

S4- Materials synthesis

Room: Colorado B

Session Chairs: Seung Sae Hong, University of California, Davis; Jennifer Fowlie, Northwestern University

10:00 AM

(EMA-S4-001-2025) High-Mobility, Deep-Ultraviolet Transparent Conducting SrSnO₃ Films with Room-Temperature Mobility Exceeding 140 cm²/Vs (Invited)

B. Jalan^{*1}

1. University of Minnesota, USA

10:30 AM

(EMA-S4-002-2025) Rethinking Epitaxial Strain with Post-Growth Functionalization (Invited)

A. Frano^{*1}

1. University of California San Diego, Physics, USA

11:00 AM

(EMA-S4-003-2025) Enhancing energy storage performance via microstructure and defect design in BaTiO₃ related thin films (Invited)

A. Chen^{*1}

1. Los Alamos National Lab, USA

11:30 AM

(EMA-S4-004-2025) Fractional Double Perovskites (Invited)

K. Ahadi^{*1}

1. The Ohio State University, USA

12:00 PM

(EMA-S4-005-2025) Metastable Fractional Double Perovskites Synthesis by Molecular-Beam Epitaxy

T. Schwaigert^{*1}; A. Tenneti⁴; S. Hasko⁵; B. Gregory²; P. Malinowski²; B. Faith²; P. Woodward¹; A. Singer¹; K. M. Shen³; S. Salmani-Rezaie²; D. Schlom⁴; K. Ahadi³

1. Ohio State University, Chemistry and Biochemistry, USA

2. Cornell University, Physics, USA

3. The Ohio State University, USA

4. Cornell University, Department of Materials Science and Engineering, USA

5. Princeton University, Department of Chemical and Biological Engineering, USA

12:15 PM

(EMA-S4-006-2025) Observation of Charge Transfer Phenomena in (SrCoO₃)_n/(SrIrO₃)_n Superlattices and Sr₂CoIrO₆ Double Perovskites Grown By Molecular Beam Epitaxy (MBE)

J. Ahammad^{*1}; G. Rimal²; G. Sterbinsky²; G. Ortiz²; J. Hwang⁴; L. Lapinski²; U. Jayatilake⁵; A. Gray²; R. Comes⁶

1. Auburn University, Physics, USA

2. Western Michigan University, Physics, USA

3. Argonne National Laboratory, Advanced Photon Source, USA

4. The Ohio State University, Materials Science and Engineering, USA

5. Temple University, Physics, USA

6. University of Delaware, Materials Science and Engineering, USA

S5 In-Situ/Operando Characterization of Nanomaterials

S5- In situ/Operando Study of Quantum and Topological Materials

Room: Colorado E

Session Chairs: Di Zhang, Los Alamos National Lab; Hao Zheng, Argonne National Lab

10:00 AM

(EMA-S5-001-2025) Operando Visualization of Ultrafast Structural Dynamics in Electronic Devices (Invited)

A. Sood^{*1}

1. Princeton University, USA

10:30 AM

(EMA-S5-002-2025) Ultrafast THz dynamics of novel topological polar structures (Invited)

Q. Li^{*1}

1. Tsinghua University, School of Materials Science and Engineering, China

11:00 AM

(EMA-S5-003-2025) Atomic Visualization of Polar Order across Temperatures in Ferroelectric Oxides (Invited)

Y. Zhang^{*1}; I. El Baggari¹

1. Harvard University, Rowland institute, USA

11:30 AM

(EMA-S5-004-2025) Polarization Switching and Domain Propagation in Novel Ferroelectrics via Electron Microscopy (Invited)

S. Calderon^{*1}; E. C. Dickey¹

1. Carnegie Mellon University, Materials Science and Engineering, USA

12:00 PM

(EMA-S5-005-2025) Unveiling Behavior of Nanoscale Spin Textures in van der Waals Ferromagnets Using Cryo Lorentz Electron Microscopy (Invited)

Y. Li^{*1}

1. Argonne National Laboratory, Materials Science Division, USA

S8 New Frontiers and Science in Additive Manufacturing of Ceramic Materials

S8 -Additive Manufacturing of Ceramics

Room: Matchless

Session Chairs: Joe Cesarano, Robocasting Enterprises LLC; Russell Maier, National Institute of Standards and Technology

10:00 AM

(EMA-S8-001-2025) The State of Robocasting: Extrusion-Based AM Technology (Invited)

J. Cesarano^{*1}

1. Robocasting Enterprises LLC, USA

10:30 AM

(EMA-S8-002-2025) An Additive Manufacturing Approach to Produce Silicon Nitride (Si₃N₄) Fibers via Laser Chemical Vapor Deposition (LCVD) (Invited)

J. Vervlied^{*1}; S. Harrison¹; J. Pegna¹; S. Shuster¹

1. Free Form Fibers, US, USA

11:00 AM

(EMA-S8-003-2025) Development of contact dispense reactive ink printing of SiO_x film for replacement of ARC deposition in III-V solar cell fabrication

M. P. Nicodemus^{*1}; J. Selvidge²; M. Steiner²; O. Hildreth³

1. Colorado School of Mines, Chemical Engineering, USA

2. National Renewable Energy Laboratory, USA

3. Colorado School of Mines, Mechanical Engineering, USA

11:15 AM**(EMA-S8-004-2025) Reactive selective laser sintering of compositionally complex carbide ceramics**B. Cui^{*1}; L. Trinh¹; Z. Hua²; K. Bawane²; L. He³; L. Malakkal²; X. Chen¹; L. Wadle¹; Y. Lu¹

1. University of Nebraska-Lincoln, USA
2. Idaho National Laboratory, USA
3. NC State University, USA

11:30 AM**Break****11:40 AM****(EMA-S8-005-2025) Metrology and Standards Development of Ceramic Additive Manufacturing (Invited)**R. Maier^{*1}; A. J. Allen¹; I. Levin¹

1. NIST, Materials Measurement Science Division, USA

12:10 PM**(EMA-S8-006-2025) Localized domain switching and tunable functional properties in 3D printed architected ferroelectric ceramics**A. Pramanick^{*1}; C. Baboori¹; F. Albertini²; F. Gjørup⁴; A. Kumar³; M. Jorgensen⁴; L. Daniel¹

1. Université Paris-Saclay, CentraleSuepelec, France
2. Université Paris-Saclay, Université de Versailles Saint-Quentin-en-Yvelines, France
3. Indian Institute of Technology, Bhilai, India
4. Aarhus Universitet, Denmark

12:25 PM**(EMA-S8-007-2025) Digital Light Processing of Ytria Stabilized Zirconia Scaffolds**B. Cui^{*1}; L. Wadle¹; M. Krishnan²; R. Wall¹; L. Trinh¹; B. Duan²

1. University of Nebraska-Lincoln, USA
2. University of Nebraska Medical Center, USA

S10 Structure, dynamics and functionalities in high-entropy and compositionality complex oxides**S10- Structure, dynamics, and functionalities in high-entropy and compositionally complex oxides I**

Room: Colorado D

Session Chair: Raphael Hermann, Oak Ridge National Laboratory

10:00 AM**(EMA-S10-001-2025) Exploring Disorder-Driven Phenomena in High-Entropy Oxides (Invited)**C. M. Rost^{*1}; G. R. Bejger¹; J. Barber¹; G. Niculescu²; S. Ayyagari³; M. Webb⁴; L. Min³; S. S. Almishal³; M. Caucci²; Y. Son²; J. Sivak²; B. Yang²; N. Alem²; J. Heron²; Z. Mao²; J. Maria²; S. Sinnott²; S. Trolier-McKinstry³

1. Virginia Polytechnic Institute and State University, Materials Science & Engineering, USA
2. James Madison University, Physics and Astronomy, USA
3. The Pennsylvania State University, USA
4. University of Michigan, USA

10:30 AM**(EMA-S10-002-2025) Disorder by design in strongly correlated materials (Invited)**A. Mazza^{*1}

1. Los Alamos National Laboratory, USA

11:00 AM**(EMA-S10-003-2025) Impact of synthesis method on the structure and function of high entropy oxides (Invited)**M. Gonzalez Rivas^{*1}; S. S. Aamlid²; M. Rutherford¹; J. Freese⁴; E. Villalobos Portillo⁵; H. Castillo Michel⁵; M. Kim³; N. Chen⁶; R. Sutar⁶; H. Takagi³; R. Green⁴; A. Hallas¹

1. The University of British Columbia, Blusson Quantum Matter Institute/Physics and Astronomy, Canada
2. University of British Columbia, Stewart Blusson Quantum Matter Institute, Canada
3. Max Planck Institute for Solid State Research, Germany
4. University of Saskatchewan, Physics and Engineering Physics, Canada
5. ESRF, France
6. Canadian Light Source Inc, Canada

11:30 AM**(EMA-S10-004-2025) Investigating Size Effects on the Phase Stability of High Entropy Oxide**W. J. Deary^{*1}; J. Barber¹; G. R. Bejger¹; S. Muhlenberg¹; C. M. Rost¹

1. Virginia Polytechnic Institute and State University, Materials Science and Engineering, USA

11:45 AM**(EMA-S10-005-2025) 2D High Entropy Perovskites for Electrocatalysis**S. N. Gonzalez^{*1}

1. Colorado School of Mines, Chemistry, USA

12:00 PM**(EMA-S10-006-2025) Rock Salt High-Entropy Oxide Heterostructures: Structural and Magnetic Properties**S. S. Almishal^{*3}; P. Kezer⁶; S. Ayyagari⁵; T. Charlton²; N. Alem³; C. M. Rost⁴; J. Heron⁶; J. Maria¹

1. Penn State, Materials Science and Engineering, USA
2. Oak Ridge National Lab, USA
3. Pennsylvania State University, Department of Materials Science and Engineering, USA
4. Virginia Polytechnic Institute and State University, Materials Science and Engineering, USA
5. The Pennsylvania State University, USA
6. University of Michigan, Materials Science and Engineering, USA

12:15 PM**(EMA-S10-007-2025) Structural Complexity and Properties of Entropy Enhanced Yttrium Iron Garnets**R. Tanveer^{*1}; C. Overstreet²; T. Kanyowa¹; B. Hu¹; M. Lang²; V. Keppens¹; W. J. Weber³

1. The University of Tennessee Knoxville, Materials Science and Engineering, USA
2. The University of Tennessee Knoxville Tickle College of Engineering, Nuclear Engineering, USA
3. University of Tennessee, Materials Science & Engineering, USA

S12 Advanced semiconductors and microelectronics**S12- Semiconducting thin films I**

Room: Colorado G

Session Chairs: Aiping Chen, Los Alamos National Lab; Ludi Miao, New Mexico State University; Chonglin Chen, University of Texas San Antonio

10:00 AM**(EMA-S12-001-2025) Emergent magnetism and superconductivity through tailored strain and charge gradients at epitaxial interfaces (Invited)**M. Brahlek^{*1}

1. Oak Ridge National Lab, materials science, USA

10:30 AM**(EMA-S12-002-2025) A New Rhombohedral R3 Phase in Mn-doped Hf0.5Zr0.5O2 Epitaxial Films with Robust Ferroelectricity (Invited)**J. Guo³; X. Xu¹; L. Tao²; S. Du²; J. Ma⁴; C. Chen^{*1}

1. University of Texas San Antonio, Physics, USA
2. Chinese Academy of Sciences Institute of Physics, China
3. Tsinghua University, China
4. Tsinghua University, School of Materials Science, China

11:00 AM**(EMA-S12-003-2025) Capacitive Energy-density and Colossal Electrocaloric and Pyroelectric Effects of Sm-doped PMN-PT Thin Films (Invited)**M. Spreitzer^{*1}; Z. Hanani¹; J. Belhadi²; U. Trstenjak¹; N. A. Shepelin³; T. Lippert²

1. Jozef Stefan Institute, Slovenia
2. University of Picardie Jules Verne, France
3. Paul Scherrer Institut PSI, Switzerland
4. Southern Federal University, Faculty of Physics, Russian Federation

11:30 AM**(EMA-S12-004-2025) Germanium based photocathode for green hydrogen production**L. Bučar^{*1}; M. Spreitzer¹

1. Jozef Stefan Institute, Advanced materials department, Slovenia

11:45 AM

(EMA-S12-005-2025) Expansion of compositional space of Gd^{3+} in wurtzite $Al_{1-x}Gd_xN$ heterostructural alloys via reactive HiPIMS technique

B. Paudel^{*1}; K. Yazawa¹; R. Smaha²; G. Brennecke¹

1. Colorado School of Mines, USA
2. National Renewable Energy Laboratory, USA

12:00 PM

(EMA-S12-006-2025) Investigating the Resistive Switching Mechanism of Nitride-based Memristor Devices (Invited)

D. Zhang^{*2}; R. Dhall²; M. Schneider¹; C. Song²; H. Dou³; S. Kunwar⁴; N. Yazzie⁴; J. Ciston²; N. Cucciniello²; P. Roy²; M. T. Pettes²; J. Watt²; W. Kuo²; H. Wang²; R. McCabe²; A. Chen⁴

1. Los Alamos National Lab, USA
2. E O Lawrence Berkeley National Laboratory, Molecular Foundry, USA
3. Purdue University, Materials Engineering, USA
4. Los Alamos National Lab, Center for Integrated Nanotechnologies, USA
5. Purdue University, School of Materials Engineering, USA

12:30 PM

(EMA-S12-007-2025) Disentangling electronic and ionic effects of LRS relaxation in valence change memory

J. Hellwig^{*1}; C. Funck¹; D. Spithouris¹; R. Dittman¹

1. Forschungszentrum Jülich GmbH, Peter Grünberg Institute, Germany

12:45 PM

(EMA-S12-008-2025) Enhancing the surface treatment of Nb-doped $SrTiO_3$ substrates: effects on structural and chemical properties

M. Son^{*1}; K. Kang¹

1. Kyungpook National University, Physics, Republic of Korea

S13 Defects and transport in ceramics

S13- Defects and Transport in Ceramics I

Room: Colorado H

Session Chairs: Xin Xu, Arizona State University; Dong Hou, Clemson University

10:00 AM

(EMA-S13-001-2025) Discovery of New Fast Oxygen Conductors with Vacancy and Interstitial Mechanisms (Invited)

D. Morgan^{*1}; J. Meng¹; R. Jacobs¹; J. Liu²; L. Schultz¹

1. University of Wisconsin-Madison, Materials Science and Engineering, USA
2. NETL, USA

10:30 AM

(EMA-S13-002-2025) Exploring transport processes in solid oxide electrochemical cells (Invited)

S. Skinner^{*1}

1. Imperial College London, United Kingdom

11:00 AM

(EMA-S13-003-2025) The effect of controlling the defect chemistry of $Na_{0.5}Bi_{0.5}TiO_3$ -based ceramics on its solid solutions

S. Bauer¹; T. Frömling^{*1}

1. Technische Universität Darmstadt, Materials Science, Germany

11:15 AM

(EMA-S13-004-2025) Defect chemistry regulated dislocation nucleation in oxides: an electromigration and nanoindentation study

C. K. Okafor^{*1}; S. Bruns²; A. Sayyadishahraki¹; K. Durst²; T. Frömling⁴; P. Carrez³; P. Hirel³; X. Fang¹

1. Karlsruher Institut für Technologie, Institute of Applied Materials, Germany
2. Technical University Darmstadt, Physical Metallurgy, Germany
3. Université Lille, Materials and Transformation Unit CNRS, France
4. Technische Universität Darmstadt, Materials Science, Germany

11:30 AM

(EMA-S13-005-2025) Fundamental design principles for fast oxygen exchange: the interplay of surface and bulk properties of mixed conducting oxides (Invited)

M. Siebenhofer^{*1}

1. TU Wien, Institute of Chemical Technologies and Analytics, Austria

12:00 PM

(EMA-S13-006-2025) Design Rules for Ionic Conduction in Amorphous Thin-Film Metal Oxides

D. Shin^{*1}; A. V. Levlev²; Y. Li¹

1. University of Michigan, Materials Science and Engineering, USA
2. Oak Ridge National Lab, Center for Nanophase Materials Sciences, USA

12:15 PM

(EMA-S13-007-2025) Defect chemistry-transport-chemical strain coupling of mixed-conducting (Pr,Ce) O_{2-8} nanoparticles: role of interfaces

S. Zhang^{*1}; Z. Fang²; M. Chi²; N. H. Perry¹

1. University of Illinois Urbana-Champaign, Materials Science & Engineering, USA
2. Oak Ridge National Laboratory Center for Nanophase Materials Sciences, USA

S16 Controlling grain boundary structure, chemistry, and their network as a function of material processing

S16- Microstructure evolution

Room: Colorado C

Session Chair: James Wollmershauser, U.S. Naval Research Laboratory

10:00 AM

(EMA-S16-001-2025) Microstructure by Design: Thin Film Grain Growth Experiments, Simulations, Data Analytics (Invited)

K. Bramak^{*1}

1. Columbia University, Applied Physics and Applied Mathematics, USA

10:30 AM

(EMA-S16-002-2025) Surface composites synthesized through the incorporation of atomic layer deposited AlO_x into nanoporous fuzzy tungsten (Invited)

P. Bandaru^{*1}

1. University of California San Diego, Mechanical & Aerospace Engineering, USA

11:00 AM

(EMA-S16-003-2025) Reverse-Engineering A Legacy Ferroelectric Material of Known Composition and Microstructure

G. Kamm^{*1}; E. Neuman¹; W. Dong¹; S. Bishop²; P. Yang¹; R. Trujillo¹; W. Bachman¹; C. Bailey¹; S. Ehlers¹

1. Sandia National Laboratories, USA
2. Sandia National Laboratories, Materials, USA

11:15 AM

(EMA-S16-004-2025) Effects of Grain Size on Plasticity Mechanisms of Nanocrystalline $MgAl_2O_4$ Spinel under Nanoindentation: Hall-Petch vs. Inverse Hall-Petch

Z. S. Arenella^{*1}; S. Rommel¹; Z. H. Aitken²; H. Ryou³; J. Wollmershauser³; E. Gorzkowski³; B. N. Feigelson⁴; Y. Zhang²; M. Aindow¹; S. Lee¹

1. University of Connecticut, Materials Science and Engineering, USA
2. Agency for Science, Technology and Research, Institute of High Performance Computing, Singapore
3. U.S. Naval Research Laboratory, Material Science & Technology Division, USA
4. U.S. Naval Research Laboratory, Electronics Science & Technology Division, USA

S16- Processing parameters

Room: Colorado C

Session Chairs: Hadas Sternlicht, The Pennsylvania State University
Department of Materials Science and Engineering; Ece Gunay, Carnegie Mellon University; Sai Venkata Gayathri Ayyagari, The Pennsylvania State University

11:30 AM

(EMA-S16-005-2025) The Impact of Bismuth on the Nonlinearity and Reliability of Cold Sintered ZnO Varistors

K. Chuong^{*1}; Y. Liu¹; T. Forbes¹; D. Senthilkumar¹; L. Graber¹; L. Garten¹

1. Georgia Institute of Technology, USA

11:45 AM

(EMA-S16-006-2025) A systematic study of Black Light Sintering (BLS): Dependence of grain growth on processing parameters, thermal and optical properties

P. Zahler^{*1}; J. N. Ebert²; D. Jennings³; T. Froemmling³; W. Rheinheimer²

1. Universität Stuttgart, Institute for Manufacturing Technologies of Ceramic Components and Composites, Germany
2. Universität Stuttgart, IFKB, Germany
3. Technische Universität Darmstadt, Germany
4. Forschungszentrum Jülich GmbH, Germany

12:00 PM

(EMA-S16-007-2025) Free Carbon and Processing Considerations in Entropy Stabilized Carbides

A. Salanova Giampaoli^{*1}; H. Ryou¹; K. P. Anderson¹; E. Patterson¹; S. C. Mills¹; H. Keshmiri¹; L. Backman¹; B. N. Feigelson¹; E. Gorzkowski¹; J. Wollmershauser¹

1. US Naval Research Laboratory, USA

12:15 PM

(EMA-S16-015-2025) Polycrystal Microstructure Informatics (Invited)

J. Hu^{*1}

1. University of Wisconsin-Madison, USA

S17 Emerging semiconductor materials and interfaces

S17- 2D Materials

Room: Colorado I

Session Chairs: Sanghoon Bae, Washington University, St. Louis;
Nidhin Kalarickal, Arizona State University

10:00 AM

(EMA-S17-001-2025) Atomically-thin nonvolatile memory based on sliding ferroelectricity (Invited)

K. Yasuda^{*1}

1. Cornell University, Applied and Engineering Physics, USA

10:30 AM

(EMA-S17-002-2025) Controlling Structure and Symmetry in 2D Semiconductors and Heterostructures (Invited)

A. J. Mannix^{*1}

1. Stanford University, Materials Science and Engineering, USA

11:00 AM

(EMA-S17-003-2025) Improving the planar growth of SnSe by tuning substrate surface energy and lattice match

J. R. Chin^{*1}; M. Frye¹; D. Liu²; M. Yu³; M. Hilse⁴; S. Law²; L. M. Garten¹

1. Georgia Institute of Technology, School of Materials Science and Engineering, USA
2. The Pennsylvania State University, Department of Materials Science and Engineering, USA
3. University of Delaware, Materials Science and Engineering, USA
4. The Pennsylvania State University, Materials Research Institute, USA

S17- Wide bandgap (WBG) and ultra-wide bandgap (UWBG) materials

Room: Colorado I

Session Chairs: Nidhin Kalarickal, Arizona State University; Hari Nair, Cornell University

11:15 AM

(EMA-S17-004-2025) MOCVD of Ga₂O₃ (Invited)

H. Zhao^{*1}

1. The Ohio State University, USA

11:45 AM

(EMA-S17-005-2025) High-Throughput Ab Initio Study of Ultra-Wide Bandgap Materials (Invited)

A. Singh^{*1}

1. Arizona State University, Physics, USA

12:15 PM

(EMA-S17-006-2025) Damage recovery due to high-temperature Ge ion implantation in β -Ga₂O₃ **WITHDRAWN**

A. Sardar^{*1}; T. Isaacs-Smith¹; S. Schaefer¹; B. Tellekamp¹; T. Kaspar²; R. Comes²; M. Park¹

1. Auburn University, Physics, USA
2. University of Delaware, Department of Materials Science and Engineering, USA
3. Pacific Northwest National Lab, Physical and Computational Sciences Directorate, USA
4. National Renewable Energy Laboratory, Materials Science, USA

S18 Characterization of structure-property relationships in functional ceramics

S18- Integrating computational-imaging techniques and machine-learning into the structural measurement workflow

Room: Colorado J

Session Chair: James LeBeau, Massachusetts Institute of Technology

10:00 AM

(EMA-S18-001-2025) From Data to Discovery: AI's Transformative Role in Thin Film Research (Invited)

S. R. Spurgeon^{*1}

1. National Renewable Energy Laboratory, USA

10:30 AM

(EMA-S18-002-2025) Robust multislice ptychography for quantitative imaging of ceramics

C. Gilgenbach^{*1}; J. LeBeau²

1. Massachusetts Institute of Technology, Materials Science and Engineering, USA
2. Massachusetts Institute of Technology, USA

10:45 AM

(EMA-S18-003-2025) AI's Promise and the Limits: Unpacking Structure-Property Relationships in Functional Ceramics Amid Infrastructure Constraints (Invited)

J. Agar^{*1}

1. Drexel University, USA

11:15 AM

(EMA-S18-004-2025) Next-Generation Gaussian Processes for Function Approximation, Uncertainty Quantification, and Decision-Making (Invited)

M. M. Noack^{*1}

1. Lawrence Berkeley National Laboratory, Applied Mathematics, USA

11:45 AM

(EMA-S18-005-2025) Unveiling the Impact of Electrode Materials on the Structure and Ferroelectric Properties of Hf_{0.5}Zr_{0.5}O₂ Thin Films using 4D-STEM

G. Baucom^{*1}; T. Tharpe¹; R. Tabrizian¹; H. Kim¹

1. University of Florida, USA

12:00 PM

(EMA-S18-006-2025) Combinatorial synthesis and characterization of thin film $Al_{1-x}RE_xN$ ($RE = Pr^{3+}$ and Tb^{3+})

R. Smaha^{*1}; B. Paudel²; J. Mangum¹; C. Lee²; K. Yazawa¹; P. Gorai²; G. Brenneka²

1. National Renewable Energy Laboratory, USA
2. Colorado School of Mines, USA

S22 Advanced Electronic Materials- Processing structures and applications

S22- Advanced electronic materials, including ferroelectric, piezoelectric, dielectric, electrostrictive, and pyroelectric materials

Room: Colorado F

Session Chairs: Eric Patterson, Naval Research Laboratory; Tadej Rojac, Jozef Stefan Institute

10:00 AM

(EMA-S22-001-2025) Discovery and Design of AlN-based Ferroelectric Materials (Invited)

K. Yazawa^{*1}; N. Bernstein²; D. Drury³; B. Hanrahan⁴; C. Lee¹; P. Gorai¹; N. Haegel³; A. Zakutayev²; G. Brenneka¹

1. Colorado School of Mines, USA
2. Colorado School of Mines, Materials and Metallurgical Engineering, USA
3. National Renewable Energy Laboratory, USA
4. US Army Combat Capabilities Development Command Army Research Laboratory, USA

10:30 AM

(EMA-S22-002-2025) Ferroelectricity of Wurtzite Aluminum Hafnium Nitride Heterovalent Alloys

N. Bernstein^{*1}; D. Drury²; K. Yazawa³; G. R. Fox²; A. Zakutayev⁴; B. Hanrahan³; G. Brenneka²

1. Colorado School of Mines, Materials and Metallurgical Engineering, USA
2. Colorado School of Mines, USA
3. US Army Combat Capabilities Development Command Army Research Laboratory, USA
4. National Renewable Energy Laboratory, USA
5. Fox Materials Consulting, LLC, USA

10:45 AM

(EMA-S22-003-2025) Ferroelectricity in ternary (Al,B,Ga)N thin films

B. DeBastiani^{*1}; J. Maria¹

1. The Pennsylvania State University, Earth and Mineral Sciences, USA

11:00 AM

(EMA-S22-004-2025) Ferroelectric $Al_{1-x}B_xN$ Sputtered thin films on n-type Si bottom electrodes

I. Mercer^{*1}; C. Skidmore¹; S. Calderon²; E. C. Dickey²; J. Maria¹

1. The Pennsylvania State University, Materials Science and Engineering, USA
2. Carnegie Mellon University, Materials Science and Engineering, USA

11:15 AM

(EMA-S22-005-2025) Developing Processing Routes to Stabilize Hexagonal Transition Metal Oxides (Invited)

M. Frye²; I. Graham¹; J. R. Chin¹; L. M. Garten^{*1}

1. Georgia Institute of Technology, School of Materials Science and Engineering, USA
2. Georgia Institute of Technology, USA

11:45 AM

(EMA-S22-006-2025) Synthesis-structure-property relationships in co-sputtered $Zn_{1-x}Mg_xO$ thin films

W. A. Prudnick^{*1}; J. Maria¹; S. Yang¹

1. The Pennsylvania State University, USA

12:00 PM

(EMA-S22-007-2025) Operando Assessment of Mixed Neutron and Gamma Radiation Effects on Ferroelectric $Hf_{0.5}Zr_{0.5}O_2$ Capacitors

C. Sharma^{*1}; J. Nimmagadda¹; M. Lee²; J. Kim³; J. C. Nino¹

1. University of Florida, Materials Science and Engineering, USA
2. The University of Texas at Dallas, Electrical and Computer Engineering, USA
3. The University of Texas at Dallas, Materials Science and Engineering, USA

12:15 PM

(EMA-S22-008-2025) Correlative Mapping of Ion Irradiated Aluminum Nitride

B. Dryzhakov^{*1}; S. J. Randolph¹; K. Kelley¹

1. Oak Ridge National Lab, Center for Nanophase Materials Sciences, USA

12:30 PM

(EMA-S22-009-2025) Low concentration ($x \leq 0.01$) doping impact on defect dipole stabilization in $BaTi_{1-x}Fe_xO_3$

S. C. Mills¹; E. Patterson²; R. Maier³; M. Staruch^{*2}

1. US Naval Research Laboratory, Material Science and Technology, USA
2. Naval Research Laboratory, USA
3. National Institute of Standards and Technology, USA

S4 Oxide Quantum Materials: Synthesis, Properties and Application

S4- Oxide electronics

Room: Colorado B

Session Chairs: Alex Frano, University of California San Diego; Elizabeth Nowadnick, University of California, Merced

2:00 PM

(EMA-S4-007-2025) Evolutionary and neuromorphic intelligence with complex oxides (Invited)

S. Ramanathan^{*1}

1. Rutgers University, ECE, USA

2:30 PM

(EMA-S4-008-2025) Emerging Functional Heterointerfaces Enabled by Ferroelectric Oxide Thin Films and Membranes (Invited)

X. Hong^{*1}

1. University of Nebraska-Lincoln, Department of Physics and Astronomy, USA

3:00 PM

(EMA-S4-009-2025) High electroresistance in all-oxide ferroelectric tunnel junctions enabled by a narrow bandgap Mott insulator electrode

Y. Zhang^{*1}; Y. Hao¹; L. Zhang¹; K. Wang¹; X. Hong¹

1. University of Nebraska-Lincoln, Department of Physics and Astronomy, USA

S4- Superconductivity

Room: Colorado B

Session Chairs: Jennifer Fowlie, Northwestern University; Seung Sae Hong, University of California, Davis

3:15 PM

Break

3:45 PM

(EMA-S4-010-2025) Superconducting phase diagram of the layered square-planar nickelates (Invited)

G. A. Pan^{*1}

1. Harvard University, USA

4:15 PM

(EMA-S4-011-2025) Uncovering the ground state of the infinite-layer nickelate parent compound, $NdNiO_2$ (Invited)

C. T. Parzyck^{*1}; Y. Wu¹; L. Bhatt²; N. Gupta³; V. Anil¹; B. H. Goodge²; D. Muller²; L. F. Kourkoutis²; D. Hawthorn³; D. Schlom⁴; K. M. Shen¹

1. Cornell University, Laboratory of Atomic and Solid State Physics, USA
2. Cornell University, School of Applied and Engineering Physics, USA
3. University of Waterloo, Department of Physics and Astronomy, Canada
4. Cornell University, Department of Materials Science and Engineering, USA

4:45 PM

(EMA-S4-012-2025) Structural Basis for Achieving Superconductivity in an Ultrathin Multilayer-Nickelate

H. Zhou^{*1}; X. Yan²; H. Zheng³; Y. Li²; D. P. Phelan²; H. Hong¹; Y. Liu³; A. Bhattacharya²; D. Fong²

1. Argonne National Laboratory Advanced Photon Source, USA
2. Argonne National Laboratory, Materials Science Division, USA
3. Argonne National Laboratory, Center for Nanoscale Materials, USA

S5 In-Situ/Operando Characterization of Nanomaterials

S5- In situ/Operando Study of Energy and Functional Materials

Room: Colorado E

Session Chairs: Alessandro Mazza, Los Alamos National Lab; Katherine Harmon, Stanford University

2:00 PM

(EMA-S5-006-2025) Advances in In-situ Multi-Modal X-Ray Characterization of Nanomaterials (Invited)

S. Nemsak^{*1}

1. E O Lawrence Berkeley National Laboratory, Advanced Light Source, USA

2:30 PM

(EMA-S5-007-2025) Probing Ion Hopping in Solid-State Electrolytes (Invited)

K. W. Orr^{*1}

1. Stanford University, USA

3:00 PM

(EMA-S5-008-2025) Shaping lithium phosphate polycrystals in the flow (Invited)

V. Starchenko^{*1}; A. Ladd²; P. Szymczak³; M. Emmanuel⁴; Á. Tóth⁴; D. Horváth⁴

1. Oak Ridge National Laboratory, USA
2. University of Florida, USA
3. Uniwersytet Warszawski, Poland
4. Szegedi Tudományegyetem, Hungary

3:30 PM

Break

4:00 PM

(EMA-S5-009-2025) Electrochemistry combined in situ/operando neutron reflectometry for a greener future (Invited)

H. Wang^{*1}

1. Oak Ridge National Laboratory, CNMS, USA

4:30 PM

(EMA-S5-010-2025) Local Structural Changes as a Response to Heating: In-Situ Characterization using 4D-STEM (Invited)

T. M. Kucinski^{*1}

1. Los Alamos National Laboratory, MST-16, USA

5:00 PM

(EMA-S5-011-2025) Structural Explanation of the Dielectric Enhancement of Barium Titanate Nanoparticles (Invited)

A. Suzana^{*2}; S. Liu²; J. Diao³; L. Wu²; T. Assefa²; M. Abeykoon²; R. Harder¹; W. Cha¹; E. Bozin²; I. Robinson²

1. Argonne National Laboratory, USA
2. Brookhaven National Laboratory, USA
3. University College London, United Kingdom

S6 Two-Dimensional Quantum Materials-Synthesis, theories, properties and applications

S6 – Two dimensional quantum materials: Synthesis, theories, properties & applications

Room: Gold Coin

Session Chairs: Haozhe Wang, Duke University; Cheng Gong, University of Maryland

2:00 PM

(EMA-S6-001-2025) Observations on Transport in Contacts to 2D Semiconductors Using Diverse Contact Structures (Invited)

A. D. Franklin^{*1}

1. Duke University, ECE, USA

2:30 PM

(EMA-S6-002-2025) Chemically Functionalized 2D Materials for Quantum Photonic Science and Technology (Invited)

M. C. Hersam^{*1}

1. Northwestern University, Materials Science and Engineering, USA

3:00 PM

(EMA-S6-003-2025) Materials innovation through single crystalline 2D and 3D nanomembranes: From energy storage to AI hardware (Invited)

S. Bae^{*1}

1. Washington University in St Louis, USA

3:30 PM

(EMA-S6-004-2025) Atomrissors: Resistance Switching at the Atomic Limit and Low-Energy Electronic Applications (Invited)

D. Akinwande^{*1}

1. The University of Texas at Austin, USA

4:00 PM

(EMA-S6-005-2025) Maxwell-Wagner interfacial charge driven MoS₂ synaptic devices and their applications for reservoir computing (Invited)

X. Zhang^{*1}

1. Carnegie Mellon University, USA

S10 Structure, dynamics and functionalities in high-entropy and compositionality complex oxides

S10- Structure, dynamics, and functionalities in high-entropy and compositionally complex oxides II

Room: Colorado D

Session Chairs: Megan Butala, University of Florida; Thomas Ward, Oak Ridge National Lab

2:00 PM

(EMA-S10-008-2025) Exploring the Landscape of Entropy Stabilized Oxides (Invited)

V. R. Cooper^{*1}

1. Oak Ridge National Laboratory, Materials Science and Technology Division, USA

2:30 PM

(EMA-S10-009-2025) Oxygen vacancy formation energetics in MgO-based high entropy oxides from DFT and experimental validation

O. Opetubo¹; T. Shen¹; R. Bordia¹; D. Aidhy^{*1}

1. Clemson University, Materials Science and Engineering, USA

2:45 PM

(EMA-S10-010-2025) Element-sensitive characterization of high-entropy oxide perovskite thin films (Invited)

A. Farhan*¹

1. Baylor University, Department of Physics, USA

3:15 PM

(EMA-S10-011-2025) Magnetism in bulk iron-base rocksalt high-entropy oxide

R. Hermann*¹; M. Manley¹; J. Yan¹; D. Moseley¹; S. Calder¹; D. Abernathy¹; B. Winn¹

1. Oak Ridge National Laboratory, USA

3:30 PM

Break

4:00 PM

(EMA-S10-012-2025) Entropy-stabilized oxide memristors for efficient data processing (Invited)

S. Chae*¹

1. Oregon State University, School of Electrical Engineering and Computer Science, USA

4:30 PM

(EMA-S10-013-2025) Resolving Local Structure of Pb-based High Entropy Perovskites via Combined X-ray and Neutron Fitting

J. Barber*¹; Y. Son²; S. Troler-McKinstry²; C. M. Rost¹

1. Virginia Polytechnic Institute and State University, Materials Science and Engineering, USA
2. The Pennsylvania State University, Materials Science and Engineering, USA

4:45 PM

(EMA-S10-014-2025) Unraveling the Local Disorder in High Entropy Oxides with XAFS and DFT-Assisted Analysis

G. R. Bejger*¹; M. Caucchi²; J. Sivak²; L. Anderson¹; J. Maria²; S. Sinnott²; C. M. Rost¹

1. Virginia Polytechnic Institute and State University, Materials Science and Engineering, USA
2. The Pennsylvania State University, USA

5:00 PM

(EMA-S10-015-2025) Local and Average Crystallographic and Magnetic Structure and Magnetic Dynamics in Compositionally Complex Perovskite Oxides

N. Arndt*¹; B. L. Musico²; K. Sahebkar¹; K. Puri¹; L. Pattison¹; G. Young¹; R. Baral³; J. Paddison³; Q. Zhang³; A. Mazza⁴; V. Keppens²; T. Z. Ward³; S. Calder²; R. Need²; M. M. Butala¹

1. University of Florida, Materials Science and Engineering, USA
2. The University of Tennessee Knoxville Tickle College of Engineering, Materials Science and Engineering, USA
3. Oak Ridge National Laboratory, USA
4. Los Alamos National Lab, USA
5. University of Florida, USA

S11 Complex oxide thin films and heterostructures- from synthesis to strain/interface-engineered emergent properties

S11- Freestanding Metal Oxide Membranes

Room: Colorado A

Session Chair: Ludi Miao, New Mexico State University

2:00 PM

(EMA-S11-001-2025) Atomic scale imaging of freestanding oxide membranes (Invited)

S. Hong*¹

1. University of California, Davis, USA

2:30 PM

(EMA-S11-002-2025) Advanced Strain Engineering for Large-Area Freestanding Ti-Based Metal Oxide Membranes

H. Rostaghi Chalaki*¹; D. Kamleshkumar¹; J. Tindal¹; D. Lee¹

1. University of South Carolina, Mechanical Engineering, USA

2:45 PM

(EMA-S11-003-2025) Emerging phase transitions in sodium niobate heterostructures and membranes (Invited)

R. Xu*¹

1. North Carolina State University, USA

S11- Emergent phenomena in complex oxide thin films I

Room: Colorado A

Session Chair: Xin Xu, Arizona State University

4:00 PM

(EMA-S11-004-2025) Two-dimensional magnetic monopole gas at oxide interfaces (Invited)

L. Miao*¹; Y. Lee²; P. Timsina¹; M. Lawler³; K. M. Shen⁴

1. New Mexico State University, Physics, USA
2. Cornell University, USA
3. Binghamton University, USA
4. Cornell University, Physics, USA

4:30 PM

(EMA-S11-005-2025) Emergent tunability in polar vortices

N. Orloff*¹; F. Bergmann¹; P. Meisenheimer²; S. Das²; R. Ramesh³

1. NIST, Communications Technology Laboratory, USA
2. University of California Berkeley, USA
3. Rice University, USA

4:45 PM

(EMA-S11-006-2025) Observation of high out-of-plane tunability and low loss in Ruddlesden-Popper films

F. Bergmann*²; S. Freed²; M. Papac²; M. R. Barone¹; Z. Tian³; A. Ross⁴; D. Schlom¹; N. Orloff¹

1. Cornell University, Department of Materials Science and Engineering, USA
2. NIST, Communications Technology Laboratory, USA
3. University of California Berkeley, USA
4. The Pennsylvania State University, USA

5:00 PM

(EMA-S11-007-2025) Topotactic redox reactions in thin film transition metal oxides (Invited)

J. Fowlie*¹

1. Northwestern University, USA

S12 Advanced semiconductors and microelectronics

S12- Semiconducting thin films II

Room: Colorado G

Session Chairs: Hua Zhou, Argonne National Lab; Chonglin Chen, University of Texas San Antonio

2:00 PM

(EMA-S12-009-2025) II-VI based organic-inorganic hybrid superlattices: structure, stability, properties, and potential applications (Invited)

Y. Zhang*¹

1. UNC Charlotte, ECE, USA

2:30 PM

(EMA-S12-010-2025) The role of interface in mixed dimensional van der Waals heterostructures (Invited)

M. Cotlet*¹

1. Brookhaven National Laboratory, Center for Functional Nanomaterials, USA

3:00 PM

(EMA-S12-011-2025) Anisotropic Semiconductors for Infrared Opto-electronics (Invited)

J. Ravichandran*¹

1. University of Southern California, Chemical Engineering and Material Science, USA

3:30 PM

Break

S12- Characterization and applications of semiconducting materials

Room: Colorado G

Session Chairs: Ruijuan Xu, North Carolina State University;
Aiping Chen, Los Alamos National Lab

4:00 PM

(EMA-S12-012-2025) Dielectric Screening and Breakdown of 2D Hybrid Organic-Inorganic Perovskites (Invited)

Q. Tu^{*1}

1. Texas A&M University System, Materials Science and Engineering, USA

4:30 PM

(EMA-S12-013-2025) Nanovolumetric Surface Milling and Tomography of Functional Materials Properties: Pushing the Limits (Invited)

K. Lizu¹; K. Del Cid-Ledezma¹; A. Akoma¹; A. Chen²; B. Huey^{*1}

1. University of Connecticut, Materials Science and Engineering, USA
2. Los Alamos National Lab, USA

5:00 PM

(EMA-S12-014-2025) Engineering antiphase domain boundaries boosted tunable ferromagnetic insulation

X. Jia¹; Y. Chen¹; C. Nan¹; J. Ma¹; C. Chen^{*2}

1. Tsinghua University, China
2. University of Texas San Antonio, Physics, USA

5:15 PM

(EMA-S12-015-2025) De-embedding interconnects from mmWave flip-chip integrated photodiodes

A. Osella^{*1}; B. Bosworth²; N. Jungwirth²; A. Feldman²; N. Orloff²

1. Colorado School of Mines, Metallurgy and Materials Engineering, USA
2. NIST, Communications Technology Laboratory, USA

5:30 PM

(EMA-S12-016-2025) Study of an enhanced photocatalytic hybrid semiconductor Z-scheme ZnO@CdS nano heterojunction for efficient H₂ Production **WITHDRAWN**

A. Ali^{*1}; K. Kang¹

1. Kyungpook National University, Physics, Republic of Korea

S13 Defects and transport in ceramics

S13- Defects and Transport in Ceramics II

Room: Colorado H

Session Chairs: Till Frömling; Di Chen, Tsinghua University

2:00 PM

(EMA-S13-008-2025) Electric Field Effects on Defects Transport and Microstructural Evolution (Invited)

J. Luo^{*1}

1. University of California, San Diego, USA

2:30 PM

(EMA-S13-009-2025) Characterization of Interfaces in Ceramics-From "Conventional" Hard Ceramics to Sensitive and Softer Systems (Invited)

H. Sternlicht^{*1}; A. M. Minor²; N. P. Padture²

1. The Pennsylvania State University Department of Materials Science and Engineering, USA
2. Brown University, School of Engineering, USA
3. University of California, Berkeley, Department of Materials Science and Engineering, USA

3:00 PM

(EMA-S13-010-2025) Evolution of defects and disorder at epitaxial Fe₃O₄ / Cr₂O₃ and Fe₂O₃ / Cr₂O₃ interfaces under irradiation

T. Kaspar^{*6}; M. Liedke²; K. Yano¹; J. Christudasjustus⁶; B. Matthews¹; M. Bowden⁶; C. Ophus³; H. Kim³; Y. Wang³; G. Sterbinsky²; D. Schreiber¹

1. Pacific Northwest National Laboratory, Energy and Environment Directorate, USA
2. Helmholtz-Zentrum Dresden-Rossendorf, Institute of Radiation Physics, Germany
3. E O Lawrence Berkeley National Laboratory, NSEM, Molecular Foundry, USA
4. Los Alamos National Laboratory, Materials Science and Technology Division, USA
5. Argonne National Laboratory, Advanced Photon Source, USA
6. Pacific Northwest National Laboratory, Physical and Computational Sciences Directorate, USA

3:15 PM

(EMA-S13-011-2025) Effects of Electronic Energy Loss on Defect Production and Evolution in Oxide Perovskites under Ion Irradiation

W. J. Weber^{*1}

1. University of Tennessee, Materials Science & Engineering, USA

S13- Defects and Transport in Ceramics III

Room: Colorado H

Session Chairs: Tiffany Kaspar, Pacific Northwest National Lab;
Hadas Sternlicht, The Pennsylvania State University Department of Materials Science and Engineering

3:30 PM

Break

4:00 PM

(EMA-S13-012-2025) Optoionics – A New Opportunity for Ionic Conduction-Based Radiation Detection (Invited)

T. Defferriere^{*1}; C. Gilgenbach¹; M. Muller²; J. F. Christian²; J. LeBeau¹; H. L. Tuller¹

1. Massachusetts Institute of Technology, Material Science and Engineering, USA
2. Radiation Monitoring Devices Inc, USA

4:30 PM

(EMA-S13-013-2025) Light-Driven Stoichiometry Changes in a Non-Dilute, Mixed Conducting Perovskite Thin Film

E. J. Skiba¹; H. Buckner¹; C. Lee¹; G. E. McKnight¹; R. Wallick¹; R. van der Veen²; E. Ertekin¹; N. H. Perry^{*1}

1. University of Illinois Urbana-Champaign, USA
2. Helmholtz Zentrum Berlin, Germany

4:45 PM

(EMA-S13-014-2025) Dynamic thermo-chemical interactions in Ni-rich layered cathodes for Li-ion batteries (Invited)

D. Hou^{*1}

1. Clemson University, Materials Science and Engineering, USA

5:15 PM

(EMA-S13-015-2025) First principles investigations of the electronic properties of defects and impurities in 3C-, 4H-, and 6H-SiC

M. N. Huda^{*1}; S. R. Jhilik¹; N. D. Alkhalidi²

1. The University of Texas at Arlington, Physics, USA
2. ndawasalkhalidi@uhb.edu.sa, Department of Science and Technology, Saudi Arabia

S15 High-Performance computational design and discovery of electronic materials

S15- Computational Material Design and Discovery

Room: Matchless

Session Chairs: Christian Carbogno, Fritz-Haber-Institut der Max-Planck-Gesellschaft; Kayahan Saritas

2:00 PM

(EMA-S15-001-2025) From BIG-data to HOT-extreme-properties of high-entropy carbides, carbo-nitrides and borides (Invited)

S. Curtarolo*¹

1. Duke University, Materials Science, Electrical Engineering and Physics, USA

2:30 PM

(EMA-S15-002-2025) Finding Signal in Noisy Data-Sets: Optimizing Feature Space for Small or Lower-Quality Data (Invited)

Y. Yao¹; R. Anjum²; L. M. Ghiringhelli³; C. Carbogno⁴; M. Scheffler¹; T. A. Purcell*²

1. Fritz-Haber-Institut der Max-Planck-Gesellschaft, NOMAD LAB, Germany
2. The University of Arizona College of Science, Chemistry and Biochemistry, USA
3. University of Erlangen-Nuremberg Department of Materials Science, Institute of Materials Simulation (WW8), Germany
4. Fritz-Haber-Institut der Max-Planck-Gesellschaft, Germany

3:00 PM

(EMA-S15-003-2025) Gated Active Learning for Scientific Exploration with Expert Knowledge in Autonomous Microscopy (Invited)

Y. Liu*¹

1. Oak Ridge National Lab, USA

3:30 PM

Break

4:00 PM

(EMA-S15-004-2025) Extending first-principles materials science across time and length scales via machine learning (Invited)

C Lee*¹

1. University of Illinois at Urbana-Champaign, Materials Science and Engineering, USA

4:30 PM

(EMA-S15-005-2025) Inorganic and Organic-Inorganic Semiconductors for Optoelectronics and Spin Control from Large-Scale Hybrid DFT (Invited)

V. Blum*¹

1. Duke University, USA

S16 Controlling grain boundary structure, chemistry, and their network as a function of material processing

S16- Interface structure and chemistry

Room: Colorado C

Session Chairs: James Wollmershauser, U.S. Naval Research Laboratory; Amanda Krause, Carnegie Mellon University

2:00 PM

(EMA-S16-008-2025) Grain Boundary Space Charge Engineering in Model Ion Conducting Ceramic Thin Films (Invited)

T. Defferriere*¹; Y. Kim²; C. Gilgenbach¹; J. LeBeau¹; W. Jung²; H. L. Tuller¹

1. Massachusetts Institute of Technology, Material Science and Engineering, USA
2. Korea Advanced Institute of Science and Technology, Materials Science and Engineering, Republic of Korea

2:30 PM

(EMA-S16-009-2025) Atomic Layer Deposition for Interfacial Engineering: Achieving Nano-to-Macroscale Ceramic Materials (Invited)

A. J. Cendejas*¹; B. L. Greenberg¹; K. Anderson²; B. N. Feigelson¹

1. US Naval Research Laboratory, Electronics Science and Technology, USA
2. US Naval Research Laboratory, USA

3:00 PM

(EMA-S16-010-2025) Co-design and Interface Control During Semiconductor Manufacturing of On-Wafer Solid-state Li⁺ and Na⁺ Microbatteries and Supercapacitors (Invited)

K. E. Gregorczyk*¹; D. Fontecha¹; K. Ahuja¹; R. Nuwayhid³; D. Long³; A. Kozen²; D. Stewart¹; S. Lee⁴; G. Rubloff¹

1. University of Maryland, Materials Science & Engineering, USA
2. University of Vermont, Physics, USA
3. US Naval Research Laboratory, USA
4. University of Maryland, Chemistry, USA
5. Center for Integrated Nanotechnologies, USA

3:30 PM

Break

4:00 PM

(EMA-S16-011-2025) Using a Novel Spectro-electrochemical Set-up to Study Extrinsic Poisoning of the Metal-oxide Gas Interface (Invited)

K. F. Valeti¹; S. Astle¹; K. Rafiq¹; A. F. Staerz*¹

1. Colorado School of Mines, USA

4:30 PM

(EMA-S16-012-2025) Experimental Measurements of Grain Boundary Chemistry and Electrical Potentials in Electronic Oxides (Invited)

E. Dickey*¹

1. Carnegie Mellon University, USA

5:00 PM

(EMA-S16-013-2025) Investigation of grain boundaries in SrTiO₃: Correlation of Space charge, grain growth and non-Arrhenius grain growth

P. Zahler*¹; D. Jennings²; O. Guillon²; W. Rheinheimer¹

1. Universitat Stuttgart, Institute for Manufacturing Technologies of Ceramic Components and Composites, Germany
2. Forschungszentrum Julich GmbH, Germany

5:15 PM

(EMA-S16-014-2025) Modeling Charged Interfaces, Linear, and Point Defects in Ionic Ceramics (Invited)

R. Garcia*¹

1. Purdue University, Materials Engineering, USA

S17 Emerging semiconductor materials and interfaces

S17- Wide bandgap (WBG) and ultra-wide bandgap (UWBG) materials

Room: Colorado I

Session Chairs: Hari Nair, Cornell University; Nidhin Kalarickal, Arizona State University

2:00 PM

(EMA-S17-007-2025) III-Nitride Heterojunction Bipolar Transistors for mm-wave Applications (Invited)

C. Joishi*¹; S. Rahman¹; Z. Xia¹; A. Xie²; S. H. Sohel¹; S. Rajan¹

1. The Ohio State University, Electrical and Computer Engineering, USA
2. Qorvo Inc Richardson, USA

2:30 PM**(EMA-S17-008-2025) Ultrawide Bandgap Aluminum Nitride Power Electronics (Invited)**D. Herath Mudiyansele^{*1}; B. Da¹; H. Fu¹

1. Arizona State University, School of Electrical, Computer and Energy Engineering, USA

3:00 PM**(EMA-S17-009-2025) Visualizing and Quantifying Thermal Conductance and Strain at Compression Bonded GaN-Diamond Interfaces (Invited)**L. Yates^{*1}; W. Delmas¹; A. Jarzembki¹; M. Bahr¹; Z. Piontkowski¹; W. Hodges¹; A. McDonald¹; J. Steinfeldt¹; R. Kaplar¹

1. Sandia National Laboratories, USA

3:30 PM**Break****4:00 PM****(EMA-S17-010-2025) Epitaxial Growth of c-BN on Diamond for Electronic Applications (Invited)**R. Nemanich^{*1}; A. Ebadi Yekta¹; A. Patel¹; S. Vishwakarma¹; J. Brown¹; D. Smith¹

1. Arizona State University, USA

4:30 PM**(EMA-S17-011-2025) Sub-nanometer RMS roughness of thick homoepitaxial growth on miscut (100) β -Ga₂O₃ substrates by MOCVD**J. Buontempo^{*1}; C. Gorsak¹; S. Hellyer¹; K. Gann¹; M. Thompson¹; H. Nair¹

1. Cornell University, USA

4:45 PM**(EMA-S17-012-2025) Activation of Ge in β -Ga₂O₃: Role of capping layer, ambient, and defect formation**T. Luo^{*2}; K. Gann²; C. Gorsak²; P. Evans¹; H. Nair²; M. Thompson²

1. Air Force Research Laboratory, USA
2. Cornell University, Materials Science and Engineering, USA

5:00 PM**(EMA-S17-013-2025) Shubnikov-de Haas Oscillations in MOCVD Grown β -(Al, Ga)₂O₃ 2DEG**P. Tripathi^{*1}; C. Gorsak¹; D. Jena¹; H. Nair¹

1. Cornell University, Materials Science and Engineering, USA

5:15 PM**(EMA-S17-014-2025) Investigation of BC₃ vs Cl₂ ICP-RIE etching for fabrication of 3-D structures on (001) β -Ga₂O₃**N. Das^{*1}; A. Gilankar¹; N. Kalarickal¹

1. Arizona State University, ECEE, USA

S18 Characterization of structure-property relationships in functional ceramics**S18- Addressing open questions in functional ceramics**

Room: Colorado J

Session Chair: Megan Holtz, Colorado School of Mines

2:00 PM**(EMA-S18-007-2025) Correlations among polar nanoregions in PbMg_{1/3}Nb_{2/3}O₃-PbTiO₃**M. Eremanko¹; V. Krayzman²; S. Gorfman³; A. Bosak⁴; H. Playford⁵; B. Ravel⁶; Z. Ye⁶; M. Tucker¹; I. Levin^{*2}

1. Oak Ridge National Laboratory, USA
2. National Institute of Standards and Technology, USA
3. Tel Aviv University, Israel
4. ESRF, France
5. Rutherford Appleton Laboratory, ISIS Facility, United Kingdom
6. Simon Fraser University, Canada

2:15 PM**(EMA-S18-008-2025) Engineering nanostructured ceramics using eutectoid transformations (Invited)**A. Johnston-Peck^{*1}; R. Maier¹

1. National Institute of Standards and Technology, USA

2:45 PM**(EMA-S18-009-2025) Phase formation Anomalies in Mixed-Oxide Aluminates ~~WITHDRAWN~~**Y. Akyol¹; Y. Yilmaz¹; G. Sanli¹; S. Semsari Parapari²; S. Sturm²; C. Ow-Yang¹; M. A. Gulgun^{*1}

1. Sabanci University, FENS MatSE and NanoEng, Turkey
2. Josef Stefan Institute, Department for Nanostructured Materials, Slovenia

3:00 PM**(EMA-S18-010-2025) Solution-deposited epitaxial thin films: Bilayer La_xSr_{1-x}MnO₃/Ba_xSr_{1-x}TiO₃ heterostructures**D. Piper^{*1}; J. Vukmirović¹; M. Milanović¹; I. Stijepović¹; X. Guo²; B. Rodriguez³; W. Wani³; D. Pajić⁴; I. Toković⁵; S. Armaković⁵; V. Srdić¹

1. Univerzitet u Novom Sadu Tehnoloski fakultet, Department of Materials Engineering, Serbia
2. The University of Dublin Trinity College, Ireland
3. University College Dublin Conway Institute of Biomolecular and Biomedical Research, Ireland
4. Sveuciliste u Zagrebu Prirodoslovno-matematski fakultet, Croatia
5. Univerzitet u Novom Sadu Prirodno-Matematski fakultet, Serbia

3:15 PM**(EMA-S18-011-2025) Use of X-ray and Neutron Scattering to Inform the Science of Additively Manufactured Soft Magnetics**C. Fancher^{*1}; L. DeBeer-Schmitt²

1. Oak Ridge National Lab, USA
2. ORNL, Neutron Scattering Division, USA

3:30 PM**Break****S18- Advances in connecting local and global structure to properties**

Room: Colorado J

Session Chairs: Igor Levin, NIST; Chris Fancher, Oak Ridge National Lab

4:00 PM**(EMA-S18-012-2025) Compositional Effects on Proton and Oxygen Ionic Transport of BaCo_xFe_{0.8-x}Zr_{0.1}Y_{0.1}O_{3-δ}**K. Agyekum^{*1}; Z. Jiang²; B. Cladek¹; Y. Shin³; S. M. Haile²; R. O'Hayre⁴; C. Wolverton²; J. Liu⁵; K. Page¹

1. The University of Tennessee Knoxville, Materials Science and Engineering, USA
2. Northwestern University, Materials Science and Engineering, USA
3. Colorado School of Mines, Materials Science, USA
4. Colorado School of Mines, Metallurgical and Materials Engineering, USA
5. Oak Ridge National Laboratory, Spallation Neutron Source, USA

4:15 PM**(EMA-S18-013-2025) Investigating the local structure and chemical nuances in High Entropy Oxides using Scanning/Transmission Electron Microscope**S. Ayyagari^{*1}; D. Mukherjee²; K. M. Roccapriore⁴; S. S. Almishal³; J. Maria³; N. Alem³

1. The Pennsylvania State University, USA
2. Oak Ridge National Lab, Computational Sciences & Engineering Division, USA
3. Pennsylvania State University, Department of Materials Science and Engineering, USA
4. Oak Ridge National Laboratory, USA

4:30 PM**(EMA-S18-014-2025) Chemical and Structural Changes in H₂O Ferroelectric Films on TaN and W Electrodes: An EELS Study**E. Gunay^{*1}; B. L. Aronson²; J. Ihlefeld²; E. C. Dickey¹

1. Carnegie Mellon University, Materials Science and Engineering, USA
2. University of Virginia, Department of Materials Science and Engineering, USA

4:45 PM

(EMA-S18-016-2025) Simple Method to Determine Image-Diffraction Pattern Rotations in TEM

A. Roshko^{*}; G. Burton¹; R. Geiss²

1. National Institute of Standards and Technology, USA
2. Colorado State University, ARC, OVPR, USA

5:00 PM

(EMA-S18-015-2025) Structure-property Exploration in Compositionally Complex Rare Earth Titanate and Zirconate Families (Invited)

K. Page^{*}

1. University of Tennessee, Materials Science and Engineering, USA

S22 Advanced Electronic Materials- Processing structures and applications

S22- Advanced electronic materials, including ferroelectric, piezoelectric, dielectric, electrostrictive, and pyroelectric materials

Room: Colorado F

Session Chairs: Neamul Khansur, Case Western Reserve University; Lynette Keeney, Tyndall National Institute, University College Cork

2:00 PM

(EMA-S22-010-2025) Mechanistic aspects of the piezoelectric response of samarium-doped $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$ - PbTiO_3 ceramics (Invited)

M. Arzensek²; U. Tos²; S. Drnovsek²; M. Dragomir²; H. Uršič²; M. Otonicar²; P. Jankauskas¹; S. Svirskas¹; M. Koblar²; T. Rojac^{2*}

1. Vilniaus Universitetas, Lithuania
2. Institut Jozef Stefan, Slovenia

2:30 PM

(EMA-S22-011-2025) Aliovalent Substitution of Pb with $(\text{Li}_{1/2}\text{Bi}_{1/2})$ in PbZrO_3 Model System

O. Taylor^{*}; A. Hoyt¹; X. Tan¹

1. Iowa State University, Materials Science and Engineering, USA

2:45 PM

(EMA-S22-012-2025) So Many Cations, So Little Time: A Structural Study of $(1-x)\text{Bi}(\text{Fe}_{2/3}\text{Mg}_{1/3}\text{Ti}_{1/3})\text{O}_3 - (x)\text{PbTiO}_3$ Using X-ray and Neutron Diffraction

M. Dolgos^{*}

1. Oak Ridge National Laboratory Neutron Sciences Directorate, USA

3:00 PM

(EMA-S22-013-2025) Understanding, design and control of electrical properties and defect chemistry in electroceramics

M. Li^{*}

1. University of Nottingham, Advanced Materials Research Group, Faculty of Engineering, United Kingdom

3:15 PM

(EMA-S22-014-2025) Structural and electrical property relationship of Mn doped BiFeO_3 - xBaTiO_3 ceramics

A. R. Marotta^{*}; G. Kamm¹; S. Bishop¹; E. Neuman¹; D. Lowry¹; T. C. Douglas¹

1. Sandia National Laboratories, USA

3:30 PM

Break

4:00 PM

(EMA-S22-015-2025) Insights into the Performance of Multifunctional Flexible Structures Fabricated by Deposition of Ferroelectric Oxide Films on Magnetic Metallic Foils (Invited)

M. Algueró^{*}; A. Barreto¹; R. Jiménez¹; H. Amorín¹; I. Bretos¹; P. Ramos¹; L. Calzada¹

1. Instituto de Ciencia de Materiales de Madrid (ICMM), CSIC, Spain
2. Universidad de Alcala Escuela Politecnica Superior, Spain

4:30 PM

(EMA-S22-016-2025) Ceramics Nanocomposite Materials for Green Energy and Heat Management

Z. Hanani²; B. Rozic¹; M. Spreitzer²; H. Uršič²; D. Mezzane⁴; M. El Marssi⁵; A. N. Morozovska⁶; S. Ivanchenko⁷; Z. Kutnjak^{1*}

1. Jozef Stefan Institute, Slovenia
2. Jozef Stefan Institute, Advanced Materials, Slovenia
3. Jozef Stefan Institute, Electronic Ceramics Department, Slovenia
4. Université Cadi Ayyad, Morocco
5. Université de Picardie Jules Verne, LPMC, France
6. Nacional'na akademija nauk Ukraini, Institute of Physics, Ukraine
7. Nacional'na akademija nauk Ukraini, Institute for Problems of Materials Science, Ukraine

4:45 PM

(EMA-S22-017-2025) Aerosol Deposition of Nano-structured Mixed Composite Thick Films

E. Patterson^{*}; S. C. Mills¹; J. Wollmershauser¹; E. Gorzkowski¹

1. U.S. Naval Research Laboratory, Materials Science & Technology Division, USA

5:00 PM

(EMA-S22-018-2025) Piezoelectric and energy-storage properties of $0.5\text{BaZr}_{0.2}\text{Ti}_{0.8}\text{O}_3$ - $0.5\text{Ba}_{0.7}\text{Ca}_{0.3}\text{TiO}_3$ films prepared by the aerosol deposition

S. Merselmiz¹; I. Goričan¹; V. Regis¹; B. Kmet¹; A. Bencan Golob¹; T. Rojac¹; A. Debevec¹; B. Malic¹; H. Uršič^{1*}

1. Institut Jozef Stefan, Slovenia

Poster Session

Room: Penrose Ballroom

5:30 PM

(EMA-P001-2025) Mechanical Characterization of Kaolin Clays for Microporous Membrane Reactors

R. McGinnis^{*}; S. Ricote³; G. Coors⁴; I. Reimanis²

1. Colorado School of Mines, Metallurgical and Materials Engineering, USA
2. Colorado School of Mines, USA
3. Colorado School of Mines, Mechanical Engineering, USA
4. Hydrogen Helix, LLC, USA

(EMA-P002-2025) Insights into the electrode-electrolyte interface of protonic ceramic electrochemical cells using thin film nanostructures

P. Chery^{*}; E. Griffin¹; G. Trindade dos Santos¹; Y. Cheng¹; R. dos Reis¹; V. David¹; S. M. Haile¹

1. Northwestern University, Materials Science and Engineering, USA

(EMA-P003-2025) Materials Selection Principles for Designing Electro-thermal Neurons

F. Jaldali¹; J. Chong^{*}; Y. Yu¹; M. Altvater²; T. Nguyen¹; Y. Lin¹; R. S. Williams⁴; S. Kumar³; P. Shamberger¹; T. D. Brown³

1. Texas A&M University System, Materials Science and Engineering, USA
2. Air Force Research Laboratory, USA
3. Sandia National Laboratories California, USA
4. Texas A&M University System, Electrical & Computer Engineering, USA

(EMA-P005-2025) Chemical Contributions in Functionality of Energy and Electronic Materials

A. V. Levlev^{*}

1. Oak Ridge National Lab, Center for Nanophase Materials Sciences, USA

(EMA-P006-2025) Focused helium beam patterned nickelate synaptic device for neuromorphic computing **WITHDRAWN**

R. Basak^{*}; A. Frano¹

1. University of California San Diego, Physics, USA

(EMA-P007-2025) Siloxane Poisoning of Semiconducting Metal Oxide Gas Sensors: Mechanism Elucidation and Material Design

S. Astle^{*}; A. F. Staerz²

1. Colorado School of Mines, USA
2. Colorado School of Mines, MME, USA

(EMA-P008-2025) Dynamic Implementation of Metal Oxide Based Gas Sensors

K. Rafiq^{*}; A. F. Staerz²

1. Colorado School of Mines, Mechanical Engineering, USA
2. Colorado School of Mines, MME, USA

(EMA-P009-2025) Room-Temperature Thermal Rectification in Suspended Graphene: Asymmetric Channel Design via Electron Beam Lithography

R. Ali^{*1}; M. Islam²

1. University of Kentucky, Department of Electrical and Computer Engineering, USA
2. Hokuriku Sentan Kagaku Gijutsu Daigakuin Daigaku, School of Material Science, Japan

(EMA-P010-2025) Additive manufacturing of architected battery components for fast charging batteries

A. Orhan^{*1}; J. Ye¹

1. Lawrence Livermore National Laboratory, USA

(EMA-P011-2025) Rapid Fabrication of Solid-State Batteries by Cold Spray Deposition

E. P. Ramos Guzman^{*1}; A. Baker¹; E. Kim¹; J. Ye²; J. Roehling¹

1. Lawrence Livermore National Laboratory, Material Science, USA
2. Lawrence Livermore National Laboratory, USA

(EMA-P012-2025) Strain Engineering of NdNiO₃ Thin Films with Substrate-implanted Helium

R. Glefke^{*1}; A. Frano¹

1. University of California San Diego, Physics, USA

(EMA-P013-2025) Spin reorientation in Dy-based high-entropy oxide perovskite thin films

M. Cocconcelli¹; D. Miertschin^{*1}; B. Regmi¹; D. Crater¹; F. Stramaglia³; L. Yao⁴; R. Bertacco²; C. Piamonteze³; S. van Dijken³; A. Farhan¹

1. Baylor University, Physics, USA
2. Politecnico di Milano, Physics, Italy
3. Paul Scherrer Institut PSI, Physics, Switzerland
4. Aalto-yliopisto, OtaNano-Nanomicroscopy Center, Finland
5. Aalto-yliopisto, Applied Physics, Finland

(EMA-P014-2025) Apparent ferrimagnetism in Sr(Fe_{0.2}Mn_{0.2}Co_{0.2}Ti_{0.2}V_{0.2})O₃ high-entropy oxide perovskite thin films

B. Regmi¹; D. Miertschin¹; M. Cocconcelli²; C. Piamonteze^{*3}; A. Farhan¹

1. Baylor University, Physics, USA
2. Politecnico di Milano, Dipartimento di Fisica, Italy
3. Paul Scherrer Institut PSI, Switzerland

(EMA-P015-2025) Effect of Argon Ion Bombardment During Growth on Phase Stabilization of Hafnium Zirconium Oxide Thin Films

N. Lam^{*1}; L. Shvilberg¹; M. K. Lenox¹; B. L. Aronson¹; Y. Choi¹; I. A. Brummel¹; J. Ihlefeld¹

1. University of Virginia, Material Science and Engineering, USA

(EMA-P016-2025) Ordering in Sr₂CoTaO₆ Double Perovskites Grown Via Hybrid Molecular Beam Epitaxy

B. Opatosky^{*1}; J. Ahammad¹; R. Comes¹

1. University of Delaware, Astronomy & Physics, USA
2. Auburn University, Physics, USA

(EMA-P017-2025) Doping regulated room-temperature dislocation plasticity in oxides: A scale bridging study on SrTiO₃

C. K. Okafor^{*1}; S. Bruns²; I. Huck³; K. Takahara⁴; Y. Li⁴; A. Nakamura⁴; K. Durst²; X. Fang¹

1. Karlsruher Institut für Technologie, Mechanical Engineering, Germany
2. Technical University Darmstadt, Physical Metallurgy, Germany
3. Technische Universität Darmstadt, Department of Chemistry, Germany
4. Osaka University, Department of Mechanical Science and Bioengineering, Japan

(EMA-P018-2025) He-Doping Induced Symmetry Breaking and Metal-Insulator Transition in Correlated Electron Materials

C. L. Jacobson^{*1}; A. Georgescu¹

1. Indiana University, Department of Chemistry, USA

(EMA-P019-2025) Automating Hf_{0.5}Zr_{0.5}O₂ Phase Identification from 4D-STEM Data with Hybrid Machine Learning

T. J. Yoo¹; S. Gandhi^{*1}; G. Baucom¹; H. Kim¹

1. University of Florida, USA

(EMA-P020-2025) Accelerating Discovery of Atomistic Defects via Machine Learning

G. Guinan^{*1}; M. A. Smeaton¹; B. Wyatt²; H. Egan¹; B. Anasori²; S. R. Spurgeon¹

1. National Renewable Energy Laboratory, USA
2. Purdue University, USA

(EMA-P021-2025) Modeling Surface Structure by Broken Bond Density

A. Loew^{*1}; V. Stevanovic¹

1. Colorado School of Mines, Metallurgical and Materials Engineering, USA

(EMA-P022-2025) Tracking Grain Growth Behavior in Polycrystalline Alumina using 3D X-ray Diffraction Microscopy

H. Hall^{*1}; D. P. DeLellis¹; M. S. Kesler²; A. Krause¹

1. Carnegie Mellon University, Materials Science and Engineering, USA
2. Oak Ridge National Laboratory, USA

(EMA-P023-2025) Magnetic field-driven grain boundary mobility measurements in doped metal oxides

M. C. Dursun^{*1}; M. S. Kesler²; A. Krause¹

1. Carnegie Mellon University, Materials Science and Engineering, USA
2. Oak Ridge National Laboratory Physical Sciences Directorate, USA

(EMA-P024-2025) Structure-Property Relationships in Electrospun Ba_{1-x}Sr_xTiO₃ Nanofibers for Dielectric Applications

B. X. Ekdahl^{*1}; A. S. Padgett²; S. Bishop³; J. Andrew¹

1. University of Florida, Materials Science and Engineering, USA
2. Sandia National Laboratories, High Voltage Sciences, USA
3. Sandia National Laboratories, Materials, USA

(EMA-P025-2025) Tight-Binding Models for Complex Materials and Applications to Lone Pair, Heteroanionic Solids

E. G. Ward^{*1}; A. Georgescu¹

1. Indiana University Bloomington, USA

(EMA-P026-2025) Elucidating the Coupling in Inorganic-Organic Magnetoelectric Materials

A. Hope^{*1}

1. Colorado School of Mines, Metallurgical and Materials Engineering, USA

(EMA-P027-2025) Enhanced dielectric and energy storage properties in (Na_{0.5}Bi_{0.5})TiO₃-Ba(Ti_{0.98}Zr_{0.02})O₃ piezoceramics

E. Kumari^{*1} **WITHDRAWN**

1. Indian Institute of Technology Patna, Metallurgical and materials engineering, India

(EMA-P028-2025) Design, Fabrication, and Characterization of UHF Ferrite Hybrid Absorbers

A. S. Padgett¹; D. Bosomtwi¹; A. Peretti^{*2}; S. Bishop²; D. Lowry²; M. Blea-Kirby²;

- C. A. Sahasrabudhe²
1. Sandia National Laboratories, Electrical Sciences, USA
 2. Sandia National Laboratories, Ceramics and Materials Physics, USA

(EMA-P030-2025) Oxygen Doping of Ferroelectric Al_{0.73}Sc_{0.27}N Thin Films

M. Brown^{*1}; M. Islam²; N. Wolff²; T. Kreutzer³; G. Schoenweger²; M. Gremmel²; S. Fichtner³; L. Kienle³; G. Brennecke⁴

1. Colorado School of Mines, Metallurgical and Materials Engineering, USA
2. Christian-Albrechts-Universität zu Kiel, Institute for Materials Science, Germany
3. Fraunhofer-Institut für Siliziumtechnologie ISIT, Germany
4. Colorado School of Mines, USA

(EMA-P031-2025) Exploration of the (AlN)_x(SiC)_{1-x} system for enhanced piezoelectricity & increased elastic modulus

W. Yeo^{*1}; G. Brennecke¹; V. Stevanovic¹; L. Wolf¹

1. Colorado School of Mines, Metallurgical & Materials Engineering, USA

(EMA-P032-2025) Electrical and thermal properties of Al_{0.5}Sc_{1.5}W₃O₁₂, a zero thermal expansion insulator

S. Bishop^{*1}; A. S. Padgett²; R. R. Martin¹; M. Blea-Kirby¹; P. A. Salinas¹; D. Lowry¹; A. Peretti¹

1. Sandia National Laboratories, Materials, USA
2. Sandia National Laboratories, High Voltage Sciences, USA

(EMA-P033-2025) Structure and Thermoelectric Properties of Hydrothermally Grown Bi₂Te_{3-x}Se_x Nanocrystals

M. Isram^{*1}; D. Pankratova²; V. Demontis³; A. Vomiero¹; F. Rossella¹

1. Università degli Studi di Modena e Reggio Emilia, Physics and Nanoscience, Italy
2. Lulea tekniska universitet, Department of Engineering Sciences and Mathematics, Sweden
3. Università degli Studi di Cagliari, Physics, Italy
4. Lulea University of Technology, Engineering Sciences & Mathematics, Sweden

(EMA-P034-2025) The Effect of Sintering on the Dielectric and Polarization Properties of PZT 65/35 Ceramics

E. Neuman^{*}; W. Dong¹; S. Bishop¹; W. Bachman¹; C. Bailey¹; S. Ehlers¹; J. Nikkel¹; R. Trujillo¹
1. Sandia National Laboratories, USA

(EMA-P035-2025) Marine energy harvesting through piezoelectric fluttering flags

H. Chavez^{*}; A. Marotta¹; X. S. Bishop¹; D. Kim¹; B. Gunawan¹
1. Sandia National Laboratories, Albuquerque, USA

Thursday, February 27, 2025

Plenary Sessions

Plenary Speaker- Sergei V. Kalinin

Room: Colorado E

Session Chairs: Mina Yoon, Oak Ridge National Laboratory;
Reeja Jayan, Carnegie Mellon University

8:30 AM

(EMA-PLEN 01-002-2025) Closing the Materials Discovery Loop via ML-Assisted Characterization: Building Optimized Rewards

S. Kalinin^{*}
1. The University of Tennessee Knoxville Tickle College of Engineering, USA

S2 Electronic and Ionic Materials for Energy Storage and Conversion Systems

S2- Characterizations, mechanics, and development of advanced electrodes, electrolytes, and interfaces

Room: Colorado I

Session Chairs: Hua Zhou, Argonne National Lab; Hui Xiong, Boise State University

10:00 AM

(EMA-S2-001-2025) Insights into Na-ion Battery Operation through X-ray Scattering (Invited)

M. Toney^{*}
1. University of Colorado, USA

10:30 AM

(EMA-S2-002-2025) Impacts of the conductive networks on solid-state battery operation (Invited)

Y. Liu^{*}
1. The University of Texas at Austin, Walker Department of Mechanical Engineering, USA

11:00 AM

(EMA-S2-003-2025) Morphology and Crystallinity Effects of Nanochanneled Niobium Oxide Electrodes for Na-Ion Batteries

C. A. Koroni^{*}; K. Dixon¹; P. Barnes²; D. Hou³; L. Landsberg¹; Z. Wang¹; G. Grbic¹; S. Pooley¹; S. Frisone¹; T. Olsen¹; A. Muenzer¹; D. Nguyen¹; B. Bernal¹; H. Xiong¹
1. Boise State University, Materials Science and Engineering, USA
2. Idaho National Laboratory, Energy Storage and Electric Vehicle Department, USA
3. Argonne National Laboratory, Center for Nanoscale Materials, USA

11:15 AM

(EMA-S2-004-2025) Pressure Gradient-Driven Preferential Lithium Plating in All-Solid-State Batteries for Enhanced Stability

D. Shin^{*}; J. Jung¹; Y. Roh¹; C. Park¹; I. Kim¹; H. Kwon¹; J. Baek¹; W. Oh¹; J. Kim¹; S. Jeong¹; J. Hwang¹; Y. Kim¹; D. Yoon²; H. Kim¹
1. Korea Advanced Institute of Science and Technology, Chemical and Biomolecular Engineering, Republic of Korea
2. Samsung SDI Co Ltd, Republic of Korea

11:30 AM

(EMA-S2-005-2025) Defect Structure, Ionic Transport, and Surface Exchange Kinetics in the $\text{BaCo}_{x-1}\text{Fe}_{0.8-x}\text{Zr}_{0.1}\text{Y}_{0.1}\text{O}_{3-d}$ (BCFZY, $0.1 \leq x \leq 0.7$) Triple-Conducting Oxide System (Invited)

R. O'Hayre^{*}; Y. Shin¹; M. Sanders¹; Z. Jiang²; C. Wolverton²; S. M. Haile²; K. Ageyem³; B. Cladek⁴; K. Page⁵; J. Liu²; B. Ogbolu²; E. Truong²; Y. Hu⁶
1. Colorado School of Mines, Metallurgical and Materials Engineering, USA
2. Northwestern University, Materials Science and Engineering, USA
3. The University of Tennessee Knoxville Tickle College of Engineering, Materials Science and Engineering, USA
4. University of Tennessee, Materials Science and Engineering, USA
5. Oak Ridge National Laboratory, USA
6. Florida State University, Chemistry, USA

12:00 PM

(EMA-S2-006-2025) Dynamics and heterogeneity of particle network in composite electrodes (Invited)

K. Zhao^{*}
1. Purdue University System, USA

12:30 PM

(EMA-S2-007-2025) Electrochemically-Driven Orthorhombic-to-Cubic Phase Transition in Ta2O5 Electrode Materials

S. Pooley^{*}; C. A. Koroni¹; T. Merrell¹; K. Dixon¹; P. Barnes²; D. Hou³; H. Xiong¹
1. Boise State University, Micron School of Materials Science & Engineering, USA
2. Idaho National Laboratory, USA
3. Argonne National Laboratory, USA

S3 Nano4Neuro-Mechanisms and Materials for Next Generation Computing

S3- Materials that compute

Room: Colorado C

Session Chair: Petro Maksymovych, Clemson University

10:00 AM

(EMA-S3-001-2025) Low-Dimensional Neuromorphic Electronic Materials and Applications (Invited)

M. C. Hersam^{*}
1. Northwestern University, Materials Science and Engineering, USA

10:30 AM

(EMA-S3-002-2025) Electrochemical memory for robust analog computing systems (Invited)

A. A. Talin^{*}
1. Sandia National Laboratories, USA

11:00 AM

(EMA-S3-003-2025) Proton migration in mixed conducting oxides for fast conductivity modulation in neuromorphic devices

M. Siebenhofer^{*}; P. Zguns²; B. Yildiz²
1. TU Wien, Institute of Chemical Technologies and Analytics, Austria
2. Massachusetts Institute of Technology, USA

11:15 AM

(EMA-S3-004-2025) High-temperature electrochemical memory based on phase separation of Tantalum Suboxide

A. J. Jalbert^{*}; Y. Li¹
1. University of Michigan, Materials Science & Engineering, USA

11:30 AM

(EMA-S3-005-2025) Materials and Device Engineering of Resistive Non-volatile Memory for Next Generation Computing (Invited)

N. Cady^{*}
1. University at Albany, Nanoscale Science & Engineering, USA

12:00 PM

(EMA-S3-006-2025) Recent Progress on Phase Change Memory for Analog In-Memory Computing (Invited)

N. Li^{*}
1. The Pennsylvania State University, USA

S4 Oxide Quantum Materials: Synthesis, Properties and Application

S4- Quantum Electromagnetism

Room: Colorado B

Session Chairs: Ho Nyung Lee, Oak Ridge National Lab;
Seung Sae Hong, University of California, Davis

10:00 AM

(EMA-S4-013-2025) Spin and Topological Phenomena in Low Loss Ferromagnetic Insulator Thin Films (Invited)

S. Channa⁴; C. Zheng⁴; H. Sabri²; H. Ren¹; T. Chen¹; Z. Galazka³; Y. Li⁴; A. Kent¹; J. Zang²; Y. Suzuki^{4*}

1. New York University, USA
2. University of New Hampshire, USA
3. Leibniz-Institut für Kristallzüchtung im Forschungsverbund Berlin eV, Germany
4. Stanford University, USA

10:30 AM

(EMA-S4-014-2025) Model-Based Quantum Materials Realized in Oxide Heterostructures and Superlattices (Invited)

J. Liu^{*1}

1. University of Tennessee, USA

11:00 AM

(EMA-S4-015-2025) Insight on Two-Dimensional Electron Gas Systems at KTaO₃ (001) and (111) Surfaces (Invited)

K. Zou^{*1}

1. The University of British Columbia, Physics and Astronomy, Canada

11:30 AM

(EMA-S4-016-2025) Nonsymmorphic symmetry induced correlated topological states in 4d perovskite oxide thin films (Invited)

Y. Park^{*1}; S. Kang¹; J. Song¹; S. Lin¹; H. Zhou²; M. Yoon³; S. Yoon⁵; J. Ok⁴; S. Okamoto¹; H. Lee³

1. Oak Ridge National Laboratory, Materials Science and Technology Division, USA
2. Argonne National Lab, Advanced Photon Source, USA
3. Oak Ridge National Laboratory, USA
4. Pusan National University, Republic of Korea
5. Gachon University, Republic of Korea

12:00 PM

(EMA-S4-017-2025) Anisotropic magnetoresistance and planar Hall effect in NiCo₂O₄ thin films and membranes

Q. Wu^{*1}; Y. Zhang¹; T. Li¹; X. Chen¹; X. Hong¹

1. University of Nebraska-Lincoln, Department of Physics and Astronomy, USA

12:15 PM

(EMA-S4-018-2025) Electronic Phenomena in Doped SrIrO₃ Films and SrIrO₃/SrNbO₃ Superlattices Grown by Hybrid Molecular Beam Epitaxy

T. Tasnim^{*1}; G. Rimal³; B. Opatosky²; R. Comes²

1. University of Delaware College of Arts & Sciences, Physics, USA
2. University of Delaware College of Engineering, Material Science and Engineering, USA
3. Western Michigan University, Physics, USA
4. University of Delaware, Astronomy & Physics, USA

S7 Additive manufacturing for power sources in electronics

S7 - AM for Lithium Batteries I

Room: Colorado E

Session Chair: Jianchao Ye, Lawrence Livermore National Laboratory

10:00 AM

(EMA-S7-001-2025) Manufacturing RD&D Needs for Power Sources: From the Perspective of the U.S. DOE's Advanced Materials and Manufacturing Technologies Office (Invited)

C. Suh^{*1}

1. US Department of Energy, USA

11:00 AM

(EMA-S7-002-2025) Reinventing Manufacturing For Better Batteries (Invited) *WITHDRAWN*

A. Niestroj^{*1}

1. Sakuu Corporation, Commercialization, USA

11:30 AM

(EMA-S7-003-2025) Electrodeposition of dense monolithic cathodes for small and large format conventional and solid-state batteries (Invited)

P. V. Braun^{*1}; B. Zahiri¹; H. Yang²

1. University of Illinois Urbana-Champaign, Materials Science and Engineering, USA
2. Xerion Advanced Battery Corp, USA

12:00 PM

(EMA-S7-004-2025) Developing Methods to Additively Manufacture Energy Storage Electrodes (Invited)

M. Worsley^{*1}

1. Lawrence Livermore National Laboratory Physical and Life Sciences Directorate, USA

S6 Two-Dimensional Quantum Materials-Synthesis, theories, properties and applications

S6- Two dimensional quantum materials: Synthesis, theories, properties & applications

Room: Colorado G

Session Chair: Haozhe Wang, Duke University

10:00 AM

(EMA-S6-006-2025) Atomic layer etching of lithium niobate for quantum photonics (Invited)

A. Minnich^{*1}

1. California Institute of Technology, USA

10:30 AM

(EMA-S6-007-2025) Semimetal Device Technology for 2D Semiconductor Electronics (Invited)

Y. Lin^{*1}

1. Texas A&M University, Department of Materials Science and Engineering, USA

11:00 AM

(EMA-S6-008-2025) The Resurrection of Tellurium as an Elemental van der Waals Semiconductor (Invited)

P. Ye^{*1}

1. Purdue University, USA

11:30 AM

(EMA-S6-009-2025) High-Throughput Search and Prediction of New Two-Dimensional 4f-Magnets

L. Hou^{*1}; Y. Li¹; C. Lane²

1. Los Alamos National Laboratory, USA
2. Los Alamos National Lab, Theoretical Division, USA

11:45 AM

(EMA-S6-010-2025) Atomic substitution approach for non-vdW 2D materials (Invited)

X. Ling^{*1}

1. Boston University, Department of Chemistry, USA

12:15 PM

(EMA-S6-011-2025) Controlled Morphology and Crystallinity of (200) SnSe Grown by Pulsed Laser Deposition

M. Frye^{*1}; J. R. Chin¹; J. Knight¹; V. Pozzi¹; L. M. Garten¹

1. Georgia Institute of Technology, School of Materials Science and Engineering, USA

S11 Complex oxide thin films and heterostructures- from synthesis to strain/interface-engineered emergent properties

S11- Ferroelectric Oxide Thin Films and Heterostructures

Room: Colorado A

Session Chair: Shriram Ramanathan, Rutgers University

10:00 AM

(EMA-S11-008-2025) Highly tunable magnetocrystalline anisotropy energies in magnetically-doped ferroelectric oxides (Invited)

E. Nowadnick^{*1}; B. Barker²; H. Ahmad¹; N. Pokhrel¹; M. Hossain¹; K. Inzani³; S. Griffin⁴

1. University of California, Merced, USA
2. Florida Polytechnic University, USA
3. University of Nottingham, United Kingdom
4. E O Lawrence Berkeley National Laboratory, USA

10:30 AM

(EMA-S11-009-2025) Oxygen Transport During Electric Field Cycling and Retention Testing in Ferroelectric Hafnium Zirconium Oxide Thin Films

L. Shvilberg^{*1}; F. J. Vega⁴; C. Zhou³; B. L. Aronson²; T. E. Beechem⁴; J. Ihlefeld¹

1. University of Virginia, Department of Materials Science and Engineering, USA
2. University of Virginia, USA
3. NC State University, USA
4. Purdue University, Mechanical Engineering, USA

10:45 AM

(EMA-S11-010-2025) Effect of precursor purge time on plasma-enhanced atomic layer deposition-prepared ferroelectric Hf_{0.5}Zr_{0.5}O₂ performance

Y. Choi^{*1}; B. L. Aronson¹; M. K. Lenox¹; L. Shvilberg¹; C. Zhou²; K. Holsgrove³; A. Kumar³; A. Watson¹; S. McDonnell¹; J. Ihlefeld¹

1. University of Virginia, Materials Science and Engineering, USA
2. NC State University, Analytical Instrumentation Facility, USA
3. Queen's University Belfast, School of Mathematics and Physics, United Kingdom

11:00 AM

(EMA-S11-011-2025) Exploring Atomic Layer Deposition of Wurtzite-Structured Zinc Magnesium Oxide Thin Films for Ferroelectric Applications

B. L. Aronson^{*1}; J. Maria²; J. Ihlefeld¹

1. University of Virginia, Department of Materials Science and Engineering, USA
2. The Pennsylvania State University, Department of Materials Science and Engineering, USA

11:15 AM

(EMA-S11-012-2025) Electrode Elastic Modulus as the Dominant Factor in the Capping Effect in Ferroelectric Hafnium Zirconium Oxide Thin Films

M. K. Lenox^{*1}; M. Islam²; M. Bin Hoque³; C. Skidmore⁴; A. Salanova Giampaoli¹; S. Fields²; S. Jaszewski²; J. Maria⁴; P. Hopkins³; J. Ihlefeld¹

1. University of Virginia, Department of Materials Science and Engineering, USA
2. US Naval Research Laboratory, Materials Science and Technology, USA
3. University of Virginia, Mechanical and Aerospace Engineering, USA
4. Pennsylvania State University, Materials Science and Engineering, USA
5. Sandia National Laboratories, USA

11:30 AM

(EMA-S11-013-2025) Active and dynamic photonic devices enabled by non-centrosymmetric oxide thin films (Invited)

D. Barton^{*1}

1. Northwestern University, Materials Science and Engineering, USA

12:00 PM

(EMA-S11-014-2025) Tunable electrochemical activity in ferroionic CeO₂/BTO thin films

M. Vasiljevic^{*1}; V. Esposito¹

1. Danmarks Tekniske Universitet, DTU Energy, Denmark

12:15 PM

(EMA-S11-015-2025) Nano-volumetric Characterization of BCT-BZT Ferroelectric Superlattice with Tomographic PFM

K. Lizu^{*2}; A. Chen¹; B. Huey²

1. Los Alamos National Laboratory, Center for Integrated Nanotechnologies (CINT), USA
2. University of Connecticut College of Engineering, Materials Science & Engineering, USA

S13 Defects and transport in ceramics

S13- Defects and Transport in Ceramics IV

Room: Colorado H

Session Chairs: Nicola Perry, University of Illinois at Urbana-Champaign; Thomas Defferriere, Massachusetts Institute of Technology

10:00 AM

(EMA-S13-016-2025) Exploring Oxygen-Ion Transport Kinetics via In Situ Isotope Exchange Raman Spectroscopy (IERS) (Invited)

M. Burriel^{*1}

1. Centre National de la Recherche Scientifique, LMGP, France

10:30 AM

(EMA-S13-017-2025) Leveraging defects for optimal stability-activity tradeoff in mixed conductors

F. Baiutti^{*1}; J. Sirvent¹; F. Chiabrera²; A. Morata¹; A. Tarancon³

1. IREC, Spain
2. Institut de Recerca en Energia de Catalunya, Spain
3. ICREA/IREC, Spain

10:45 AM

(EMA-S13-018-2025) Oxygen diffusion in amorphous metal oxides for resistive memory and other microelectronic applications (Invited)

Y. Li^{*1}

1. University of Michigan, Materials Science & Engineering, USA

11:15 AM

(EMA-S13-019-2025) Revealing the surface termination effect of (La,Sr)FeO_{3-x} for oxygen exchange reaction (Invited)

D. Chen^{*1}

1. Tsinghua University, China

11:45 AM

(EMA-S13-020-2025) Modeling surface atomic structure of perovskite oxide La_{0.6}Sr_{0.4}FeO₃ under realistic thermodynamic conditions

B. Liu^{*1}; B. Yildiz²

1. Massachusetts Institute of Technology, DMSE, USA
2. Massachusetts Institute of Technology, USA

12:00 PM

(EMA-S13-021-2025) Predicting Point Defect Concentrations Upon Doping Using the Doping Factor Method

Y. Tsur^{*1}

1. Technion Israel Institute of Technology, Chemical Engineering, Israel

S14 A1 in Materials research: from data analysis, autonomous experimentation, to human AI cooperation

S14- AI for data analysis and simulation

Room: Matchless

Session Chairs: Arpan Biswas, University of Tennessee Knoxville;
Esther Tsai, Brookhaven National Laboratory

10:00 AM

(EMA-S14-001-2025) Specialized Data-Driven Framework for Predictive Synthesis of Compositionally Complex Ceramic Materials (Invited)

B. Ouyang*¹

1. Florida State University, Chemistry and Biochemistry, USA

10:30 AM

(EMA-S14-002-2025) Determining the structure and properties of defects at interfaces - a combined modeling, experiment, and AI/ML approach (Invited)

M. K. Chan*¹

1. Argonne National Laboratory, USA

11:00 AM

(EMA-S14-003-2025) Seeing crystalline defects: whether magnetic frustration or structural factor is more sensitive? (Invited)

Y. Wang*¹

1. The University of Tennessee Knoxville, Materials Science and Engineering, USA

11:30 AM

(EMA-S14-004-2025) Big Data Analytics and Neural Networks for Prediction of Oxide Film Composition Using RHEED

P. Gemperline²; S. Harris²; R. K. Vasudevan²; R. B. Comes*¹

1. University of Delaware, Dept. of Materials Science and Engineering, USA
2. Auburn University, Physics, USA
3. Oak Ridge National Lab, Center for Nanophase Materials Sciences, USA
4. Oak Ridge National Lab, USA

S18 Characterization of structure-property relationships in functional ceramics

S18- Advances in scattering, imaging, and analytical techniques

Room: Colorado J

Session Chair: Hadas Sternlicht, The Pennsylvania State University
Department of Materials Science and Engineering

10:00 AM

(EMA-S18-017-2025) Imaging 3D crystallography down to atomic resolution using 4DSTEM (Invited)

I. MacLaren*¹; A. Silling²; C. Allen³; A. Kirkland²; J. Barthel⁴; J. MacManus-Driscoll²

1. University of Glasgow, School of Physics and Astronomy, United Kingdom
2. University of Cambridge, Dept. of Materials Science, United Kingdom
3. University of Oxford, Department of Materials, United Kingdom
4. Forschungszentrum Jülich GmbH, Ernst Ruska Zentrum für Mikroskopie und Spektroskopie mit Elektronen, Germany

10:30 AM

(EMA-S18-018-2025) Towards In Situ Visualization of Nanoscale and Atomic-Level Dynamics and Transport in Electroceramics (Invited)

P. Crozier*¹

1. Arizona State University, SEMTE, USA

11:00 AM

(EMA-S18-019-2025) Measuring Polar Displacement and Lattice Strain in Ferroelastic Specimens via Precession-Enhanced Cepstral Analysis

A. Mis*¹; C. Brown²; S. Dahl²; M. Holtz²

1. NIST, Physical Measurement Laboratory, USA
2. Colorado School of Mines, Metallurgical and Materials Engineering, USA

11:15 AM

(EMA-S18-020-2025) Probing Nanoscale Optical Excitations in Low Symmetry Ceramics with Monochromated Electron Energy-Loss Spectroscopy (Invited)

J. A. Hachtel¹; S. Woo*¹

1. Oak Ridge National Laboratory, USA

11:45 AM

(EMA-S18-021-2025) In-situ characterization of the high-temperature spin-state transition in LaCoO₃ via STEM imaging and EELS (Invited)

M. A. Smeaton*¹; E. Salagre²; E. J. Fuller³; K. L. Jungjohann¹

1. National Renewable Energy Laboratory, USA
2. Sandia National Laboratories California, USA
3. Sandia National Laboratories California, Materials Physics, USA

12:15 PM

(EMA-S18-022-2025) Electric field measurement in GaAs and GaInP solar cells using differential phase contrast and precession scanning transmission electron microscopy

E. Supple*¹; K. Bertness¹; A. Mis¹; J. Geisz²; A. Roshko¹

1. National Institute of Standards and Technology, USA
2. National Renewable Energy Laboratory, USA

S20 Magnetic and superconducting materials-from basic science to applications

S20- Low Dimensional Correlated Magnetic Materials I

Room: Colorado D

Session Chair: Sara Mills, US Naval Research Laboratory

10:00 AM

(EMA-S20-001-2025) Spin Entanglement in 2D Dimer Magnets (Invited)

H. Cao*¹

1. Oak Ridge National Lab, Neutron Scattering Division, USA

10:30 AM

(EMA-S20-002-2025) Complex Magnetism and Its Coupling with Transport in Layered Mn_{2-x}Zn_xSb (Invited)

M. Rafique Un Nabi¹; R. Basnet¹; G. Acharya¹; D. Upreti¹; S. Karki Chhetri¹; J. Hu*²

1. University of Arkansas, USA
2. University of Arkansas, Physics, USA

11:00 AM

(EMA-S20-003-2025) Growth and Properties of Layered Magnetic Materials (Invited)

A. May*¹

1. Oak Ridge National Laboratory, USA

11:30 AM

(EMA-S20-004-2025) Spectrum Insight in Magnetism with A Twist (Invited)

X. Wang*¹

1. Washington University in St Louis, Physics, USA

12:00 PM

(EMA-S20-022-2025) Highly Tunable Superconductivity at the KTaO₃ Interfaces (Invited)

K. Ahadi*¹

1. The Ohio State University, USA

12:30 PM

(EMA-S20-006-2025) Exploiting the angular dependency of the magnetic anisotropy for sub-THz devices utilizing hexaferrites

D. Hedlund^{*1}; P. Kulik¹

1. University of Central Florida, Department of Electrical and Computer Engineering, USA

S22 Advanced Electronic Materials- Processing structures and applications

S22- Advanced electronic materials, including ferroelectric, piezoelectric, dielectric, electrostrictive, and pyroelectric materials

Room: Colorado F

Session Chairs: Hana Uršič, Jozef Stefan Institute; Keisuke Yazawa, Colorado School of Mines

10:00 AM

(EMA-S22-019-2025) BiFeO₃-BaTiO₃ for High-Temperature Piezoelectric Applications: Synthesis, Defect Studies and Nonlinear Harmonic Analysis (Invited)

A. Iacomini^{*1}; J. Roknić¹; H. Uršič²; T. Rojac²

1. Institut Jozef Stefan, Electronic Ceramics Department K5, Slovenia
2. Jozef Stefan Institute, Electronic Ceramics Department, Slovenia

10:30 AM

(EMA-S22-020-2025) PZ-based antiferroelectric ceramics for dielectric cooling

B. Rozic^{*2}; B. Asbani¹; H. Uršič³; M. El Marssi⁴; R. Pirc¹; M. Morgan²; Z. Kutnjak²

1. Jozef Stefan Institute, Slovenia
2. Jozef Stefan Institute, Department of Condensed Matter Physics, Slovenia
3. Jozef Stefan Institute, Electronic Ceramics Department, Slovenia
4. Université de Picardie Jules Verne, LPMC, France

10:45 AM

(EMA-S22-021-2025) Stress-and temperature-dependent tailoring of functional properties in antiferroelectric AgNbO₃

N. H. Khansur^{*1}

1. Case Western Reserve University, Materials Science and Engineering, USA

11:00 AM

(EMA-S22-022-2025) Enhancing Vertical Ferroelectric Properties in Aurivillius Phase Thin Films (Invited)

D. Dutta¹; T. Simonian¹; M. Schmidt¹; S. Hussain¹; V. Nicolosi²; L. Keeney^{*1}

1. Tyndall National Institute, University College Cork, Advanced Materials and Surfaces Group, Ireland
2. Trinity College Dublin, School of Chemistry, Ireland
3. Tyndall National Institute, Speciality Products and Services, Ireland

11:30 AM

(EMA-S22-023-2025) Reversible dynamics of ferroelectric domain walls

N. Domingo Marimon^{*1}; S. Raghuraman¹; K. Kelley¹; R. K. Vasudevan¹; M. Zahn²; S. Neumayer¹; J. Schultheiss²; D. Meier²; S. Jesse¹

1. Oak Ridge National Lab, Center for Nanophase Materials Sciences, USA
2. Norges teknisk-naturvitenskapelige universitet Fakultet for naturvitenskap, Department of Materials Science and Engineering, Norway

11:45 AM

(EMA-S22-024-2025) Improving multiline thru-reflect-line calibrations for high-frequency materials characterization

N. Jungwirth^{*1}; F. Bergmann¹; R. Jones¹; B. Bosworth¹; J. Cheron¹; L. Enright¹; A. Osella¹; C. Long¹; N. Orloff¹

1. National Institute of Standards and Technology, USA

12:00 PM

(EMA-S22-025-2025) Complex permittivity measurements of substrates and thin films at millimeter-wave

L. Enright^{*1}; B. Jamroz¹; N. Orloff¹

1. National Institute of Standards & Technology, Communications Technology Laboratory, USA

12:15 PM

(EMA-S22-026-2025) Improving equivalent circuit models of interdigitated capacitors

N. Jungwirth^{*1}; B. Bosworth¹; F. Bergmann¹; E. Marks²; L. Enright¹; A. Osella¹; J. Cheron¹; A. Hagerstrom¹; I. Takeuchi²; C. Long¹; N. Orloff¹

1. National Institute of Standards and Technology, USA
2. University of Maryland, USA

S1 Ceramics for the Hydrogen Economy

S1- Ceramic processing and manufacturing techniques for hydrogen applications

Room: Colorado J

Session Chairs: Ming Li, University of Nottingham; Till Frömling

2:00 PM

(EMA-S1-001-2025) Promises and challenges of protonic ceramic electrolysis cells (Invited)

S. Ricote^{*1}; R. J. Kee¹

1. Colorado School of Mines, Mechanical Engineering, USA

2:30 PM

(EMA-S1-002-2025) Proton-conducting cells for membrane reactors and electrochemical cells – An overview (Invited)

W. Deibert^{*1}; N. H. Menzler¹; S. Baumann¹; O. Guillon¹; W. A. Meulenbergh¹

1. Forschungszentrum Julich GmbH, IMD-2, Germany

3:00 PM

(EMA-S1-003-2025) Operation-Specific Electronic Leakage in Protonic Ceramic Electrolytes for Solid Oxide Cells (Invited)

B. Guan³; H. Tian³; Y. Picard²; J. Liu²; T. Kalapos²; H. Abernathy²; L. Zhou¹; X. Li³; W. Li³; X. Liu^{*1}

1. West Virginia University, Mechanical & Aerospace Engineering, USA
2. National Energy Technology Laboratory, USA
3. West Virginia University Benjamin M Statler College of Engineering and Mineral Resources, USA

3:30 PM

Break

4:00 PM

(EMA-S1-004-2025) Chemical Modulation of Grain Boundaries and Electrochemical Interfaces -New Opportunities for Improved Energy Conversion Devices (Invited)

H. L. Tuller^{*1}; M. Yasutake²; H. Seo³; J. Matsuda²; K. Sasaki²; T. Defferriere¹; C. Gilgenbach¹; Z. Sha¹; J. LeBeau¹

1. Massachusetts Institute of Technology, Department of Materials Science and Engineering, USA
2. Kyushu University, Department of Mechanical Engineering, Japan
3. Dankook University, Department of Materials Science and Engineering, Republic of Korea

4:30 PM

(EMA-S1-005-2025) Enhancing Nanocatalyst Design: Unraveling the Role of Surfaces on Nanoparticle Exsolution by Advanced Characterization (Invited)

J. Hidalgo^{*1}; R. Li²; I. Waluyo²; A. Hunt²; B. Yildiz¹

1. Massachusetts Institute of Technology, USA
2. Brookhaven National Laboratory, NSLS II, USA

5:00 PM

(EMA-S1-006-2025) Blacklight sintering of BaZrO₃-based proton conductors

J. N. Ebert^{*1}; D. Jennings²; O. Guillon²; W. Rheinheimer¹

1. Universität Stuttgart, IFKB, Germany
2. Forschungszentrum Julich GmbH, IMD-2, Germany

5:15 PM

(EMA-S1-007-2025) Application of advanced ceramic materials for fuel cell and green hydrogen production at Ceres: achievements and future opportunities

R. T. Leah^{*1}; S. Mukerjee¹; C. Hargrove¹

1. Ceres Power Holdings plc, United Kingdom

S2 Electronic and Ionic Materials for Energy Storage and Conversion Systems

S2- Computational and experimental advances in mixed electronic and ionic conductors for energy storage and conversion systems

Room: Colorado I

Session Chairs: Fudong Han, Rensselaer Polytechnic Institute;
Nicola Perry, University of Illinois at Urbana-Champaign

2:00 PM

(EMA-S2-008-2025) Molecular Simulations and Machine Learning for Computational Design of Materials with Fast Oxygen Kinetics (Invited)

D. Morgan^{*1}; R. Jacobs¹; J. Meng¹; M. Sheikh¹; J. Liu²; M. Polak¹

1. University of Wisconsin-Madison, Materials Science and Engineering, USA
2. NETL, USA

2:30 PM

(EMA-S2-009-2025) Fundamental thermodynamics and kinetics of cathode and anode materials of Li-ion and Na-ion batteries (Invited)

A. Van der Ven^{*1}

1. University of California Santa Barbara, Materials, USA

3:00 PM

(EMA-S2-010-2025) Probing Reaction Heterogeneity in Thick Battery Electrodes: Effects of Electrode Thermodynamic Properties and Electronic Conductivity **WITHDRAWN**

M. Tang^{*1}

1. Rice University, Materials Science & NanoEngineering, USA

3:15 PM

(EMA-S2-011-2025) Extended oxygen defects modulate the ethylene selectivity in the electrochemical oxidative coupling of methane

F. Grajkowski^{*1}; B. Liu¹; S. Koohfar¹; S. Chandra¹; B. Yildiz¹

1. Massachusetts Institute of Technology, USA

3:30 PM

Break

4:00 PM

(EMA-S2-012-2025) Advanced oxides for solid oxide cells (Invited)

J. Sirvent²; F. Baiutti²; F. Chiabrera²; K. Kreka²; F. Buzi²; A. Morata²; A. Maria²; L. Bernadet²;
A. Tarancon^{*1}

1. ICREA/IREC, Spain
2. Institut de Recerca en Energia de Catalunya, Spain

4:30 PM

(EMA-S2-013-2025) Complex mixed electronic and ionic conduction in protonic ceramics (Invited)

S. Ricote^{*1}

1. Colorado School of Mines, Mechanical Engineering, USA

5:00 PM

(EMA-S2-014-2025) In-situ and Ex-situ Impedance Spectroscopy Analysis of Li₂OHCl Antiperovskite Solid Electrolyte Grown by Pulsed Laser Deposition

K. Lan^{*1}; E. Cho¹; Y. Lee¹; X. Ji¹; P. V. Braun¹; D. G. Cahill¹; A. Schleife¹; N. H. Perry¹

1. University of Illinois at Urbana-Champaign, Material Science and Engineering, USA

S3 Nano4Neuro-Mechanisms and Materials for Next Generation Computing

S3- Phase transitions for information

Room: Colorado C

Session Chair: Yiyang Li, University of Michigan

2:00 PM

(EMA-S3-007-2025) Low-Power and High-Temperature Computing with III-Nitride ferroelectrics (Invited)

D. Jariwala^{*1}

1. University of Pennsylvania, USA

2:30 PM

(EMA-S3-008-2025) Measurements of electron and phonon transport and scattering in ferroelectric thin films using ultrafast and infrared spectroscopy

S. Makarem^{*1}; S. Zare²; C. Skidmore³; I. Mercer³; J. Maria³; P. Hopkins²

1. University of Virginia, Materials Science and Engineering, USA
2. University of Virginia, USA
3. Pennsylvania State University, Materials Science and Engineering, USA

2:45 PM

(EMA-S3-009-2025) Theoretical Switching Mechanism of Wurtzite Aluminum Nitride

D. Behrendt^{*1}; A. Samanta¹; A. M. Rappe¹

1. University of Pennsylvania, Chemistry, USA

3:00 PM

(EMA-S3-010-2025) Crystalline Phase Evolution, Dimensional Scaling and Reliability of Hafnia-Zirconia Ferroelectric Thin Films (Invited)

P. McIntyre^{*1}

1. Stanford University, Materials Science and Engineering, USA

3:30 PM

Break

4:00 PM

(EMA-S3-011-2025) Ferroelectric Hafnia for Neuromorphic Computing: Overcoming Obstacles Imposed by Metastability (Invited)

J. Ihlefeld^{*1}

1. University of Virginia, Department of Materials Science and Engineering, USA

4:30 PM

(EMA-S3-012-2025) Opening the Neuromorphic Design Space: Engineering Spin Crossover Devices with Compositional Complexity (Invited)

E. J. Fuller^{*1}

1. Sandia National Laboratories California, Materials Physics, USA

5:00 PM

(EMA-S3-013-2025) Exploring electro-thermal localizations and metal-insulator transitions in micron to sub-micron thin film VO₂ devices

Y. Yu^{*1}; A. Bradicich¹; T. D. Brown³; F. Jardali¹; S. Kumar³; R. S. Williams²; P. Shamberger¹

1. Texas A&M University System, Materials Science and Engineering, USA
2. Texas A&M University, Electrical and Computer Engineering, USA
3. Sandia National Laboratories California, USA

5:15 PM

(EMA-S3-014-2025) Measuring Dynamic Data

P. Maksymovych^{*1}; N. Bauer²; O. Popova²; M. Lavrentovich⁴; M. A. Susner²; A. V. Levlev²;
S. Neumayer²

1. Clemson University, Materials Science and Engineering, USA
2. Oak Ridge National Laboratory, USA
3. Air Force Research Laboratory, Materials and Manufacturing Directorate, USA
4. Worcester State University, Earth, Environment and Physics, USA
5. Oak Ridge National Lab, Center for Nanophase Materials Sciences, USA
6. The University of Tennessee Knoxville Tickle College of Engineering, Physics, USA

S4 Oxide Quantum Materials: Synthesis, Properties and Application

S4- Advanced Characterization

Room: Colorado B

Session Chairs: Grace Pan, University of California Berkeley;
Seung Sae Hong, University of California, Davis

2:00 PM

(EMA-S4-019-2025) Electron-Beam Writing of Atomic-Scale Reconstructions at Oxide Interfaces (Invited)

G. Segantini^{*1}; C. Hsu¹; C. W. Rischau¹; P. Blah²; M. Matthiesen²; S. Gariglio¹; J. Triscone¹; D. Alexander³; A. Cavglia¹

1. Université de Genève, Switzerland
2. Technische Universiteit Delft, Netherlands
3. Ecole Polytechnique Federale de Lausanne, Switzerland

2:30 PM

(EMA-S4-020-2025) Revealing the Intricacies of Vibrations in Complex Oxides using Polarization Selective Electron Energy-loss Spectroscopy (Invited)

E. R. Hoglund^{*1}; H. A. Walker²; S. T. Pantelides³; J. A. Hachtel¹

1. Oak Ridge National Laboratory, Center for Nanophase Materials Sciences, USA
2. Vanderbilt University, Interdisciplinary Materials Science Program, USA
3. Vanderbilt University, Dept. of Physics and Astronomy, USA

3:00 PM

(EMA-S4-021-2025) Terahertz switching of ferroelectric polarization in Hafnia films (Invited)

H. Park^{*1}

1. Ulsan National Institute of Science and Technology, Department of Physics, Republic of Korea

S4- Theory and Calculations

Room: Colorado B

Session Chairs: Elizabeth Nowadnick, University of California, Merced;
Ho Nyung Lee, Oak Ridge National Lab

3:30 PM

Break

4:00 PM

(EMA-S4-022-2025) Coupling Between Magnetic Multipoles and Crystal Structure in Altermagnets (Invited)

T. Biro^{*1}; L. Buiarelli¹; R. M. Fernandes²

1. University of Minnesota Twin Cities, USA
2. University of Illinois Urbana-Champaign, USA

4:30 PM

(EMA-S4-023-2025) Electron-Crystal Structure Symmetry Breaking in Quantum Correlated Electron Materials (Invited)

A. Georgescu^{*1}

1. Indiana University Bloomington, Chemistry, USA

5:00 PM

(EMA-S4-024-2025) Piezoelectricity in Ruddlesden-Popper and Dion-Jacobson ferroelectrics from first principles

K. Hasin^{*2}; N. Pokhrel¹; E. Nowadnick²

1. Oak Ridge National Laboratory, Division of Materials Science and Technology, USA
2. University of California Merced, Department of Chemical and Materials Engineering, USA

5:15 PM

(EMA-S4-025-2025) Metal-Insulator Transitions in Multicomponent Oxide: Ruthenate Pyrochlores

S. Akhbarifar^{*1}

1. The Catholic University of America, Physics, USA

S6 Two-Dimensional Quantum Materials- Synthesis, theories, properties and applications

S6 – Two dimensional quantum materials: Synthesis, theories, properties & applications

Room: Colorado G

Session Chair: Cheng Gong, University of Maryland

2:00 PM

(EMA-S6-012-2025) Hyperbolic phonon-polariton electroluminescence in graphene-hBN van der Waals heterostructures (Invited)

Q. Guo^{*1}

1. CUNY Advanced Science Research Center, Photonics Initiative, USA

2:30 PM

(EMA-S6-013-2025) Interlayer, intralayer, and defect-bound excitons in transition metal dichalcogenide moiré heterostructures (Invited)

A. Kunin^{*1}; Z. Withers²; Z. Li³; J. Ding²; A. Adler²; J. Guo⁴; S. Chernov²; W. Zhou³; S. Cheng³; V. Chang Lee⁴; B. Hou⁴; G. Schonhense⁵; X. Du²; D. Qiu⁴; R. Kawakami³; T. Allison²

1. Princeton University, USA
2. Stony Brook University, USA
3. The Ohio State University, USA
4. Yale University, USA
5. Johannes Gutenberg Universität Mainz, Germany

3:00 PM

(EMA-S6-014-2025) Tunable magnons in van der Waals antiferromagnet (Invited)

B. Kim^{*2}; S. Xu¹; X. Lu²; Z. Wang²; J. Jin²; C. Qian²; L. He²; D. Chica⁴; X. Roy⁴; B. Zhen²

1. Southern University of Science and Technology, Electrical and Electronic Engineering, China
2. University of Pennsylvania, Physics and Astronomy, USA
3. University of Pennsylvania, Electrical and Systems Engineering, USA
4. Columbia University, Chemistry, USA

3:30 PM

Break

4:00 PM

(EMA-S6-015-2025) Excitonic band structure of monolayer hexagonal boron nitride (hBN) (Invited)

L. Liu¹; S. Woo²; J. Wu³; B. Hou³; C. Su^{*3}; D. Qiu³

1. Yale University, Applied Physics, USA
2. Oak Ridge National Laboratory, USA
3. Yale University, USA

4:30 PM

(EMA-S6-016-2025) Strong Light-Matter Coupling in Excitonic 2D semiconductors (Invited)

D. Jariwala^{*1}

1. University of Pennsylvania, USA

S7 Additive manufacturing for power sources in electronics

S7 - AM for Lithium Batteries II

Room: Colorado E

Session Chair: Bin Li, Oak Ridge National Lab

2:00 PM

(EMA-S7-005-2025) Advanced Manufacturing of Multiscale Controlled Electrodes for Lithium-Ion Batteries (Invited)

J. Park^{*1}

1. Missouri University of Science and Technology, Mechanical and Aerospace Engineering, USA

3:00 PM

(EMA-S7-006-2025) Architected Carbon Electrodes for Supercapacitors (Invited)

Y. Li*¹

1. University of California Santa Cruz, Chemistry and Biochemistry, USA

3:30 PM

Break

4:00 PM

(EMA-S7-007-2025) Printed Graphite Electrodes for Fast Charging Lithium-Ion Batteries (Invited)

Q. Wu*¹

1. Western Michigan University College of Engineering and Applied Sciences, Chemical and Paper Engineering, USA

4:30 PM

(EMA-S7-008-2025) 3D Printed Anodes for Next-Generation Batteries (Invited)

M. Wood*¹; M. C. Freyman¹; Y. Xiao¹; B. Wang¹; N. R. Cross²; T. Lin²; G. Bucci²; C. Zhu²; S. Li²

1. Lawrence Livermore National Laboratory Physical and Life Sciences Directorate, Materials Science Division, USA
2. Lawrence Livermore National Laboratory, USA

5:00 PM

(EMA-S7-009-2025) Advancing 3D-Printable Battery Systems: AI-Guided Coatings and Composite Conductors for Enhanced Performance and Scalability (Invited)

S. Thummalapalli¹; M. T. Sobczak¹; A. Ramanathan¹; K. Song*¹

1. University of Georgia, Mechanical Engineering, USA

S11 Complex oxide thin films and heterostructures- from synthesis to strain/interface-engineered emergent properties

S11- Emergent phenomena in complex oxide thin films II

Room: Colorado A

2:00 PM

(EMA-S11-016-2025) Heterogeneous Doping via Nanoscale Coating Impacts Mechanics of Li Intrusion in Brittle Solid Electrolytes (Invited)

X. Xu*¹

1. Arizona State University, USA

2:30 PM

(EMA-S11-017-2025) VO₂ nanocomposite thin films integrated on glass substrates for tunable properties

C. Mihalko*¹; J. Lu¹; Z. He²; N. Bhatt¹; Y. Zhang¹; H. Dou¹; J. P. Barnard¹; H. Wang¹

1. Purdue University, Materials Engineering, USA
2. Purdue University, Electrical and Computer Engineering, USA

2:45 PM

(EMA-S11-018-2025) Low-loss Ruddlesden-Popper ferroelectrics varactors

N. Orloff*¹; F. Bergmann¹; S. J. Freed²; M. R. Barone³; D. Schlom³

1. NIST, Communications Technology Laboratory, USA
2. University of Maryland, Materials Science & Engineering, USA
3. Cornell University, Department of Materials Science and Engineering, USA

3:00 PM

(EMA-S11-019-2025) Emergent phenomena in complex oxides via extreme electron doping (Invited)

S. Ramanathan*¹

1. Rutgers University, ECE, USA

3:30 PM

Break

4:00 PM

(EMA-S11-020-2025) Unconventional Polar Phenomena in Epitaxial Magnetic Heterostructures (Invited)

L. M. Caretta*¹

1. Brown University, USA

4:30 PM

(EMA-S11-021-2025) Continuous Lattice Symmetry Control of Oxide Films (Invited)

T. Z. Ward*¹

1. Oak Ridge National Laboratory, USA

S14 A1 in Materials research: from data analysis, autonomous experimentation, to human AI cooperation

S14- AI for smart lab and microscopy

Room: Matchless

Session Chairs: Yongtao Liu, Oak Ridge National Lab; Yan Zeng, Florida State University

2:30 PM

(EMA-S14-005-2025) Creating Smart Labs of the Future (Invited)

R. Moore*¹

1. Oak Ridge National Laboratory, USA

3:00 PM

(EMA-S14-006-2025) Autonomous Scanning Electron Microscope Powered by Vision Language Models (Invited) *WITHDRAWN*

Z. Ren*¹; J. Li¹

1. Massachusetts Institute of Technology, Materials Science and Engineering, USA

S14- Automated synthesis and characterization of 2D materials

Room: Matchless

Session Chairs: Yongtao Liu, Oak Ridge National Lab; Esther Tsai, Brookhaven National Laboratory

3:30 PM

Break

4:00 PM

(EMA-S14-007-2025) Automated 2D materials fabrication and characterization (Invited)

S. Park*¹; H. Jang¹; K. Yager¹; G. Doerk¹; A. Stein¹; J. Sadoski¹; C. Black¹

1. Brookhaven National Laboratory, center for functional nanomaterials, USA

4:30 PM

(EMA-S14-008-2025) Approaches for AI-driven pulsed laser deposition using in situ diagnostics (Invited)

S. Harris*¹; A. Biswas³; R. Fajardo²; F. Bao²; C. Rouleau¹; A. Poretzky¹; K. Xiao¹; R. K. Vasudevan¹

1. Oak Ridge National Laboratory, Center for Nanophase Materials Sciences, USA
2. Florida State University, USA
3. University of Tennessee Knoxville, USA

S19 Frontiers in ferroic ceramics-synthesis, properties and applications

S19- Frontiers in Ferroic Ceramics: Synthesis, properties and applications

Room: Colorado H

Session Chair: Jayakanth Ravichandran, University of Southern California

2:00 PM

(EMA-S19-001-2025) Controlling spin current transport in multiferroic oxides (Invited)

D. Yi^{*1}

1. Tsinghua University, Material Science and Engineering, China

2:30 PM

(EMA-S19-002-2025) In situ cryogenic TEM study of electric field control of magnetic skyrmions (Invited)

M. Han^{*1}

1. Brookhaven National Laboratory, USA

3:00 PM

(EMA-S19-003-2025) Interfacial Effects and the Magnetism of Epitaxial Perovskite Thin Films (Invited)

P. Woodward^{*1}

1. Ohio State University, Chemistry and Biochemistry, USA

3:30 PM

Break

4:00 PM

(EMA-S19-004-2025) Unlocking Atomically Precise Oxide Membrane Growth with Molecular Beam Epitaxy (Invited)

B. Jalan^{*1}

1. University of Minnesota, USA

4:30 PM

(EMA-S19-005-2025) Moiré induced polar topologies in twisted oxide membranes (Invited)

J. Santamaria^{*1}

1. Universidad Complutense, Materials Physics, Spain

5:00 PM

(EMA-S19-006-2025) Two-step phase transition enabled superelasticity in quasi-two-dimensional freestanding perovskite ferroelectric films (Invited)

X. Pan^{*1}

1. University of California Irvine, Materials Science and Engineering; Physics and Astronomy, USA

S20 Magnetic and superconducting materials-from basic science to applications

S20- Novel applications of magnetic materials

Room: Colorado D

Session Chair: Timothy Haugan, U.S. Air Force Research Laboratory

2:00 PM

(EMA-S20-007-2025) Symmetry and Chemical Stability of 2D M_3X_8 ($M = Nb$, $X = Cl, Br, I$) and Related Ionic Kagome Materials

V. Kumari^{*1}; J. Bauer²; A. Georgescu¹

1. Indiana University, Chemistry, USA
2. Yale University, USA

2:15 PM

(EMA-S20-008-2025) Frontiers in AM3X4 and AM6X6 kagome compounds; development of new kagome metals (Invited)

B. R. Ortiz^{*1}; W. Meier⁶; G. Pokharel³; D. Parker¹; H. Miao³; J. Chamorro³; F. Ye¹; S. Sarker⁴; G. D. Samolyuk¹; K. Gornicka¹; F. Yang¹; S. Mozaffari⁶; A. Thaler⁶; A. May¹; S. Wilson²; B. Sales¹; D. Mandrus⁵; M. McGuire¹

1. Oak Ridge National Laboratory, USA
2. University of California Santa Barbara, USA
3. Carnegie Mellon University, USA
4. Cornell University, USA
5. University of West Georgia, USA
6. The University of Tennessee Knoxville Tickle College of Engineering, USA

2:45 PM

(EMA-S20-009-2025) Magnetization dynamics of $LnMn_6Sn_6$ ($Ln = Tb, Dy$) ferimagnetic kagome metals (Invited)

K. Collins^{*1}; J. Flores¹; M. A. Susner²; M. Newburger³

1. Air Force Research Laboratory/Azimuth Corp, Materials and Manufacturing Directorate, USA
2. Air Force Research Laboratory, Materials and Manufacturing Directorate, USA
3. Air Force Research Lab, USA

3:15 PM

(EMA-S20-010-2025) Evolution of Magnetism and Transport Properties through Electrochemical Intercalation for a 2D Magnetic Semiconductor

Z. Zhai^{*1}; W. Liu¹; X. Guo³; N. Agarwal⁴; A. Stangel⁴; D. Schulze²; T. Kuo²; L. Deng²; N. Jalali⁵; K. Brenner²; L. Zhao³; R. Hovden⁴; C. Chu²; B. Lv¹

1. The University of Texas at Dallas, Physics, USA
2. University of Houston, Physics, USA
3. University of Michigan, Physics, USA
4. University of Michigan, MSE, USA
5. The University of Texas at Dallas, MSE, USA

3:30 PM

Break

4:00 PM

(EMA-S20-011-2025) Opportunities for Advanced Magnetism in Hybrid Organic-Inorganic Materials (Invited)

E. Mozur^{*1}

1. Colorado School of Mines, Metallurgical and Materials Engineering, USA

4:30 PM

(EMA-S20-012-2025) Engineering Electromagnetic Properties of Yttrium Iron Garnet Thin-Films Through Ion Implantation (Invited)

P. Kulik^{*1}

1. University of Central Florida, ECE, USA

5:00 PM

(EMA-S20-013-2025) Aerosol deposition of yttrium iron garnet/iron magnetic composites

S. C. Mills^{*1}; E. Patterson¹

1. US Naval Research Laboratory, Material Science and Technology, USA

5:15 PM

(EMA-S20-014-2025) "Easy peel" 1T-CrTe₂: Studying the Chemistry Change from ACrTe₂ (A=K, Rb) to 1T-CrTe₂ (Invited)

J. Wang^{*1}; K. Prasad¹

1. Wichita State University, Chemistry and Biochemistry, USA

5:45 PM

(EMA-S20-015-2025) Atomistic Magnetoelastic Simulations Using Molecular Dynamics

M. McIntosh^{*1}; G. Carman¹

1. University of California Los Angeles, Mechanical Engineering, USA

Friday, February 28, 2025

S1 Ceramics for the Hydrogen Economy**S1- Ceramic components for solid oxide cells, including electrolytes, electrodes, and sealants**

Room: Colorado J

Session Chairs: Vaibhav Vibhu, Forschungszentrum Julich GmbH;
Till Frömling, Technische Universität Darmstadt**8:30 AM****(EMA-S1-008-2025) Probing protonic transport in ceramic electrolytes for solid oxide cell applications (Invited)**S. Skinner^{*1}; K. Huang¹; C. Liao¹; Y. Han¹; M. Gonzalez²

1. Imperial College London, United Kingdom
2. Institut Laue-Langevin, France

9:00 AM**(EMA-S1-009-2025) New Hexagonal Perovskite Derivatives for Hydrogen Applications (Invited)**S. Fop^{*1}; A. McLaughlin¹

1. University of Aberdeen, Chemistry, United Kingdom

9:30 AM**(EMA-S1-010-2025) High electrical conductivity of 0.01 -0.001 S/cm at room temperature in yttria-stabilised zirconia**L. Thompson^{*1}; L. Paulsson-Habegger¹; M. Li²

1. University of Nottingham, Engineering, United Kingdom
2. University of Nottingham, Department of Mechanical, Materials and Manufacturing Engineering, United Kingdom

9:45 AM**(EMA-S1-011-2025) Low Chemical Strains in Orthorhombic Ferrite Perovskites: Relating Bond Angles, Hybridization, and Redox Coefficients of Chemical Expansion**L. O. Anderson¹; D. Nordlund²; N. H. Perry^{*1}

1. University of Illinois Urbana-Champaign, USA
2. Stanford Linear Accelerator Center, USA

10:00 AM**Break****10:30 AM****(EMA-S1-012-2025) All-ceramic solid oxide fuel cells utilizing phase-inversion derived scaffolds and impregnated nanoparticles as cathodes (Invited)**C. Chen^{*1}; C. Huang¹

1. University of Science and Technology of China, Materials Science and Engineering, China

11:00 AM**(EMA-S1-013-2025) SrCo_{0.9}Ta_{0.1}O_{3-d} vs. BaCo_{0.9}Ta_{0.1}O_{3-d}: Which Is a Better Oxygen Electrocatalyst? (Invited)**K. Huang^{*1}

1. University of South Carolina, Mechanical Engineering, USA

11:30 AM**(EMA-S1-014-2025) Development of high-performing and durable fuel electrodes for Solid Oxide Electrolysis Cells (Invited)**V. Vibhu^{*1}; R. Kumar¹; S. E. Wolf¹; J. Uecker¹; I. Unachukwu¹; L. de Haart¹; R. Eichel¹

1. Forschungszentrum Julich GmbH, Institute of Energy Technologies (IET-1), Fundamental Electrochemistry, Germany

12:00 PM**(EMA-S1-015-2025) Toward the rational design of high entropy perovskite oxide for Solid Oxide Cells with the machine learning approach**Y. Kim^{*1}; P. Rand¹; C. Miesel²; J. Yang¹; N. Sullivan²; R. O'Hayre¹

1. Colorado School of Mines, Metallurgical and Materials Engineering, USA
2. Colorado School of Mines Department of Mechanical Engineering, USA

12:15 PM**(EMA-S1-016-2025) Oxygen Non-Stoichiometry and Thermochemical Hydrogen Production in Novel Machine Learned Oxides**T. C. Douglas^{*1}; K. King¹; M. Witman¹; P. A. Salinas¹; A. McDaniel¹; E. Coker¹; S. Bishop¹

1. Sandia National Laboratories, USA

S2 Electronic and Ionic Materials for Energy Storage and Conversion Systems**S2- Next generation electrodes and electrolytes**

Room: Colorado I

Session Chairs: Hui Xiong, Boise State University

8:30 AM**(EMA-S2-015-2025) Materials Design and Structural Understanding of Cation-Disordered Oxides For Battery Applications (Invited)**D. Chen^{*1}

1. University of New Mexico College of Arts and Sciences, Chemistry, USA

9:00 AM**(EMA-S2-016-2025) Mn₃O₄ as an Anion-Hosting Cathode for Aqueous Batteries (Invited)**S. Sandstrom¹; Q. Li²; Y. Sui¹; D. Jiang²; X. Ji^{*1}

1. Oregon State University, Chemistry, USA
2. Vanderbilt University, USA

9:30 AM**(EMA-S2-017-2025) Designing Fast and Stable Li-Ion Batteries through Inter-and Intra-Polyhedral Connectivity**M. M. Butala^{*1}

1. University of Florida, Materials Science and Engineering, USA

9:45 AM**(EMA-S2-018-2025) Local and Global Structural Effects of Doping on Ionic Conductivity in Na₃SbS₄ Solid Electrolyte**C. Lee^{*1}; M. Maegawa²; H. Akamatsu²; K. Hayashi²; S. Ohno³; P. Gorai⁴

1. Colorado School of Mines, USA
2. Kyushu Daigaku, Japan
3. Tohoku Daigaku, Japan
4. Rensselaer Polytechnic Institute, USA

10:00 AM**Break****10:30 AM****(EMA-S2-019-2025) Iron (Fe) redox chemistry in concentrated aqueous electrolytes: from unexpected discovery to thermodynamic modeling (Invited)**T. Gao^{*1}

1. The University of Utah, USA

11:00 AM**(EMA-S2-020-2025) Single-particle electrochemistry of cathode particles using microelectrode arrays (Invited)**Y. Li^{*1}

1. University of Michigan, Materials Science & Engineering, USA

11:30 AM**(EMA-S2-021-2025) Uncover Transport, Mechanics and Failure in Electroceramics through Atomic and Dynamic Visualization (Invited)**X. Xu^{*1}

1. Arizona State University, USA

12:00 PM**(EMA-S2-022-2025) Understanding Calendaring Decay of Bulk-Type Solid-State Batteries**F. Han^{*1}

1. Rensselaer Polytechnic Institute, USA

S3 Nano4Neuro-Mechanisms and Materials for Next Generation Computing

S3- Neuroinformatics and architectures

Room: Colorado C

Session Chairs: Sangmin Yoo, Oregon State University; Anton levlev

8:30 AM

(EMA-S3-015-2025) Axon-like Active Signal Transmission at the Edge of Chaos (Invited) ~~WITHDRAWN~~

S. Kumar^{*1}

1. N/A, USA

9:00 AM

(EMA-S3-016-2025) Emergent oxide thin films and heterostructures based memristive devices for neuromorphic computing (Invited)

S. Kunwar^{*1}; A. Chen¹

1. Los Alamos National Laboratory, Center for Integrated Nanotechnologies, USA

9:30 AM

(EMA-S3-017-2025) Co-design of power-efficient intelligent systems (Invited)

S. Yoo^{*1}

1. Oregon State University, Electrical Engineering and Computer Science, USA

10:00 AM

Break

10:30 AM

(EMA-S3-018-2025) Characterization and Assessment of Oxide-Based Resistive and Electrochemical Memories for Energy Efficient Space-Based Analog In-Memory Computing (Invited)

M. Marinella^{*1}

1. Arizona State University, Electric, Computer and Energy Engineering, USA

11:00 AM

(EMA-S3-019-2025) Filament-free Resistive Memory with Long Retention Time

S. Lee^{*1}; Y. Li¹

1. University of Michigan, Materials Science & Engineering, USA

11:15 AM

(EMA-S3-020-2025) Boosting lifetime and resistive switching in TaOx memristors

O. Popova^{*1}; W. S. Wahby²; R. Jacobs-Gedrim²; C. Bennett²; P. S. Finnegan²; A. V. Levlev¹; A. A. Talin²; M. Marinella²; P. Maksymovych¹

1. Oak Ridge National Laboratory, CNMS, USA
2. Sandia National Laboratories, USA
3. Arizona State University, USA

11:30 AM

(EMA-S3-021-2025) Linearly programmable halide perovskite memristors for neurocomputing (Invited)

S. Kim^{*1}; J. Yang¹

1. University of Southern California, Electrical and Computer Engineering, USA

12:00 PM

(EMA-S3-022-2025) Oxide-Oxide Vertically Aligned Nanocomposite Memristor as High-Performance Electronic Synapses via Interface Engineering

Z. Hu^{*1}; H. Dou²; J. Lu²; A. Choudhury²; K. N. Evancho²; J. Huang²; H. Wang²

1. Purdue University, School of Electrical and Computer Engineering, USA
2. Purdue University, School of Materials Engineering, USA

12:15 PM

(EMA-S3-023-2025) Understanding the Non-Volatility of Hafnium Oxide Resistive Memory through Oxygen Tracer Diffusion

D. Shin^{*1}; A. V. Levlev²; K. Beckmann³; J. Li¹; P. Ren¹; N. Cady¹; Y. Li¹

1. University of Michigan, Materials Science and Engineering, USA
2. Oak Ridge National Lab, Center for Nanophase Materials Sciences, USA
3. NY CREATES, USA
4. University at Albany, College of Nanotechnology, USA

S6 Two-Dimensional Quantum Materials-Synthesis, theories, properties and applications

S6 – Two dimensional quantum materials: Synthesis, theories, properties & applications

Room: Colorado G

Session Chairs: Haozhe Wang, Duke University; Cheng Gong, University of Maryland

8:30 AM

(EMA-S6-017-2025) Designer 2D materials with new phononic and photonic properties (Invited)

S. Huang^{*1}

1. Rice University, USA

9:00 AM

(EMA-S6-019-2025) New Theoretical Insights into Moiré Solids and 2D Magnets from Machine Learning Assisted First-Principles Calculations (Invited)

T. Cao^{*1}

1. University of Washington, USA

S7 Additive manufacturing for power sources in electronics

S7 - AM for Lithium Batteries and Beyond

Room: Colorado E

Session Chair: Kun Fu, University of Delaware

8:30 AM

(EMA-S7-010-2025) Direct Ink Writing of 3D Batteries with High Energy and Power Density (Invited)

B. Dunn^{*1}; Y. Wang¹; M. Choi¹; C. Wang²; M. Worsley²; M. Wood²; E. P. Ramos Guzman²

1. University of California Los Angeles, Materials Science and Engineering, USA
2. Lawrence Livermore National Laboratory, USA
3. University of California Los Angeles, USA

9:00 AM

(EMA-S7-011-2025) Shape matters: Understanding the effect of electrode geometry and microstructure (Invited)

G. Bucci^{*1}; T. Lin¹; N. W. Brady¹; N. R. Cross¹; V. M. Ehlinger¹; H. Li¹; S. P. Mish¹; T. Roy¹; S. T. Sarnecki¹; D. A. Tortorelli¹; M. Wood¹; J. Ye¹; C. Orme¹; M. Worsley¹

1. Lawrence Livermore National Laboratory, USA

9:30 AM

(EMA-S7-012-2025) Automated High Throughput Screening of Solid Polymer Electrolytes (Invited) ~~WITHDRAWN~~

J. J. Schwartz^{*1}

1. Lawrence Livermore National Laboratory, Materials Science Division, USA

10:00 AM

Break

10:30 AM**(EMA-S7-013-2025) Direct Deposition of Separator Materials for the Additive Manufacturing of Lithium Ion Batteries (Invited)**

A. Fassler^{*1}; R. Kohlmeyer²; S. Rajput²; G. Horrocks³; J. Deneault¹; R. Green-Warren²; N. McAllister²; M. Arkhipov²; M. Grzenda²; A. Juhl¹; J. Singer²; M. Durstock¹

1. Air Force Research Laboratory Materials & Manufacturing Directorate, USA
2. Xerion Advanced Battery Corp, USA
3. Rutgers The State University of New Jersey, USA

11:00 AM**(EMA-S7-014-2025) Exploiting advanced scan strategies in Laser Powder Bed Fusion towards the manufacturing of rechargeable Zn-based batteries (Invited)**

L. Caprio^{*1}; E. Emanuele²; C. Baldi¹; A. G. Demir¹; B. Bozzini²; B. Previtali¹

1. Politecnico di Milano, Mechanical Engineering, Italy
2. Politecnico di Milano, Energy, Italy

11:30 AM**(EMA-S7-015-2025) Laser Additive Manufacturing of Battery Cathode Films (Invited)**

J. Ye^{*1}; Y. Xiao¹; E. P. Ramos Guzman¹; R. Kim²; M. Wood¹; E. Brown²; H. Du²

1. Lawrence Livermore National Laboratory, USA
2. Ampcera, USA

12:00 PM**(EMA-S7-016-2025) 3D electrodes for long duration and seasonal energy storage (Invited)**

B. S. Jayathilake^{*1}

1. Lawrence Livermore National Laboratory, Materials Science Division, USA

S9 Data-Driven and Model-supported structure-property relationships in complex electroceramics

S9- Data-driven & Model-supported structure-property relationships in complex electroceramics I

Room: Colorado B

Session Chair: Anna Grünebohm, Ruhr-Universität Bochum

8:30 AM**(EMA-S9-002-2025) Understanding domain size effect on piezoelectricity in ferroelectric perovskite oxides from thermodynamics and phase-field simulations (Invited)**

B. Wang^{*1}; L. Chen²

1. Lawrence Livermore National Laboratory, USA
2. The Pennsylvania State University, USA

9:00 AM**(EMA-S9-003-2025) A quest for new antiferroelectrics (Invited)**

H. Aramberri^{*1}

1. Luxembourg Institute of Science and Technology, Luxembourg

9:30 AM**(EMA-S9-009-2025) Automated Quantification and Quality of 'Big' AFM Data for Electro-Ceramics**

K. Del Cid-Ledezma¹; K. Lizu¹; F. Wang¹; J. L. Perez Gordillo¹; B. Huey^{*1}

1. University of Connecticut, Materials Science and Engineering, USA

9:45 AM**Break**

S9- Data-driven & Model-supported structure-property relationships in complex electroceramics II

Room: Colorado B

Session Chair: Bo Wang, Lawrence Livermore National Laboratory

10:30 AM**(EMA-S9-004-2025) Materials informatics meets ferroelectric domain walls: Scale-bridging insights from ab initio based simulations (Invited)**

A. Grünebohm^{*1}

1. Ruhr-Universität Bochum, ICAMS and ZGH, Germany

11:00 AM**(EMA-S9-005-2025) Depth-resolved X-ray photoelectron spectroscopy evidence of intrinsic polar states in hafnia-based ferroelectrics (Invited) **WITHDRAWN****

N. Strkalj^{*1}

1. Institut za Fiziku, Croatia

11:30 AM**(EMA-S9-006-2025) Waste Heat to Electricity (H2E): From 2D Materials Perspective (Invited)**

N. Singh^{*1}

1. Khalifa University, Physics, United Arab Emirates

12:00 PM**(EMA-S9-008-2025) Uncovering the mechanisms of the ultra-high, low-hysteresis electrostrain of lead-free piezoelectric**

Ba_{0.85}Ca_{0.15}Zr_{0.1}Ti_{0.9}O₃ (Invited) **WITHDRAWN**

H. Amorín^{*1}; J. E. García²; D. A. Ochoa²; M. Venet³; P. Ramos⁴; C. Pascual-Gonzalez¹; A. Castro¹; M. Alguero¹

1. Instituto de Ciencia de Materiales de Madrid, Multifunctional Materials, Spain
2. Universitat Politècnica de Catalunya, Departament de Física, Spain
3. Universidade Federal de São Carlos, Departamento de Física, Brazil
4. Universidad de Alcalá, Departamento de Electrónica, Spain

S11 Complex oxide thin films and heterostructures- from synthesis to strain/interface-engineered emergent properties

S11- Functional Properties and Applications of Oxides

Room: Colorado A

Session Chair: Lucas Caretta, Brown University

8:30 AM**(EMA-S11-022-2025) Doping Effects on the Structure and Properties of Complex Oxide Thin Films (Invited)**

L. Wang^{*1}; M. Choi¹; K. P. Koirala¹; M. Bowden¹; P. Sushko¹; Y. Du¹

1. Pacific Northwest National Laboratory, USA

9:00 AM**(EMA-S11-023-2025) Analog Computing with High Precision and Programmability Enabled by Memristors (Invited)**

W. Song^{*1}; Y. Xu¹; J. Yang¹

1. University of Southern California, Ming Hsieh Department of Electrical and Computer Engineering, USA

9:30 AM**(EMA-S11-024-2025) Functional Topological Defects: Materials at the Edge of Order (Invited)**

J. Seidel^{*1}

1. University of New South Wales, Australia

10:00 AM**Break**

10:30 AM

(EMA-S11-025-2025) Electrochemical control of oxygen deficiency in (La,Sr)FeO_{3-δ} thin films for precise modulation of magnetic and electrical properties

P. Nizet¹; F. Chiabrera^{*1}; N. López-Pintó²; P. Langner¹; F. Baiutti¹; A. Morata¹; J. Sort²; A. Tarancon³

1. Institut de Recerca en Energia de Catalunya, Spain
2. Universitat Autònoma de Barcelona, Spain
3. ICREA/IREC, Spain

10:45 AM

(EMA-S11-026-2025) Layer Resolved Cr Oxidation State Modulation in Epitaxial SrFe_{0.67}Cr_{0.33}O_{3-δ} Thin Films

K. P. Koirala¹; M. Hossain¹; L. Wang¹; Z. Zhuo²; W. Yang⁴; M. Bowden¹; S. R. Spurgeon²; C. Wang¹; P. Sushko³; Y. Du^{*1}

1. Pacific Northwest National Laboratory, USA
2. National Renewable Energy Laboratory, USA
3. Pacific Northwest National Lab, Physical Sciences Division, USA
4. E O Lawrence Berkeley National Laboratory, USA

11:00 AM

(EMA-S11-027-2025) Composition-Driven Electrocatalysis: High-Entropy Perovskites for Oxygen Evolution Reaction (Invited)

E. D. Gadea^{*1}; V. Molinero¹

1. The University of Utah, Chemistry, USA

S19 Frontiers in ferroic ceramics-synthesis, properties and applications

S19- Frontiers in Ferroic Ceramics: Synthesis, properties and applications

Room: Colorado H

Session Chair: Ruijuan Xu, North Carolina State University

8:30 AM

(EMA-S19-007-2025) Dynamics of Polar Vortex Crystallization in Ultrathin Ferroelectric Films (Invited)

S. Rijal^{*1}; Y. Nahas¹; S. Prokhorenko¹; L. Bellaiche¹

1. University of Arkansas, Physics, USA

9:00 AM

(EMA-S19-008-2025) Optical Creation of Polar Supertextures (Invited)

V. Gopalan^{*1}

1. The Pennsylvania State University, Materials Science and Engineering, USA

9:30 AM

(EMA-S19-009-2025) Polar Textures: Beyond Oxides (Invited)

J. Ravichandran^{*1}

1. University of Southern California, Chemical Engineering and Material Science, USA

10:00 AM

Break

10:30 AM

(EMA-S19-010-2025) Origin of enhanced ferroelectricity of hafnia down to 2D limit (Invited)

X. Xu^{*1}

1. University of Nebraska-Lincoln, Physics and Astronomy, USA

11:00 AM

(EMA-S19-011-2025) Experimental Synthesis, Stability, and Magnetic Properties of Co₃PdN Thin Films

S. Dugu^{*1}; S. Mahatara¹; C. Regier²; S. Lany¹; J. R. Neilson²; A. Zakutayev¹; S. Bauers¹

1. National Renewable Energy Laboratory, USA
2. Colorado State University, Chemistry, USA

11:15 AM

(EMA-S19-012-2025) Emerging Materials, Mechanisms, and Design Principles for Wurtzite Ferroelectrics (Invited)

C. Lee^{*1}

1. Colorado School of Mines, USA

11:45 AM

(EMA-S19-013-2025) Combinatorial Synthesis and Characterization of Quaternary, Wurtzite (Al,Sc,Gd)N

J. Martin^{*1}; K. Yazawa¹; C. Lee²; T. Nyugen¹; R. Smaha¹; P. Gorai²

1. National Renewable Energy Laboratory, USA
2. Colorado School of Mines, USA

12:00 PM

(EMA-S19-014-2025) Ferroelectronics: Reimagining the transistor, the capacitor, and the memristor (Invited)

S. Cheema^{*1}

1. Massachusetts Institute of Technology, Research Laboratory of Electronics, USA

12:30 PM

(EMA-S19-015-2025) On-demand nanoengineering of in-plane ferroelectric topologies via smart scanning

M. Checa^{*1}

1. Oak Ridge National Laboratory, CNMS, USA

S20 Magnetic and superconducting materials-from basic science to applications

S20- Superconductivity and Other Correlated Systems

Room: Colorado D

Session Chair: Michael Susner, Air Force Research Laboratory

8:30 AM

(EMA-S20-016-2025) Magnetomechanical Coupling for Artificial Multiferroics (Invited)

M. E. Jamer^{*1}

1. United States Naval Academy, Physics, USA

9:00 AM

(EMA-S20-017-2025) Ferroelectricity in CuInP2S6 under pressure (Invited)

J. Musfeldt^{*1}; S. Shah¹; P. Mohammadi²; S. Cheong³; Z. Liu⁴; S. Singh²

1. University of Tennessee, Chemistry, USA
2. University of Rochester, Mechanical Engineering, USA
3. Rutgers University, Physics, USA
4. University of Illinois Chicago, Physics, USA

9:30 AM

(EMA-S20-018-2025) Revealing Signatures of Unconventional Superconductivity in Tunneling Andreev Spectroscopy (Invited)

P. Maksymovych^{*1}

1. Clemson University, Materials Science and Engineering, USA

10:00 AM

Break

10:30 AM

(EMA-S20-019-2025) Next-Generation Ultralight High-Field Magnets for Higher-Performance Aerospace Applications (Invited)

T. J. Haugan^{*1}; T. Bullard²; J. Bulmer²; C. Kovacs²

1. U.S. Air Force Research Laboratory, Aerospace Systems Directorate, AFRL/RQQM, USA
2. UES, Inc., USA

11:00 AM

(EMA-S20-020-2025) Designing Polar Superconductors through Atomic-Scale Structural and Polarization Analysis (Invited)

S. Salmani-Rezaie^{*1}

1. The Ohio State University, USA

11:30 AM

(EMA-S20-021-2025) Structural, Electronic, and Magnetic Properties of Reactively Sputtered Heteroepitaxial Candidate Altermagnet RuO₂ (Invited)

S. Fields*¹; S. Bennett¹; C. Cress²; J. Prestigiacomo¹; O. van 't Erve¹; D. Wickramaratne¹; N. Combs²; M. Currie²; P. Callahan¹

1. US Naval Research Laboratory, Materials Science and Technology, USA
2. US Naval Research Laboratory, Electronics Science and Technology Division, USA
3. US Naval Research Laboratory, Optical Sciences, USA

12:00 PM

(EMA-S20-005-2025) Spin-lattice entanglement and spin-electronic interactions in quasi-2D antiferromagnet CoPS₃ (Invited)

M. A. Susner*¹; R. Rao²; B. Conner¹; T. Mai¹

1. Air Force Research Laboratory, Materials and Manufacturing Directorate, USA
2. Air Force Research Lab, USA

12:30 PM

(EMA-S20-023-2025) Understanding Bulk Nickelates Superconductivity: Impact of Pressure, Strain and Electron Correlation

B. Samanta*¹; A. Georgescu¹

1. Indiana University Bloomington, Chemistry, USA

S21 Failure The Greatest Teacher

S21-Failure-The Greatest Teacher

Room: Colorado E

Session Chair: Geoff Brennecke, Colorado School of Mines

2:00 PM

End of an Error? The Past and Future of Failure

2:45 PM

Craze-y Ruddlesden-Popper Complex Ceramics- Katharine Page

Anti-Harassment Policy

Statement of Policy

The American Ceramic Society (ACerS) is committed to ensuring that all ACerS activities are free from discrimination, harassment, and/or retaliation of any form. ACerS seeks to foster an environment promoting the free expression and exchange of scientific ideas. ACerS is committed to ensuring equality of treatment and opportunity and freedom from harassment for all members and participants regardless of race, gender, nationality, religious beliefs, gender identity, color, age, marital status, sexual orientation, disabilities, ancestry, personal appearance, or any other basis not relevant to scientific merit. Violators of this policy will be subject to discipline by the Society.

Definition of Harassment

Harassment includes, but is not limited to, offensive verbal comments related to gender, gender identity and expression, sexual orientation, disability, physical appearance, body size, race, national origin, religion, age, marital status, military status, or any other status protected by law; deliberate intimidation; stalking; following; harassing photography or recording; sustained disruption of talks or other events; and inappropriate physical contact. Attendees asked to stop any harassing behavior are expected to comply immediately.

Definition of Sexual Harassment

Sexual harassment does not refer to occasional compliments or other generally acceptable social behavior. Sexual harassment refers to verbal, physical, and visual conduct of a sexual nature that is unwelcome and offensive to the recipient. By way of example, sexual harassment may include such conduct as sexual flirtations, advances, or propositions; verbal comments or physical actions of a sexual nature; sexually degrading words used to describe an individual; an unwelcome display of sexually suggestive objects or pictures; sexually explicit jokes; and offensive, unwanted physical contact such as patting, pinching, grabbing, groping, or constant brushing against another's body. Attendees asked to stop any sexually harassing behavior are expected to comply immediately.

Scope of Policy

This policy applies to all attendees of ACerS meetings, events, and activities, including members, non-members, partnering organizations, volunteers, students, guests, staff, contractors, exhibitors, and all other participants related to ACerS events and activities.

Reporting an Incident

If you are being harassed, notice that someone else is being harassed, or have any other concerns, please contact an ACerS staff member immediately. ACerS staff can be identified by the official staff badge, their name and title. All complaints will be treated seriously and will be investigated promptly.

Names(s) and Contact Information Onsite to Report an Incident

- ACerS Executive Director, Mark Mecklenborg, ph 614-794-5829 / email: ExecDirector@ceramics.org
- ACerS President, Monica Ferraris / email: ACerSPresident@ceramics.org

Disciplinary Action

All reports of harassment will be directed immediately to the ACerS leadership team who may consult with and engage other ACerS staff, leaders and legal counsel as appropriate. Conference security and/or local law enforcement may be involved, as appropriate based on the specific circumstances. In response to a report of harassment, the ACerS leadership team or ACerS staff will take appropriate action. Such actions range from a verbal warning to ejection from the event without a refund. Repeat offenders may be subject to further disciplinary action, such as being banned from participating in future ACerS conferences or events and/or permanently expelled from ACerS membership.

The full policy can be viewed at:

<https://ceramics.org/wp-content/uploads/2021/03/Appendix-3-Anti-Harassment-Policy-Rev-Oct-2020.pdf>

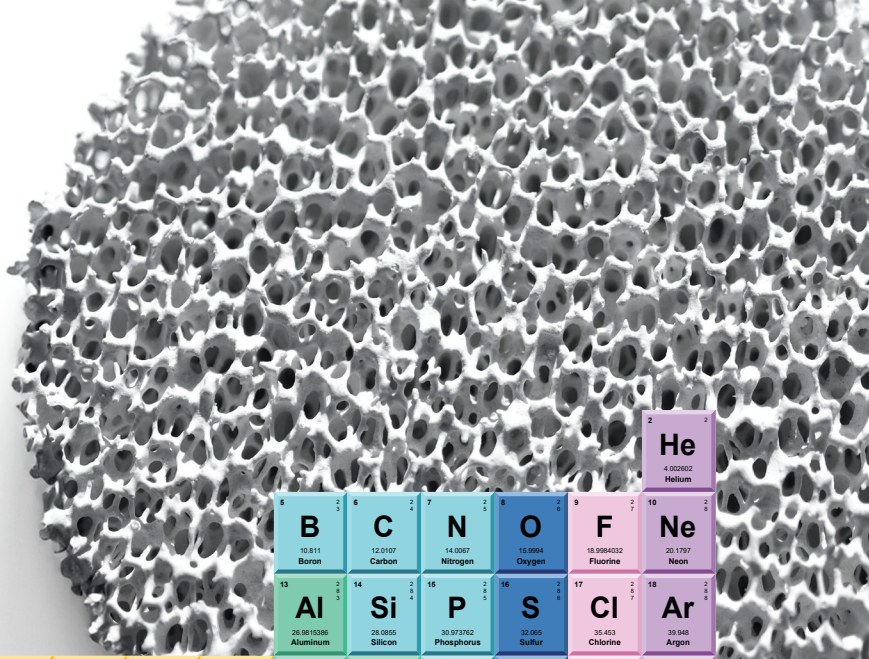


Photo: Ceramic sponge
(nanoscale morphology)
produced from American
Elements proprietary ultra
high surface area powder

Photo: Ceramic sponge (nanoscale morphology) produced from American Elements proprietary ultra high surface area powder

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